# 1.0 Introduction

## 1.1 Overview

This chapter presents an introduction to the Southwest Transitway Alternatives Analysis (AA), including the major study elements, the study partners, the history of the project, and the study process.

## 1.2 Background

In response to continued strong growth in the southwest metropolitan area and downtown Minneapolis and resulting declines in mobility, the Hennepin County Regional Railroad Authority (HCRRA), in partnership with the Metropolitan Council and the cities of Eden Prairie, Minnetonka, Edina, Hopkins, St. Louis Park and Minneapolis, conducted an Alternatives Analysis (AA) for a Southwest Transitway between Eden Prairie and downtown Minneapolis.

The Southwest Transitway AA was conducted in a fashion compliant with Federal Transit Administration (FTA) Section 5309 New Starts guidelines.[1] According to the FTA, the purpose of an Alternatives Analysis (AA) is to compare the benefits, costs and impacts of a range of transit alternatives that address identified mobility needs in order to select a preferred course of action or alternative(s).

A list of the technical reports completed for the Southwest Transitway AA is included in Appendix B of this report. The documents are available on the study website, www.southwesttransitway.org.

## 1.3 Study Elements

The Southwest Transitway AA included the following key elements:

- Public Outreach: a continuous and comprehensive public outreach process.
- Purpose & Need: Definition of the purpose and need for a Southwest Transitway.
- Goals: Establishment of goals for the Southwest Transitway Project.
- Alternatives: Definition of a broad range of transitway alternatives to meet the mobility needs of the study area cities.
- Evaluation: Development of evaluation measures based upon the identified Southwest Transitway goals and consistent with the FTA New Starts Criteria.
- Recommendation: Selection of a preferred course of action.

## 1.4 Study Management

The Southwest Transitway AA was funded by the HCRRA and guided by two inter-agency committees, a policy and technical advisory committee. A comprehensive public outreach program was conducted throughout the AA, and the results were considered in all levels of the decision-making process (Figure 1.1).

### 1.4.1 Hennepin County Regional Railroad Authority (HCRRA)

In 1980, the HCRRA was established as a separate political entity by county resolution in accordance with Minnesota law, Chapter 616. The seven members of the Hennepin County Board

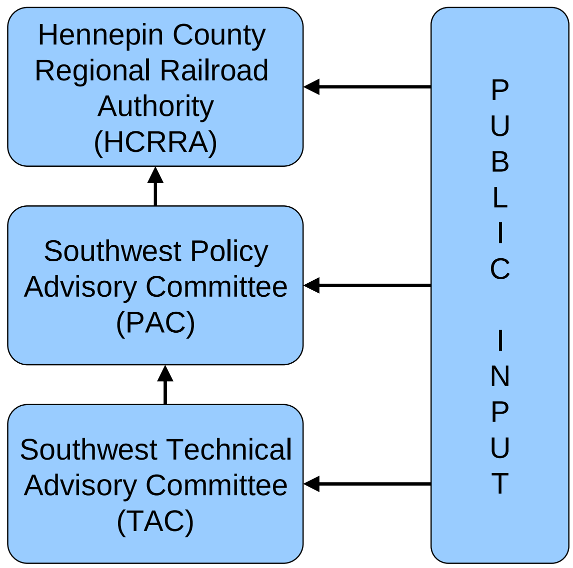
[1] *US Department of Transportation, Federal Transit Administration, Reporting Instructions for the Section 5309 New Starts Criteria, May 2006. Prepared by the Federal Transit Administration, Office of Planning and Development.*

of Commissioners comprise the Authority. The HCRRA's purpose is to acquire abandoned freight rail corridors in order to preserve them for future transportation use and to conduct transit planning.

### 1.4.2 Southwest Transitway Technical Advisory Committee (TAC)

The Southwest Transitway TAC was composed of technical staff from the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, Edina and Minneapolis; Hennepin County; the Metropolitan Council/Metro Transit; SouthWest Metro Transit; Three Rivers Park District; the Minnesota Department of Transportation (Mn/DOT); and Twin Cities & Western Railroad Company.

**Figure 1.1 Study Decision-Making Structure**




The Southwest Transitway TAC met approximately monthly to provide technical assistance throughout the study process. The Southwest TAC developed a preliminary recommendation on a preferred course of action that was shared with the public and then forwarded to the Southwest Policy Advisory Committee (PAC) for their consideration.

### 1.4.3 Southwest Transitway Policy Advisory Committee (PAC)

The Southwest Transitway PAC was composed of elected officials or representatives from Hennepin County; HCRRA; the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, Edina, and Minneapolis; the Metropolitan Council/Metro Transit; SouthWest Metro Transit; Three Rivers Park District; the Midtown Community Works Partnership; the Hopkins Depot; and the Minneapolis Regional, Twin West and Eden Prairie Chambers of Commerce.

The Southwest Transitway PAC met quarterly to provide policy guidance throughout the study process and developed the final recommendation on a preferred course of action. The Southwest PAC recommendation was forwarded to the HCRRA upon completion of the AA.

## 1.5 Study Area

The study area (shown in Figure 1.2) was defined as the geographic area within the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and southwestern and downtown Minneapolis bounded roughly by I- 494 to the south, the HCRRA right-of-way and I-494 to the west, TH 169 south of Excelsior Boulevard and I-35W south of downtown Minneapolis to the east, and I-394 to the north. Major elements of the study area are described below.

### 1.5.1 Land Use

Within the study area, a wide variety of development types and intensities exist. The study area encompasses the well-established high-density development of downtown Minneapolis, as well as quickly growing suburban communities. Downtown Minneapolis remains the largest traffic generator in the region with over 140,000 jobs, the HHH Metrodome, the Target Center, the Convention Center, the Guthrie Theater, the Walker Art Center, and Orchestra Hall. The remaining study area cities have grown quickly in recent years, developing employment concentrations in areas such as Opus and the Golden Triangle, which the Metropolitan Council identifies as the sixth largest employment concentration in the region with over 50,000 employees.

### 1.5.2 Transit Services

The study area is primarily served by Metro Transit, the largest transit provider in the region, and SouthWest Metro Transit, an opt-out (independent) transit provider serving Eden Prairie, Chanhassen, and Chaska. Metro Transit provides express, limited-stop, and local bus service to the study area cities of Minneapolis, St. Louis Park, Hopkins and Minnetonka. SouthWest Metro Transit provides express bus service between downtown Minneapolis and Eden Prairie, Chanhassen, and Chaska as well as local circulator service throughout Eden Prairie, Chanhassen, and Chaska.

A total of 49 bus routes, including 27 express, three limited stop, and 18 local routes, serve the study area. On an average weekday, nearly 28,000 commuters from the study area cities use transit to travel to downtown Minneapolis. Approximately 24,000 weekday study area commuters are carried on Metro Transit buses and 3,600 are carried on SouthWest Metro buses.

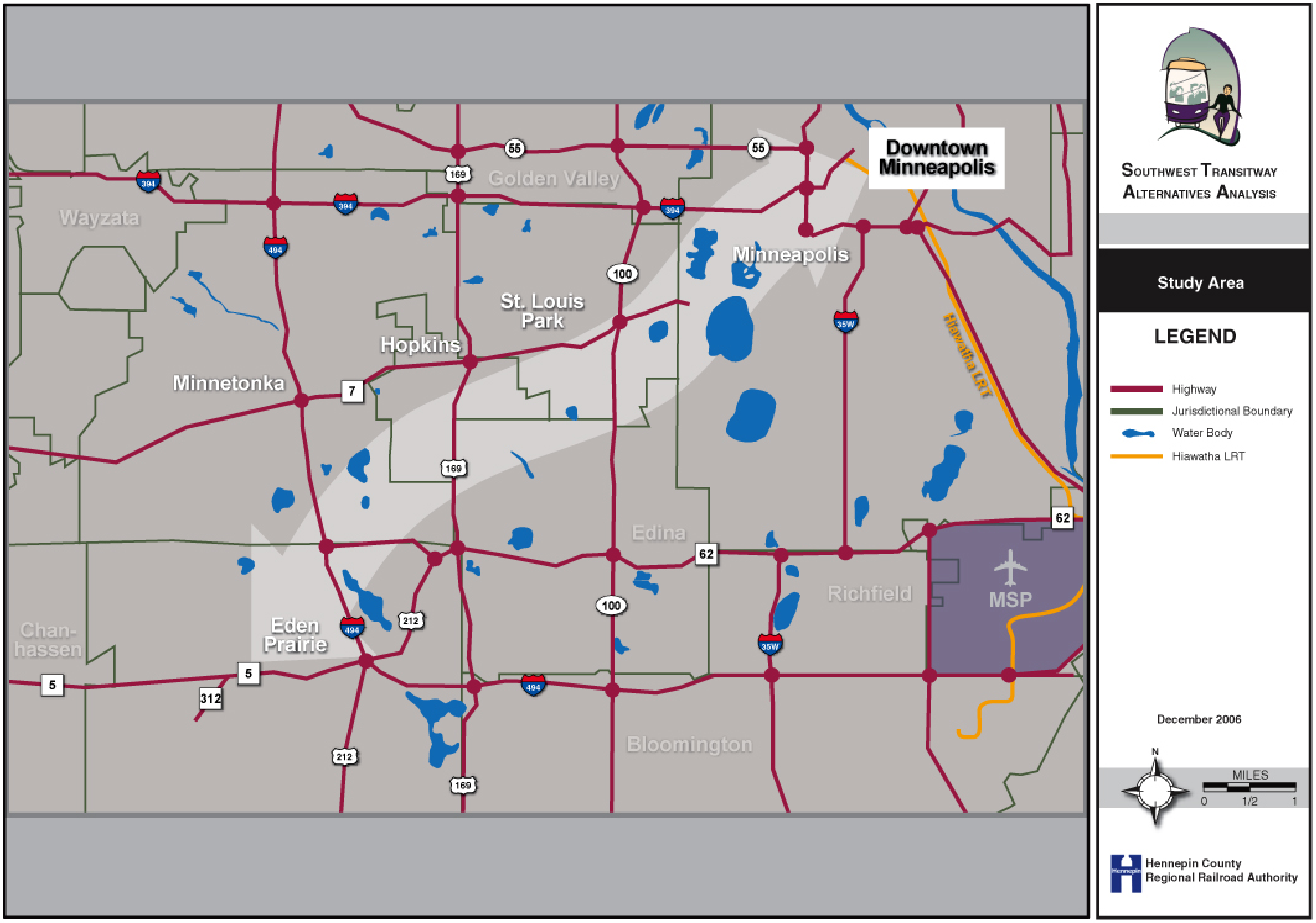
The region has also invested in park-and-ride facilities. While numerous park-and-ride lots are located throughout the study area, the largest single park-and-ride facility with over 1,000 spaces is the SouthWest Metro Transit Station located in Eden Prairie.

Through a partnership called Team Transit, Minnesota Department of Transportation (Mn/DOT), the Metropolitan Council, transit agencies, cities and counties cooperate to provide a system of advantages for transit vehicles on the region's roadway system. These advantages include authorized use of shoulders for bus operations during congested periods, ramp meter bypasses, bus-only freeway ramps, and High Occupancy Vehicle (HOV) lanes. Currently, there are 223 miles of shoulder bus operations, 88 ramp meter bypasses, at least 4 bus-only freeway ramps, and HOV lanes on I-394 and I-35W.

### 1.5.3 Roadways

The study area roadway network is a comprehensive system of interstates, major highways, arterials, collectors and local streets. Between 1990 and 2000, traffic growth on the major interstates and highways in the southwest metropolitan area increased by approximately 23 percent. With continued population and employment growth, traffic on the southwest metropolitan area major interstates and highways is expected to increase an additional 40% by 2020. This growth in demand for travel, in conjunction with limitations on the region's ability to expand existing roadways, will place a strain on mobility in the southwest metropolitan area.

## Figure 1.2 Study Area



### 1.5.4 Bicycle and Pedestrian Trails

Within the study area, four interim use trails are located on land owned by the HCRRA. This land was purchased by the HCRRA to preserve it for a future transportation use. Those trails are commonly known as the Southwest LRT Trail, the Cedar Lake Trail, the Kenilworth Trail, and the Midtown Greenway Trail. Between downtown Minneapolis and Chaska, Three Rivers Park District categorizes the Southwest and Cedar Lake trails as the Minnesota River Bluffs LRT Regional Trail (between Hopkins and Chaska), and the Cedar Lake and Cedar Lake North LRT Regional Trails (between Hopkins and Minneapolis). These trails are operated and maintained by Three Rivers Park District, formerly Suburban Hennepin Parks. The Kenilworth and Midtown Greenway Trails are operated and maintained by the City of Minneapolis.

These trails are considered allowable “interim” uses according to the HCRRA’s 1995 Land Management Plan. The ultimate vision for these corridors is a user-friendly, multi-modal corridor serving the needs of transit riders while accommodating pedestrians and bicyclists. Through the cities of Eden Prairie, Minnetonka, Hopkins, and St. Louis Park, the HCRRA owns approximately of 100 feet of right-of-way along the Southwest, Kenilworth, Cedar Lake and Midtown corridors. One notable exception is a small portion of the Kenilworth Corridor where the HCRRA right-of-way narrows to approximately 62 feet. Typically a trail requires 10 to 14 feet of space and two tracks of LRT or two lanes of BRT require 30 to 35 feet of space. Either LRT or BRT and a trail could be accommodated in 60-100 feet of right-of-way width.

According to the *Rails-to-Trails Conservancy*, trails exist adjacent to active rail lines in over 60 areas in the United States, including a number of areas in Minnesota. Within the study area, rails and trails currently co-exist in the Kenilworth, Cedar Lake, and portions of the Southwest Corridor. The shared use of these corridors has occurred since the mid-1990s with no incidents related to the operation of freight trains next to the trails.

The study area also includes portions of the Grand Rounds in Minneapolis, a National Scenic Byways system including trails and paths. Within the study area, the connecting Grand Rounds system includes trails for pedestrians and bicyclists around Brownie and Cedar Lakes, Lake of the Isles and Lake Calhoun in Minneapolis.

In addition to the trails noted above, the suburban cities in the southwest study area maintain local trail networks, with both on-road and off-road facilities.

### 1.5.5 Freight Rail Lines

Three active freight lines, the Canadian Pacific (CP), the Burlington Northern Santa Fe (BNSF), and the Twin Cities & Western (TCW), currently operate within the study area. These freight rail companies provide freight service to customers within the study area and the Twin Cities region, as well as to other regions of the country (Seattle, Washington; Aberdeen, South Dakota; and Kansas City, Missouri).

## 1.6 Previous Planning Studies

The Southwest Transitway was identified in the mid-1980s as a transit corridor, and studied for various transit modes including Light Rail Transit (LRT), Bus Rapid Transit (BRT), and Diesel Multiple Units (DMU). The following briefly describes the planning history of the Southwest Transitway.

### 1.6.1 Relevant Transportation Studies

*Comprehensive Light Rail Transit (LRT) System Plan, Hennepin County, 1988*
In 1988, the Hennepin County Regional Railroad Authority (HCRRA) completed a *Comprehensive Light Rail Transit System Plan* that identified the Southwest transitway from Hopkins to downtown Minneapolis as a future LRT corridor.

*29th Street and Southwest Busway Feasibility Study, Hennepin County, February 2000*
In 1999, Hennepin County and Metro Transit conducted a study to determine the feasibility of constructing and operating limited-stop, rapid-transit busways in the 29th Street corridor, now known as the Midtown Corridor, and in the southwest corridor from Hopkins to downtown Minneapolis (now a part of the Southwest Transitway). The study concluded that based solely on ridership forecasts and cost estimates, the busway was 'technically' feasible.

*Vintage Rail Trolley Study, 29th Street and Southwest Corridors, Hennepin County, September 2000*
In 2000, the Hennepin County Regional Railroad Authority (HCRRA) in partnership with the Metropolitan Council completed the Vintage Rail Trolley Study as an addendum to the *29th Street and Southwest Corridors Busway Feasibility Study*. This study evaluated the feasibility of constructing and operating a vintage rail trolley as a precursor to future LRT service in the 29th Street (Midtown Corridor) and the Southwest Transitway from Hopkins to downtown Minneapolis.

*Twin Cities Exclusive Busway Study, Mn/DOT, August 2000*
In 2000, Mn/DOT conducted a study to ascertain the cost of constructing and operating an exclusive busway system in the metropolitan area by the year 2020. The study recommended three potential exclusive busway corridors for implementation by 2010: the Southwest Transitway (defined as Eden Prairie to downtown Minneapolis), the St. Paul Northeast Transitway (now known as the Rushline), and the Minneapolis Northwest Transitway (now known as the Bottineau Boulevard).

*Southwest Rail Transit Study, 2003*
In 2002, the HCRRA, in partnership with the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park and Minneapolis, conducted the Southwest Rail Transit Study to determine if rail transit should be part of the transportation strategy for the southwest metropolitan area. The study evaluated twelve routes using light rail transit (LRT) and one using the diesel multiple unit (DMU) technology.

The study concluded that the following four LRT alternatives be retained for further analysis:

- LRT 1A: from TH 312 in Eden Prairie to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor.
- LRT 2A: from the SouthWest Metro Transit Station in Eden Prairie to downtown Minneapolis via I-494, the HCRRA property, and the Kenilworth Corridor.
- LRT 3A: from the SouthWest Metro Transit Station in Eden Prairie to downtown Minneapolis via the Eden Prairie Center Mall, the Golden Triangle, Opus, downtown Hopkins, the HCRRA property, and the Kenilworth Corridor.
- LRT 4A: from downtown Hopkins to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor.

In addition, the *Southwest Rail Transit Study* recommended that future studies should include an analysis of a rail transit connection in the Midtown Corridor, environmental impacts and mitigation measures, public involvement, and retention of the trails.

*2030 Transportation Policy Plan (TPP), 2004*
In 2004, the Metropolitan Council published the 2030 *Transportation Policy Plan* (TPP). The TPP incorporates the transportation policies and plans that support the Metropolitan Council's Regional Development Framework and describes the Council's approach to investments between now and 2030. The TPP was prepared pursuant to the federal Transportation Equity Act for the 21st Century (TEA-21) requirements and to Minnesota Statutes section 473.145 and 146. The TPP also includes the *2030 Transit Plan*, which identifies the Southwest Transitway as a Tier 2 Transitway for implementation after 2020.

*2030 Transit Plan*
The Metropolitan Council's 2030 Transit Plan is the region's long-range plan for transit investments. The Council goal is to double transit ridership by 2030 through doubling bus service and implementing transitways. The Transit Plan targets a 50% increase in regional transit ridership by 2020, and a 100% increase by 2030 through increased bus service and implementing a series of transitways in key regional corridors. The transitways may use light rail, commuter rail, or bus rapid transit technologies.

A system of transitways is a key component of this plan because transitways provide a travel time advantage over single-occupant automobiles, improve transit service reliability, and boost the potential for transit-oriented development, all goals and objectives of the Southwest Transitway Alternatives Analysis (AA).

The Council projects that implementing the transitway system could save approximately $2 billion in local road and utilities costs, save $2 billion through reducing time lost in congestion, reduce automobile trips by 245,000 annually in the region, reduce vehicle miles traveled by 550 million miles annually, save 27 million gallons of fuel, and reduce carbon monoxide emissions by 6,600 tons annually.

The overall plan to increase transit ridership includes the Southwest Transitway, identified as a future transitway on dedicated right-of-way. Figure 1.3 illustrates the Metropolitan Council's planned 2030 Transitway System.

### 1.6.2 Local Comprehensive Plans

The Southwest Transitway is referenced in the adopted local comprehensive plans of Hennepin County, Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. The following excerpts from current comprehensive plans pertain to the Southwest Transitway.

*Eden Prairie*
"Transit rail options for the City are anticipated, as Hennepin County acquired the old Chicago Northwestern Railroad right-of-way through Eden Prairie in 1990 for a future Light Rail Transit (LRT) System…Possible completion of the system would occur around 2015. Until LRT is developed, the right-of-way will be available for public use as a recreational trail. It is the stated goal of this Comprehensive Plan that the City will support regional transit initiatives such as Light Rail Transit and Commuter Rail." *(Comprehensive Plan Vision Goals and Policies, December 17, 2002* – pages 2-16 through 2-18)

*Minnetonka*
"The City will work with existing and new employers located in the City to ensure that employers support transit use and carpooling by their employees." *(Comprehensive Plan, April 1999* – pages 4-2 and 4-3)

*Hopkins*
"The City will encourage the HCRRA to construct the Minneapolis Southwest Corridor light rail transit line as soon as feasible, including the planned station in Hopkins. The City supports the proposed locations for the light rail transit station in Hopkins and will work with HCRRA on station planning and design. The City will publicize the expected location of the LRT station in the community in order to promote the use of this new travel mode and also to make the general public aware of the easy access Hopkins enjoys to the central city (and from the central city outward)." *(Comprehensive Plan December 21, 1999* – Transportation Chapter, Subheading Light Rail Transit)

*St. Louis Park*
"A new location was recently identified as part of the Southwest Regional Trail connecting the Hopkins trailhead to the future Midtown Greenway in Minneapolis. The regional trail has been named 'LRT' this railroad corridor is designated as a future light rail transit route and may be developed as a dedicated busway in the interim." *(Comprehensive Plan 2000-2010* – pages 1-46)

*Minneapolis*
"Light Rail Transit is considered a high priority investment for express transit corridors in both regional and city transit plans. Minneapolis will continue to aggressively pursue transit improvements in corridors which serve major transit origins and destinations, with the eventual goal of a region-wide rail system, including light rail (LRT) and commuter rail." *(The Minneapolis Plan 2000* – Movement 1.8.1)

*Hennepin County*
"Hennepin County and its departments are committed to supporting a multitude of travel modes. The Hennepin County Regional Rail Authority will continue to lend strong support for the development and implementation of LRT and provide for interim bus, pedestrian and bicycle uses along their future LRT corridors." *(Hennepin County Transportation Systems Plan, March 27, 2004* – Chapter 10, page 10-3)

## 1.7 Current Planning

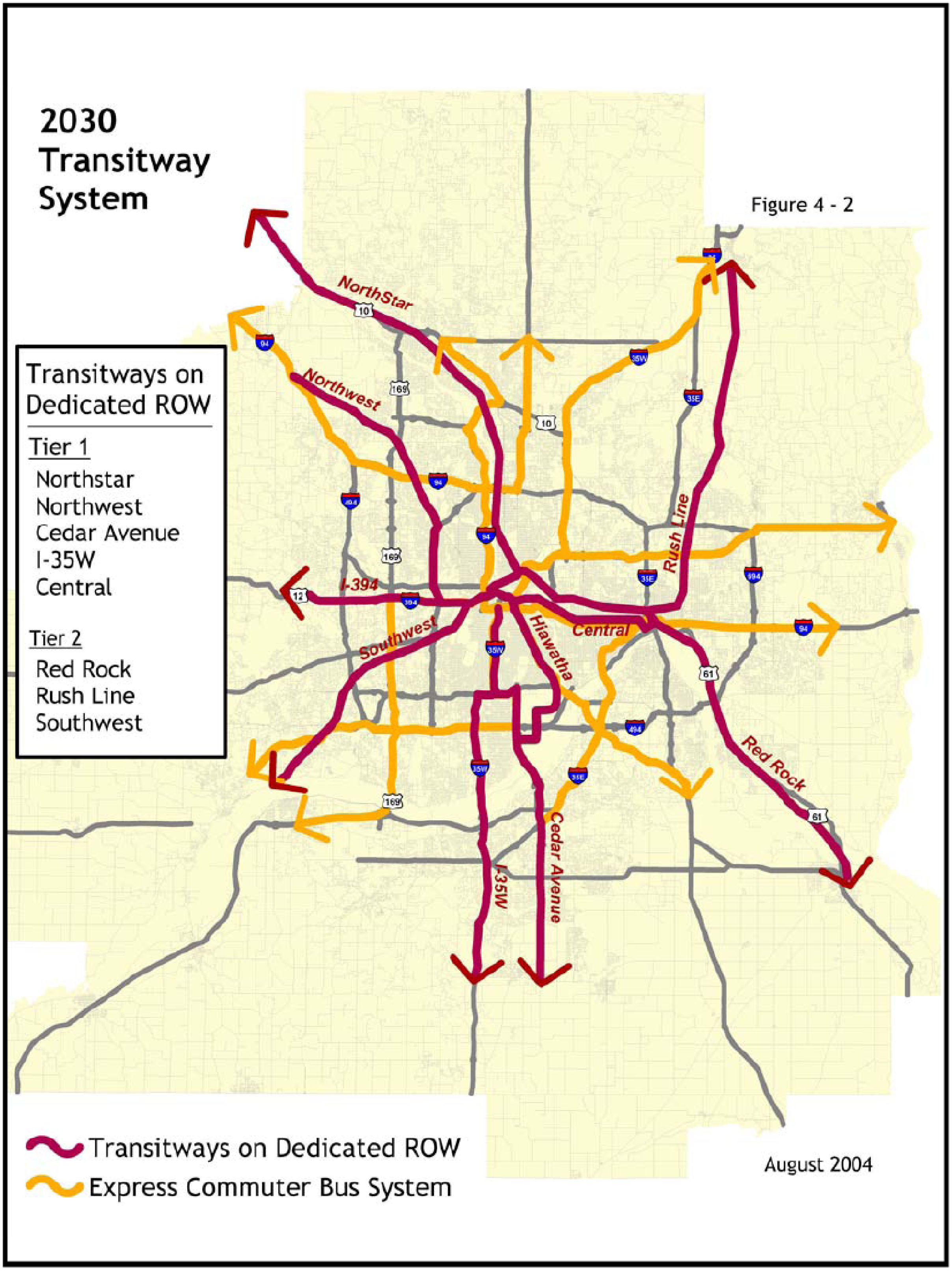
### 1.7.1 2030 Transportation Policy Plan (TPP), 2008

In 2008, the Metropolitan Council will be updating their systems plans including the TPP.

### 1.7.2 Local Comprehensive Plan Updates

Comprehensive plan updates are underway in all communities within the Twin Cities, for transmission to the Metropolitan Council in September 2008.

## Figure 1.3 Metropolitan Council 2030 Transitway System




Source: Metropolitan Council, 2004

# Southwest Transitway Alternatives Analysis

# Technical Memorandum No. 9
# Public Outreach Plan

Prepared for
Hennepin County Regional Railroad Authority

Prepared by:

Parsons Brinckerhoff Quade & Douglas, Inc.
KLD Consulting

January 28, 2005

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## Background

During the past 20 years numerous studies have been conducted regarding the Southwest Corridor. The present alternatives analysis study will expand upon previous work by further evaluating transit alternatives to reach a broad consensus on a preferred course of action. In addition to technical study tasks, this effort will include an extensive and inclusive public involvement program.

Without meaningful public participation, there is a risk of making less than optimal decisions. With it, it is possible to make a lasting contribution to an area's quality of life. Public involvement is more than an agency requirement and more than a means of fulfilling a statutory obligation. The Hennepin County Regional Railroad Authority (HCRRA) is committed to strong public participation as central to good decision-making.

## Purpose and Objective

The fundamental objective of the public involvement program is to ensure that the concerns and issues of those with a stake in the Southwest Corridor are identified and appropriate responses are provided. The public involvement plan for the alternatives analysis study must provide for:

- early and continuous involvement of stakeholders;
- reasonable public availability of technical and other information;
- collaborative input on alternatives, evaluation criteria and mitigation needs; and
- open access to the decision-making process.

This public involvement plan, which builds from the public involvement activities conducted for the Southwest Rail Transit Study in 2002 and 2003, includes the following:

- Identification of affected public and other stakeholder groups, and their issues;
- Identification of outreach techniques for engaging stakeholders in the study process, which will result in an accurate and full public understanding of transportation issues in the southwest metro area.

## Plan Development

In January 2005, the HCRRA Study Manager and the consultant team solicited input from Technical Advisory Committee members, including staff from the cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie, in identifying stakeholders and their issues. In addition, this Plan builds from the public involvement activities undertaken during the Southwest Rail Transit Study in 2002 and 2003. Principles contained in the Systematic Development of Informed Consent (SDIC) process were revisited as guidelines for developing public involvement strategies. The main element of this process that will be incorporated is the development of a public outreach strategy that is comprehensive (providing the public with multiple opportuntieis to learn about the study and to comment), and that the process for selecting mode and route alternatives is perceived as open and fair. Strategies include approaching the public in smaller group settings, and where community or business groups are already meeting. Also, tactics include active listening, avoiding ‘debating’ issues, demonstrating impartiality, working in collaboration with other governmental units (to avoid ‘the runaround’), and communicating in terms that the public understands.

## Identification of Stakeholders and their Issues

The following list of stakeholders includes stakeholders from the last Southwest transit study and expands the list to include a greater range of groups that are expected to have interest in the development of a Southwest Corridor Transitway:

A. The broader community that will have a stake in this study includes:

- Hennepin County residents
- Residents from the Cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, Eden Prairie
- Residents from other southwest metro area cities (Edina, Chanhassen, Chaska, Victoria, and Shakopee)
- Traveling public (transit users and well as auto users) in the southwest metro area
- Future Generations

**Potential Issues**:
- Easy access to basic, understandable information about the study, its purpose, timelines, connection to regional system, and other information that provides for a comprehensive understanding of the study and what it will mean to make significant transit improvements in the southwest metro area
- Multiple opportunities to provide input that will guide the study and public policy developed through the study process

B. Organized Interest Groups (groups within each category are listed in Appendix A):
- Residents adjacent to proposed alignments
- Minneapolis neighborhood groups
- Midtown Greenway Coalition
- Trails without Rails
- Friends of Birch Island Woods
- Opus Condominium LRT Committee
- Present transit system users
- Businesses located near the corridor and business organizations (chambers, Kiwanis, Lions, etc)
- Freight railroad companies
- Present trail system users
- Bicycle clubs
- Students, teachers, and school administrators
- Transit for Livable Communities

**Potential Issues**:
Various groups will have different issues, ranging from:
- impact on properties adjacent to alignments such as noise, visual impacts, safety
- development and redevelopment potential near station locations
- aversion to change, even beneficial change
- impact on existing trail and trail users
- the lengthy processes required in order to develop a major transit project
- impacts on businesses
- connectivity to high-density employment bases
- impact on highway traffic congestion
- impacts on local traffic conditions
- coordination with regional systems, and local transit operations
- capital and operating costs, and how these costs compare to other transportation options
- funding of both capital and operating costs

C. Agencies/Officials with whom the HCRRA will partner or keep apprised of study progress include:
- City mayors and councils
- State Elected Officials (Hennepin County Legislative Delegation and the Governor)
- Southwest Metro Transit
- Three Rivers Park District
- Metro Transit
- Metropolitan Council
- Minnesota Department of Transportation

**Potential Issues**:
As with community groups, issues of various agencies and officials will be unique to each group/individual. In general, the issues of agencies and officials will reflect issues raised by their constituencies. The main objective with regard to these groups and officials will be to keep them well informed throughout key phases of the study, and to build partnerships that reflect the collaborative nature of this study.

D. Local Media
- Star Tribune
- Southwest Journal
- Eden Prairie News
- Eden Prairie Sun Current
- Minnetonka Sun Sailor
- Hopkins-East Minnetonka Sun Sailor
- St. Louis Park Sun-Sailor
- The Pulse
- City Pages
- The Minnesota Daily
- Skyway News

**Potential Issues**:
Media representatives expect to be kept current regarding issues of interest to their reading public. Addressing growing mobility concerns in the metro area is one of the higher profile issues facing our region, and therefore, local media will wish to report on study progress and policy implications that arise from the study.

## Outreach Techniques and Strategies

**Table 1: Summary of Techniques and Strategies to be Employed**

| | Techniques/Strategies | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Stakeholders** | Newsletters/ Fact Sheets | Open Houses | Presentations | News Releases/ Articles | Web Site/ Email Communications | Community/ Neighborhood Meetings | Policy Advisory Committee | Technical Advisory Committee | Special Meetings/ Relationship Building |
| Broader community | ● | ● | | ● | ● | | | | |
| Organized Interest Groups of interested citizens | ● | ● | ● | ● | ● | ● | | | ● |
| Agencies/officials | ● | ● | ● | ● | ● | | ● | ● | ● |
| Local media | ● | ● | | ● | ● | | | | ● |

## Table 2: Timing and Logistical Details for Outreach Strategies

| Technique | Timing | Logistics |
|---|---|---|
| **Newsletters (5)** | 1) Study Outset (April 2005)<br>2) Purpose and Need, Alternatives (July 2005)<br>3) Study Progress / Community Issues (October 2005)<br>4) Ridership, costs, evaluation (January 2006)<br>5) Recommendation for a Preferred Alternative (April 2006) | Newsletters to be developed with direction from the Project Manager, and distributed to PAC and TAC mailing lists, interested citizens, and at open houses and other community meetings. |
| **Fact Sheets / FAQs /News Releases (6)** | At key study intervals, as determined by the Project Manager with input from the PAC and TAC. | Hennepin County Public Affairs will be the primary contact with the local media. At key intervals, the consultant team will work with the Project Manger to provide study information and develop feature stories for Hennepin County Public Affairs to distribute to local papers and media outlets. |
| **Community Open Houses (6 = 2 series of open house at 3 locations within the corridor)** | Open Houses to be held at 3 locations within the corridor, once in the early project phase (May 2005), and when a preferred alternative is being recommended (June 2006). | Open houses will be at locations convenient for residents and will feature clear and accessible information shown in handouts and on presentation boards, and will offer residents an opportunity to discuss the project directly with HC staff and consultants. Input will be actively solicited and tallied for reporting to the TAC and PAC in order to provide a sense of community concerns and opinions. |
| **Council Workshops (15)** | Presentations to each of the five partner cities at the outset of the Study (February / March 2005); when alternatives have been analyzed and comparison data is available (February 2006), and when a recommended PA is being considered (May / June 2006) | Council workshops in each of five cities at three points in the Study. |

| | | |
|---|---|---|
| **Web Site** | The web site will contain basic descriptive information about the proposed transitway and the Study, including corridor maps, newsletters, PAC actions, links to various related sites, etc. | To be updated at least quarterly throughout the Study. Hosted by Hennepin County & linked to other websites (cities, Metropolitan Council, Southwest Metro, etc.) |
| **E-mail communications** | The web site will include an email address that will be answered by the Hennepin County Project Manager. Emails received by interested citizens to be logged and responded to as deemed appropriate by the Project Manager. | Maintained by Hennepin County; auto response to all messages and individualized responses as deemed appropriate; record all e-mail addresses received; broadcast emails |
| **Technical Advisory Committee (TAC) (16)** | Approximately monthly meetings between January 2005 and June 2006 to track study progress and to solicit input at frequent intervals from partner cities. | TAC meets every four-to-six weeks to discuss interim results; review draft products; provide input and recommendations regarding public outreach efforts. |
| **Community/Neighborhood Meetings and Presentations (36)** | March 2005 – June 2006 | Build relationships with neighborhood and community groups; offer to attend and present Study information at regularly scheduled meetings or in a way that is convenient for community members. Solicit input and feedback, document and report. |
| **Business Meetings (18)** | March 2005 – June 2006 Business Breakfast in June 2005 | Build relationships with local businesses and business groups. Convene at least one "Business Breakfast" in conjunction with chambers to engage the business community. Include invitations to local school superintendents as well to engage schools. |
| **Documentation of Public Outreach Activities and Community Input** | Throughout the Study, with a report section to be included in the full Alternatives Analysis report. | |

## Appendix A: Community/Neighborhood Groups

| | |
|---|---|
| **Minneapolis neighborhood groups** | - CIDNA (Cedar Isles Dean)<br>- CARAG<br>- East Isles<br>- West Calhoun<br>- Lowry Hill<br>- Kenwood Isles<br>- Bryn Mawr<br>- Warehouse District North Loop |
| **Other Minneapolis Groups** | - Midtown Greenway Coalition<br>- Midtown Community Works Partnership<br>- AIMCO (Calhoun Beach Club Apartment Buildings and businesses) |
| **Suburban neighborhood groups / associations** | - Trails without Rails<br>- Friends of Birch Island Woods<br>- Opus Condominium Group<br>- Fern Hill Neighborhood Association<br>- Birchwood Neighborhood Association<br>- South Oak Neighborhood Association<br>- Oak Hill Neighborhood Association<br>- Wolf Lake Neighborhood Association<br>- Triangle Neighborhood Association<br>- Elmwood Neighborhood Association<br>- Meadowbrook Neighborhood Association<br>- Edenvale Neighborhood Association<br>- Forest Hills/Kings Forest Neighborhood Association<br>- Hillcrest Neighborhood Association |
| **Businesses located in the study area and business organizations (chambers, Kiwanis, lions, etc)** | - City of Lakes Chamber (part of the Minneapolis Regional Chamber)<br>- Minneapolis Downtown Council<br>- Twin West Chamber<br>- Eden Prairie Chamber<br>- SuperValu<br>- Methodist Hospital and Park Nicollet Clinic<br>- Opus complex<br>- Golden Triangle<br>- Wooddale Business Area<br>- Downtown Hopkins Business Area<br>- Elmwood Business Area<br>- Minneapolis Farmers' Market Area<br>- Calhoun Commons Area<br>- Hopkins Business & Civic Association<br>- Hopkins Rotary<br>- Minnetonka Corporate Center<br>- Crosstown Industrial Park<br>- Northland Aluminum<br>- Skunk Hollow<br>- Eden Prairie Market Center<br>- Beltline Industrial Park<br>- Uptown Area<br>- Lake Street Business Association |

| | |
|---|---|
| **Freight railroad companies** | - Canadian Pacific<br>- Twin City & Western<br>- Burlington Northern Santa Fe |
| **Others** | - *Present trail system users*<br>- Transit system users<br>- Transit for Livable Communities<br>- Minneapolis Transportation Management Organization (TMO)<br>- Immigrant groups<br>- Watershed Districts<br>- Citizens League<br>- Minneapolis Park & Recreation Board<br>- Three Rivers Park District<br>- Minneapolis TMO<br>- Metro Transitways Development Board<br>- State Legislators<br>- MN Governor<br>- Federal Congressional Delegation<br>- Federal Transit Administration<br>- Local Elected Officials<br>- Local Planning Commissions & Transportation Committees |
| ***Stakeholder Partners*** | |
| **City / Agency Partners** | - *Cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, Eden Prairie*<br>- *Southwest Metro Transit*<br>- Three Rivers Park District<br>- Metropolitan Council<br>- Metro Transit<br>- Mn DOT |

# Southwest Transitway Alternatives Analysis

# Technical Memorandum No. 8
# Operating Cost Estimates

*Prepared for*
*Hennepin County Regional Railroad Authority*

*Prepared by:*

*PB Americas, Inc. (PB)*

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# 1. Introduction

This technical memorandum documents the methodology, assumptions, and results of the Operating and Maintenance Cost Estimate task prepared for the Southwest Transitway Alternatives Analysis (Southwest Transitway AA).

# 2. Background and Assumptions

Annual operating and maintenance (O&M) costs consist of the ongoing costs of operating, maintaining, and managing the transit system.

These costs typically include:

- Labor costs (wages, fringe benefits, and other costs) for bus and rail operators, vehicle and facility maintainers, and other personnel directly engaged in providing transit service
- Fuel and electricity for motive power
- Parts, fluids and materials for maintaining the vehicles
- The non-labor operating costs of operating facilities (such as rail stations or bus park-and-ride lots) or maintenance facilities (such as bus and rail storage and maintenance facilities. These include utilities and materials for cleaning and maintaining the facilities.
- Administrative costs—labor and other costs associated with the management and direction of the transit agency.
- Insurance

Operating and maintenance costs were estimated in 2005 dollars and then escalated to 2006 dollars for reporting in this document. The costs also are reported in 2015 dollars, with all categories uniformly inflated at an annualized rate of 2.7%.

When estimating the annual operating and maintenance costs for the various Southwest Transitway alternatives it was assumed that all service identified in the Metropolitan Council's Transit 2030 Plan is operational. This includes the following transitway corridors: the Hiawatha light rail transit (LRT) line, the Northstar Commuter Rail line, the Central LRT line, the Cedar Avenue Busway, the I-35W Busway, the Bottineau Boulevard Busway, the Red Rock Commuter Rail, and the Rush Line Corridor. O&M costs include all bus and light rail system costs associated with the Southwest Transitway alternative improvements to the transit system but do not include costs for commuter rail services.

# 3. Methodology

The annual operating and maintenance cost estimates are developed on a system-wide basis, disaggregated into rail and bus services, to see that all changes to the transit system associated with a given alternative—whether the change is in the addition or modification of the rail system, or is in the underlying bus transit system—are reflected in the cost estimates. This methodology is consistent with the requirements of the Federal Transit Administration's New Starts process, which requires that projected annual system-wide operating costs be a component of the calculation of user benefit statistics used for ranking potential projects.

Annual operating and maintenance costs for the alternatives were estimated using a multi-factor cost model. The cost model disaggregates actual O&M costs for recent years as reported by Metro Transit to the National Transit Database (NTDB), a database maintained by the Federal Transit Administration (FTA) to monitor and report the performance of US mass transit agencies. The costs are disaggregated into cost categories that can be reasonably assumed to vary with quantities of service provided. The differences in quantities of service provided under each alternative are expressed in differences in operating statistics that serve as cost drivers. These cost drivers include:

- Vehicle revenue hours of service
- Vehicle revenue miles of service
- Number of vehicles required in maximum service
- Number of fixed guideway miles

Some of the operating statistics relevant to operations and maintenance costing come from the Twin Cities Regional Model such as miles of bus and rail service and running times for the bus and rail routes; other operating statistics are factored from model numbers based on assumptions Metropolitan Council staff helped develop -- to obtain vehicle hours of service and fleet size, for example. As an example, under the LRT 1A alternative, the Twin Cities Regional Model estimated that compared to the Enhanced Bus alternative, the region would operate about 790,000 fewer annual revenue miles of service.

The basis for the FTA preferred process for operations and maintenance costing is based on existing local agency bus (and rail, if available) service characteristics factored for the cost categories that vary by the amount of each type of service characteristic. For example, some categories of operating costs tend to vary by miles of service (such as fuel costs), while others vary by hours of service (such as driver labor and fringe benefits), still others vary by the number of required peak vehicles (such as vehicle cleaning). For light rail operations, the model further segregates costs that vary by the number of fixed guideway miles.[1] These cost drivers were generated based on outputs from the ridership estimation tasks performed for each of the alternatives (the enhanced bus, BRT and LRT alternatives) using the Twin Cities Regional Model. Administrative costs are assumed to increase proportionally in response to changes in the volume of service based on their current proportion in the cost of operating the transit system. The model allows some cost items to remain “fixed” and invariable regardless of the volume of service operated. A full breakdown of the cost items and their assignment by cost categories is shown for bus operations in Table 1 and for rail operations in Table 2.

The data source for bus operating costs was Metro Transit’s 2003, 2004 and 2005 submissions to the NTDB. Costs for 2003 and 2004 were inflated to 2005 dollars at an annual inflation rate of 2.7%. Costs categories associated with each of the three cost drivers (revenue vehicle miles, hours and peak vehicles required under maximum

[1] NTDB does not require transit agencies to report statistics for BRT operations separate from those of other bus operations. For this reason the methodology applied to light rail—in which some cost categories are driven by the number of fixed guideway miles—was not used to estimate costs of BRT operations. BRT costs were included in overall bus operations.

service) were then averaged for the three years. The totals under each cost driver were then divided by the average value for each cost driver for the years 2003-2005.

For LRT, only 2005 costs categories and cost drivers were used, because 2005 was the first full year of LRT operations in the Twin Cities. For LRT, cost categories were assigned to a fourth cost driver, fixed guideway miles. The unit costs used in the estimates are reported at the bottom of Table 1 for bus and Table 2 for rail.

**Table 1 Assignment of Operating Cost Items and Operating Cost Factors for Metro Bus Operations, Based on 2003-2005 Average Costs and Units**

| **2003-2005 Actual Expenses** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **Annual Cost & Attribution** | | | | | | |
| | **Annual Cost** | **Revenue-Vehicle-Hours** | **Scheduled Revenue-Vehicle-Miles** | **Peak Vehicles** | **Exclusive Access Right-of-Way Miles** | **Fixed (not in model)** | **Gen Admin. Percentage Add-On** | **% of Total** |
| **Vehicle Operations Labor** | | | | | | | | |
| Operator Salaries and Wages | $ 54,900,139 | $ 54,900,139 | | | | | | 27% |
| Other Salaries and Wages | $ 12,748,443 | $ 12,748,443 | | | | | | 6% |
| Fringe Benefits | $ 46,082,752 | $ 46,082,752 | | | | | | 23% |
| Services | $ 341,688 | | | $ 341,688 | | | | 0% |
| **Sub-Total** | **$ 114,073,022** | **$ 113,731,334** | **$ -** | **$ 341,688** | **$ -** | **$ -** | | **57%** |
| **Vehicle Operations Materials and Supplies** | | | | | | | | |
| Fuel and Lubricants | $ 10,853,228 | | $ 10,853,228 | | | | | 5% |
| Tires and Tubes | $ 70,359 | | $ 70,359 | | | | | 0% |
| Other Materials/Supplies | $ 428,846 | | $ 428,846 | | | | | 0% |
| Utilities | $ - | | $ - | | | | | 0% |
| Casualty and Liability | $ - | | | $ - | | | | 0% |
| Taxes | $ - | | | $ - | | | | 0% |
| Miscellaneous | $ - | | | $ - | | | | 0% |
| Expense Transfers | $ - | | | | | $ - | | 0% |
| **Sub-Total** | **$ 11,352,433** | **$ -** | **$ 11,352,433** | **$ -** | **$ -** | **$ -** | | **6%** |
| **Vehicle Maintenance Labor** | | | | | | | | |
| Other Salaries and Wages | $ 16,072,345 | | $ 8,036,173 | $ 8,036,173 | | | | 8% |
| Fringe Benefits | $ 10,935,826 | | $ 5,467,913 | $ 5,467,913 | | | | 5% |
| Services | $ 261,054 | | $ 130,527 | $ 130,527 | | | | 0% |
| **Sub-Total** | **$ 27,269,225** | **$ -** | **$ 13,634,613** | **$ 13,634,613** | **$ -** | **$ -** | | **14%** |

*Source: Parsons Brinckerhoff, 2006*

**Table 1 cont. Assignment of Operating Cost Items and Operating Cost Factors for Metro Bus Operations, Based on 2003-2005 Average Costs and Units (continued)**

| 2003-2005 Actual Expenses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Annual Cost & Attribution | | | | | | |
| | Annual Cost | Revenue-Vehicle-Hours | Scheduled Revenue-Vehicle-Miles | Peak Vehicles | Exclusive Access Right-of-Way Miles | Fixed (not in model) | Gen Admin. Percentage Add-On | % of Total |
| **Non-Vehicle Maintenance Materials and Supplies** | | | | | | | | |
| Fuel and Lubricants | $ - | | | $ - | | | | 0% |
| Tires and Tubes | $ - | | | $ - | | | | 0% |
| Other Materials and Supplies | $ 723,529 | | | $ 723,529 | | | | 0% |
| Utilities | $ - | | | $ - | | | | 0% |
| Casualty & Liability | $ 81,802 | | | $ 81,802 | | | | 0% |
| Taxes | $ - | | | $ - | | | | 0% |
| Miscellaneous | $ - | | | $ - | | | | 0% |
| Expense Transfer | **$ 805,331** | | | | | $ - | | 0% |
| **Sub-Total** | **$ 7,144,542** | **$ -** | **$ -** | **$ 805,331** | **$ -** | **$ -** | | 4% |
| **General Administration** | | | | | | | | |
| Other Salaries and Wages | $ 13,383,947 | | | | | | $ 13,383,947 | 7% |
| Fringe Benefits | $ 8,402,777 | | | | | | $ 8,402,777 | 4% |
| Services | $ 4,993,994 | | | | | | $ 4,993,994 | 2% |
| Fuel and Lubricants | $ - | | | | | | $ - | 0% |
| Tires and Tubes | $ - | | | | | | $ - | 0% |
| Other Materials and Supplies | $ 1,655,942 | | | | | | $ 1,655,942 | 1% |
| Utilities | $ 4,751,012 | | | | | | $ 4,751,012 | 2% |
| Casualty and Liability | $ 2,482,302 | | | | | | $ 2,482,302 | 1% |
| Taxes | $ 25,130 | | | | | | $ 25,130 | 0% |
| Miscellaneous Expense | $ 2,028,723 | | | | | | $ 2,028,723 | 1% |
| Expense Transfers | $ (2,980,879) | | | | | $ (2,980,879) | $ (2,980,879) | -1% |
| **Sub-Total** | **$ 34,742,949** | **$ -** | **$ -** | **$ -** | **$ -** | **$ (2,980,879)** | **$ 34,742,949** | **17%** |
| **TOTAL** | **$ 199,881,320** | **$ 113,731,334** | **$ 30,351,760** | **$ 21,055,278** | **$ -** | **$ (2,980,879)** | **$ 34,742,949** | **100%** |
| **Percent** | | | | | | | | |
| **Units Per Year** | | **1,878,701** | **23,657,087** | **724** | | **1** | **$ 165,138,371** | |
| **UNIT COST (2005 Dollars)** | | **$ 60.54** | **$ 1.28** | **$ 29,095** | | **$ (2,980,879)** | **21.0% add-on** | |

*Source: Parsons Brinckerhoff, 2006*

**Table 2 Assignment of Operating Cost Items and Operating Cost Factors for Metro Light Rail Operations, Based on 2005 Costs and Units**

| 2005 Actual Expenses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Annual Cost & Attribution | | | | | | |
| | Annual Cost | Train-Revenue Hours | Scheduled Revenue-Car-Miles | Peak Vehicles | Track-Miles | Fixed (not in model) | Gen Admin. Percentage Add-On | % of Total |
| **Vehicle Operations Labor** | | | | | | | | |
| Operator Salaries and Wages | $ 1,909,153 | $ 1,909,153 | | | | | | 11% |
| Other Salaries and Wages | $ 983,729 | $ 983,729 | | | | | | 6% |
| Fringe Benefits | $ 1,317,904 | $ 1,317,904 | | | | | | 8% |
| Services | $ 88,872 | | | $ 88,872 | | | | 1% |
| **Sub-Total** | **$ 4,299,658** | **$ 4,210,786** | **$ -** | **$ 88,872** | **$ -** | **$ -** | | **26%** |
| | | | | | | | | |
| **Vehicle Operations Materials and Supplies** | | | | | | | | |
| Fuel and Lubricants | $ 6,201 | | $ 6,201 | | | | | 0% |
| Tires and Tubes | $ - | | $ - | | | | | 0% |
| Other Materials/Supplies | $ 79,520 | | $ 79,520 | | | | | 0% |
| Utilities | $ 1,107,638 | | $ 1,107,638 | | | | | 7% |
| Casualty and Liability | $ - | | | $ - | | | | 0% |
| Taxes | $ - | | | $ - | | | | 0% |
| Miscellaneous | $ - | | | $ - | | | | 0% |
| Expense Transfers | $ - | | | | | $ - | | 0% |
| **Sub-Total** | **$ 1,193,359** | **$ -** | **$ 1,193,359** | **$ -** | **$ -** | **$ -** | | **7%** |
| | $ 5,493,017 | | | | | | | |
| **Vehicle Maintenance Labor** | | | | | | | | |
| Other Salaries and Wages | $ 1,168,568 | | $ 584,284 | $ 584,284 | | | | 7% |
| Fringe Benefits | $ 532,453 | | $ 266,227 | $ 266,227 | | | | 3% |
| Services | $ 2,947 | | $ 1,474 | $ 1,474 | | | | 0% |
| **Sub-Total** | **$ 1,703,968** | **$ -** | **$ 851,984** | **$ 851,984** | **$ -** | **$ -** | | **10%** |
| | | | | | | | | |
| | | | | | | | | |
| **Vehicle Maintenance Materials and Supplies** | | | | | | | | |
| Fuel and Lubricants | $ 33,479 | | $ 33,479 | | | | | 0% |
| Tires and Tubes | $ - | | $ - | | | | | 0% |
| Other Materials and Supplies | $ 174,084 | | $ 174,084 | | | | | 1% |
| Utilities | $ - | | | $ - | | | | 0% |
| Casualty & Liability | $ 196,373 | | | $ 196,373 | | | | 1% |
| Taxes | $ - | | | $ - | | | | 0% |
| Miscellaneous | $ - | | $ - | | | | | 0% |
| Expense Transfer | **$ 403,936** | | | | | $ - | | 0% |
| **Sub-Total** | **$ 2,107,904** | **$ -** | **$ 207,563** | **$ 196,373** | **$ -** | **$ -** | | **2%** |

*Source: Parsons Brinckerhoff, 2006*

**Table 2 cont. Assignment of Operating Cost Items and Operating Cost Factors for Metro Light Rail Operations, Based on 2005**

| 2005 Actual Expenses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Annual Cost & Attribution | | | | | | |
| | Annual Cost | Train-Revenue Hours | Scheduled Revenue-Car-Miles | Peak Vehicles | Track-Miles | Fixed (not in model) | Gen Admin. Percentage Add-On | % of Total |
| **Non-Vehicle Maintenance Labor** | | | | | | | | |
| Other Salaries and Wages | $ 1,602,646 | | | | $ 1,602,646 | | | 10% |
| Fringe Benefits | $ 730,150 | | | | $ 730,150 | | | 4% |
| Services | $ 94,723 | | | | $ 94,723 | | | 1% |
| **Sub-Total** | **$ 2,427,519** | **$ -** | **$ -** | **$ -** | **$ 2,427,519** | **$ -** | | **15%** |
| | | | | | | | | |
| | | | | | | | | |
| **Non-Vehicle Maintenance Materials and Supplies** | | | | | | | | |
| Fuel and Lubricants | $ - | | | | $ - | | | 0% |
| Tires and Tubes | $ - | | | | $ - | | | 0% |
| Other Materials and Supplies | $ 326,707 | | | | $ 326,707 | | | 2% |
| Utilities | $ - | | | | $ - | | | 0% |
| Casualty & Liability | $ 19,176 | | | | $ 19,176 | | | 0% |
| Taxes | $ - | | | | $ - | | | 0% |
| Miscellaneous | $ - | | | | $ - | | | 0% |
| Expense Transfer | $ - | | | | | $ - | | 0% |
| **Sub-Total** | **$ 345,883** | **$ -** | **$ -** | **$ -** | **$ 345,883** | **$ -** | | **2%** |
| | **$ 2,773,402** | | | | | | | |
| **General Administration** | | | | | | | | |
| Other Salaries and Wages | $ 817,588 | | | | | | $ 817,588 | 5% |
| Fringe Benefits | $ 402,385 | | | | | | $ 402,385 | 2% |
| Services | $ 495,065 | | | | | | $ 495,065 | 3% |
| Fuel and Lubricants | $ - | | | | | | $ - | 0% |
| Tires and Tubes | $ - | | | | | | $ - | 0% |
| Other Materials and Supplies | $ 126,583 | | | | | | $ 126,583 | 1% |
| Utilities | $ 469,828 | | | | | | $ 469,828 | 3% |
| Casualty and Liability | $ 255,844 | | | | | | $ 255,844 | 2% |
| Taxes | $ - | | | | | | $ - | 0% |
| Miscellaneous Expense | $ 176,971 | | | | | | $ 176,971 | 1% |
| Expense Transfers | $ 3,545,727 | | | | | $ 3,545,727 | $ 3,545,727 | 21% |
| **Sub-Total** | **$ 6,289,991** | **$ -** | **$ -** | **$ -** | **$ -** | **$ 3,545,727** | **$ 6,289,991** | **38%** |
| | | | | | | | | |
| **TOTAL** | **$ 16,664,314** | **$ 4,210,786** | **$ 2,252,906** | **$ 1,137,229** | **$ 2,773,402** | **$ 3,545,727** | **$ 6,289,991** | **100%** |
| **Percent** | | | | | | | | |
| | | | | | | | | |
| **Units Per Year** | | **67,081** | **1,051,373** | **22** | **24.40** | **1** | **$ 10,374,323** | |
| **UNIT COST (Jan 2005 Dollars)** | | **$ 62.77** | **$ 2.14** | **$ 51,692** | **$ 113,664** | **$ 3,545,727** | **60.6% add-on** | |

*Source: Parsons Brinckerhoff, 2006*

The annual operating and maintenance cost estimates for the bus components of the Enhanced Bus, BRT and LRT alternatives were derived by multiplying the annual revenue vehicle hours of service, the annual revenue vehicle miles of service, and the number of vehicles required during the peak period by their respective cost factors. In addition, administrative costs were calculated by multiplying the total costs associated with these three cost drivers by the administrative cost factor (21%).

The operating statistics for the Enhanced bus and the BRT and LRT alternatives were developed through use of output for each of the alternatives generated by the Twin Cities Regional Ridership Model. The model generates an estimate of the directional revenue hours and miles of service, and the number of buses or trains required to operate the service, for each direction of each bus route or rail line in the network; this is done for one hour of peak and one hour of off-peak period of operation. By way of example, Table 3, below, shows the estimated one-way revenue travel time and distance in miles for the LRT lines included under Alternative 1C, which includes the existing Hiawatha Corridor LRT and planned Central Corridor LRT lines as well as one of the options for LRT service in the Southwest Transitway AA:

**Table 3 One-Way Revenue Travel Time and Mileage for LRT Lines Tested Under Alternative 1C.**

| Line | Revenue Travel Time (mins) | Revenue Distance (miles) |
|---|---|---|
| Hiawatha Northbound | 37.7 | 11.63 |
| Hiawatha Southbound | 37.7 | 11.63 |
| Central Corridor Eastbound | 44.7 | 10.71 |
| Central Corridor Westbound | 44.7 | 10.71 |
| Southwest Transitway Northbound | 29.9 | 14.44 |
| Southwest Transitway Southbound | 29.9 | 14.44 |

*Source: Parsons Brinckerhoff, 2006*

The estimates of revenue travel time and distance are used to generate an estimate of the number of vehicles required to operate the service during the peak hour, and also are built up through factoring to create the annual estimates of revenue vehicle hours and miles of service for each alternative, with separate estimates developed for rail and bus services.

Revenue travel time is converted to revenue vehicle hours for bus and rail by adding a 15% layover factor to each single direction trip, to account for required operator rest and schedule recovery time. On LRT lines an additional 2 minutes is added to each directional trip for turn time, the time required for the LRT operator to walk from the head end to the tail end of the train between directional trips. Revenue vehicle miles, which do not include deadhead miles, are taken directly from the travel distance estimates provided by the model. The revenue vehicle hours and miles are multiplied by the number of trips operated during each peak and off peak hour to estimate the number of revenue vehicle hours and miles that each line will generate during each peak and off-peak hour.

The revenue vehicle hours and miles for the peak period are multiplied by 6, for the number of peak hours of operation in each weekday. The consultant team estimated the equivalent number of hours of typical mid-day service that would be required to approximate a typical weekday, based on information provided by Metropolitan Council-Metro Transit that indicated the number of buses in operation under the existing (2004) Minneapolis-St. Paul regional transit system for each hour of the day. This equivalency factor accounted for the fluctuations in service over the course of a weekday; the buildup of service from 4:00 a.m. to 6:00 a.m.; the morning peak period (approximately 6:00 a.m. to 9:00 a.m.), the midday period (approximately 3:30 p.m. to 6:30 p.m.) and the gradual tapering off of service levels from approximately 7:00 p.m. to 2:00 a.m. Based on this analysis, the consultants estimated that make up the revenue vehicle hours of service operated by each line during each peak and off-peak hour was equivalent to about 12.45 hours of off-peak service and six hours of peak service as measured by the Twin Cities Transportation Model. Analysis of the existing Hiawatha LRT operation indicated that LRT services would operate approximately 10.5 equivalent hours of off peak service each day, in addition to six hours of peak period service.

The final step in developing annual revenue vehicle hours and miles of service is the application of the annualization factor. This factor converts the estimates of weekday vehicle revenue hours and miles of service to an annual estimate, taking into account the lower levels of service provided on Saturdays, Sundays and Holidays. For bus services, this factor was developed by comparing the average number of buses in operation by hour on weekdays to the number in operation on Saturdays and Sundays-Holidays. Using this methodology, the consultants estimated that the Saturday volume of service is about half (50%) of the weekday volume of service, and the volume on Sundays and Holidays is about one-third (35%) of the weekday volume. Based on this analysis, the consultants estimated the annualization factor for bus service to be 299 equivalent weekdays of service per year.

Based on examination of weekday and weekend schedules for the Hiawatha LRT service, the annualization factor for LRT was determined to be 349 equivalent weekdays per year.

The number of buses required under each alternative is estimated by dividing the travel and layover time for each direction of each bus route by the peak period headway of the route as provided under each alternative in the travel demand model. The number of buses required for each route are added together to make up a system-wide estimate. For the LRT services, a more precise methodology in which the travel and layover time for *both* directions of the service are added together and then divided by the peak headway was employed. This latter method is more precise than the method used for the bus alternatives, but was deemed impractical for estimating the number of vehicles required for the bus routes, primarily because many of the routes do not operate parallel alignments or schedules in the inbound and outbound directions during the peak period. These estimates are provided as inputs to the Capital Cost estimates, which are documented in Technical Memorandum No. 7.

Table 4 illustrates the operating and maintenance cost calculation for the bus portion of the Enhanced Bus alternative. This Enhanced Bus alternative includes improvements recommended as a part of the Southwest Transitway Alternatives Analysis to address transit needs in the southwest corridor, as well as numerous other improvements that would increase the volume of service provided by the Twin Cities Metropolitan Region's transit system. These include the recommendations of the Metropolitan Council's Transit 2030 Plan, which includes implementation of Central Corridor LRT and Cedar Avenue Busway, among other major projects. Under this alternative, the region's transit system would operate an estimated 3.4 million annual revenue vehicle hours of service and about 49.4 million annual revenue vehicle miles of service. The system would require 1,275 buses (not including spares) to operate during the peak period of service. Multiplying each of these drivers by the relevant cost factors (and escalating the 2005$ by 2.7% for 2006$) indicates an operating cost of about $314.9 million each year before administrative markup. Adding the 21% administrative markup increases the cost to $381.2 million per year. The calculation is shown in Table 4.

**Table 4 Calculation of Bus O&M Costs for 2030 Operation of Enhanced Bus Alternative (2006$)**

| Enhanced Bus | Ann Rev Veh Hrs | Ann Rev Veh Miles | Peak Fleet Requirement | O&M Costs |
|---|---|---|---|---|
| Bus Units | 3,404,857 | 49,430,242 | 1,275 | |
| Bus Unit Costs | 60.54 | 1.28 | 29,095.27 | |
| Units X Unit Costs | 206,120,628 | 63,418,408 | 37,096,470 | 314,914,665 |
| General Administrative Costs related to bus (factored) 21% | | | | 66,253,918 |
| Total Bus Annual O&M Costs (2006$) | | | | 381,168,582 |

*Source: Parsons Brinckerhoff, 2006*

The LRT component of the Enhanced Bus alternative includes both the operation of the existing Hiawatha Line as well as the planned Central Corridor line. The estimates anticipate that operation of these two lines, which together comprise 45.8 miles of fixed guideway, would generate 141,000 annual revenue vehicle hours and nearly 1.9 million annual revenue vehicle miles of service each year. The operation would require 56 vehicles (28 two-car trains) to operate at the period of peak demand. These operating statistics generate an annual O&M cost (escalated to 2006$) for the LRT system of $21.6 million. Adding the administrative markup (60.6%) increases the annual O&M cost to $35.0 million. The calculations are shown in Table 5.

**Table 5 Calculation of Rail O&M Costs for 2030 operation of Enhanced Bus Alternative (2006$)**

| Enhanced Bus-LRT | Ann Rev Veh Hrs | Ann Rev Veh Miles | Peak Fleet Requirement | Fixed Guideway Miles | O&M Costs |
|---|---|---|---|---|---|
| Rail Units | 141,424 | 1,887,846 | 56 | 45.8 | |
| Rail Unit Costs | 62.77 | 2.14 | 51,692.23 | 113,664.02 | |
| Units X Unit Costs | 8,877,440.96 | 4,045,318.74 | 2,894,764.73 | 5,205,811.95 | 21,590,925 |
| General Administrative Costs related to rail (factored) | | | | 60.6% | 13,090,659 |
| Total Bus Annual O&M Costs (2006$) | | | | | 34,681,585 |

*Source: Parsons Brinckerhoff, 2006*

## 4. Results: Operating and Maintenance Cost Estimates for Build Alternatives

Annual O&M cost estimates were generated for the Enhanced Bus alternative, two BRT and eight LRT alternatives. The incremental annual O&M costs for the "Build" alternatives, defined as BRT and LRT, are generated by comparing the system wide transit costs with the "build" alternative implemented to the system wide transit costs with the Enhanced Bus alternative implemented. Again, for purposes of this analysis, the Enhanced Bus alternative assumes that by 2030 the following transitways are operational, the Hiawatha and Central LRT lines, the Northstar Commuter Rail line, the Cedar Avenue, I-35W, and Bottineau Boulevard busways, and the Red Rock and Rush Line Corridors.

The cost estimates take into account system wide costs for the Bus, BRT and LRT portions of the system, but do not include costs for commuter rail services. Table 6 includes the estimated costs for operating the entire regional transit system, including the proposed Southwest Transitway alternative, in year 2006 dollars.
Table 7 includes the incremental cost over the Enhanced Bus alternative for operating the proposed Southwest Transitway alternative in year 2006 dollars.

As noted above, System wide revenue vehicle hours and miles and the peak requirement for vehicles were derived from the results of the regional travel demand model runs. The model generated these statistics for the following alternatives: Enhanced Bus, BRT 1, LRT 1A, LRT 1C, LRT 2C, LRT 3C, and LRT 4A. For the remaining alternatives interpolation was used to generate annual operating and maintenance cost estimates.

**Table 6 Estimated Total System Cost for 2030 Operation of Enhanced Bus and LRT and BRT Build Alternatives (2006 $)**

| | Bus | Light Rail | Total |
|---|---|---|---|
| Enhanced Bus | 381,168,582 | 34,681,585 | 415,850,167 |
| BRT 1 | 382,555,936 | 34,681,585 | 417,237,521 |
| BRT 2* | 383,141,199 | 34,681,585 | 417,822,783 |
| LRT 1A | 375,869,578 | 49,041,817 | 424,911,395 |
| LRT 1C | 375,630,349 | 50,722,625 | 426,352,974 |
| LRT 2A* | 376,714,840 | 50,770,988 | 427,485,829 |
| LRT 2C | 375,879,380 | 52,186,273 | 428,065,652 |
| LRT 3A* | 377,041,536 | 51,298,970 | 428,340,506 |
| LRT 3C | 376,205,436 | 53,075,423 | 429,280,859 |
| LRT 4A | 377,641,151 | 44,209,584 | 421,850,735 |
| LRT 4C* | 376,803,735 | 45,706,912 | 422,510,647 |

*Not modeled, estimate based on interpolation of data
*Source: Parsons Brinckerhoff, 2006*

**Table 7 Estimated Incremental System Cost for Build Alternatives Compared to Enhanced Bus (2006 $)**

| | Bus | Light Rail | Total |
|---|---|---|---|
| BRT 1 | 1,387,354 | - | 1,387,354 |
| BRT 2* | 1,972,616 | - | 1,972,616 |
| LRT 1A | (5,299,004) | 14,360,232 | 9,061,228 |
| LRT 1C | (5,538,233) | 16,041,040 | 10,502,807 |
| LRT 2A* | (4,453,742) | 16,089,404 | 11,635,662 |
| LRT 2C | (5,289,203) | 17,504,688 | 12,215,485 |
| LRT 3A* | (4,127,047) | 16,617,386 | 12,490,339 |
| LRT 3C | (4,963,146) | 18,393,838 | 13,430,692 |
| LRT 4A | (3,527,431) | 9,527,999 | 6,000,568 |
| LRT 4C* | (4,364,847) | 11,025,328 | 6,660,480 |
| BRT 1 | 1,387,354 | - | 1,387,354 |

*Not modeled, estimate based on interpolation of data
*Source: Parsons Brinckerhoff, 2006*

The operating costs also were escalated to 2015 dollars, using a single annual inflation factor of 2.7% (at 2.7% compounded annually 2005 to 2015). Table 8 shows the system-wide costs in 2015 dollars, while Table 9 shows the incremental cost in 2015 dollars.

**Table 8 Estimated Total System Cost for Enhanced Bus and Build Alternatives (2015 $)**

| | Bus | Light Rail | Total |
|---|---|---|---|
| Enhanced Bus | 484,452,375 | 44,079,121 | 528,531,496 |
| BRT 1 | 486,215,655 | 44,079,121 | 530,294,776 |
| BRT 2* | 486,959,504 | 44,079,121 | 531,038,625 |
| LRT 1A | 477,717,520 | 62,330,490 | 540,048,010 |
| LRT 1C | 477,413,468 | 64,466,740 | 541,880,208 |
| LRT 2A* | 478,791,820 | 64,528,209 | 543,320,028 |
| LRT 2C | 477,729,977 | 66,326,987 | 544,056,965 |
| LRT 3A* | 479,207,038 | 65,199,256 | 544,406,294 |
| LRT 3C | 478,144,384 | 67,457,067 | 545,601,451 |
| LRT 4A | 479,969,129 | 56,188,886 | 536,158,015 |
| LRT 4C* | 478,904,802 | 58,091,939 | 536,996,741 |

*Not modeled, estimate based on interpolation of data
Source: Parsons Brinckerhoff, 2006

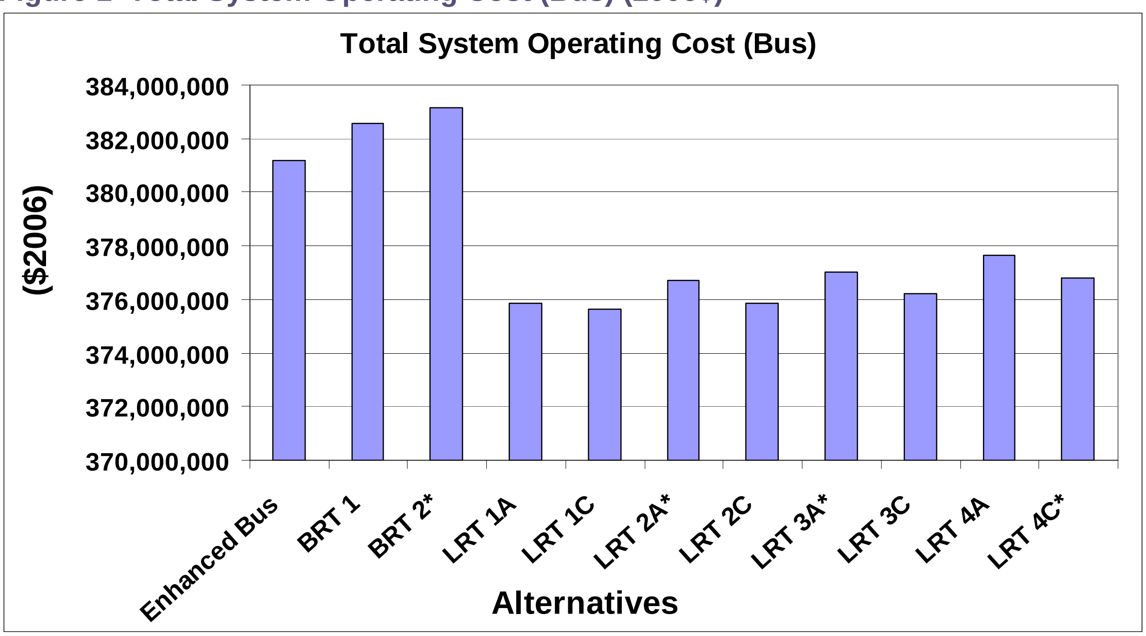
**Table 9  Estimated Incremental System Cost for Build Alternatives Compared to Enhanced Bus (2015$)**

| | Bus | Light Rail | Total |
|---|---|---|---|
| BRT 1 | 1,763,280 | - | 1,763,280 |
| BRT 2* | 2,507,129 | - | 2,507,129 |
| LRT 1A | (6,734,855) | 18,251,370 | 11,516,514 |
| LRT 1C | (7,038,907) | 20,387,619 | 13,348,712 |
| LRT 2A* | (5,660,555) | 20,449,088 | 14,788,533 |
| LRT 2C | (6,722,398) | 22,247,867 | 15,525,469 |
| LRT 3A* | (5,245,337) | 21,120,135 | 15,874,798 |
| LRT 3C | (6,307,991) | 23,377,946 | 17,069,955 |
| LRT 4A | (4,483,246) | 12,109,765 | 7,626,519 |
| LRT 4C* | (5,547,573) | 14,012,818 | 8,465,245 |
| BRT 1 | 1,763,280 | - | 1,763,280 |

*Not modeled, estimate based on interpolation of data
Source: Parsons Brinckerhoff, 2006

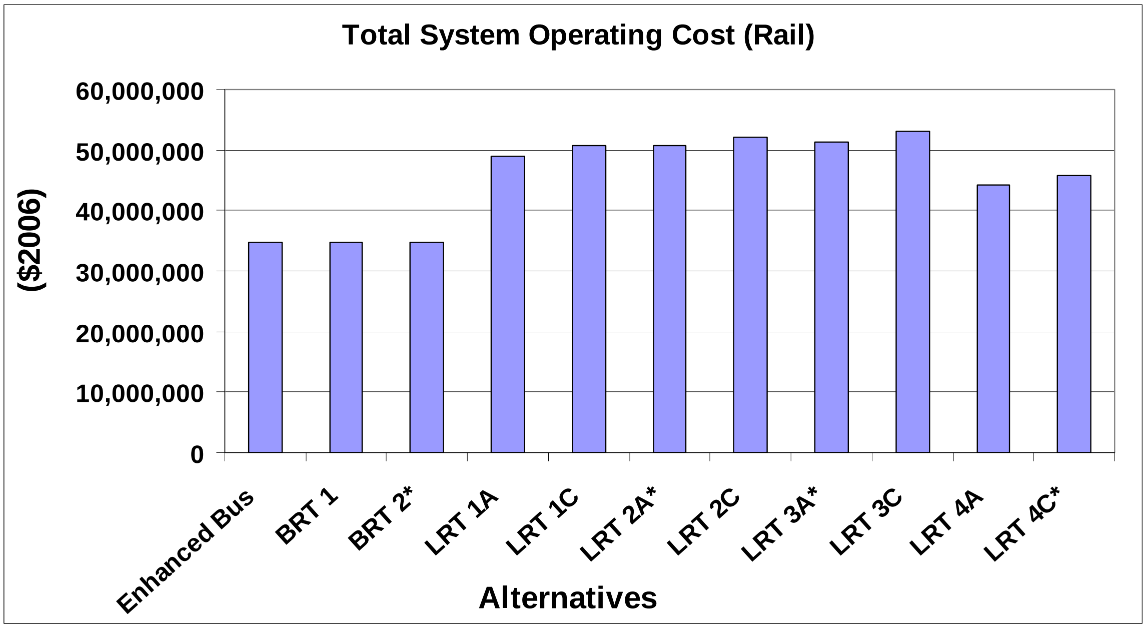
The following four figures illustrate the comparative relationships by modal types of operating costs among all alternatives for 2006. The relationships among the alternatives in 2015 would be exactly the same but at higher levels of operating costs.

**Figure 1  Total System Operating Cost (Bus) (2006$)**



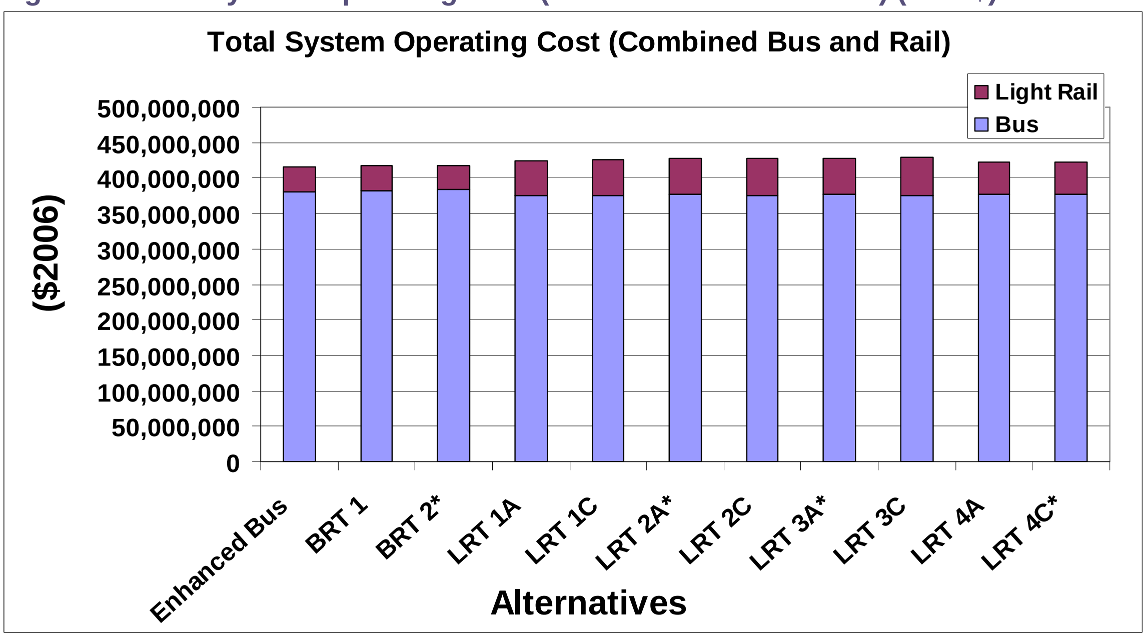

Source: Parsons Brinckerhoff, 2006

**Figure 2  Total System Operating Cost (Rail) (2006$)**



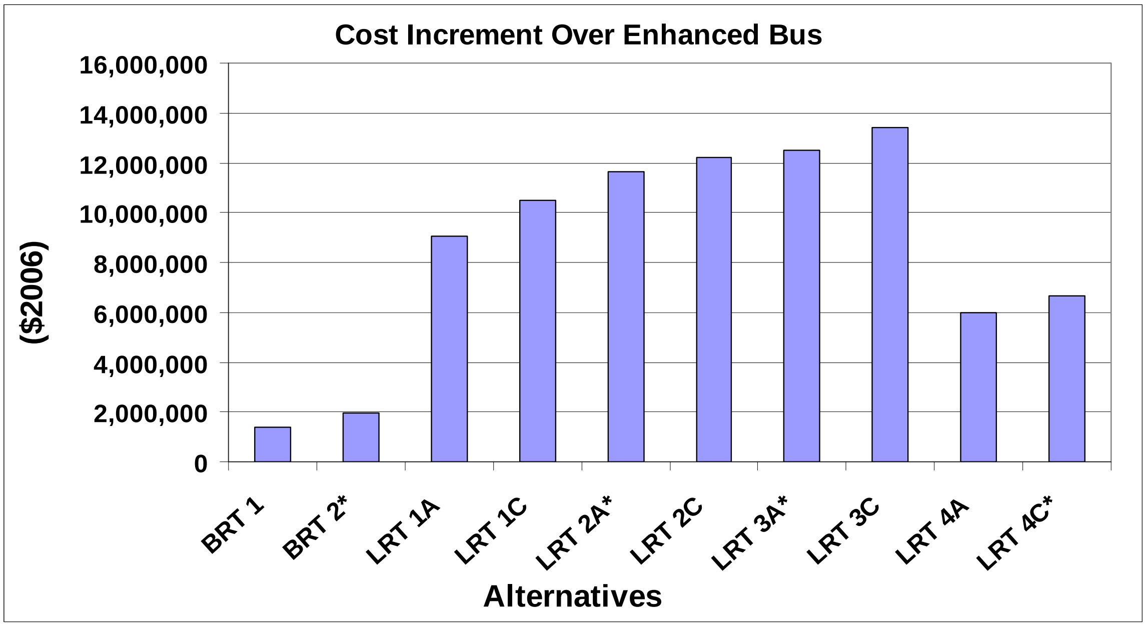

Source: Parsons Brinckerhoff, 2006

**Figure 3  Total System Operating Cost (Combined Bus and Rail) (2006$)**




Source: Parsons Brinckerhoff, 2006

**Figure 4  Cost Increment of Total System over Enhanced Bus ($2006)**




Source: Parsons Brinckerhoff, 2006

*Southwest Transitway Alternatives Analysis*

# *Technical Memorandum No. 7*
# *Capital Cost Estimate*

*Prepared for*
*Hennepin County Regional Railroad Authority*

*Prepared by:*

*PB Americas, Inc. (PB)*
*LTK Engineering Services*

*January, 2007*

# Table of Contents



# List of Tables

# 1. Introduction

This technical memorandum documents the methodology, assumptions, and results of the Capital Cost Estimate task of the Southwest Transitway Alternatives Analysis (Southwest Transitway AA).

Capital cost estimates include the one-time expenditure to build the system and typically include tracks, stations, structures, signalization and communications systems, maintenance facility, vehicles, as well as right-of-way acquisition and relocations.

# 2. Background

At this early study stage, the capital cost estimates are developed on a per unit basis. Assuming additional studies are conducted, the capital cost estimates contained in this document will be refined based upon additional engineering work.

The per unit capital costs contained in this document were calculated for year 2006 and escalated to year 2015 by applying a 2.7% annual escalation rate, which is consistent with the escalation rate used for the Central Corridor in the *Central Corridor Draft Environmental Impact Statement, 2002.*

A large proportion of the potential right-of-way needed for several of the Southwest Transitway alternatives is already owned by the Hennepin County Regional Railroad Authority (HCRRA). This includes former railroad routes known as the Southwest Corridor, the Kenilworth Corridor, the Cedar Lakes Corridor, and the Midtown Corridor. It also owns land for several stations on these Southwest transitway alignments. The costs for acquiring any needed HCRRA rights-of-way are not included in the Southwest Transitway AA capital cost estimates.

Throughout this study there has been an emphasis on building upon previous work by HCRRA and others related to the Southwest Transitway. With respect to the capital cost estimates, that was accomplished by reviewing and validating previous estimates for the Southwest and Central corridors and maintaining consistent assumptions, wherever reasonably possible.

Capital cost estimates have been developed for the full range of potential Southwest Transitway alternatives, including the Enhanced Bus or baseline alternative, BRT 1, BRT 2, LRT 1A, LRT 2A, LRT 3A, LRT 4A, LRT 1C, LRT 2C, LRT 3C, and LRT 4C.

Maps illustrating the alternatives are provided in Appendix A, and more detailed descriptions can be found in *Technical Memorandum No. 3, Definition of Alternatives.*

### Enhanced Bus Alternative

The Enhanced Bus alternative includes two new limited stop bus routes providing bi-directional service from Eden Prairie to downtown Minneapolis, minor modifications to the existing study area express service, and restructuring of local bus service providing access to the two new limited stop bus routes. The Enhanced Bus alternative also includes increases in service frequency for many Metro Transit and SouthWest Metro bus routes to improve the overall level of transit service in the corridor.

In addition to route additions and modifications, the definition of the Enhanced Bus alternative includes construction of new or expanded park-and-ride facilities at the following locations:

- Mitchell Road
- SouthWest Metro Station
- Shady Oak Road
- Hopkins
- Texas Avenue

## BRT Alternatives

There are two bus rapid transit (BRT) alternatives for the Southwest Transitway.

### BRT 1

The BRT 1 route begins at TH 5 in Eden Prairie and runs along an exclusive bus-only guideway within existing HCRRA right-of-way through Eden Prairie, Minnetonka, Hopkins, St. Louis Park and Minneapolis. As it nears downtown Minneapolis the exclusive guideway ends and the route turns onto Dunwoody Boulevard and Hennepin Avenue. BRT 1 includes 16 stations:

- TH 5 (P&R)
- TH 62 (P&R)
- Rowland Road (P&R)
- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- 21st Street (P&R)
- Penn Avenue (P&R)
- Van White Boulevard
- 12th Street
- 8th Street
- 5th Street

### BRT 2

The BRT 2 route begins at Mitchell Road in Eden Prairie and runs along TH 5, Prairie Center Drive, Singletree Lane, and Flying Cloud Drive. At Valley View Road it enters an exclusive bus-only guideway that continues to Bren Road. BRT 2 follows Bren Road and TH 169 to Excelsior Boulevard. It enters existing HCRRA right-of-way near Excelsior Boulevard, running along an exclusive bus-only guideway through Hopkins, St. Louis Park, and Minneapolis. As it nears downtown Minneapolis the exclusive guideway ends and the route turns onto Dunwoody Boulevard and Hennepin Avenue. BRT 2 includes 19 stations:

- Mitchell Road (P&R)
- SouthWest Station (P&R)
- Eden Prairie Town Center (P&R)
- Golden Triangle (P&R)
- City West (P&R)
- Opus (P&R)
- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- 21st Street (P&R)
- Penn Avenue (P&R)
- Van White Boulevard
- 12th Street
- 8th Street
- 5th Street

## LRT Alternatives

There are eight light rail transit (LRT) alternatives being evaluated for the Southwest Transitway.

### LRT 1A

The LRT 1A route begins at TH 5 in Eden Prairie and run along existing HCRRA right-of-way through Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and into Minneapolis. It continues in Minneapolis along existing HCRRA right-of-way through the Kenilworth corridor and into the Cedar Lake corridor. As the LRT 1A route approaches downtown Minneapolis it leaves the HCRRA right-of-way and follows Royalston Avenue and 6th Avenue to a connection with the Hiawatha line on 5th Street. LRT 1A includes 14 stations:

- TH 5 (P&R)
- TH 62 (P&R)
- Rowland Road (P&R)
- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- 21st Street (P&R)
- Penn Avenue (P&R)
- Van White Boulevard
- Royalston Avenue

### LRT 2A

The LRT 2A route begins at Mitchell Road in Eden Prairie and runs along TH 5 and I-494 through Eden Prairie and Minnetonka. It leaves the I-494 right-of-way as the freeway crosses over the existing HCRRA right-of-way in Minnetonka. From that point the LRT 2A route runs along the existing HCRRA right-of-way through Hopkins, St. Louis Park, and into Minneapolis. It continues in Minneapolis along existing HCRRA right-of-way through the Kenilworth corridor and into the Cedar Lake corridor. As the LRT 2A route approaches downtown Minneapolis it leaves the HCRRA right-of-way and follows Royalston Avenue and 6th Avenue to a connection with the Hiawatha line on 5th Street. LRT 2A includes 16 stations:

- Mitchell Road (P&R)
- SouthWest Station (P&R)
- Valley View Road (P&R)
- TH 62 (P&R)
- Rowland Road (P&R)
- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- 21st Street (P&R)
- Penn Avenue (P&R)
- Van White Boulevard
- Royalston Avenue

### LRT 3A

The LRT 3A route begins at Mitchell Road in Eden Prairie and runs along TH 5 and Prairie Center Drive, turns east into new right-of-way north of Singletree Lane, then follows Leona Lane to Flying Cloud Drive. After crossing over I-494, the LRT 3A route enters new right-of-way and continues through Eden Prairie, Minnetonka, and Hopkins. In Hopkins the LRT 3A route turns east and follows the existing HCRRA right-of-way through Hopkins, St. Louis Park, and into Minneapolis. It continues in Minneapolis along existing HCRRA right-of-way through the Kenilworth corridor and into the Cedar Lake corridor. As the LRT 3A route approaches downtown Minneapolis it leaves the HCRRA right-of-way and follows Royalston Avenue and 6th Avenue to a connection with the Hiawatha line on 5th Street. LRT 3A includes 17 stations:

- Mitchell Road (P&R)
- SouthWest Station (P&R)
- Eden Prairie Town Center (P&R)
- Golden Triangle (P&R)
- City West (P&R)
- Opus (P&R)
- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- 21st Street (P&R)
- Penn Avenue (P&R)
- Van White Boulevard
- Royalston Avenue

### LRT 4A

The LRT 4A route begins at Shady Oak Road in Minnetonka and runs along existing HCRRA right-of-way through Hopkins, St. Louis Park, and into Minneapolis. It continues in Minneapolis along existing HCRRA right-of-way through the Kenilworth corridor and into the Cedar Lake corridor. As the LRT 4A route approaches downtown Minneapolis it leaves the HCRRA right-of-way and follows Royalston Avenue and 6th Avenue to a connection with the Hiawatha line on 5th Street. LRT 4A includes 11 stations:

- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- 21st Street (P&R)
- Penn Avenue (P&R)
- Van White Boulevard
- Royalston Avenue

### LRT 1C

The LRT 1C route begins at TH 5 in Eden Prairie and run along existing HCRRA right-of-way through Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and into Minneapolis. It continues in Minneapolis along existing HCRRA right-of-way into the Midtown corridor. At Nicollet Avenue the LRT 1C route turns north, running in a tunnel between 28th Street and Franklin Avenue, and continues north along Nicollet Avenue into downtown Minneapolis. LRT 1C includes 17 stations:

- TH 5 (P&R)
- TH 62 (P&R)
- Rowland Road (P&R)
- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- Uptown
- Lyndale Avenue
- 28th Street
- Franklin Avenue
- 12th Street
- 8th Street
- 4th Street

### LRT 2C

The LRT 2C route begins at Mitchell Road in Eden Prairie and runs along TH 5 and I-494 through Eden Prairie and Minnetonka. It leaves the I-494 right-of-way as the freeway crosses over the existing HCRRA right-of-way in Minnetonka. From that point the LRT 2C route runs along the existing HCRRA right-of-way through Hopkins, St. Louis Park, and into Minneapolis. It continues in Minneapolis along existing HCRRA right-of-way into the Midtown corridor. At Nicollet Avenue the LRT 2C route turns north, running in a tunnel between 28th Street and Franklin Avenue, and continues north along Nicollet Avenue into downtown Minneapolis. LRT 2C includes 19 stations:

- Mitchell Road (P&R)
- SouthWest Station (P&R)
- Valley View Road (P&R)
- TH 62 (P&R)
- Rowland Road (P&R)
- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- Uptown
- Lyndale Avenue
- 28th Street
- Franklin Avenue
- 12th Street
- 8th Street
- 4th Street

### LRT 3C

The LRT 3C route begins at Mitchell Road in Eden Prairie and runs along TH 5 and Prairie Center Drive, turns east into new right-of-way north of Singletree Lane, then follows Leona Lane to Flying Cloud Drive. After crossing over I-494, the LRT 3C route enters new right-of-way and continues through Eden Prairie, Minnetonka, and Hopkins. In Hopkins the LRT 3C route turns east and follows the existing HCRRA right-of-way through Hopkins, St. Louis Park, and into Minneapolis. It continues in Minneapolis along existing HCRRA right-of-way into the Midtown corridor.
At Nicollet Avenue the LRT 3C route turns north, running in a tunnel between 28th Street and Franklin Avenue, and continues north along Nicollet Avenue into downtown Minneapolis. LRT 3C includes 20 stations:

- Mitchell Road (P&R)
- SouthWest Station (P&R)
- Eden Prairie Town Center (P&R)
- Golden Triangle (P&R)
- City West (P&R)
- Opus (P&R)
- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- Uptown
- Lyndale Avenue
- 28th Street
- Franklin Avenue
- 12th Street
- 8th Street
- 4th Street

### LRT 4C

The LRT 4C route begins at Shady Oak Road in Minnetonka and runs along existing HCRRA right-of-way through Hopkins, St. Louis Park, and into Minneapolis. It continues in Minneapolis along existing HCRRA right-of-way into the Midtown corridor. At Nicollet Avenue the LRT 4C route turns north, running in a tunnel between 28th Street and Franklin Avenue, and continues north along Nicollet Avenue into downtown Minneapolis. LRT 4C includes 14 stations:

- Shady Oak Road (P&R)
- Hopkins (P&R)
- Blake Road (P&R)
- Louisiana Avenue (P&R)
- Wooddale Avenue (P&R)
- Beltline Boulevard (P&R)
- West Lake Street (P&R)
- Uptown
- Lyndale Avenue
- 28th Street
- Franklin Avenue
- 12th Street
- 8th Street
- 4th Street

## 3. Methodology

Capital cost estimates have been prepared using the format and procedures currently recommended by the Federal Transit Administration (FTA). The FTA methodology includes the use of standard cost categories (SCC) and groupings for organization of the data, and detailed spreadsheets for development of forecast year estimates and annualized capital costs. Appendix B includes the list of the FTA SCC categories and definitions.

The FTA SCC organization for capital cost estimates was developed for application to many different types of transit improvements, and on project phases ranging from alternatives analysis (AA) to final design and construction. The capital cost elements for the Southwest Transitway AA Study were organized into the FTA SCC format as indicated in Table 1.

The level of detail of the capital cost estimates for this study corresponds with the current level of Southwest Transitway definition, engineering, and environmental analyses. The level of estimating detail typically increases as the project progresses through the various phases of development during the AA, Environmental Impact Statement, Preliminary Engineering, and eventually into Final Design. The corollary is that as the level of design detail increases, more and more items are specifically costed, which in turn leads to lower contingency costs in the estimate. Ideally, such project design and cost estimating maturization will not materially change the overall total capital cost estimate, it just makes the estimate far more specific in nature.

### Table 1 FTA SCC Capital Cost Estimate Organization

| | |
|---|---|
| **10: Guideway** | Guideway grading and drainage; retaining walls, bridges and tunnels; LRT trackwork; BRT roadway construction; estimating contingency |
| **20: Stations** | Construction of station platforms, enclosures, canopies and fixtures; elevators, escalators and stairs; multi-story auto parking structures; estimating contingency |
| **30: Support Facilities** | Light-duty vehicle maintenance and storage facilities; LRT yard and yard trackwork; estimating contingency |
| **40: Sitework and Special Conditions** | Demolition, clearing, and earthwork; utilities and utility relocation; hazardous soil and water remediation; environmental mitigation; reconstruction of roadways, intersection, and non-guideway structures; construction of surface parking at stations; pedestrian and bicycle accommodations, sidewalks and trails; landscaping, fencing and lighting; estimating contingency |
| **50: Systems** | LRT train control signals and signal houses; LRT roadway crossing protection; LRT traction power substations; LRT overhead catenary system; communication systems; central control hardware and software; fare collection systems; roadway traffic signals; estimating contingency |
| **60: Right-of-way** | Acquisition of right-of-way or easements for guideway, stations; relocation of existing households and businesses; estimating contingency |
| **70: Vehicles** | Light rail vehicles, buses, non-revenue vehicles, spare parts; estimating contingency |
| **80: Professional Services** | Preliminary engineering; final design; project management for design and construction; construction administration and management; insurance; legal, permits review fees; surveys, testing, investigation, inspection; agency force account work |
| **90: Unallocated Contingency** | Overall project contingency and reserves |
| **100: Finance Changes** | Estimated expenses for local financing of project activities prior to Federal funding commitment |

Source: Federal Transit Administration, 2006.

The Southwest Transitway AA capital cost estimates have been developed using a segmented and tiered approach. Each of the BRT and LRT alternatives were divided into geographic segments, many of which are common to multiple alternatives. Within each geographic segment the estimates have been separated into the individual SCC categories. Finally, each of those SCC categories consist of multiple line-items with corresponding quantities and unit prices.

The methodology differs for corridor-wide cost elements such as vehicles and support facilities, and for soft costs such as professional services and unallocated contingencies. Cost for those elements were identified and added after the individual segment estimates had been combined into the full alternatives.

For those alternatives forwarded from the 2003 *Southwest Corridor Rail Transit Study*, (LRT 1A, 2A, 3A, and 4A) the capital cost estimates were reviewed and modified to fit within the current FTA SCC format.

# 4. Assumptions

These capital cost estimates are based upon information obtained from a number of sources. The assumptions include capital cost parameters applied at certain steps during the process, unit prices for the various capital cost elements, and specific information regarding each of the alternatives.

## Parameters

Capital cost parameters are necessary assumptions that are not related to the specific features of the Southwest Transitway or the alternatives under consideration. The Southwest Transitway AA capital cost estimates have been based upon the following parameters:

**Base Year –** Year 2006 was used as the base year for definition of the unit prices and preparation of the capital cost estimates.

**Forecast Year –** Year 2015 was used as the forecast year for projecting base year capital costs estimates to the assumed midpoint of expenditure.

**Unallocated Contingency –** An unallocated contingency of 20% was used in the estimates. This contingency is applied to the total capital cost for each alternative, and is in addition to the estimating contingencies included within each cost category.

**Escalation Factor –** An annual escalation factor of 2.7% was used to inflate capital cost estimates from the base year to the forecast year. This assumption is consistent with the capital cost estimate developed for the *Central Corridor AA/DEIS.*

**Annualization Factors –** Annualization factors are necessary to convert base year capital cost estimates into annualized capital costs, which are used in calculation of cost effectiveness measures. The FTA-required annualization factors (based upon a 7% internal rate of return) were used for these estimates.

## Unit Prices

Base year unit prices for the various capital cost elements have been developed using several references and resources. Primary sources for unit price assumptions included:

- *Southwest Rail Transit Study,* 2003
- *Central Corridor AA/DEIS,* 2002
- *Hiawatha Project Office Cost Proposal Analysis,* 2003
- *Northstar Corridor LRT Connection Advanced Design,* 2006
- *29th Street and Southwest Corridor Busway Feasibility Study,* 2000
- *St. Louis Park Railroad Study,* 1999

The unit price assumptions from these sources were reviewed to determine if they were applicable to the Southwest Transitway alternatives and compatible with the methodology and format being used.
Most of the unit price assumptions were derived from the 2003 *Southwest Corridor Rail Transit Study* and the 2002 *Central Corridor AA/DEIS*. Where possible, the data available from the Hiawatha LRT project was used to validate and refine the unit prices. In all cases the unit prices have been adjusted from the source year to Year 2006 dollars using the 2.7% annual escalation factor.

### Guideway

Year 2006 unit prices for items in the Guideway category are listed in Table 2. This category includes all of the civil and structural costs for construction of the roadbed and pavement (BRT) or trackwork (LRT). Guideway and structure unit prices are based upon a typical 28' BRT roadway or double track LRT.

### Stations

Year 2006 unit prices for items in the Stations category are listed in Table 3. This category includes costs for platforms, ramps, platform fixtures, canopies, and passenger amenities, along with costs for vertical circulation (elevators, escalators and stairs) to the platform, where necessary. It also includes the cost of parking structures at stations, but does not include the costs for surface parking and other station site construction costs which are included in the Sitework category. BRT and LRT stations are proposed to be "high amenity" designs similar to the Hiawatha LRT stations.

**Table 2 Year 2006 Unit Prices – Guideway**

| Description | Unit | Unit Price | SCC Line |
|---|---|---|---|
| At-grade Guideway - BRT/LRT | RF | $ 225 | 10.02 |
| Aerial Guideway Structure - BRT/LRT | RF | $ 6,000 | 10.04 |
| Cut and Cover Tunnel - BRT/LRT | RF | $ 12,000 | 10.06 |
| Cut and Cover Tunnel Portal - BRT/LRT | EA | $ 750,000 | 10.06 |
| Bridge Reconstruction - BRT/LRT | RF | $ 5,300 | 10.04 |
| Bridge Modification - BRT/LRT | RF | $ 2,200 | 10.04 |

| | | | |
|---|---|---|---|
| Bridge Abutment Modification - BRT/LRT | EA | $ 100,000 | 10.08 |
| Retaining Wall (10' Average Height) | LF | $ 560 | 10.08 |
| BRT Roadway | SF | $ 15 | 10.02 |
| BRT Shared Roadway Improvements | RF | $ 100 | 10.03 |
| LRT Ballast Curb | LF | $ 25 | 10.02 |
| LRT Ballasted Track | TF | $ 160 | 10.11 |
| LRT Direct Fixation Track | TF | $ 350 | 10.09 |
| LRT Embedded Track | TF | $ 350 | 10.10 |
| LRT At-Grade Roadway Crossing | TF | $ 350 | 10.12 |
| LRT Track Crossover | EA | $ 195,000 | 10.12 |
| LRT Track Turnout | EA | $ 100,000 | 10.12 |
| LRT Crossing Diamond | EA | $ 100,000 | 10.12 |
| Railroad Track Removal | TF | $ 15 | 10.02 |
| Railroad Temporary Shoofly Track | TF | $ 175 | 10.02 |
| Railroad Grading and Drainage | TF | $ 150 | 10.02 |
| Railroad Bridge | TF | $ 5,600 | 10.02 |
| Railroad Ballasted Track | TF | $ 170 | 10.02 |
| Railroad Turnout | EA | $ 150,000 | 10.02 |

*Source: LTK, 2006.*

### Table 3 Year 2006 Unit Prices – Stations

| Description | Unit | Unit Price | SCC Line |
|---|---|---|---|
| Station Platform (200' Length) - BRT/LRT | LS | $ 1,100,000 | 20.01 |
| Elevator, Escalator and Stairway Allowance | LS | $ 890,000 | 20.07 |
| Structured Parking Stall | EA | $ 13,000 | 20.06 |
| Conventional Bus Stop | LS | $ 30,000 | 20.01 |

*Source: LTK, 2006.*

### Support Facilities

Year 2006 unit prices for items in the Support Facilities category are listed in Table 4. The Support Facilities category includes costs for operations and maintenance facilities for the system.

For the LRT alternatives it is assumed that the excess capacity at the existing Hiawatha operations and maintenance facility will be used by the proposed Central Corridor LRT line. During this AA study no specific site was identified for a Southwest Corridor LRT support facility, rather an allowance was included to cover the potential requirements. The lump sum unit price for LRT support facilities was taken from the 2003 *Southwest Rail Transit Study* and divided into components representing a light-duty maintenance and storage facility and the surrounding yard and yard trackwork. This distinction was necessary for the subsequent calculation of annualized capital costs.

The requirements for BRT support facilities are dependent on the type of vehicle, the size of the fleet, and the maintenance needs of the system. The Southwest BRT alternatives are assumed to utilize low-floor hybrid diesel-electric buses. It's unlikely that an entirely new facility would be needed to support a Southwest BRT line; existing Metro Transit facilities could be modified and expanded to meet the need. The BRT cost estimates include an allowance for that purpose based on fleet changes.

**Table 4 Year 2006 Unit Prices – Support Facilities**

| Description | Unit | Unit Price | SCC Line |
|---|---|---|---|
| LRT Light Maintenance Facility | LS | $ 25,996,960 | 30.02 |
| LRT Yard and Yard Track | LS | $ 12,998,480 | 30.05 |
| BRT Support Facility Allowance | RF | $ 150 | 30.02 |

*Source: LTK, 2006.*

### Sitework and Special Conditions

Year 2006 unit prices for items in the Sitework and Special Conditions category are listed in Table 5. This category includes all sitework and civil construction for the alternatives except the guideways, station platforms, and parking structures. It includes costs for site preparation (grading, drainage); surface parking; public utility work; soil and groundwater remediation; environmental mitigation; construction or modification of bridges, roadways (including BRT station by-pass lanes for through bus services), intersections, sidewalks, and trails; and landscaping, fencing and lighting.

The estimates do not include potential costs associated with relocation of private utilities such as electricity, gas, and telecommunications. It is assumed these costs are the responsibility of the owning utility.

Temporary relocations and other indirect costs during construction are not specifically identified in these estimates. The unit prices for construction include allowances for such direct or indirect costs for that primary work unit price.

**Table 5 Year 2006 Unit Prices – Sitework and Special Conditions**

| Description | Unit | Unit Price | SCC Line |
|---|---|---|---|
| Station Site Preparation Allowance | LS | $ 500,000 | 40.01 |
| Surface Park-and-Ride Parking Stall | EA | $ 3,000 | 40.07 |
| Utility Allowance - High | RF | $ 670 | 40.02 |
| Utility Allowance - Medium | RF | $ 390 | 40.02 |
| Utility Allowance - Low | RF | $ 200 | 40.02 |
| Soil/Water Remediation Allowance - High | RF | $ 20 | 40.03 |
| Soil/Water Remediation Allowance - Medium | RF | $ 10 | 40.03 |
| Soil/Water Remediation Allowance - Low | RF | $ 5 | 40.03 |
| Environmental Mitigation Allowance - High | RF | $ 20 | 40.04 |
| Environmental Mitigation Allowance - Medium | RF | $ 10 | 40.04 |

| | | | |
|---|---|---|---|
| Environmental Mitigation Allowance - Low | RF | $ 5 | 40.04 |
| Traffic Control Allowance | RF | $ 100 | 40.07 |
| Cut and Cover Tunnel Traffic Control Allowance | RF | $ 1,000 | 40.07 |
| Minor Roadway Closure Allowance | EA | $ 50,000 | 40.07 |
| Major Roadway Closure Allowance | EA | $ 100,000 | 40.07 |
| Roadway Demolition | SF | $ 5 | 40.07 |
| Roadway Bridge Demolition | SF | $ 50 | 40.07 |
| Roadway Construction | SF | $ 15 | 40.07 |
| Roadway Bridge Construction | SF | $ 100 | 40.07 |
| Minor Roadway Intersection Construction | EA | $ 167,000 | 40.07 |
| Major Roadway Intersection Construction | EA | $ 278,000 | 40.07 |
| Complex Roadway Intersection Construction | EA | $ 389,000 | 40.07 |
| Sidewalk Construction | SF | $ 10 | 40.06 |
| Pedestrian Bridge | LF | $ 1,200 | 40.06 |
| Bituminous Trail (12' average width) | LF | $ 85 | 40.06 |
| Bituminous Trail (20' average width) | LF | $ 115 | 40.06 |
| Fencing | LF | $ 30 | 40.06 |
| Landscaping Allowance | RF | $ 70 | 40.06 |
| Lighting Allowance | RF | $ 15 | 40.06 |

*Source: LTK, 2006.*

### Systems

Year 2006 unit prices for items in the Systems category are listed in Table 6. The Systems category includes train control signals; communications; central control hardware and software; traction power substations; overhead catenary systems; underground ductbanks; fare collection; grade crossing protection; and roadway traffic signal systems.

### Table 6 Year 2006 Unit Prices – Systems

| Description | Unit | Unit Price | SCC Line |
|---|---|---|---|
| LRT Signal and Communication Building Allowance | RF | $ 20 | 50.01 |
| LRT Train Control Signal Allowance | RF | $ 335 | 50.01 |
| LRT Roadway Grade Crossing Protection | EA | $ 250,000 | 50.02 |
| Minor Traffic Signal System | EA | $ 110,000 | 50.02 |
| Major Traffic Signal System | EA | $ 225,000 | 50.02 |
| LRT Substation Enclosure Allowance | RF | $ 30 | 50.03 |
| LRT Substation Equipment Allowance | RF | $ 160 | 50.03 |
| LRT Ductbank Allowance | RF | $ 100 | 50.04 |
| LRT Corrosion Control Allowance | RF | $ 15 | 50.04 |
| LRT OCS Foundation Allowance | RF | $ 20 | 50.04 |

| | | | |
|---|---|---|---|
| LRT OCS Simple Catenary Allowance | RF | $ 125 | 50.04 |
| LRT OCS Single Contact Wire Allowance | RF | $ 140 | 50.04 |
| Bus Stop Communications Allowance | EA | $ 5,000 | 50.05 |
| Communications Allowance - BRT/LRT | RF | $ 155 | 50.05 |
| Fare Collection Allowance - BRT/LRT | EA | $ 85,000 | 50.06 |
| Central Control Allowance - BRT/LRT | RF | $ 25 | 50.07 |

*Source: LTK, 2006.*

### Right-of-Way

Year 2006 unit prices for items in the Right-of-Way category (which also includes relocation costs) are listed in Table 7. For the portions of the alternatives assumed to use the existing HCRRA right-of-way, the allowance for right-of-way at stations is added only at park-and-ride sites that are not currently owned by HCRRA. For the portions of the alternatives not assumed to be on HCRRA right-of-way, allowances for guideway right-of-way are assigned by the current use; commercial (high), industrial (medium), or state/municipal right-of-way (low).

In addition to the allowances for station and guideway right-of-way, the BRT 1, BRT 2, LRT 1A, LRT 2A, LRT 3A, and LRT 4A estimates include a portion of the cost to reroute freight rail traffic from the Kenilworth Corridor in Minneapolis through St. Louis Park. The railroad relocation project is distinct from the proposed Southwest Transitway project, but is required in order to construct either BRT or LRT through the Kenilworth Corridor. The cost estimate for the HCRRA portion of the freight rail relocation was taken from the 1999 *St. Louis Park Railroad Study.*

### Table 7 Year 2006 Unit Prices – Right-of-Way

| Description | Unit | Unit Price | SCC Line |
|---|---|---|---|
| Station Site Allowance | LS | $1,083,207 | 60.01 |
| Guideway Allowance - High | SF | $ 13 | 60.01 |
| Guideway Allowance - Medium | SF | $ 6 | 60.01 |
| Guideway Allowance - Low | SF | $ 1 | 60.01 |
| St. Louis Park Railroad Connection | EA | $4,867,930 | 60.02 |

*Source: LTK, 2006.*

### Vehicles

Year 2006 unit prices for items in the Vehicles category are listed in Table 8. Vehicle costs include light rail vehicles, low-floor diesel-electric hybrid buses for BRT, standard transit buses for regular route and feeder bus service, spare vehicles and other service vehicles to support operations and maintenance. The cost estimates also include allowances for vehicle spare parts.

**Table 8 Year 2006 Unit Prices – Vehicles**

| Description | Unit | Unit Price | SCC Line |
|---|---|---|---|
| LRT Light Rail Vehicle | EA | $ 3,000,000 | 70.01 |
| BRT Low-Floor Hybrid Bus | EA | $ 650,000 | 70.05 |
| Standard Bus | EA | $ 352,042 | 70.04 |
| Non-revenue Vehicle Allowance | RF | $ 30 | 70.06 |
| LRT Spare Parts Allowance | EA | $ 500,000 | 70.07 |
| BRT Spare Parts Allowance | EA | $ 100,000 | 70.07 |

*Source: LTK, 2006.*

### Professional Services

Cost estimates for professional services are generated by applying assumed rates to different categories of the estimate. Table 9 lists the rate assumptions provided by the FTA for estimating costs in the Professional Services category.

**Table 9 Professional Services**

| Description | Construction | Right-of-way | Vehicles | SCC Line |
|---|---|---|---|---|
| Preliminary Engineering | 2% | - | - | 80.01 |
| Final Design | 5% | 1% | 2% | 80.02 |
| Project Management for Design and Construction | 2% | 3% | 1% | 80.03 |
| Construction Administration and Management | 8% | 1% | - | 80.04 |
| Insurance | 4% | - | - | 80.05 |
| Legal; Permits; Review Fees by Other Agencies | 1% | 5% | - | 80.06 |
| Surveys, Testing, Investigation, Inspection | 2% | 10% | 2% | 80.07 |
| Agency Force Account Work | 6% | 10% | - | 80.08 |
| **Total** | **30%** | **30%** | **5%** | |

*Source: Federal Transit Administration, LTK, 2006*

### Allocated Contingencies

Allocated contingencies are contingencies that are associated with individual cost estimate categories. These contingencies are intended to compensate for unforeseen items of work, quantity fluctuations, and variances in unit costs that develop as the project progresses through the various stages of development. The level of contingency applied to each cost category reflects the relative potential variability of those costs. Table 10 lists the contingencies included in the capital cost estimates for each of the SCC categories.

### Table 10 Allocated Contingencies

| SCC Category | Allocated Contingency |
|---|---|
| 10: Guideway and Track Elements | 20% |
| 20: Stations | 20% |
| 30: Support Facilities | 20% |
| 40: Sitework and Special Conditions | 20% |
| 50: Systems | 20% |
| 60: Right-of-Way | 100% |
| 70: Vehicles | 5% |

*Source: LTK, 2006.*

## Basis of the Estimate

The Southwest Transitway AA capital cost estimates are based upon the alternatives as defined in *Technical Memorandum No. 3, Definition of Alternatives.* Those definitions have been refined into conceptual engineering drawings for each alternative, with sufficient detail to estimate quantities for the various capital cost elements.

This section identifies and describes the specific assumptions regarding the alternatives that have been necessary during the conceptual engineering and capital cost estimation tasks. These assumptions and the conceptual engineering drawings are the basis of the capital cost estimates.

### Enhanced Bus Alternative

By definition, the Enhanced Bus Alternative has limited capital costs. The assumptions for the capital cost estimate were limited to the addition of 49 standard buses and infrastructure costs at 13 bus stop locations. The infrastructure costs include construction of conventional bus stops with shelters and electronic readerboards, and park-and-ride facilities at certain locations. Table 11 lists the assumed improvements with the Enhanced Bus alternative.

### Table 11 Enhanced Bus Improvements

| Stop Location | Bus Stop | Park-and-Ride | |
|---|---|---|---|
| | | Surface | Structured |
| Mitchell Road | ○ | 230 | |
| SouthWest Station | ○ | | 675 |
| Flying Cloud Drive | ○ | | |
| US 212/Shady Oak Road | ○ | 35 | |
| Bren Road | ○ | | |
| Shady Oak Road | ○ | | |
| Hopkins | ○ | 90 | |
| TH 169 | ○ | | |

| | | | |
|---|---|---|---|
| Excelsior Boulevard | ○ | | |
| Blake Road | ○ | | |
| Texas Avenue | ○ | 265 | |
| Louisiana Avenue | ○ | | |
| Wooddale Drive | ○ | | |

*Source: LTK, 2006.*

### BRT Alternatives

**Guideway**

The BRT 1 alternative consist of an exclusive bus-only roadway along the existing HCRRA right-of-way between Eden Prairie and Minneapolis, and restricted diamond lanes in Minneapolis along Dunwoody Boulevard and Hennepin Avenue. The exclusive guideway is assumed to be a 28-foot wide paved roadway. The BRT 2 alternative includes a combination of restricted diamond lanes, bus only shoulder lanes, and exclusive bus-only roadway. Table 12 lists the locations of new guideway structures for the BRT alternatives.

### Table 12 BRT Guideway Structures

| | |
|---|---|
| **BRT 1** | over Valley View Road in Eden Prairie<br>under TC&W Railroad in Minnetonka<br>over Excelsior Boulevard in Hopkins |
| **BRT 2** | over TH 212 in Eden Prairie<br>over TH 62 in Eden Prairie<br>over Excelsior Boulevard in Hopkins |

*Source: LTK, 2006.*

**Stations**

Tables 13 and 14 list the assumed station characteristics for the two BRT alternatives, including station type, need for vertical circulation (i.e., elevator, escalator, stairs), and park-and-ride facilities.

**Systems**

The BRT estimates include allowances for communication systems and central control hardware and software based upon the total route length, and costs for two (2) fare collection systems at each BRT station.

The BRT alternatives assume a new traffic signal system would be required at every at-grade BRT crossing or intersection along the route.

**Right-of-Way**

A right-of-way allowance has been included for each BRT park-and-ride station that is on property not currently owned by the HCRRA. Potential BRT station sites currently owned by the HCRRA include Wooddale, Beltline, and West Lake.

Both BRT alternatives require that existing freight traffic be rerouted from the Kenilworth Corridor in Minneapolis to St. Louis Park. Assumptions regarding the HCRRA contribution to the relocation project were taken from the 1999 *St. Louis Park Railroad Study*, and adjusted to Year 2006 dollars.

### Table 13 BRT 1 Stations

| Station | Type | Vertical Circulation | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| TH 5 | At-Grade | | 400 | 785 |
| TH 62 | At-Grade | | 200 | |
| Rowland Road | At-Grade | | 50 | |
| Shady Oak Road | At-Grade | | 230 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 305 | |
| Louisiana Avenue | Elevated | ○ | 40 | |
| Wooddale | At-Grade | | 85 | |
| Beltline Road | At-Grade | | 25 | |
| West Lake | At-Grade | | 150 | |
| 21st Street | At-Grade | | 30 | |
| Penn Avenue | At-Grade | ○ | 70 | |
| Van White Boulevard | At-Grade | | | |
| 12th Street | At-Grade | | | |
| 8th Street | At-Grade | | | |
| 4th Street | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

### Table 14 BRT 2 Stations

| Station | Type | Vertical Circulation | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| Mitchell Road | At-Grade | | 400 | 420 |
| SouthWest | At-Grade | | | 370 |
| Eden Prairie Town Center | At-Grade | | | 655 |
| Golden Triangle | At-Grade | | 70 | |
| City West | At-Grade | | | 100 |
| Opus | At-Grade | | 80 | |
| Shady Oak Road | At-Grade | | 255 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 330 | |
| Louisiana Avenue | Elevated | ○ | 40 | |
| Wooddale | At-Grade | | 90 | |
| Beltline Road | At-Grade | | 25 | |
| West Lake | At-Grade | | 145 | |
| 21st Street | At-Grade | | 30 | |

| | | | | |
|---|---|---|---|---|
| Penn Avenue | At-Grade | ○ | 70 | |
| Van White Boulevard | At-Grade | | | |
| 12th Street | At-Grade | | | |
| 8th Street | At-Grade | | | |
| 4th Street | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

**Vehicles**
The BRT alternatives have been defined to include both conventional buses and low-floor hybrid diesel-electric buses. In addition, conventional buses will operate feeder bus routes and regular route and express service outside of the bus-only guideway. Vehicle requirements were estimated from the operating plans and ridership estimates of each BRT alternative. Assumed vehicle requirements for the BRT alternatives are listed in Table 15.

### Table 15 BRT Vehicle Requirements

| Alternative | Hybrid Low-floor Buses | Conventional Buses |
|---|---|---|
| BRT 1 | 15 | 39 |
| BRT 2 | 18 | 39 |

*Source: LTK, 2006.*

## LRT Alternatives

**Guideway**
The LRT guideway costs include elements such as grading, drainage, retaining walls, bridges, tunnels, and trackwork. All of the LRT alternatives assume a double track alignment, with crossover tracks at one-mile intervals. Table 16 lists the locations of new guideway structures for each of the LRT alternatives.

**Stations**
Tables 17 though 24 list the assumed station "high amenity design" characteristics for the eight LRT alternatives, including station type, need for vertical circulation (i.e., elevator, escalator, stairs), and park-and-ride spaces. LRT station costs assume two-car train operation.

**Right-of-Way**
A right-of-way allowance has been included for each LRT park-and-ride station that is on property not currently owned by the HCRRA. Station sites owned by the HCRRA include Wooddale Avenue, Beltline Boulevard, West Lake Street, 21$^{st}$ Street, and Penn Avenue.

LRT 1A, LRT 2A, LRT 3A, and LRT 4A require that existing freight traffic be rerouted from the HCRRA Kenilworth Corridor in Minneapolis to St. Louis Park. Assumptions regarding the HCRRA contribution to the relocation project were taken from the 1999 *St. Louis Park Railroad Study.*

### Table 16  LRT Guideway Structures

| | |
|---|---|
| **LRT 1A** | over Valley View Road in Eden Prairie<br>under TC&W Railroad in Minnetonka<br>over Excelsior Boulevard in Hopkins<br>over BNSF Railroad in Minneapolis<br>under 7th Street in Minneapolis |
| **LRT 2A** | under Prairie Center Drive in Eden  Prairie<br>over TH 5 in Eden Prairie<br>over Valley View exit ramp in Eden Prairie<br>over TH 62 in Eden Prairie<br>over TC&W Railroad in Minnetonka<br>over Excelsior Boulevard in Hopkins<br>over BNSF Railroad in Minneapolis<br>under 7th Street in Minneapolis |
| **LRT 3A** | under Prairie Center Drive in Eden Prairie<br>over I-494 in Eden Prairie<br>over Flying Cloud Drive in Eden Prairie<br>over TH 212 in Eden Prairie<br>over TH 62 in Eden Prairie<br>under Smetana Road in Minnetonka<br>under CP Railroad in Hopkins<br>over Excelsior Boulevard in Hopkins<br>over BNSF Railroad in Minneapolis<br>under 7th Street in Minneapolis |
| **LRT 4A** | over Excelsior Boulevard in Hopkins<br>over BNSF Railroad in Minneapolis<br>under 7th Street in Minneapolis |
| **LRT 1C** | over Valley View Road in Eden Prairie<br>under TC&W Railroad in Minnetonka<br>over Excelsior Boulevard in Hopkins<br>over Wooddale/CP Railroad in St. Louis Park<br>Nicollet Avenue tunnel in Minneapolis |
| **LRT 2C** | under Prairie Center Drive in Eden  Prairie<br>over TH 5 in Eden Prairie<br>over Valley View exit ramp in Eden Prairie<br>over TH 62 in Eden Prairie<br>over TC&W Railroad in Minnetonka<br>over Excelsior Boulevard in Hopkins<br>over Wooddale/CP Railroad in St. Louis Park<br>Nicollet Avenue tunnel in Minneapolis |
| **LRT 3C** | under Prairie Center Drive in Eden Prairie<br>over I-494 in Eden Prairie<br>over Flying Cloud Drive in Eden Prairie<br>over TH 212 in Eden Prairie<br>over TH 62 in Eden Prairie<br>under Smetana Road in Minnetonka<br>under CP Railroad in Hopkins<br>over Excelsior Boulevard in Hopkins<br>over Wooddale/CP Railroad in St. Louis Park<br>Nicollet Avenue tunnel in Minneapolis |
| **LRT 4C** | over Excelsior Boulevard in Hopkins<br>over Wooddale/CP Railroad in St. Louis Park<br>Nicollet Avenue tunnel in Minneapolis |

*Source: Parsons Brinckerhoff, 2006.*

### Table 17 LRT 1A Stations

| Station | Type | Vertical Circulation | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| TH 5 | At-Grade | | 400 | 785 |
| TH 62 | At-Grade | | 200 | |
| Rowland Road | At-Grade | | 50 | |
| Shady Oak Road | At-Grade | | 230 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 305 | |
| Louisiana Avenue | Elevated | ○ | 40 | |
| Wooddale Avenue | At-Grade | | 85 | |
| Beltline Boulevard | At-Grade | | 25 | |
| West Lake Street | At-Grade | | 150 | |
| 21st Street | At-Grade | | 30 | |
| Penn Avenue | At-Grade | ○ | 70 | |
| Van White Boulevard | At-Grade | | | |
| Royalston Avenue | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

### Table 18 LRT 2A Stations

| Station | Type | Vertical Circulation | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| Mitchell Road | At-Grade | | 400 | 330 |
| SouthWest | At-Grade | | | 625 |
| Valley View Road | At-Grade | | 220 | |
| TH 62 | At-Grade | | 120 | |
| Rowland Road | At-Grade | | 55 | |
| Shady Oak Road | At-Grade | | 240 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 335 | |
| Louisiana Avenue | Elevated | ○ | 40 | |
| Wooddale Avenue | At-Grade | | 90 | |
| Beltline Boulevard | At-Grade | | 25 | |
| West Lake Street | At-Grade | | 155 | |
| 21st Street | At-Grade | | 30 | |
| Penn Avenue | At-Grade | ○ | 70 | |
| Van White Boulevard | At-Grade | | | |
| Royalston Avenue | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

### Table 19  LRT 3A Stations

| Station | Type | Vertical Circulation | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| Mitchell Road | At-Grade | | 400 | 420 |
| SouthWest | At-Grade | | | 370 |
| Eden Prairie Town Center | At-Grade | | | 655 |
| Golden Triangle | At-Grade | | 70 | |
| City West | At-Grade | | | 100 |
| Opus | At-Grade | | 80 | |
| Shady Oak Road | At-Grade | | 255 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 330 | |
| Louisiana Avenue | Elevated | ○ | 40 | |
| Wooddale Avenue | At-Grade | | 90 | |
| Beltline Boulevard | At-Grade | | 25 | |
| West Lake Street | At-Grade | | 145 | |
| 21st Street | At-Grade | | 30 | |
| Penn Avenue | At-Grade | ○ | 70 | |
| Van White Boulevard | At-Grade | | | |
| Royalston Avenue | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

### Table 20  LRT 4A Stations

| Station | Type | Vertical Circulation | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| Mitchell Road | At-Grade | | 180 | |
| Shady Oak Road | At-Grade | | 885 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 325 | |
| Louisiana Avenue | Elevated | ○ | 35 | |
| Wooddale Avenue | At-Grade | | 85 | |
| Beltline Boulevard | At-Grade | | 25 | |
| West Lake Street | At-Grade | | 115 | |
| 21st Street | At-Grade | | 30 | |
| Penn Avenue | At-Grade | ○ | 70 | |
| Van White Boulevard | At-Grade | | | |
| Royalston Avenue | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

### Table 21  LRT 1C Stations

| Station | Type | Vertical Circulation | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| TH 5 | At-Grade | | 400 | 700 |
| TH 62 | At-Grade | | 200 | |
| Rowland Road | At-Grade | | 50 | |
| Shady Oak Road | At-Grade | | 215 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 300 | |
| Louisiana Avenue | Elevated | ○ | 35 | |
| Wooddale Avenue | At-Grade | | 80 | |
| Beltline Boulevard | At-Grade | | 25 | |
| West Lake Street | At-Grade | | 145 | |
| Uptown | Open Cut | ○ | | |
| Lyndale Avenue | Open Cut | ○ | | |
| 28th Street | Open Cut | ○ | | |
| Franklin Avenue | Open Cut | ○ | | |
| 12th Street | At-Grade | | | |
| 8th Street | At-Grade | | | |
| 4th Street | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

### Table 22  LRT 2C Stations

| Station | Type | Vertical Circulatio n | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| Mitchell Road | At-Grade | | 400 | 315 |
| SouthWest | At-Grade | | | 605 |
| Valley View Road | At-Grade | | 215 | |
| TH 62 | At-Grade | | 115 | |
| Rowland Road | At-Grade | | 50 | |
| Shady Oak Road | At-Grade | | 230 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 325 | |
| Louisiana Avenue | Elevated | ○ | 40 | |
| Wooddale Avenue | At-Grade | | 85 | |
| Beltline Boulevard | At-Grade | | 25 | |
| West Lake Street | At-Grade | | 150 | |
| Uptown | Open Cut | ○ | | |
| Lyndale Avenue | Open Cut | ○ | | |
| 28th Street | Open Cut | ○ | | |

| | | | | |
|---|---|---|---|---|
| Franklin Avenue | Open Cut | ○ | | |
| 12th Street | At-Grade | | | |
| 8th Street | At-Grade | | | |
| 4th Street | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

### Table 23 LRT 3C Stations

| Station | Type | Vertical Circulation | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| Mitchell Road | At-Grade | | 400 | 395 |
| SouthWest | At-Grade | | | 360 |
| Eden Prairie Town Center | At-Grade | | | 640 |
| Golden Triangle | At-Grade | | 70 | |
| City West | At-Grade | | | 100 |
| Opus | At-Grade | | 80 | |
| Shady Oak Road | At-Grade | | 250 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 320 | |
| Louisiana Avenue | Elevated | ○ | 40 | |
| Wooddale Avenue | At-Grade | | 90 | |
| Beltline Boulevard | At-Grade | | 25 | |
| West Lake Street | At-Grade | | 145 | |
| Uptown | Open Cut | ○ | | |
| Lyndale Avenue | Open Cut | ○ | | |
| 28th Street | Open Cut | ○ | | |
| Franklin Avenue | Open Cut | ○ | | |
| 12th Street | At-Grade | | | |
| 8th Street | At-Grade | | | |
| 4th Street | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

### Table 24 LRT 4C Stations

| Station | Type | Vertical Circulation | Park-and-Ride | |
|---|---|---|---|---|
| | | | Surface | Structured |
| Mitchell Road | At-Grade | | 180 | |
| Shady Oak Road | At-Grade | | 865 | |
| Hopkins | At-Grade | | 90 | |
| Blake Road | At-Grade | | 315 | |
| Louisiana Avenue | Elevated | ○ | 35 | |
| Wooddale Avenue | At-Grade | | 85 | |

| | | | | |
|---|---|---|---|---|
| Beltline Boulevard | At-Grade | | 25 | |
| West Lake Street | At-Grade | | 115 | |
| Uptown | Open Cut | ○ | | |
| Lyndale Avenue | Open Cut | ○ | | |
| 28th Street | Open Cut | ○ | | |
| Franklin Avenue | Open Cut | ○ | | |
| 12th Street | At-Grade | | | |
| 8th Street | At-Grade | | | |
| 4th Street | At-Grade | | | |

*Source: Parsons Brinckerhoff, LTK, LSA Design, 2006.*

**Vehicles**
The LRT alternatives have been defined to include both light rail vehicles and conventional buses. The light rail vehicles would operate as one- or two-car trains that either interline with Hiawatha service (LRT 1A, LRT 2A, LRT 3A, and LRT 4A) or operate exclusively on the Southwest line (LRT 1C, LRT 2C, LRT 3C, and LRT 4C). The conventional buses would primarily be used on feeder routes to LRT stations.

Vehicle requirements were estimated from the operating plans and ridership estimates of each LRT alternative. Table 25 lists the vehicle requirements identified for each alternative.

### Table 25 LRT Vehicle Requirements

| Alternative | Light Rail Vehicles | Conventional Buses |
|---|---|---|
| LRT 1A | 19 | 38 |
| LRT 2A | 21 | 40 |
| LRT 3A | 24 | 42 |
| LRT 4A | 12 | 44 |
| LRT 1C | 24 | 38 |
| LRT 2C | 26 | 40 |
| LRT 3C | 28 | 42 |
| LRT 4C | 17 | 44 |

*Source: Parsons Brinckerhoff, 2006.*

# 5. Results

Table 26 contains summaries of the total capital cost estimates for the Southwest Transitway alternatives. For each alternative the summaries include the Base Year (2006) total estimate, the unallocated contingency (20%), the Base Year (2006) project total, and the Forecast Year (2015) project total.

### Table 26 Summary of Total Capital Cost Estimates

| Alternative | Year 2006 Estimate (thousands) | Unallocated Contingency (thousands) | Year 2006 Project Total (thousands) | Year 2015 Project Total (thousands) |
|---|---|---|---|---|
| Enhanced Bus | $ 52,376 | $ 10,475 | $ 62,851 | $ 79,882 |
| BRT 1 | $ 354,057 | $ 70,811 | $ 424,869 | $ 539,994 |
| BRT 2 | $ 461,580 | $ 92,316 | $ 553,896 | $ 703,983 |
| LRT 1A | $ 566,786 | $ 113,357 | $ 680,143 | $ 864,438 |
| LRT 2A | $ 647,578 | $ 129,516 | $ 777,093 | $ 987,659 |
| LRT 3A | $ 758,842 | $ 151,768 | $ 910,611 | $ 1,157,355 |
| LRT 4A | $ 414,963 | $ 82,993 | $ 497,956 | $ 632,885 |
| LRT 1C | $ 732,908 | $ 146,582 | $ 879,490 | $ 1,117,801 |
| LRT 2C | $ 814,692 | $ 162,938 | $ 977,630 | $ 1,242,535 |
| LRT 3C | $ 921,938 | $ 184,388 | $ 1,106,326 | $ 1,406,103 |
| LRT 4C | $ 582,877 | $ 116,575 | $ 699,453 | $ 888,981 |

*Source: LTK, 2006.*

In addition to total project costs, the capital cost estimates have been computed on a per mile basis. Table 27 contains a summary of the estimated costs per mile for the BRT and LRT alternatives. The table lists the overall length of each alternative, the number of stations, the Base Year (2006) total project cost per mile, and the Forecast Year (2015) total project cost per mile.

Details of the capital cost estimates for each alternative are included in the Appendices:

- Appendix C: Enhanced Bus Alternative
- Appendix D: BRT Alternatives
- Appendix E: LRT Alternatives

**Table 27 Summary of per Mile Capital Cost Estimates**

| Alternative | Length (miles) | Stations | Capital Cost per Mile | |
|---|---|---|---|---|
| | | | Year 2006 (thousands) | Year 2015 (thousands) |
| BRT 1 | 13.9 | 16 | $ 30,657 | $ 38,964 |
| BRT 2 | 18.3 | 19 | $ 30,245 | $ 38,441 |
| LRT 1A | 13.8 | 14 | $ 49,374 | $ 62,752 |
| LRT 2A | 15.1 | 16 | $ 51,448 | $ 65,389 |
| LRT 3A | 15.7 | 17 | $ 57,895 | $ 73,583 |
| LRT 4A | 9.1 | 11 | $ 54,728 | $ 69,558 |
| LRT 1C | 14.6 | 17 | $ 60,088 | $ 76,370 |
| LRT 2C | 16.0 | 19 | $ 61,233 | $ 77,825 |
| LRT 3C | 16.6 | 20 | $ 66,686 | $ 84,756 |
| LRT 4C | 10.0 | 14 | $ 70,226 | $ 89,255 |

*Source: LTK, 2006.*

The results of the capital cost estimate have been used to estimate the annualized capital cost for each of the Southwest Transitway alternatives. The annualized capital cost estimates are summarized in Table 28. Details of the annualized capital cost estimates are included in Appendix F.

**Table 28 Summary of Annualized Capital Cost Estimates**

| Alternative | Annualized Capital Cost (thousands) |
|---|---|
| Enhanced Bus | $ 5,788 |
| BRT 1 | $ 35,336 |
| BRT 2 | $ 45,276 |
| LRT 1A | $ 55,457 |
| LRT 2A | $ 62,795 |
| LRT 3A | $ 73,226 |
| LRT 4A | $ 40,779 |
| LRT 1C | $ 71,409 |
| LRT 2C | $ 78,835 |
| LRT 3C | $ 88,832 |
| LRT 4C | $ 56,888 |

*Source: LTK, 2006.*

# Appendices

## Appendix A: Southwest Transitway Alternative Maps

## Appendix B: FTA Standard Cost Category (SCC) Definitions

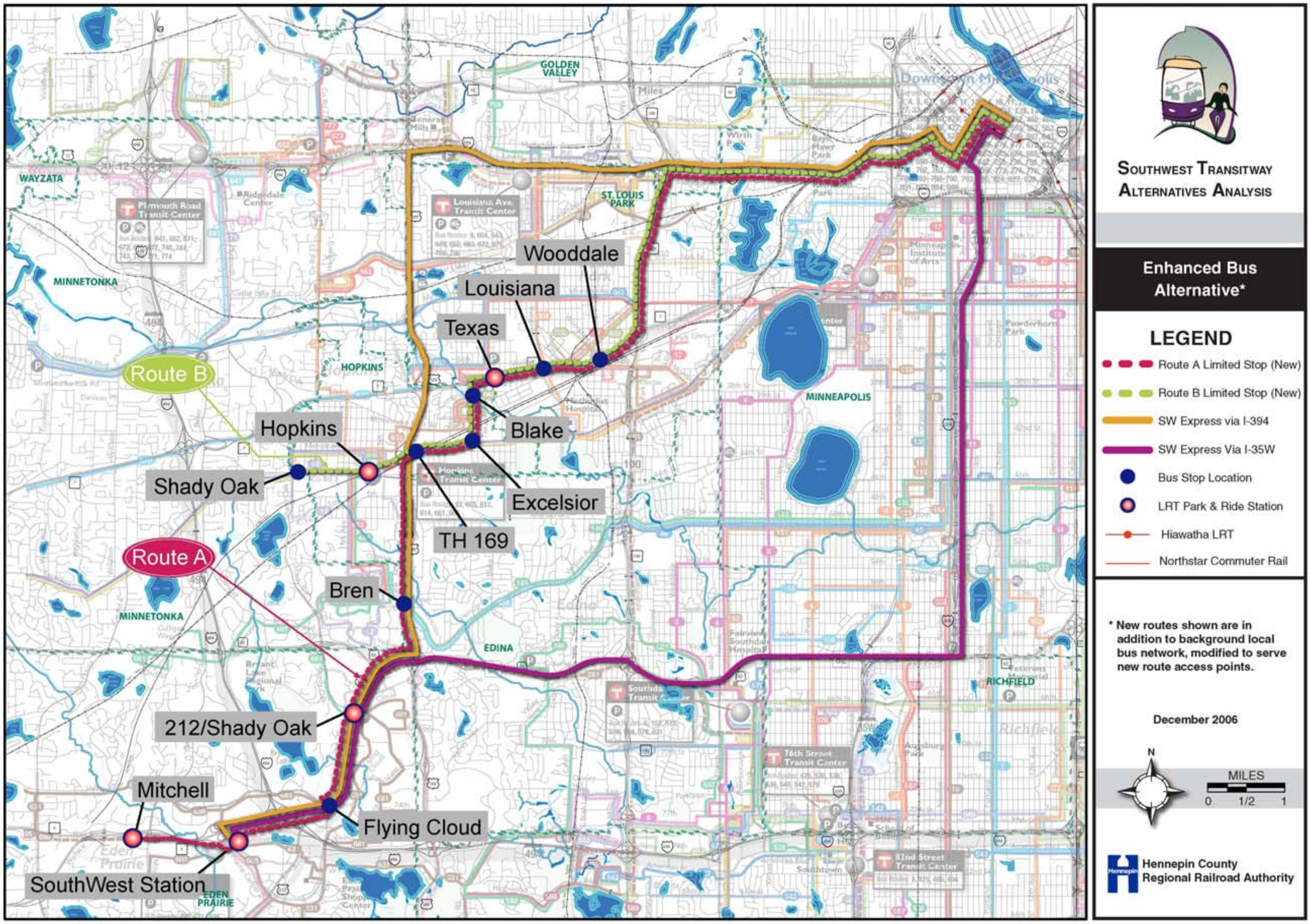
## Appendix C: Enhanced Bus Alternative

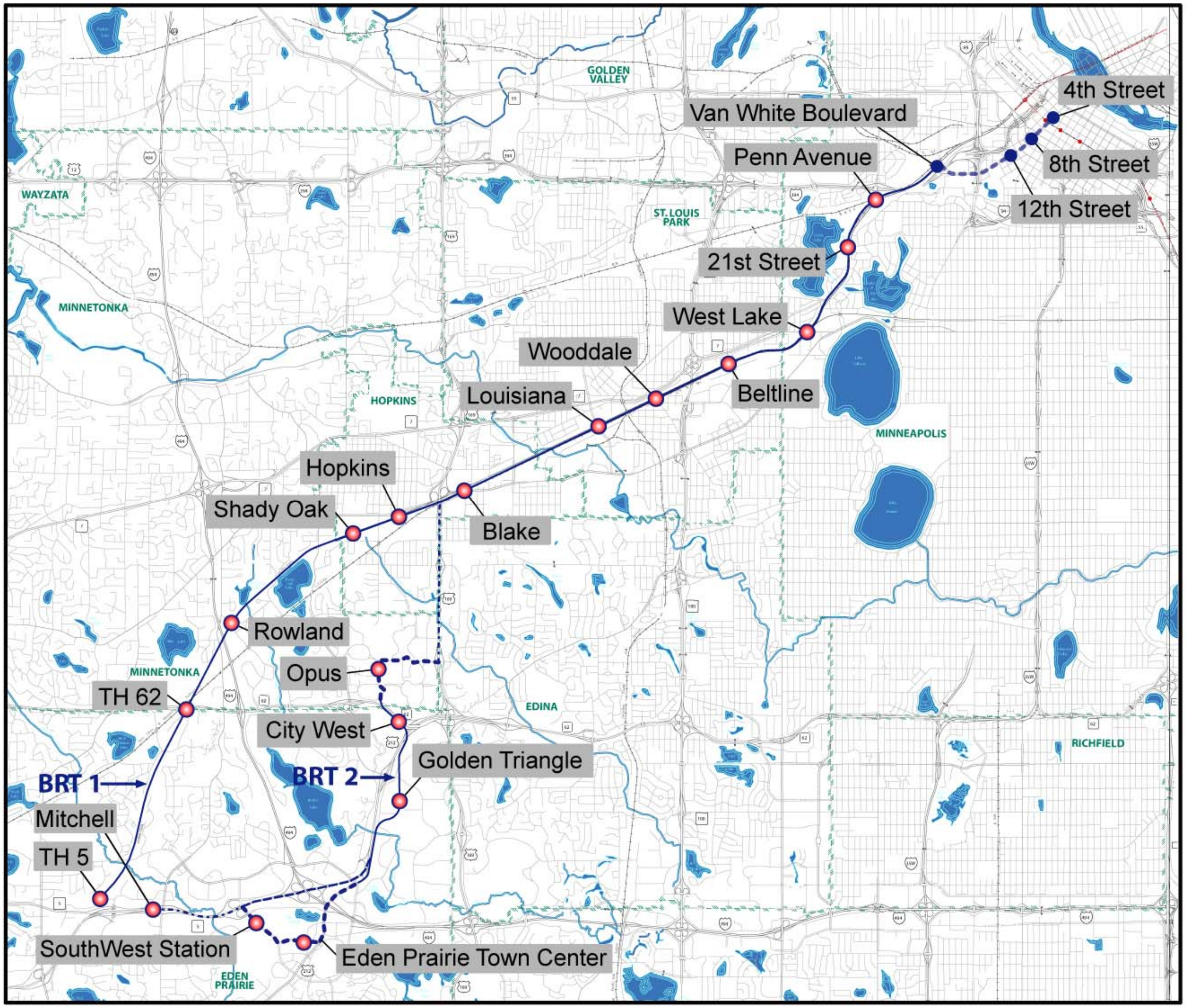
## Appendix D: BRT Alternatives

## Appendix E: LRT Alternatives

## Appendix F: Annualized Capital Costs

# Appendix A: Southwest Transitway Alternative Maps


Southwest Transitway
Alternatives Analysis
Enhanced Bus Alternative*
LEGEND
Route A Limited Stop (New)
Route B Limited Stop (New)
SW Express via I-394
SW Express Via I-35W
Bus Stop Location
LRT Park & Ride Station
Hiawatha LRT
Northstar Commuter Rail
* New routes shown are in addition to background local bus network, modified to serve new route access points.
December 2006
N
MILES
0 1/2 1
Hennepin County Regional Railroad Authority
Route B
Route A
Wooddale
Louisiana
Texas
Blake
Hopkins
Shady Oak
Excelsior
TH 169
Bren
212/Shady Oak
Mitchell
Flying Cloud
SouthWest Station
GOLDEN VALLEY
WAYZATA
ST. LOUIS PARK
MINNETONKA
HOPKINS
MINNEAPOLIS
EDINA
RICHFIELD
EDEN PRAIRIE




Southwest Transitway Alternatives Analysis

**Bus Rapid Transit Alternatives**

## LEGEND

- New Exclusive Busway
- Existing Bus Shoulder Lanes
- New Bus Only Lanes
- Alternative Alignment Option
- BRT Station
- BRT Park & Ride Station
- Hiawatha LRT
- Northstar Commuter Rail

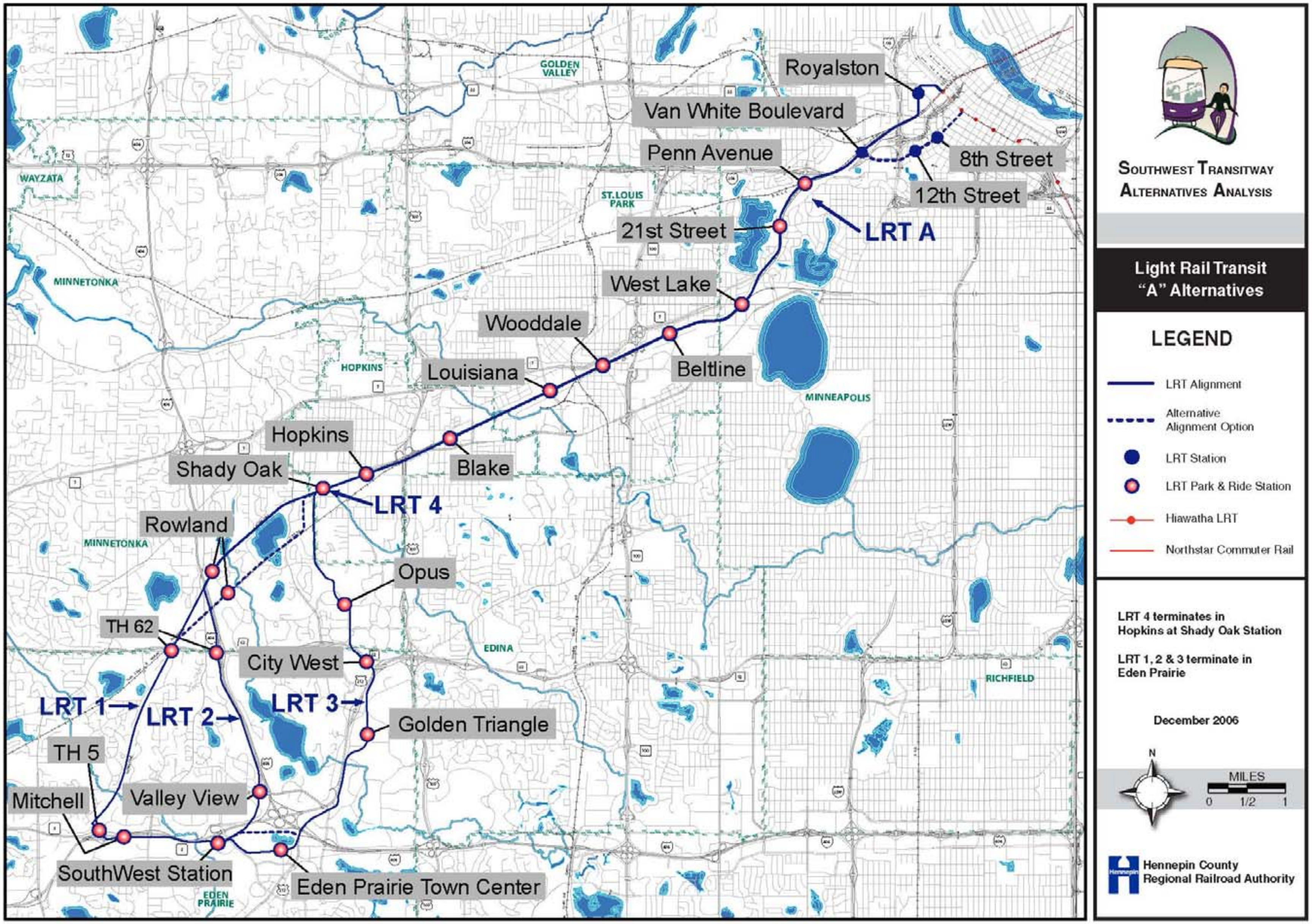
December 2006

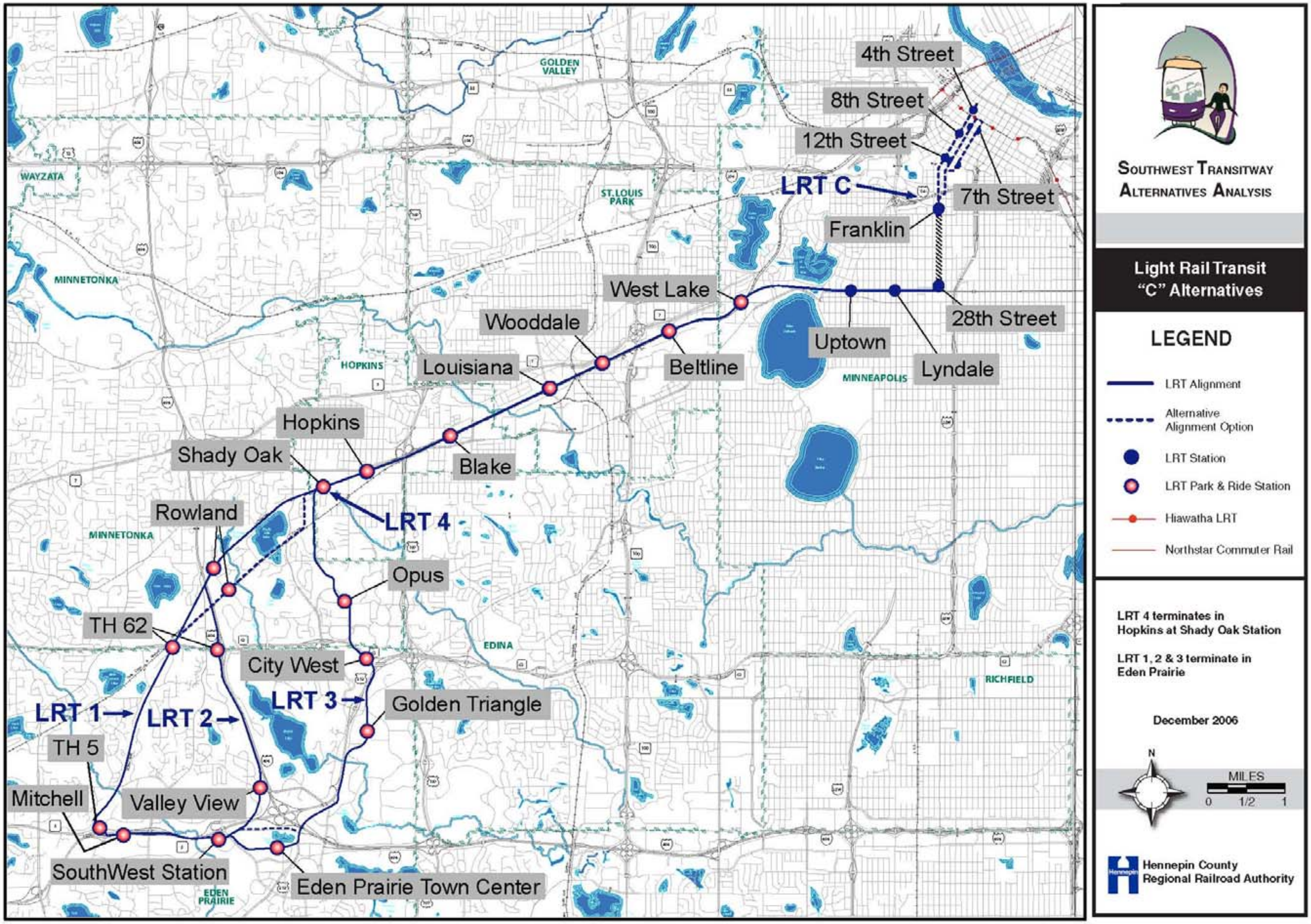
N

MILES

0 1/2 1

Hennepin County Regional Railroad Authority


GOLDEN VALLEY
WAYZATA
ST. LOUIS PARK
MINNETONKA
HOPKINS
MINNEAPOLIS
EDINA
RICHFIELD
EDEN PRAIRIE
Royalston
Van White Boulevard
Penn Avenue
8th Street
12th Street
21st Street
LRT A
West Lake
Wooddale
Beltline
Louisiana
Hopkins
Blake
Shady Oak
LRT 4
Rowland
Opus
TH 62
City West
LRT 1
LRT 2
LRT 3
Golden Triangle
TH 5
Mitchell
Valley View
SouthWest Station
Eden Prairie Town Center
Southwest Transitway
Alternatives Analysis
Light Rail Transit
"A" Alternatives
LEGEND
LRT Alignment
Alternative Alignment Option
LRT Station
LRT Park & Ride Station
Hiawatha LRT
Northstar Commuter Rail
LRT 4 terminates in Hopkins at Shady Oak Station
LRT 1, 2 & 3 terminate in Eden Prairie
December 2006
N
MILES
0
1/2
1
Hennepin County Regional Railroad Authority



Southwest Transitway
Alternatives Analysis
Light Rail Transit
"C" Alternatives
LEGEND
LRT Alignment
Alternative Alignment Option
LRT Station
LRT Park & Ride Station
Hiawatha LRT
Northstar Commuter Rail
LRT 4 terminates in Hopkins at Shady Oak Station
LRT 1, 2 & 3 terminate in Eden Prairie
December 2006
N
MILES
0
1/2
1
Hennepin County
Regional Railroad Authority
4th Street
8th Street
12th Street
7th Street
LRT C
Franklin
West Lake
28th Street
Wooddale
Uptown
Lyndale
Beltline
Louisiana
Hopkins
Blake
Shady Oak
LRT 4
Rowland
Opus
TH 62
City West
LRT 1
LRT 2
LRT 3
Golden Triangle
TH 5
Mitchell
Valley View
SouthWest Station
Eden Prairie Town Center
GOLDEN VALLEY
WAYZATA
ST. LOUIS PARK
MINNETONKA
HOPKINS
MINNEAPOLIS
EDINA
RICHFIELD
EDEN PRAIRIE

# Appendix B: FTA Standard Cost Category (SCC) Definitions

| Standard Cost Categories Definitions<br>(Rev. 6, Feb 7, 2006) | | **NOTE:** The SCC cost breakdown is based on a traditional Design Bid Build model. If your project is Design Build, to the best of your ability, separate construction costs from design, administration, testing, etc. Put construction in 10 through 50. Put design, administration, testing, etc. in 80. |
|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | Include guideway and track costs for all transit modes (rail, bus, monorail, cable car, etc.) The unit of measure is route miles of guideway, regardless of width. As associated with the guideway, include costs for rough grading, excavation, and concrete base for guideway where applicable. Include all construction materials and labor regardless of who is performing the work.<br><br>In your written description of the scope and in supporting graphic diagrams, indicate whether busway or rail track is single, double, triple, relocated, etc. For guideway and track elements associated with yards, see *30 Support Facilities* below. |
| 10.01 | Guideway: At-grade exclusive right-of-way | |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | |
| 10.03 | Guideway: At-grade in mixed traffic | |
| 10.04 | Guideway: Aerial structure | Include foundation excavation; guideway structures including caissons, columns, bridges, viaducts, cross-overs, fly-overs. |
| 10.05 | Guideway: Built-up fill | Include construction of earthen berms. |
| 10.06 | Guideway: Underground cut & cover | Include excavation, retaining walls, backfill, underground guideway structure and finishes. |
| 10.07 | Guideway: Underground tunnel | Include tunneling by means of a tunnel boring machine, drill blasting, mining, and immersed tube tunneling; tunnel structure and finishes. |
| 10.08 | Guideway: Retained cut or fill | Include excavation, retaining walls, backfill, underground guideway structure and finishes. |
| 10.09 | Track: Direct fixation | Include rails, connectors. |
| 10.10 | Track: Embedded | Include rails, ties; ballast where applicable |
| 10.11 | Track: Ballasted | Include rails, ties and ballast. |
| 10.12 | Track: Special (switches, turnouts) | Include transitional curves. |
| 10.13 | Track: Vibration and noise dampening | Include upcharge for vib/noise dampening to any track condition above. |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | As associated with stations, include costs for rough grading, excavation, ventilation structures and equipment, station power and lighting, public address/customer information system, safety systems such as fire detection and prevention, security surveillance, access control, and life safety systems; finishes and equipment. Include all construction materials and labor regardless of who is performing the work. |
| | | Place all guideway and track associated with stations in *10 Guideway & Track Elements* above. |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | Include station structures including caissons, columns, platforms, superstructures, etc. |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | Include retaining walls, backfill, structure. |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | |
| 20.05 | Joint development | Per the FTA Circular 5010.1C Grant Management Guidelines, "Joint development is any income-producing activity with a transit nexus related to a real estate asset in which FTA has an interest. . .Joint development projects are commercial, residential, industrial, or mixed-use developments that are induced by or enhance the effectiveness of transit projects. . ." See circular for additional information. Path: www.fta.dot.gov -- Home / Government & Legal / Guidance / Circulars / 5000 - Grants Management - General / Table of Contents, Appendix: Joint Development Projects |
| 20.06 | Automobile parking multi-story structure | Include retaining walls, backfill, structure. |
| 20.07 | Elevators, escalators | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | As associated with support facilities, include costs for rough grading, excavation, ventilation structures and equipment, facility power and lighting, safety systems such as fire detection and prevention, security surveillance, access control, and life safety systems; finishes and equipment. Include fueling stations, alternative fueling stations. Include all construction materials and labor regardless of who is performing the work. |
| | | Where a support facility shares structure with a station, its cost may be included with station cost. Identify this with a note. |
| | | Except for guideway and track associated with a yard, include all guideway and track costs associated with support facilities in *10 Guideway & Track Elements* above. |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | |
| 30.02 | Light Maintenance Facility | Include service, inspection, and storage facilities and equipment. |
| 30.03 | Heavy Maintenance Facility | Include heavy maintenance and overhaul facilities and equipment. |
| 30.04 | Storage or Maintenance of Way Building | |
| 30.05 | Yard and Yard Track | Include yard construction, guideway and track associated with yard. |
| **40 SITEWORK & SPECIAL CONDITIONS** | | Include all construction materials and labor regardless of who is performing the work. |
| 40.01 | Demolition, Clearing, Earthwork | Include project-wide clearing, demolition and fine grading. |
| 40.02 | Site Utilities, Utility Relocation | Include all site utilities - storm, sewer, water, gas, electric. |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | Include underground storage tanks, fuel tanks and other hazardous materials and treatments not listed. |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | Include other environmental mitigation not listed. |
| 40.05 | Site structures including retaining walls, sound walls | |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | Include sidewalks, paths, plazas, landscape, site and station furniture, site lighting, signage, public artwork, bike facilities, permanent fencing. |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | |

| | | |
|---|---|---|
| 40.08 | Temporary Facilities and other indirect costs during construction | As a general rule and to the extent possible, appropriately allocate indirect costs among the construction costs in Categories 10 through 50. Where that is not possible, include in *40.08 Temporary Facilities* costs for mobilization, demobilization, phasing; time and temporary construction associated with weather (heat, rain, freezing, etc.); temporary power and facilities; temporary construction, easements, and barriers for storm water pollution prevention, temporary access and to mitigate construction impacts; project and construction supervision; general conditiions, overhead, profit.<br>NOTE: Include contractor's general liability and other insurance related to construction such as builder's risk in 10 through 50, not in 80 Professional Services below. |
| **50 SYSTEMS** | | Include all construction materials and labor regardless of who is performing the work. |
| 50.01 | Train control and signals | |
| 50.02 | Traffic signals and crossing protection | |
| 50.03 | Traction power supply: substations | |
| 50.04 | Traction power distribution: catenary and third rail | |
| 50.05 | Communications | Include intelligent transportation systems for stations and vehicles. |
| 50.06 | Fare collection system and equipment | Include fare sales and swipe machines, fare counting equipment. |
| 50.07 | Central Control | |
| **Construction Subtotal (10 - 50)** | | |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | |
| 60.01 | Purchase or lease of real estate | Include donated, leased or purchased land. Include existing buildings and other structures on land. Include permanent surface and subsurface easements, costs for trackage rights.<br><br>Include professional services associated with the real estate component of the project. These may include legal services and court expenses and consulting real estate services. |
| 60.02 | Relocation of existing households and businesses | Include professional services associated with relocation component of the project. Include costs related to exercise of eminent domain. |
| **70 VEHICLES (number)** | | Include design and manufacturing costs associated with vehicles. Include warranty costs. |
| 70.01 | Light Rail | Include streetcar. |
| 70.02 | Heavy Rail | |
| 70.03 | Commuter Rail | Include Locomotive Diesel, Locomotive Electric, Trailer Cars, Self-Propelled Electric (EMU), Self-Propelled Diesel (DMU). |
| 70.04 | Bus | Include STD 40 ft bus, STD 35 ft bus, 30 ft bus, <30 ft bus, School, Articulated, Commuter/Suburban, Intercity, Trolley STD, Trolley Articulated, Double Decker, Used, Used School Bus, Dual Mode. |
| 70.05 | Other | Include Vans, Sedan/Station Wagon, Cable Car, People Mover, Monorail, Car/Inclined Railway, Ferry Boat, Transferred Vehicle |
| 70.06 | Non-revenue vehicles | |
| 70.07 | Spare parts | |
| **80 PROFESSIONAL SERVICES** | | Include all professional, technical and management services (and related professional liability insurance costs) during the preliminary engineering, final design, and construction phases of the project. This includes environmental work, design, engineering and architectural services; specialty services such as safety or security analyses; value engineering, risk assessment, cost estimating, scheduling, Before and After studies, ridership modeling and analyses, auditing, legal services, administration and management, etc. by agency staff or outside consultants. As required, use back-up worksheets to track detailed costs within each of the line items.<br>*(Note that costs for alternatives analysis and NEPA work done before FTA approval to enter preliminary engineering (PE), regardless of funding source, are not included in an FFGA and therefore, should not be included in the Standard Cost Category worksheets. For example, on one and the same grant, costs incurred prior to FTA approval to enter PE should be omitted from these worksheets whereas costs incurred after FTA approval to enter PE should be included.)* |
| 80.01 | Preliminary Engineering | |
| 80.02 | Final Design | |
| 80.03 | Project Management for Design and Construction | |
| 80.04 | Construction Administration & Management | |
| 80.05 | Insurance | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | |
| 80.07 | Surveys, Testing, Investigation, Inspection | |
| 80.08 | Agency Force Account Work | Include construction work by agency staff including access and protection work in Categories 10 through 50 above. Include here testing, inspection, start up and training. |
| **Subtotal (10 - 80)** | | |
| **90 UNALLOCATED CONTINGENCY** | | Includes unallocated contingency, project reserves. Document allocated contingencies for individual line items on the Allocated Contingency worksheet. |
| **Subtotal (10 - 90)** | | |
| **100 FINANCE CHARGES** | | Include finance charges expected to be paid by the project sponsor/grantee prior to either the completion of the project or the fulfillment of the New Starts funding commitment, whichever occurs later in time. Finance charges incurred after this date should not be included in Total Project Cost on the *Main Worksheet* or in the FFGA Baseline Cost Estimate. (See FFGA Circular FTA C5200.1A Chapter III for additional information.)<br><br>Derive finance charges from the New Starts project's financial plan, based on an analysis of the sources and uses of funds. The amount and type of debt financing required and revenues available determine the finance charges. By year, compute finance charges in year-of-expenditure (YOE) dollars. On the Inflation Calculation to YOE worksheet enter the finance charges for the appropriate years. The Inflation worksheet automatically calculates the amounts in base year dollars. |
| **Total Project Cost (10 - 100)** | | |

# Appendix C: Enhanced Bus Alternative

| Major Capital Project Costs - Main Worksheet | | | | | (Rev. 6, Feb 7, 2006) |
|---|---|---|---|---|---|
| Project | Southwest Transitway - Enhanced Bus Baseline | | | Date | 10/17/06 |
| Location | Hennepin County, MN | | | Base Year | 2006 |
| Project ID | | | | | |
| | (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | | Revenue Ops | 2015 |
| | (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | | Forecast Year | 2015 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **16.00** | **-** | **-** | **-** | **-** | **0%** | **0%** | **-** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | - | - | - | - | - | | | |
| 10.03 Guideway: At-grade in mixed traffic | 16.00 | - | - | - | - | | | |
| 10.04 Guideway: Aerial structure | - | - | - | - | - | | | |
| 10.05 Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 Guideway: Underground cut & cover | - | - | - | - | - | | | |
| 10.07 Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 Guideway: Retained cut or fill | - | - | - | - | - | | | |
| 10.09 Track: Direct fixation | | - | - | - | | | | |
| 10.10 Track: Embedded | | - | - | - | | | | |
| 10.11 Track: Ballasted | | - | - | - | | | | |
| 10.12 Track: Special (switches, turnouts) | | - | - | - | | | | |
| 10.13 Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **13** | **9,165** | **2,750** | **11,915** | **917** | **70%** | **19%** | **15,143** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 13 | 390 | 117 | 507 | 39 | | | |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 Joint development | | - | - | - | | | | |
| 20.06 Automobile parking multi-story structure | | 8,775 | 2,633 | 11,408 | | | | |
| 20.07 Elevators, escalators | | - | - | - | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | **16.00** | **-** | **-** | **-** | **-** | **0%** | **0%** | **-** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 Light Maintenance Facility | | - | - | - | | | | |
| 30.03 Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 Yard and Yard Track | | - | - | - | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | **16.00** | **3,860** | **1,158** | **5,018** | **314** | **29%** | **8%** | **6,378** |
| 40.01 Demolition, Clearing, Earthwork | | 2,000 | 600 | 2,600 | | | | |
| 40.02 Site Utilities, Utility Relocation | | - | - | - | | | | |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | - | - | - | | | | |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | - | - | - | | | | |
| 40.05 Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | - | - | - | | | | |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 1,860 | 558 | 2,418 | | | | |
| 40.08 Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | **16.00** | **65** | **20** | **85** | **5** | **0%** | **0%** | **107** |
| 50.01 Train control and signals | | - | - | - | | | | |
| 50.02 Traffic signals and crossing protection | | - | - | - | | | | |
| 50.03 Traction power supply: substations | | - | - | - | | | | |
| 50.04 Traction power distribution: catenary and third rail | | - | - | - | | | | |
| 50.05 Communications | | 65 | 20 | 85 | | | | |
| 50.06 Fare collection system and equipment | | - | - | - | | | | |
| 50.07 Central Control | | - | - | - | | | | |
| **Construction Subtotal (10-50)** | **16.00** | **13,090** | **3,927** | **17,017** | **1,064** | **100%** | **27%** | **21,628** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | **16.00** | **5,416** | **5,416** | **10,832** | **677** | | **17%** | **13,767** |
| 60.01 Purchase or lease of real estate | | 5,416 | 5,416 | 10,832 | | | | |
| 60.02 Relocation (freight railroad traffic) | | - | - | - | | | | |
| **70 VEHICLES (number)** | **49** | **17,250** | **863** | **18,113** | **370** | | **29%** | **23,020** |
| 70.01 Light Rail | - | - | - | - | - | | | |
| 70.02 Heavy Rail | - | - | - | - | - | | | |
| 70.03 Commuter Rail | - | - | - | - | - | | | |
| 70.04 Bus | 49 | 17,250 | 863 | 18,113 | 370 | | | |
| 70.05 Other | - | - | - | - | - | | | |
| 70.06 Non-revenue vehicles | | - | - | - | - | | | |
| 70.07 Spare parts | | - | - | - | | | | |
| **80 PROFESSIONAL SERVICES** | **16.00** | **6,414** | **-** | **6,414** | **401** | | **10%** | **8,152** |
| 80.01 Preliminary Engineering | | 262 | - | 262 | | | | |
| 80.02 Final Design | | 1,054 | - | 1,054 | | | | |
| 80.03 Project Management for Design and Construction | | 597 | - | 597 | | | | |
| 80.04 Construction Administration & Management | | 1,101 | - | 1,101 | | | | |
| 80.05 Insurance | | 524 | - | 524 | | | | |
| 80.06 Legal; Permits; Review Fees by other agencies, cities, etc. | | 402 | - | 402 | | | | |
| 80.07 Surveys, Testing, Investigation, Inspection | | 1,148 | - | 1,148 | | | | |
| 80.08 Agency Force Account Work | | 1,327 | - | 1,327 | | | | |
| **Subtotal (10-80)** | **16.00** | **42,170** | **10,206** | **52,376** | **3,273** | | **83%** | **66,568** |
| **90 UNALLOCATED CONTINGENCY** | | | | **10,475** | | | **17%** | **13,314** |
| **Subtotal (10-90)** | **16.00** | | | **62,851** | **3,928** | | **100%** | **79,882** |
| **100 FINANCE CHARGES** | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | **16.00** | | | **62,851** | **3,928** | | **100%** | **79,882** |
| Total Allocated Contingency as % of Base Year Estimate | | | | 24% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | 20,681 | | | | |
| Total Contingency as % of Base Year Estimate | | | | 49% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | 33% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | 33% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | 1,352 |
| Forecast Year Total Project Cost per Mile | | | | | | | | **4,993** |
| Professional Services as % of Construction | | | | 38% | | | | |

# Appendix D: BRT Alternatives

## Major Capital Project Costs - Main Worksheet

(Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | Southwest Transitway - Alternative BRT 1 | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | Revenue Ops | 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | Forecast Year | 2015 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **13.86** | **54,305** | **16,291** | **70,596** | **5,094** | **31%** | **17%** | **89,725** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 11.29 | 39,239 | 11,772 | 51,010 | 4,518 | | | |
| 10.03 Guideway: At-grade in mixed traffic | 1.41 | 742 | 223 | 965 | 686 | | | |
| 10.04 Guideway: Aerial structure | 0.24 | 6,353 | 1,906 | 8,259 | 34,499 | | | |
| 10.05 Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 Guideway: Underground cut & cover | - | - | - | - | - | | | |
| 10.07 Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 Guideway: Retained cut or fill | 0.92 | 7,971 | 2,391 | 10,362 | 11,207 | | | |
| 10.09 Track: Direct fixation | | - | - | - | | | | |
| 10.10 Track: Embedded | | - | - | - | | | | |
| 10.11 Track: Ballasted | | - | - | - | | | | |
| 10.12 Track: Special (switches, turnouts) | | - | - | - | | | | |
| 10.13 Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **16** | **29,585** | **8,876** | **38,461** | **2,404** | **17%** | **9%** | **48,882** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 15 | 16,500 | 4,950 | 21,450 | 1,430 | | | |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 | 1,430 | 1,430 | | | |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 Joint development | | - | - | - | | | | |
| 20.06 Automobile parking multi-story structure | | 10,205 | 3,062 | 13,267 | | | | |
| 20.07 Elevators, escalators | | 1,780 | 534 | 2,314 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | **13.86** | **10,976** | **3,293** | **14,269** | **1,030** | **6%** | **3%** | **18,136** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 Light Maintenance Facility | | 10,976 | 3,293 | 14,269 | | | | |
| 30.03 Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 Yard and Yard Track | | - | - | - | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | **13.86** | **61,972** | **18,592** | **80,564** | **5,813** | **35%** | **19%** | **102,394** |
| 40.01 Demolition, Clearing, Earthwork | | 8,000 | 2,400 | 10,400 | | | | |
| 40.02 Site Utilities, Utility Relocation | | 16,095 | 4,828 | 20,923 | | | | |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 366 | 110 | 476 | | | | |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 382 | 115 | 497 | | | | |
| 40.05 Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 16,311 | 4,893 | 21,204 | | | | |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 20,819 | 6,246 | 27,064 | | | | |
| 40.08 Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | **13.86** | **21,187** | **6,356** | **27,542** | **1,987** | **12%** | **6%** | **35,006** |
| 50.01 Train control and signals | | - | - | - | | | | |
| 50.02 Traffic signals and crossing protection | | 4,785 | 1,436 | 6,221 | | | | |
| 50.03 Traction power supply: substations | | - | - | - | | | | |
| 50.04 Traction power distribution: catenary and third rail | | - | - | - | | | | |
| 50.05 Communications | | 11,342 | 3,403 | 14,745 | | | | |
| 50.06 Fare collection system and equipment | | 3,230 | 969 | 4,199 | | | | |
| 50.07 Central Control | | 1,829 | 549 | 2,378 | | | | |
| **Construction Subtotal (10-50)** | **13.86** | **178,025** | **53,407** | **231,432** | **16,699** | **100%** | **54%** | **294,142** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | **13.86** | **17,098** | **17,098** | **34,196** | **2,467** | | **8%** | **43,462** |
| 60.01 Purchase or lease of real estate | | 12,230 | 12,230 | 24,460 | | | | |
| 60.02 Relocation (freight railroad traffic) | | 4,868 | 4,868 | 9,736 | | | | |
| **70 VEHICLES (number)** | **54** | **27,175** | **1,359** | **28,534** | **528** | | **7%** | **36,265** |
| 70.01 Light Rail | - | - | - | - | - | | | |
| 70.02 Heavy Rail | - | - | - | - | - | | | |
| 70.03 Commuter Rail | - | - | - | - | - | | | |
| 70.04 Bus | 39 | 13,730 | 686 | 14,416 | 370 | | | |
| 70.05 Other (BRT) | 15 | 9,750 | 488 | 10,238 | 683 | | | |
| 70.06 Non-revenue vehicles | | 2,195 | 110 | 2,305 | - | | | |
| 70.07 Spare parts | | 1,500 | 75 | 1,575 | | | | |
| **80 PROFESSIONAL SERVICES** | **13.86** | **59,896** | **-** | **59,896** | **4,322** | | **14%** | **76,125** |
| 80.01 Preliminary Engineering | | 3,560 | - | 3,560 | | | | |
| 80.02 Final Design | | 9,616 | - | 9,616 | | | | |
| 80.03 Project Management for Design and Construction | | 4,345 | - | 4,345 | | | | |
| 80.04 Construction Administration & Management | | 14,413 | - | 14,413 | | | | |
| 80.05 Insurance | | 7,121 | - | 7,121 | | | | |
| 80.06 Legal; Permits; Review Fees by other agencies, cities, etc. | | 2,635 | - | 2,635 | | | | |
| 80.07 Surveys, Testing, Investigation, Inspection | | 5,814 | - | 5,814 | | | | |
| 80.08 Agency Force Account Work | | 12,391 | - | 12,391 | | | | |
| **Subtotal (10-80)** | **13.86** | **282,193** | **71,864** | **354,057** | **25,547** | | **83%** | **449,995** |
| **90 UNALLOCATED CONTINGENCY** | | | | **70,811** | | | **17%** | **89,999** |
| **Subtotal (10-90)** | **13.86** | | | **424,869** | **30,657** | | **100%** | **539,994** |
| **100 FINANCE CHARGES** | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | **13.86** | | | **424,869** | **30,657** | | **100%** | **539,994** |
| Total Allocated Contingency as % of Base Year Estimate | | | | 25% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | 142,676 | | | | |
| Total Contingency as % of Base Year Estimate | | | | 51% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | 34% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | 34% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | 21,224 |
| Forecast Year Total Project Cost per Mile | | | | | | | | **38,964** |
| Professional Services as % of Construction | | | | 26% | | | | |

| | | | |
|---|---|---|---|
| **Major Capital Project Costs - Main Worksheet** | | (Rev. 6, Feb 7, 2006) | |
| Project | Southwest Transitway - Alternative BRT 2 | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | Revenue Ops | 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | Forecast Year | 2015 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **18.31** | **81,932** | **24,580** | **106,511** | **5,816** | **34%** | **19%** | **135,373** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 8.36 | 29,262 | 8,778 | 38,040 | 4,550 | | | |
| 10.03 | Guideway: At-grade in mixed traffic | 7.58 | 5,796 | 1,739 | 7,534 | 994 | | | |
| 10.04 | Guideway: Aerial structure | 0.87 | 32,805 | 9,842 | 42,647 | 49,015 | | | |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 | Guideway: Underground cut & cover | - | - | - | - | - | | | |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 | Guideway: Retained cut or fill | 1.51 | 14,070 | 4,221 | 18,290 | 12,141 | | | |
| 10.09 | Track: Direct fixation | | - | - | - | | | | |
| 10.10 | Track: Embedded | | - | - | - | | | | |
| 10.11 | Track: Ballasted | | - | - | - | | | | |
| 10.12 | Track: Special (switches, turnouts) | | - | - | - | | | | |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **19** | **42,765** | **12,830** | **55,595** | **2,926** | **18%** | **10%** | **70,659** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 18 | 19,800 | 5,940 | 25,740 | 1,430 | | | |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 | 1,430 | 1,430 | | | |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 | Joint development | | - | - | - | | | | |
| 20.06 | Automobile parking multi-story structure | | 20,085 | 6,026 | 26,111 | | | | |
| 20.07 | Elevators, escalators | | 1,780 | 534 | 2,314 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **18.31** | **14,504** | **4,351** | **18,856** | **1,030** | **6%** | **3%** | **23,965** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 | Light Maintenance Facility | | 14,504 | 4,351 | 18,856 | | | | |
| 30.03 | Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 | Yard and Yard Track | | - | - | - | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **18.31** | **75,299** | **22,590** | **97,888** | **5,345** | **31%** | **18%** | **124,413** |
| 40.01 | Demolition, Clearing, Earthwork | | 9,500 | 2,850 | 12,350 | | | | |
| 40.02 | Site Utilities, Utility Relocation | | 20,688 | 6,206 | 26,895 | | | | |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 606 | 182 | 787 | | | | |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 777 | 233 | 1,010 | | | | |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 15,685 | 4,705 | 20,390 | | | | |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 28,044 | 8,413 | 36,457 | | | | |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | | **18.31** | **28,694** | **8,608** | **37,302** | **2,037** | **12%** | **7%** | **47,410** |
| 50.01 | Train control and signals | | - | - | - | | | | |
| 50.02 | Traffic signals and crossing protection | | 7,380 | 2,214 | 9,594 | | | | |
| 50.03 | Traction power supply: substations | | - | - | - | | | | |
| 50.04 | Traction power distribution: catenary and third rail | | - | - | - | | | | |
| 50.05 | Communications | | 14,987 | 4,496 | 19,483 | | | | |
| 50.06 | Fare collection system and equipment | | 3,910 | 1,173 | 5,083 | | | | |
| 50.07 | Central Control | | 2,417 | 725 | 3,143 | | | | |
| **Construction Subtotal (10-50)** | | **18.31** | **243,194** | **72,958** | **316,152** | **17,263** | **100%** | **57%** | **401,819** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **18.31** | **17,098** | **17,098** | **34,196** | **1,867** | | **6%** | **43,462** |
| 60.01 | Purchase or lease of real estate | | 12,230 | 12,230 | 24,460 | | | | |
| 60.02 | Relocation (freight railroad traffic) | | 4,868 | 4,868 | 9,736 | | | | |
| **70 VEHICLES (number)** | | **57** | **30,130** | **1,507** | **31,637** | **555** | | **6%** | **40,210** |
| 70.01 | Light Rail | - | - | - | - | - | | | |
| 70.02 | Heavy Rail | - | - | - | - | - | | | |
| 70.03 | Commuter Rail | - | - | - | - | - | | | |
| 70.04 | Bus | 39 | 13,730 | 686 | 14,416 | 370 | | | |
| 70.05 | Other (BRT) | 18 | 11,700 | 585 | 12,285 | 683 | | | |
| 70.06 | Non-revenue vehicles | | 2,901 | 145 | 3,046 | - | | | |
| 70.07 | Spare parts | | 1,800 | 90 | 1,890 | | | | |
| **80 PROFESSIONAL SERVICES** | | **18.31** | **79,594** | **-** | **79,594** | **4,346** | | **14%** | **101,162** |
| 80.01 | Preliminary Engineering | | 4,864 | - | 4,864 | | | | |
| 80.02 | Final Design | | 12,933 | - | 12,933 | | | | |
| 80.03 | Project Management for Design and Construction | | 5,678 | - | 5,678 | | | | |
| 80.04 | Construction Administration & Management | | 19,627 | - | 19,627 | | | | |
| 80.05 | Insurance | | 9,728 | - | 9,728 | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 3,287 | - | 3,287 | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 7,176 | - | 7,176 | | | | |
| 80.08 | Agency Force Account Work | | 16,301 | - | 16,301 | | | | |
| **Subtotal (10-80)** | | **18.31** | **370,017** | **91,563** | **461,580** | **25,204** | | **83%** | **586,652** |
| **90 UNALLOCATED CONTINGENCY** | | | | | **92,316** | | | **17%** | **117,330** |
| **Subtotal (10-90)** | | **18.31** | | | **553,896** | **30,245** | | **100%** | **703,983** |
| **100 FINANCE CHARGES** | | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | | **18.31** | | | **553,896** | **30,245** | | **100%** | **703,983** |

| | | |
|---|---|---|
| Total Allocated Contingency as % of Base Year Estimate | 25% | |
| Total Contingency (Allocated and Unallocated) | 183,879 | |
| Total Contingency as % of Base Year Estimate | 50% | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | 33% | |
| Total Contingency as % of Base Year Total Project Cost | 33% | |
| Forecast Year Construction Cost per Mile | | 21,941 |
| Forecast Year Total Project Cost per Mile | | **38,441** |
| Professional Services as % of Construction | 25% | |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment BRT 1-1 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 2.20 |
| | | | Stations | 1 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **2.20** | **8,492** | **2,548** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 2.11 | 7,176 | 2,153 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | 0.03 | 858 | 257 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.06 | 458 | 137 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | - | - |
| 10.12 | Track: Special (switches, turnouts) | | - | - |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **1** | **1,100** | **330** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **7,642** | **2,293** |
| 40.01 | Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 | Site Utilities, Utility Relocation | | 2,323 | 697 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 58 | 17 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 58 | 17 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 2,696 | 809 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 2,006 | 602 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **2,371** | **711** |
| 50.01 | Train control and signals | | - | - |
| 50.02 | Traffic signals and crossing protection | | 110 | 33 |
| 50.03 | Traction power supply: substations | | - | - |
| 50.04 | Traction power distribution: catenary and third rail | | - | - |
| 50.05 | Communications | | 1,801 | 540 |
| 50.06 | Fare collection system and equipment | | 170 | 51 |
| 50.07 | Central Control | | 290 | 87 |
| **Construction Subtotal (10-50)** | | | **19,605** | **5,882** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **1,083** | **1,083** |
| 60.01 | Purchase or lease of real estate | | 1,083 | 1,083 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|
| Project: Southwest Transitway - Segment BRT 1-2 | | Date | 10/17/06 |
| Location: Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | |
| | | Route Miles | 2.70 |
| | | Stations | 3 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **2.70** | **11,621** | **3,486** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 2.26 | 7,697 | 2,309 |
| 10.03 Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 Guideway: Aerial structure | - | - | - |
| 10.05 Guideway: Built-up fill | - | - | - |
| 10.06 Guideway: Underground cut & cover | - | - | - |
| 10.07 Guideway: Underground tunnel | - | - | - |
| 10.08 Guideway: Retained cut or fill | 0.44 | 3,924 | 1,177 |
| 10.09 Track: Direct fixation | | - | - |
| 10.10 Track: Embedded | | - | - |
| 10.11 Track: Ballasted | | - | - |
| 10.12 Track: Special (switches, turnouts) | | - | - |
| 10.13 Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **3** | **3,300** | **990** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 3 | 3,300 | 990 |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 Joint development | | - | - |
| 20.06 Automobile parking multi-story structure | | - | - |
| 20.07 Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **-** | **-** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 Light Maintenance Facility | | | - |
| 30.03 Heavy Maintenance Facility | | | - |
| 30.04 Storage or Maintenance of Way Building | | | - |
| 30.05 Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **11,859** | **3,558** |
| 40.01 Demolition, Clearing, Earthwork | | 1,500 | 450 |
| 40.02 Site Utilities, Utility Relocation | | 2,853 | 856 |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 71 | 21 |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 71 | 21 |
| 40.05 Site structures including retaining walls, sound walls | | - | - |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 3,582 | 1,075 |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 3,782 | 1,135 |
| 40.08 Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | **3,627** | **1,088** |
| 50.01 Train control and signals | | - | - |
| 50.02 Traffic signals and crossing protection | | 550 | 165 |
| 50.03 Traction power supply: substations | | - | - |
| 50.04 Traction power distribution: catenary and third rail | | - | - |
| 50.05 Communications | | 2,211 | 663 |
| 50.06 Fare collection system and equipment | | 510 | 153 |
| 50.07 Central Control | | 357 | 107 |
| **Construction Subtotal (10-50)** | | **30,407** | **9,122** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **3,250** | **3,250** |
| 60.01 Purchase or lease of real estate | | 3,250 | 3,250 |
| 60.02 Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment BRT 1-3 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 0.99 |
| | | | Stations | 1 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **0.99** | **3,807** | **1,142** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.99 | 3,807 | 1,142 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | - | - | - |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | - | - | - |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | - | - |
| 10.12 | Track: Special (switches, turnouts) | | - | - |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **1** | **1,100** | **330** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **4,123** | **1,237** |
| 40.01 | Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 | Site Utilities, Utility Relocation | | 1,041 | 312 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 26 | 8 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 26 | 8 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 1,197 | 359 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 1,333 | 400 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **1,552** | **466** |
| 50.01 | Train control and signals | | - | - |
| 50.02 | Traffic signals and crossing protection | | 445 | 134 |
| 50.03 | Traction power supply: substations | | - | - |
| 50.04 | Traction power distribution: catenary and third rail | | - | - |
| 50.05 | Communications | | 807 | 242 |
| 50.06 | Fare collection system and equipment | | 170 | 51 |
| 50.07 | Central Control | | 130 | 39 |
| **Construction Subtotal (10-50)** | | | **10,582** | **3,175** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **1,083** | **1,083** |
| 60.01 | Purchase or lease of real estate | | 1,083 | 1,083 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment BRT 1-4 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 0.16 |
| | | | Stations | 1 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **0.16** | **542** | **163** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.16 | 542 | 163 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | - | - | - |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | - | - | - |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | - | - |
| 10.12 | Track: Special (switches, turnouts) | | - | - |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **1** | **1,100** | **330** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **2,744** | **823** |
| 40.01 | Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 | Site Utilities, Utility Relocation | | 168 | 50 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 4 | 1 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 4 | 1 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 496 | 149 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 1,571 | 471 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **431** | **129** |
| 50.01 | Train control and signals | | - | - |
| 50.02 | Traffic signals and crossing protection | | 110 | 33 |
| 50.03 | Traction power supply: substations | | - | - |
| 50.04 | Traction power distribution: catenary and third rail | | - | - |
| 50.05 | Communications | | 130 | 39 |
| 50.06 | Fare collection system and equipment | | 170 | 51 |
| 50.07 | Central Control | | 21 | 6 |
| **Construction Subtotal (10-50)** | | | **4,818** | **1,445** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **1,083** | **1,083** |
| 60.01 | Purchase or lease of real estate | | 1,083 | 1,083 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) |
|---|---|---|---|
| Project | Southwest Transitway - Segment BRT 2-1 | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| | | Route Miles | 1.13 |
| | | Stations | 1 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **1.13** | **2,140** | **642** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.38 | 1,291 | 387 |
| 10.03 Guideway: At-grade in mixed traffic | 0.75 | 849 | 255 |
| 10.04 Guideway: Aerial structure | - | - | - |
| 10.05 Guideway: Built-up fill | - | - | - |
| 10.06 Guideway: Underground cut & cover | - | - | - |
| 10.07 Guideway: Underground tunnel | - | - | - |
| 10.08 Guideway: Retained cut or fill | - | - | - |
| 10.09 Track: Direct fixation | | - | - |
| 10.10 Track: Embedded | | - | - |
| 10.11 Track: Ballasted | | - | - |
| 10.12 Track: Special (switches, turnouts) | | - | - |
| 10.13 Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **1** | **1,100** | **330** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 Joint development | | - | - |
| 20.06 Automobile parking multi-story structure | | - | - |
| 20.07 Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **-** | **-** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 Light Maintenance Facility | | | - |
| 30.03 Heavy Maintenance Facility | | | - |
| 30.04 Storage or Maintenance of Way Building | | | - |
| 30.05 Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **3,223** | **967** |
| 40.01 Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 Site Utilities, Utility Relocation | | 1,197 | 359 |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 20 | 6 |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 20 | 6 |
| 40.05 Site structures including retaining walls, sound walls | | - | - |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 509 | 153 |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 977 | 293 |
| 40.08 Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | **1,472** | **441** |
| 50.01 Train control and signals | | - | - |
| 50.02 Traffic signals and crossing protection | | 225 | 68 |
| 50.03 Traction power supply: substations | | - | - |
| 50.04 Traction power distribution: catenary and third rail | | - | - |
| 50.05 Communications | | 927 | 278 |
| 50.06 Fare collection system and equipment | | 170 | 51 |
| 50.07 Central Control | | 150 | 45 |
| **Construction Subtotal (10-50)** | | **7,934** | **2,380** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **1,083** | **1,083** |
| 60.01 Purchase or lease of real estate | | 1,083 | 1,083 |
| 60.02 Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment BRT 2-2 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 2.93 |
| | | | Stations | 2 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **2.93** | **23,016** | **6,905** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | - | - | - |
| 10.03 | Guideway: At-grade in mixed traffic | 2.09 | 1,101 | 330 |
| 10.04 | Guideway: Aerial structure | 0.35 | 16,980 | 5,094 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.49 | 4,935 | 1,480 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | - | - |
| 10.12 | Track: Special (switches, turnouts) | | - | - |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **2** | **2,200** | **660** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **14,053** | **4,216** |
| 40.01 | Demolition, Clearing, Earthwork | | 1,000 | 300 |
| 40.02 | Site Utilities, Utility Relocation | | 4,700 | 1,410 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 155 | 46 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 310 | 93 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 1,792 | 538 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 6,097 | 1,829 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **5,772** | **1,732** |
| 50.01 | Train control and signals | | - | - |
| 50.02 | Traffic signals and crossing protection | | 2,475 | 743 |
| 50.03 | Traction power supply: substations | | - | - |
| 50.04 | Traction power distribution: catenary and third rail | | - | - |
| 50.05 | Communications | | 2,400 | 720 |
| 50.06 | Fare collection system and equipment | | 510 | 153 |
| 50.07 | Central Control | | 387 | 116 |
| **Construction Subtotal (10-50)** | | | **45,041** | **13,512** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **5,676** | **5,676** |
| 60.01 | Purchase or lease of real estate | | 5,676 | 5,676 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment BRT 2-3 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 5.13 |
| | | | Stations | 3 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **5.13** | **22,041** | **6,612** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.90 | 3,062 | 919 |
| 10.03 | Guideway: At-grade in mixed traffic | 3.33 | 3,104 | 931 |
| 10.04 | Guideway: Aerial structure | 0.30 | 10,330 | 3,099 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.60 | 5,546 | 1,664 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | - | - |
| 10.12 | Track: Special (switches, turnouts) | | - | - |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **3** | **3,300** | **990** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 3 | 3,300 | 990 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **12,958** | **3,888** |
| 40.01 | Demolition, Clearing, Earthwork | | 1,500 | 450 |
| 40.02 | Site Utilities, Utility Relocation | | 3,705 | 1,111 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 190 | 57 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 190 | 57 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 2,856 | 857 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 4,518 | 1,355 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **5,831** | **1,749** |
| 50.01 | Train control and signals | | - | - |
| 50.02 | Traffic signals and crossing protection | | 445 | 134 |
| 50.03 | Traction power supply: substations | | - | - |
| 50.04 | Traction power distribution: catenary and third rail | | - | - |
| 50.05 | Communications | | 4,199 | 1,260 |
| 50.06 | Fare collection system and equipment | | 510 | 153 |
| 50.07 | Central Control | | 677 | 203 |
| **Construction Subtotal (10-50)** | | | **44,131** | **13,239** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **6,707** | **6,707** |
| 60.01 | Purchase or lease of real estate | | 6,707 | 6,707 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment BRT A-1 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 1.56 |
| | | | Stations | 1 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **1.56** | **11,173** | **3,352** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 1.10 | 3,731 | 1,119 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | 0.13 | 4,381 | 1,314 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.34 | 3,060 | 918 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | - | - |
| 10.12 | Track: Special (switches, turnouts) | | - | - |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **1** | **1,100** | **330** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **5,431** | **1,629** |
| 40.01 | Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 | Site Utilities, Utility Relocation | | 1,649 | 495 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 41 | 12 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 41 | 12 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 1,897 | 569 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 1,303 | 391 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **1,879** | **564** |
| 50.01 | Train control and signals | | - | - |
| 50.02 | Traffic signals and crossing protection | | 225 | 68 |
| 50.03 | Traction power supply: substations | | - | - |
| 50.04 | Traction power distribution: catenary and third rail | | - | - |
| 50.05 | Communications | | 1,278 | 383 |
| 50.06 | Fare collection system and equipment | | 170 | 51 |
| 50.07 | Central Control | | 206 | 62 |
| **Construction Subtotal (10-50)** | | | **19,583** | **5,875** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **1,083** | **1,083** |
| 60.01 | Purchase or lease of real estate | | 1,083 | 1,083 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment BRT A-2 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 4.87 |
| | | | Stations | 6 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **4.87** | **18,004** | **5,401** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 4.70 | 16,362 | 4,909 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | 0.08 | 1,114 | 334 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.08 | 529 | 159 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | - | - |
| 10.12 | Track: Special (switches, turnouts) | | - | - |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **6** | **8,380** | **2,514** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 5 | 5,500 | 1,650 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | 1,780 | 534 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **18,006** | **5,402** |
| 40.01 | Demolition, Clearing, Earthwork | | 3,000 | 900 |
| 40.02 | Site Utilities, Utility Relocation | | 5,140 | 1,542 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 129 | 39 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 129 | 39 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 5,688 | 1,706 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 3,921 | 1,176 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **6,431** | **1,929** |
| 50.01 | Train control and signals | | - | - |
| 50.02 | Traffic signals and crossing protection | | 785 | 236 |
| 50.03 | Traction power supply: substations | | - | - |
| 50.04 | Traction power distribution: catenary and third rail | | - | - |
| 50.05 | Communications | | 3,984 | 1,195 |
| 50.06 | Fare collection system and equipment | | 1,020 | 306 |
| 50.07 | Central Control | | 643 | 193 |
| **Construction Subtotal (10-50)** | | | **50,822** | **15,247** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **8,118** | **8,118** |
| 60.01 | Purchase or lease of real estate | | 3,250 | 3,250 |
| 60.02 | Relocation (freight railroad traffic) | | 4,868 | 4,868 |

| Major Capital Project Costs - By Segment | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|
| Project | Southwest Transitway - Segment BRT A-3 | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| | | Route Miles | 1.54 |
| | | Stations | 4 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **1.54** | **1,207** | **362** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.14 | 465 | 140 |
| 10.03 Guideway: At-grade in mixed traffic | 1.41 | 742 | 223 |
| 10.04 Guideway: Aerial structure | - | - | - |
| 10.05 Guideway: Built-up fill | - | - | - |
| 10.06 Guideway: Underground cut & cover | - | - | - |
| 10.07 Guideway: Underground tunnel | - | - | - |
| 10.08 Guideway: Retained cut or fill | - | - | - |
| 10.09 Track: Direct fixation | | - | - |
| 10.10 Track: Embedded | | - | - |
| 10.11 Track: Ballasted | | - | - |
| 10.12 Track: Special (switches, turnouts) | | - | - |
| 10.13 Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **4** | **4,400** | **1,320** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 4 | 4,400 | 1,320 |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 Joint development | | - | - |
| 20.06 Automobile parking multi-story structure | | - | - |
| 20.07 Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **-** | **-** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 Light Maintenance Facility | | | - |
| 30.03 Heavy Maintenance Facility | | | - |
| 30.04 Storage or Maintenance of Way Building | | | - |
| 30.05 Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **9,886** | **2,966** |
| 40.01 Demolition, Clearing, Earthwork | | 2,000 | 600 |
| 40.02 Site Utilities, Utility Relocation | | 3,088 | 926 |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 41 | 12 |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 57 | 17 |
| 40.05 Site structures including retaining walls, sound walls | | - | - |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 1,251 | 375 |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 3,449 | 1,035 |
| 40.08 Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | **5,326** | **1,598** |
| 50.01 Train control and signals | | - | - |
| 50.02 Traffic signals and crossing protection | | 2,670 | 801 |
| 50.03 Traction power supply: substations | | - | - |
| 50.04 Traction power distribution: catenary and third rail | | - | - |
| 50.05 Communications | | 1,262 | 379 |
| 50.06 Fare collection system and equipment | | 1,190 | 357 |
| 50.07 Central Control | | 204 | 61 |
| **Construction Subtotal (10-50)** | | **20,819** | **6,246** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **2,481** | **2,481** |
| 60.01 Purchase or lease of real estate | | 2,481 | 2,481 |
| 60.02 Relocation (freight railroad traffic) | | - | - |

# Appendix E: LRT Alternatives

## Major Capital Project Costs - Main Worksheet

(Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 1A | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | Revenue Ops | 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | Forecast Year | 2015 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | 13.78 | 63,070 | 18,921 | 81,991 | 5,952 | 23% | 12% | 104,208 |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 11.82 | 14,914 | 4,474 | 19,389 | 1,640 | | | |
| 10.03 Guideway: At-grade in mixed traffic | 0.23 | 279 | 84 | 362 | 1,544 | | | |
| 10.04 Guideway: Aerial structure | 0.34 | 9,011 | 2,703 | 11,714 | 34,925 | | | |
| 10.05 Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 Guideway: Underground cut & cover | 0.02 | 1,056 | 317 | 1,373 | 82,368 | | | |
| 10.07 Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 Guideway: Retained cut or fill | 1.37 | 8,425 | 2,528 | 10,953 | 8,006 | | | |
| 10.09 Track: Direct fixation | | 775 | 232 | 1,007 | | | | |
| 10.10 Track: Embedded | | 867 | 260 | 1,127 | | | | |
| 10.11 Track: Ballasted | | 22,572 | 6,772 | 29,344 | | | | |
| 10.12 Track: Special (switches, turnouts) | | 5,171 | 1,551 | 6,722 | | | | |
| 10.13 Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | 14 | 27,385 | 8,216 | 35,601 | 2,543 | 10% | 5% | 45,247 |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 13 | 14,300 | 4,290 | 18,590 | 1,430 | | | |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 | 1,430 | 1,430 | | | |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 Joint development | | - | - | - | | | | |
| 20.06 Automobile parking multi-story structure | | 10,205 | 3,062 | 13,267 | | | | |
| 20.07 Elevators, escalators | | 1,780 | 534 | 2,314 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | 13.78 | 38,995 | 11,699 | 50,694 | 3,680 | 14% | 7% | 64,430 |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 Light Maintenance Facility | | 25,997 | 7,799 | 33,796 | | | | |
| 30.03 Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 Yard and Yard Track | | 12,998 | 3,900 | 16,898 | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | 13.78 | 66,475 | 19,942 | 86,417 | 6,273 | 24% | 13% | 109,833 |
| 40.01 Demolition, Clearing, Earthwork | | 7,000 | 2,100 | 9,100 | | | | |
| 40.02 Site Utilities, Utility Relocation | | 15,129 | 4,539 | 19,667 | | | | |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 364 | 109 | 473 | | | | |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 364 | 109 | 473 | | | | |
| 40.05 Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 15,825 | 4,747 | 20,572 | | | | |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 27,794 | 8,338 | 36,132 | | | | |
| 40.08 Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | 13.78 | 77,475 | 23,243 | 100,718 | 7,311 | 28% | 15% | 128,009 |
| 50.01 Train control and signals | | 25,821 | 7,746 | 33,567 | | | | |
| 50.02 Traffic signals and crossing protection | | 6,470 | 1,941 | 8,411 | | | | |
| 50.03 Traction power supply: substations | | 13,819 | 4,146 | 17,965 | | | | |
| 50.04 Traction power distribution: catenary and third rail | | 18,911 | 5,673 | 24,584 | | | | |
| 50.05 Communications | | 8,256 | 2,477 | 10,733 | | | | |
| 50.06 Fare collection system and equipment | | 2,380 | 714 | 3,094 | | | | |
| 50.07 Central Control | | 1,818 | 546 | 2,364 | | | | |
| **Construction Subtotal (10-50)** | 13.78 | 273,400 | 82,020 | 355,420 | 25,801 | 100% | 52% | 451,727 |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | 13.78 | 16,991 | 16,991 | 33,982 | 2,467 | | 5% | 43,190 |
| 60.01 Purchase or lease of real estate | | 12,123 | 12,123 | 24,247 | | | | |
| 60.02 Relocation (freight railroad traffic) | | 4,868 | 4,868 | 9,736 | | | | |
| **70 VEHICLES (number)** | 57 | 82,060 | 4,103 | 86,163 | 1,512 | | 13% | 109,510 |
| 70.01 Light Rail | 19 | 57,000 | 2,850 | 59,850 | 3,150 | | | |
| 70.02 Heavy Rail | - | - | - | - | - | | | |
| 70.03 Commuter Rail | - | - | - | - | - | | | |
| 70.04 Bus | 38 | 13,378 | 669 | 14,046 | 370 | | | |
| 70.05 Other | - | - | - | - | - | | | |
| 70.06 Non-revenue vehicles | | 2,182 | 109 | 2,291 | - | | | |
| 70.07 Spare parts | | 9,500 | 475 | 9,975 | | | | |
| **80 PROFESSIONAL SERVICES** | 13.78 | 91,220 | - | 91,220 | 6,622 | | 13% | 115,938 |
| 80.01 Preliminary Engineering | | 5,468 | - | 5,468 | | | | |
| 80.02 Final Design | | 15,481 | - | 15,481 | | | | |
| 80.03 Project Management for Design and Construction | | 6,798 | - | 6,798 | | | | |
| 80.04 Construction Administration & Management | | 22,042 | - | 22,042 | | | | |
| 80.05 Insurance | | 10,936 | - | 10,936 | | | | |
| 80.06 Legal; Permits; Review Fees by other agencies, cities, etc. | | 3,584 | - | 3,584 | | | | |
| 80.07 Surveys, Testing, Investigation, Inspection | | 8,808 | - | 8,808 | | | | |
| 80.08 Agency Force Account Work | | 18,103 | - | 18,103 | | | | |
| **Subtotal (10-80)** | 13.78 | 463,671 | 103,114 | 566,786 | 41,145 | | 83% | 720,365 |
| **90 UNALLOCATED CONTINGENCY** | | | | 113,357 | | | 17% | 144,073 |
| **Subtotal (10-80)** | 13.78 | | | 680,143 | 49,374 | | 100% | 864,438 |
| **100 FINANCE CHARGES** | | | | - | | | 0% | - |
| **Total Project Cost (10-100)** | 13.78 | | | 680,143 | 49,374 | | 100% | 864,438 |
| Total Allocated Contingency as % of Base Year Estimate | | | | 22% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | 216,471 | | | | |
| Total Contingency as % of Base Year Estimate | | | | 47% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | 32% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | 32% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | 32,792 |
| Forecast Year Total Project Cost per Mile | | | | | | | | 62,752 |
| Professional Services as % of Construction | | | | 26% | | | | |

| Major Capital Project Costs - Main Worksheet | | | (Rev. 6, Feb 7, 2006) |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 2A | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | Revenue Ops | 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | Forecast Year | 2015 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **15.10** | **84,385** | **25,316** | **109,701** | **7,263** | **27%** | **14%** | **139,426** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 11.16 | 14,417 | 4,325 | 18,742 | 1,680 | | | |
| 10.03 | Guideway: At-grade in mixed traffic | 0.23 | 279 | 84 | 362 | 1,544 | | | |
| 10.04 | Guideway: Aerial structure | 0.63 | 18,239 | 5,472 | 23,711 | 37,834 | | | |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 | Guideway: Underground cut & cover | 0.05 | 3,348 | 1,004 | 4,352 | 82,368 | | | |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 | Guideway: Retained cut or fill | 3.04 | 16,035 | 4,811 | 20,846 | 6,868 | | | |
| 10.09 | Track: Direct fixation | | 1,913 | 574 | 2,487 | | | | |
| 10.10 | Track: Embedded | | 867 | 260 | 1,127 | | | | |
| 10.11 | Track: Ballasted | | 24,298 | 7,289 | 31,587 | | | | |
| 10.12 | Track: Special (switches, turnouts) | | 4,990 | 1,497 | 6,487 | | | | |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **16** | **31,795** | **9,539** | **41,334** | **2,583** | **10%** | **5%** | **52,533** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 15 | 16,500 | 4,950 | 21,450 | 1,430 | | | |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 | 1,430 | 1,430 | | | |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 | Joint development | | - | - | - | | | | |
| 20.06 | Automobile parking multi-story structure | | 12,415 | 3,725 | 16,140 | | | | |
| 20.07 | Elevators, escalators | | 1,780 | 534 | 2,314 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **15.10** | **38,995** | **11,699** | **50,694** | **3,356** | **12%** | **7%** | **64,430** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 | Light Maintenance Facility | | 25,997 | 7,799 | 33,796 | | | | |
| 30.03 | Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 | Yard and Yard Track | | 12,998 | 3,900 | 16,898 | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **15.10** | **74,027** | **22,208** | **96,235** | **6,371** | **24%** | **12%** | **122,311** |
| 40.01 | Demolition, Clearing, Earthwork | | 7,500 | 2,250 | 9,750 | | | | |
| 40.02 | Site Utilities, Utility Relocation | | 21,065 | 6,319 | 27,384 | | | | |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 486 | 146 | 631 | | | | |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 399 | 120 | 518 | | | | |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 14,589 | 4,377 | 18,966 | | | | |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 29,988 | 8,997 | 38,985 | | | | |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | | **15.10** | **85,177** | **25,553** | **110,730** | **7,331** | **27%** | **14%** | **140,734** |
| 50.01 | Train control and signals | | 28,312 | 8,493 | 36,805 | | | | |
| 50.02 | Traffic signals and crossing protection | | 6,920 | 2,076 | 8,996 | | | | |
| 50.03 | Traction power supply: substations | | 15,153 | 4,546 | 19,698 | | | | |
| 50.04 | Traction power distribution: catenary and third rail | | 20,735 | 6,221 | 26,956 | | | | |
| 50.05 | Communications | | 9,343 | 2,803 | 12,146 | | | | |
| 50.06 | Fare collection system and equipment | | 2,720 | 816 | 3,536 | | | | |
| 50.07 | Central Control | | 1,994 | 598 | 2,592 | | | | |
| **Construction Subtotal (10-50)** | | **15.10** | **314,379** | **94,314** | **408,693** | **27,058** | **100%** | **53%** | **519,435** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **15.10** | **19,826** | **19,826** | **39,651** | **2,625** | | **5%** | **50,395** |
| 60.01 | Purchase or lease of real estate | | 14,958 | 14,958 | 29,915 | | | | |
| 60.02 | Relocation (freight railroad traffic) | | 4,868 | 4,868 | 9,736 | | | | |
| **70 VEHICLES (number)** | | **61** | **89,974** | **4,499** | **94,473** | **1,549** | | **12%** | **120,072** |
| 70.01 | Light Rail | 21 | 63,000 | 3,150 | 66,150 | 3,150 | | | |
| 70.02 | Heavy Rail | - | - | - | - | - | | | |
| 70.03 | Commuter Rail | - | - | - | - | - | | | |
| 70.04 | Bus | 40 | 14,082 | 704 | 14,786 | 370 | | | |
| 70.05 | Other | - | - | - | - | - | | | |
| 70.06 | Non-revenue vehicles | | 2,393 | 120 | 2,512 | - | | | |
| 70.07 | Spare parts | | 10,500 | 525 | 11,025 | | | | |
| **80 PROFESSIONAL SERVICES** | | **15.10** | **104,760** | **-** | **104,760** | **6,936** | | **13%** | **133,147** |
| 80.01 | Preliminary Engineering | | 6,288 | - | 6,288 | | | | |
| 80.02 | Final Design | | 17,717 | - | 17,717 | | | | |
| 80.03 | Project Management for Design and Construction | | 7,782 | - | 7,782 | | | | |
| 80.04 | Construction Administration & Management | | 25,349 | - | 25,349 | | | | |
| 80.05 | Insurance | | 12,575 | - | 12,575 | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 4,135 | - | 4,135 | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 10,070 | - | 10,070 | | | | |
| 80.08 | Agency Force Account Work | | 20,845 | - | 20,845 | | | | |
| **Subtotal (10-80)** | | **15.10** | **528,940** | **118,638** | **647,578** | **42,874** | | **83%** | **823,049** |
| **90 UNALLOCATED CONTINGENCY** | | | | | **129,516** | | | **17%** | **164,610** |
| **Subtotal (10-90)** | | **15.10** | | | **777,093** | **51,448** | | **100%** | **987,659** |
| **100 FINANCE CHARGES** | | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | | **15.10** | | | **777,093** | **51,448** | | **100%** | **987,659** |
| Total Allocated Contingency as % of Base Year Estimate | | | | | 22% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | | 248,154 | | | | |
| Total Contingency as % of Base Year Estimate | | | | | 47% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | | 32% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | | 32% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | | 34,390 |
| Forecast Year Total Project Cost per Mile | | | | | | | | | **65,389** |
| Professional Services as % of Construction | | | | | 26% | | | | |

| Major Capital Project Costs - Main Worksheet | | | (Rev. 6, Feb 7, 2006) |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 3A | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | Revenue Ops | 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | Forecast Year | 2015 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **15.73** | **100,025** | **30,008** | **130,033** | **8,267** | **28%** | **14%** | **165,267** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 10.98 | 14,047 | 4,214 | 18,260 | 1,664 | | | |
| 10.03 | Guideway: At-grade in mixed traffic | 0.43 | 515 | 155 | 670 | 1,544 | | | |
| 10.04 | Guideway: Aerial structure | 0.92 | 27,569 | 8,271 | 35,840 | 38,905 | | | |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 | Guideway: Underground cut & cover | 0.06 | 3,864 | 1,159 | 5,023 | 82,368 | | | |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 | Guideway: Retained cut or fill | 3.34 | 19,011 | 5,703 | 24,714 | 7,407 | | | |
| 10.09 | Track: Direct fixation | | 2,898 | 869 | 3,767 | | | | |
| 10.10 | Track: Embedded | | 1,603 | 481 | 2,083 | | | | |
| 10.11 | Track: Ballasted | | 24,642 | 7,393 | 32,034 | | | | |
| 10.12 | Track: Special (switches, turnouts) | | 5,878 | 1,763 | 7,641 | | | | |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **17** | **40,565** | **12,170** | **52,735** | **3,102** | **11%** | **6%** | **67,024** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 16 | 17,600 | 5,280 | 22,880 | 1,430 | | | |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 | 1,430 | 1,430 | | | |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 | Joint development | | - | - | - | | | | |
| 20.06 | Automobile parking multi-story structure | | 20,085 | 6,026 | 26,111 | | | | |
| 20.07 | Elevators, escalators | | 1,780 | 534 | 2,314 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **15.73** | **38,995** | **11,699** | **50,694** | **3,223** | **11%** | **6%** | **64,430** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 | Light Maintenance Facility | | 25,997 | 7,799 | 33,796 | | | | |
| 30.03 | Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 | Yard and Yard Track | | 12,998 | 3,900 | 16,898 | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **15.73** | **86,884** | **26,065** | **112,949** | **7,181** | **24%** | **12%** | **143,554** |
| 40.01 | Demolition, Clearing, Earthwork | | 8,000 | 2,400 | 10,400 | | | | |
| 40.02 | Site Utilities, Utility Relocation | | 24,001 | 7,200 | 31,201 | | | | |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 950 | 285 | 1,235 | | | | |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 863 | 259 | 1,122 | | | | |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 15,252 | 4,576 | 19,828 | | | | |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 37,817 | 11,345 | 49,163 | | | | |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | | **15.73** | **93,263** | **27,979** | **121,242** | **7,708** | **26%** | **13%** | **154,094** |
| 50.01 | Train control and signals | | 29,566 | 8,870 | 38,436 | | | | |
| 50.02 | Traffic signals and crossing protection | | 11,355 | 3,407 | 14,762 | | | | |
| 50.03 | Traction power supply: substations | | 15,824 | 4,747 | 20,571 | | | | |
| 50.04 | Traction power distribution: catenary and third rail | | 21,654 | 6,496 | 28,150 | | | | |
| 50.05 | Communications | | 9,891 | 2,967 | 12,859 | | | | |
| 50.06 | Fare collection system and equipment | | 2,890 | 867 | 3,757 | | | | |
| 50.07 | Central Control | | 2,082 | 625 | 2,707 | | | | |
| **Construction Subtotal (10-50)** | | **15.73** | **359,732** | **107,920** | **467,652** | **29,733** | **100%** | **51%** | **594,369** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **15.73** | **31,246** | **31,246** | **62,492** | **3,973** | | **7%** | **79,425** |
| 60.01 | Purchase or lease of real estate | | 26,378 | 26,378 | 52,756 | | | | |
| 60.02 | Relocation (freight railroad traffic) | | 4,868 | 4,868 | 9,736 | | | | |
| **70 VEHICLES (number)** | | **66** | **101,277** | **5,064** | **106,341** | **1,611** | | **12%** | **135,156** |
| 70.01 | Light Rail | 24 | 72,000 | 3,600 | 75,600 | 3,150 | | | |
| 70.02 | Heavy Rail | - | - | - | - | - | | | |
| 70.03 | Commuter Rail | - | - | - | - | - | | | |
| 70.04 | Bus | 42 | 14,786 | 739 | 15,525 | 370 | | | |
| 70.05 | Other | - | - | - | - | - | | | |
| 70.06 | Non-revenue vehicles | | 2,491 | 125 | 2,616 | - | | | |
| 70.07 | Spare parts | | 12,000 | 600 | 12,600 | | | | |
| **80 PROFESSIONAL SERVICES** | | **15.73** | **122,357** | **-** | **122,357** | **7,779** | | **13%** | **155,512** |
| 80.01 | Preliminary Engineering | | 7,195 | - | 7,195 | | | | |
| 80.02 | Final Design | | 20,325 | - | 20,325 | | | | |
| 80.03 | Project Management for Design and Construction | | 9,145 | - | 9,145 | | | | |
| 80.04 | Construction Administration & Management | | 29,091 | - | 29,091 | | | | |
| 80.05 | Insurance | | 14,389 | - | 14,389 | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 5,160 | - | 5,160 | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 12,345 | - | 12,345 | | | | |
| 80.08 | Agency Force Account Work | | 24,709 | - | 24,709 | | | | |
| **Subtotal (10-80)** | | **15.73** | **614,613** | **144,230** | **758,842** | **48,246** | | **83%** | **964,463** |
| **90 UNALLOCATED CONTINGENCY** | | | | | **151,768** | | | **17%** | **192,893** |
| **Subtotal (10-90)** | | **15.73** | | | **910,611** | **57,895** | | **100%** | **1,157,355** |
| **100 FINANCE CHARGES** | | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | | **15.73** | | | **910,611** | **57,895** | | **100%** | **1,157,355** |
| Total Allocated Contingency as % of Base Year Estimate | | | | | 23% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | | 295,998 | | | | |
| Total Contingency as % of Base Year Estimate | | | | | 48% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | | 33% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | | 33% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | | 37,789 |
| Forecast Year Total Project Cost per Mile | | | | | | | | | **73,583** |
| Professional Services as % of Construction | | | | | 26% | | | | |

## Major Capital Project Costs - Main Worksheet

(Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 4A | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | Revenue Ops | 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | Forecast Year | 2015 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **9.10** | **44,070** | **13,221** | **57,291** | **6,297** | **22%** | **12%** | **72,815** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 7.68 | 9,873 | 2,962 | 12,835 | 1,672 | | | |
| 10.03 | Guideway: At-grade in mixed traffic | 0.23 | 279 | 84 | 362 | 1,544 | | | |
| 10.04 | Guideway: Aerial structure | 0.31 | 8,111 | 2,433 | 10,544 | 34,345 | | | |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 | Guideway: Underground cut & cover | 0.02 | 1,056 | 317 | 1,373 | 82,368 | | | |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 | Guideway: Retained cut or fill | 0.86 | 5,166 | 1,550 | 6,715 | 7,788 | | | |
| 10.09 | Track: Direct fixation | | 775 | 232 | 1,007 | | | | |
| 10.10 | Track: Embedded | | 867 | 260 | 1,127 | | | | |
| 10.11 | Track: Ballasted | | 14,671 | 4,401 | 19,072 | | | | |
| 10.12 | Track: Special (switches, turnouts) | | 3,273 | 982 | 4,255 | | | | |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **11** | **13,880** | **4,164** | **18,044** | **1,640** | **7%** | **4%** | **22,933** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 10 | 11,000 | 3,300 | 14,300 | 1,430 | | | |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 | 1,430 | 1,430 | | | |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 | Joint development | | - | - | - | | | | |
| 20.06 | Automobile parking multi-story structure | | - | - | - | | | | |
| 20.07 | Elevators, escalators | | 1,780 | 534 | 2,314 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **9.10** | **38,996** | **11,699** | **50,694** | **5,572** | **20%** | **10%** | **64,430** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 | Light Maintenance Facility | | 25,997 | 7,799 | 33,796 | | | | |
| 30.03 | Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 | Yard and Yard Track | | 12,998 | 3,900 | 16,898 | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **9.10** | **50,746** | **15,224** | **65,969** | **7,250** | **25%** | **13%** | **83,845** |
| 40.01 | Demolition, Clearing, Earthwork | | 5,500 | 1,650 | 7,150 | | | | |
| 40.02 | Site Utilities, Utility Relocation | | 10,190 | 3,057 | 13,247 | | | | |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 240 | 72 | 312 | | | | |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 240 | 72 | 312 | | | | |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 10,468 | 3,140 | 13,609 | | | | |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 24,107 | 7,232 | 31,339 | | | | |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | | **9.10** | **51,392** | **15,418** | **66,810** | **7,343** | **26%** | **13%** | **84,913** |
| 50.01 | Train control and signals | | 17,055 | 5,116 | 22,171 | | | | |
| 50.02 | Traffic signals and crossing protection | | 5,220 | 1,566 | 6,786 | | | | |
| 50.03 | Traction power supply: substations | | 9,128 | 2,738 | 11,866 | | | | |
| 50.04 | Traction power distribution: catenary and third rail | | 12,491 | 3,747 | 16,238 | | | | |
| 50.05 | Communications | | 4,428 | 1,329 | 5,757 | | | | |
| 50.06 | Fare collection system and equipment | | 1,870 | 561 | 2,431 | | | | |
| 50.07 | Central Control | | 1,201 | 360 | 1,561 | | | | |
| **Construction Subtotal (10-50)** | | **9.10** | **199,083** | **59,725** | **258,808** | **28,445** | **100%** | **52%** | **328,937** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **9.10** | **13,742** | **13,742** | **27,483** | **3,021** | | **6%** | **34,930** |
| 60.01 | Purchase or lease of real estate | | 8,874 | 8,874 | 17,747 | | | | |
| 60.02 | Relocation (freight railroad traffic) | | 4,868 | 4,868 | 9,736 | | | | |
| **70 VEHICLES (number)** | | **56** | **58,931** | **2,947** | **61,878** | **1,105** | | **12%** | **78,644** |
| 70.01 | Light Rail | 12 | 36,000 | 1,800 | 37,800 | 3,150 | | | |
| 70.02 | Heavy Rail | - | - | - | - | - | | | |
| 70.03 | Commuter Rail | - | - | - | - | - | | | |
| 70.04 | Bus | 44 | 15,490 | 774 | 16,264 | 370 | | | |
| 70.05 | Other | - | - | - | - | - | | | |
| 70.06 | Non-revenue vehicles | | 1,441 | 72 | 1,513 | - | | | |
| 70.07 | Spare parts | | 6,000 | 300 | 6,300 | | | | |
| **80 PROFESSIONAL SERVICES** | | **9.10** | **66,794** | **-** | **66,794** | **7,341** | | **13%** | **84,893** |
| 80.01 | Preliminary Engineering | | 3,982 | - | 3,982 | | | | |
| 80.02 | Final Design | | 11,270 | - | 11,270 | | | | |
| 80.03 | Project Management for Design and Construction | | 4,983 | - | 4,983 | | | | |
| 80.04 | Construction Administration & Management | | 16,064 | - | 16,064 | | | | |
| 80.05 | Insurance | | 7,963 | - | 7,963 | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 2,678 | - | 2,678 | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 6,534 | - | 6,534 | | | | |
| 80.08 | Agency Force Account Work | | 13,319 | - | 13,319 | | | | |
| **Subtotal (10-80)** | | **9.10** | **338,560** | **76,413** | **414,963** | **45,607** | | **83%** | **527,404** |
| **90 UNALLOCATED CONTINGENCY** | | | | | **82,993** | | | **17%** | **105,481** |
| **Subtotal (10-90)** | | **9.10** | | | **497,956** | **54,728** | | **100%** | **632,885** |
| **100 FINANCE CHARGES** | | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | | **9.10** | | | **497,956** | **54,728** | | **100%** | **632,885** |
| Total Allocated Contingency as % of Base Year Estimate | | | | | 23% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | | 159,406 | | | | |
| Total Contingency as % of Base Year Estimate | | | | | 47% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | | 32% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | | 32% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | | 36,152 |
| Forecast Year Total Project Cost per Mile | | | | | | | | | **69,558** |
| Professional Services as % of Construction | | | | | 26% | | | | |

| Major Capital Project Costs - Main Worksheet | | | (Rev. 6, Feb 7, 2006) |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 1C | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | Revenue Ops | 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | Forecast Year | 2015 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **14.64** | **124,934** | **37,480** | **162,414** | **11,096** | **33%** | **18%** | **206,423** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 9.56 | 14,921 | 4,476 | 19,397 | 2,028 | | | |
| 10.03 Guideway: At-grade in mixed traffic | 1.40 | 1,661 | 498 | 2,159 | 1,544 | | | |
| 10.04 Guideway: Aerial structure | 0.56 | 17,132 | 5,140 | 22,272 | 39,608 | | | |
| 10.05 Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 Guideway: Underground cut & cover | 0.59 | 38,988 | 11,696 | 50,684 | 85,664 | | | |
| 10.07 Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 Guideway: Retained cut or fill | 2.52 | 15,278 | 4,583 | 19,861 | 7,878 | | | |
| 10.09 Track: Direct fixation | | 4,348 | 1,304 | 5,652 | | | | |
| 10.10 Track: Embedded | | 7,496 | 2,249 | 9,744 | | | | |
| 10.11 Track: Ballasted | | 19,316 | 5,795 | 25,111 | | | | |
| 10.12 Track: Special (switches, turnouts) | | 5,795 | 1,738 | 7,533 | | | | |
| 10.13 Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **17** | **33,140** | **9,942** | **43,082** | **2,534** | **9%** | **5%** | **54,756** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 15 | 16,500 | 4,950 | 21,450 | 1,430 | | | |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 | 2,860 | 1,430 | | | |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 Joint development | | - | - | - | | | | |
| 20.06 Automobile parking multi-story structure | | 9,100 | 2,730 | 11,830 | | | | |
| 20.07 Elevators, escalators | | 5,340 | 1,602 | 6,942 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | **14.64** | **38,995** | **11,699** | **50,694** | **3,463** | **10%** | **6%** | **64,430** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 Light Maintenance Facility | | 25,997 | 7,799 | 33,796 | | | | |
| 30.03 Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 Yard and Yard Track | | 12,998 | 3,900 | 16,898 | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | **14.64** | **89,458** | **26,837** | **116,295** | **7,945** | **24%** | **13%** | **147,807** |
| 40.01 Demolition, Clearing, Earthwork | | 8,500 | 2,550 | 11,050 | | | | |
| 40.02 Site Utilities, Utility Relocation | | 22,505 | 6,751 | 29,256 | | | | |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 386 | 116 | 502 | | | | |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 549 | 165 | 714 | | | | |
| 40.05 Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 19,748 | 5,924 | 25,672 | | | | |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 37,769 | 11,331 | 49,100 | | | | |
| 40.08 Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | **14.64** | **87,934** | **26,380** | **114,314** | **7,810** | **23%** | **13%** | **145,290** |
| 50.01 Train control and signals | | 27,435 | 8,231 | 35,666 | | | | |
| 50.02 Traffic signals and crossing protection | | 8,670 | 2,601 | 11,271 | | | | |
| 50.03 Traction power supply: substations | | 14,684 | 4,405 | 19,089 | | | | |
| 50.04 Traction power distribution: catenary and third rail | | 20,175 | 6,052 | 26,227 | | | | |
| 50.05 Communications | | 11,979 | 3,594 | 15,572 | | | | |
| 50.06 Fare collection system and equipment | | 3,060 | 918 | 3,978 | | | | |
| 50.07 Central Control | | 1,932 | 580 | 2,512 | | | | |
| **Construction Subtotal (10-50)** | **14.64** | **374,461** | **112,338** | **486,799** | **33,259** | **100%** | **55%** | **618,705** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | **14.64** | **10,480** | **10,480** | **20,961** | **1,432** | | **2%** | **26,640** |
| 60.01 Purchase or lease of real estate | | 10,480 | 10,480 | 20,961 | | | | |
| 60.02 Relocation (freight railroad traffic) | | - | - | - | | | | |
| **70 VEHICLES (number)** | **62** | **99,696** | **4,985** | **104,681** | **1,688** | | **12%** | **133,046** |
| 70.01 Light Rail | 24 | 72,000 | 3,600 | 75,600 | 3,150 | | | |
| 70.02 Heavy Rail | - | - | - | - | - | | | |
| 70.03 Commuter Rail | - | - | - | - | - | | | |
| 70.04 Bus | 38 | 13,378 | 669 | 14,046 | 370 | | | |
| 70.05 Other | - | - | - | - | - | | | |
| 70.06 Non-revenue vehicles | | 2,318 | 116 | 2,434 | - | | | |
| 70.07 Spare parts | | 12,000 | 600 | 12,600 | | | | |
| **80 PROFESSIONAL SERVICES** | **14.64** | **120,467** | **-** | **120,467** | **8,230** | | **14%** | **153,110** |
| 80.01 Preliminary Engineering | | 7,489 | - | 7,489 | | | | |
| 80.02 Final Design | | 20,822 | - | 20,822 | | | | |
| 80.03 Project Management for Design and Construction | | 8,801 | - | 8,801 | | | | |
| 80.04 Construction Administration & Management | | 30,062 | - | 30,062 | | | | |
| 80.05 Insurance | | 14,978 | - | 14,978 | | | | |
| 80.06 Legal; Permits; Review Fees by other agencies, cities, etc. | | 4,269 | - | 4,269 | | | | |
| 80.07 Surveys, Testing, Investigation, Inspection | | 10,531 | - | 10,531 | | | | |
| 80.08 Agency Force Account Work | | 23,516 | - | 23,516 | | | | |
| **Subtotal (10-80)** | **14.64** | **605,105** | **127,803** | **732,908** | **50,073** | | **83%** | **931,501** |
| **90 UNALLOCATED CONTINGENCY** | | | | **146,582** | | | **17%** | **186,300** |
| **Subtotal (10-90)** | **14.64** | | | **879,490** | **60,088** | | **100%** | **1,117,801** |
| **100 FINANCE CHARGES** | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | **14.64** | | | **879,490** | **60,088** | | **100%** | **1,117,801** |
| Total Allocated Contingency as % of Base Year Estimate | | | | 21% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | 274,385 | | | | |
| Total Contingency as % of Base Year Estimate | | | | 45% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | 31% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | 31% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | 42,271 |
| Forecast Year Total Project Cost per Mile | | | | | | | | **76,370** |
| Professional Services as % of Construction | | | | 25% | | | | |

| Major Capital Project Costs - Main Worksheet | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 2C | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | | AA | Revenue Ops | 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | | Design Bid Build | Forecast Year | 2015 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **15.97** | **146,249** | **43,875** | **190,124** | **11,908** | **35%** | **19%** | **241,641** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 8.90 | 14,424 | 4,327 | 18,751 | 2,107 | | | |
| 10.03 Guideway: At-grade in mixed traffic | 1.40 | 1,661 | 498 | 2,159 | 1,544 | | | |
| 10.04 Guideway: Aerial structure | 0.85 | 26,360 | 7,908 | 34,269 | 40,146 | | | |
| 10.05 Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 Guideway: Underground cut & cover | 0.63 | 41,280 | 12,384 | 53,664 | 85,474 | | | |
| 10.07 Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 Guideway: Retained cut or fill | 4.19 | 22,888 | 6,866 | 29,754 | 7,105 | | | |
| 10.09 Track: Direct fixation | | 5,486 | 1,646 | 7,132 | | | | |
| 10.10 Track: Embedded | | 7,496 | 2,249 | 9,744 | | | | |
| 10.11 Track: Ballasted | | 21,041 | 6,312 | 27,354 | | | | |
| 10.12 Track: Special (switches, turnouts) | | 5,614 | 1,684 | 7,298 | | | | |
| 10.13 Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **19** | **38,200** | **11,460** | **49,660** | **2,614** | **9%** | **5%** | **63,116** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 17 | 18,700 | 5,610 | 24,310 | 1,430 | | | |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 | 2,860 | 1,430 | | | |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 Joint development | | - | - | - | | | | |
| 20.06 Automobile parking multi-story structure | | 11,960 | 3,588 | 15,548 | | | | |
| 20.07 Elevators, escalators | | 5,340 | 1,602 | 6,942 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | **15.97** | **38,995** | **11,699** | **50,694** | **3,175** | **9%** | **5%** | **64,430** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 Light Maintenance Facility | | 25,997 | 7,799 | 33,796 | | | | |
| 30.03 Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 Yard and Yard Track | | 12,998 | 3,900 | 16,898 | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | **15.97** | **96,980** | **29,094** | **126,074** | **7,897** | **23%** | **13%** | **160,236** |
| 40.01 Demolition, Clearing, Earthwork | | 9,000 | 2,700 | 11,700 | | | | |
| 40.02 Site Utilities, Utility Relocation | | 28,441 | 8,532 | 36,974 | | | | |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 508 | 153 | 661 | | | | |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 584 | 175 | 759 | | | | |
| 40.05 Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 18,512 | 5,554 | 24,065 | | | | |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 39,934 | 11,980 | 51,914 | | | | |
| 40.08 Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | **15.97** | **95,636** | **28,691** | **124,327** | **7,787** | **23%** | **13%** | **158,015** |
| 50.01 Train control and signals | | 29,926 | 8,978 | 38,904 | | | | |
| 50.02 Traffic signals and crossing protection | | 9,120 | 2,736 | 11,856 | | | | |
| 50.03 Traction power supply: substations | | 16,017 | 4,805 | 20,822 | | | | |
| 50.04 Traction power distribution: catenary and third rail | | 21,999 | 6,600 | 28,599 | | | | |
| 50.05 Communications | | 13,066 | 3,920 | 16,986 | | | | |
| 50.06 Fare collection system and equipment | | 3,400 | 1,020 | 4,420 | | | | |
| 50.07 Central Control | | 2,107 | 632 | 2,740 | | | | |
| **Construction Subtotal (10-50)** | **15.97** | **416,060** | **124,818** | **540,878** | **33,877** | **100%** | **55%** | **687,438** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | **15.97** | **13,315** | **13,315** | **26,629** | **1,668** | | **3%** | **33,845** |
| 60.01 Purchase or lease of real estate | | 13,315 | 13,315 | 26,629 | | | | |
| 60.02 Relocation (freight railroad traffic) | | - | - | - | | | | |
| **70 VEHICLES (number)** | **66** | **107,611** | **5,381** | **112,991** | **1,712** | | **12%** | **143,608** |
| 70.01 Light Rail | 26 | 78,000 | 3,900 | 81,900 | 3,150 | | | |
| 70.02 Heavy Rail | - | - | - | - | - | | | |
| 70.03 Commuter Rail | - | - | - | - | - | | | |
| 70.04 Bus | 40 | 14,082 | 704 | 14,786 | 370 | | | |
| 70.05 Other | - | - | - | - | - | | | |
| 70.06 Non-revenue vehicles | | 2,529 | 126 | 2,655 | - | | | |
| 70.07 Spare parts | | 13,000 | 650 | 13,650 | | | | |
| **80 PROFESSIONAL SERVICES** | **15.97** | **134,193** | **-** | **134,193** | **8,405** | | **14%** | **170,555** |
| 80.01 Preliminary Engineering | | 8,321 | - | 8,321 | | | | |
| 80.02 Final Design | | 23,088 | - | 23,088 | | | | |
| 80.03 Project Management for Design and Construction | | 9,797 | - | 9,797 | | | | |
| 80.04 Construction Administration & Management | | 33,418 | - | 33,418 | | | | |
| 80.05 Insurance | | 16,642 | - | 16,642 | | | | |
| 80.06 Legal; Permits; Review Fees by other agencies, cities, etc. | | 4,826 | - | 4,826 | | | | |
| 80.07 Surveys, Testing, Investigation, Inspection | | 11,805 | - | 11,805 | | | | |
| 80.08 Agency Force Account Work | | 26,295 | - | 26,295 | | | | |
| **Subtotal (10-80)** | **15.97** | **671,179** | **143,513** | **814,692** | **51,028** | | **83%** | **1,035,446** |
| **90 UNALLOCATED CONTINGENCY** | | | | **162,938** | | | **17%** | **207,089** |
| **Subtotal (10-90)** | **15.97** | | | **977,630** | **61,233** | | **100%** | **1,242,535** |
| **100 FINANCE CHARGES** | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | **15.97** | | | **977,630** | **61,233** | | **100%** | **1,242,535** |
| Total Allocated Contingency as % of Base Year Estimate | | | | 21% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | 306,452 | | | | |
| Total Contingency as % of Base Year Estimate | | | | 46% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | 31% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | 31% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | 43,057 |
| Forecast Year Total Project Cost per Mile | | | | | | | | 77,825 |
| Professional Services as % of Construction | | | | 25% | | | | |

| Major Capital Project Costs - Main Worksheet | | | (Rev. 6, Feb 7, 2006) |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 3C | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |
| Project ID | | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | Revenue Ops | 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | Forecast Year | 2015 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **16.59** | **161,889** | **48,567** | **210,455** | **12,686** | **35%** | **19%** | **267,482** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 8.72 | 14,053 | 4,216 | 18,269 | 2,095 | | | |
| 10.03 Guideway: At-grade in mixed traffic | 1.60 | 1,897 | 569 | 2,466 | 1,544 | | | |
| 10.04 Guideway: Aerial structure | 1.15 | 35,690 | 10,707 | 46,398 | 40,412 | | | |
| 10.05 Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 Guideway: Underground cut & cover | 0.64 | 41,796 | 12,539 | 54,335 | 85,434 | | | |
| 10.07 Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 Guideway: Retained cut or fill | 4.49 | 25,863 | 7,759 | 33,622 | 7,489 | | | |
| 10.09 Track: Direct fixation | | 6,471 | 1,941 | 8,412 | | | | |
| 10.10 Track: Embedded | | 8,232 | 2,469 | 10,701 | | | | |
| 10.11 Track: Ballasted | | 21,385 | 6,416 | 27,801 | | | | |
| 10.12 Track: Special (switches, turnouts) | | 6,502 | 1,950 | 8,452 | | | | |
| 10.13 Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **20** | **46,775** | **14,033** | **60,808** | **3,040** | **10%** | **5%** | **77,284** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 18 | 19,800 | 5,940 | 25,740 | 1,430 | | | |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 | 2,860 | 1,430 | | | |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 Joint development | | - | - | - | | | | |
| 20.06 Automobile parking multi-story structure | | 19,435 | 5,831 | 25,266 | | | | |
| 20.07 Elevators, escalators | | 5,340 | 1,602 | 6,942 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | **16.59** | **38,995** | **11,699** | **50,694** | **3,056** | **8%** | **5%** | **64,430** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 Light Maintenance Facility | | 25,997 | 7,799 | 33,796 | | | | |
| 30.03 Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 Yard and Yard Track | | 12,998 | 3,900 | 16,898 | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | **16.59** | **109,927** | **32,978** | **142,905** | **8,614** | **24%** | **13%** | **181,627** |
| 40.01 Demolition, Clearing, Earthwork | | 9,500 | 2,850 | 12,350 | | | | |
| 40.02 Site Utilities, Utility Relocation | | 31,377 | 9,413 | 40,790 | | | | |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 973 | 292 | 1,265 | | | | |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 1,049 | 315 | 1,363 | | | | |
| 40.05 Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 19,175 | 5,753 | 24,928 | | | | |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 47,853 | 14,356 | 62,209 | | | | |
| 40.08 Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | **16.59** | **103,722** | **31,117** | **134,838** | **8,128** | **22%** | **12%** | **171,375** |
| 50.01 Train control and signals | | 31,181 | 9,354 | 40,535 | | | | |
| 50.02 Traffic signals and crossing protection | | 13,555 | 4,067 | 17,622 | | | | |
| 50.03 Traction power supply: substations | | 16,688 | 5,006 | 21,695 | | | | |
| 50.04 Traction power distribution: catenary and third rail | | 22,918 | 6,875 | 29,793 | | | | |
| 50.05 Communications | | 13,614 | 4,084 | 17,698 | | | | |
| 50.06 Fare collection system and equipment | | 3,570 | 1,071 | 4,641 | | | | |
| 50.07 Central Control | | 2,196 | 659 | 2,855 | | | | |
| **Construction Subtotal (10-50)** | **16.59** | **461,308** | **138,392** | **599,700** | **36,148** | **100%** | **54%** | **762,199** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | **16.59** | **24,735** | **24,735** | **49,470** | **2,982** | | **4%** | **62,875** |
| 60.01 Purchase or lease of real estate | | 24,735 | 24,735 | 49,470 | | | | |
| 60.02 Relocation (freight railroad traffic) | | - | - | - | | | | |
| **70 VEHICLES (number)** | **70** | **115,414** | **5,771** | **121,184** | **1,731** | | **11%** | **154,021** |
| 70.01 Light Rail | 28 | 84,000 | 4,200 | 88,200 | 3,150 | | | |
| 70.02 Heavy Rail | - | - | - | - | - | | | |
| 70.03 Commuter Rail | - | - | - | - | - | | | |
| 70.04 Bus | 42 | 14,786 | 739 | 15,525 | 370 | | | |
| 70.05 Other | - | - | - | - | - | | | |
| 70.06 Non-revenue vehicles | | 2,628 | 131 | 2,759 | - | | | |
| 70.07 Spare parts | | 14,000 | 700 | 14,700 | | | | |
| **80 PROFESSIONAL SERVICES** | **16.59** | **151,584** | **-** | **151,584** | **9,137** | | **14%** | **192,658** |
| 80.01 Preliminary Engineering | | 9,226 | - | 9,226 | | | | |
| 80.02 Final Design | | 25,621 | - | 25,621 | | | | |
| 80.03 Project Management for Design and Construction | | 11,122 | - | 11,122 | | | | |
| 80.04 Construction Administration & Management | | 37,152 | - | 37,152 | | | | |
| 80.05 Insurance | | 18,452 | - | 18,452 | | | | |
| 80.06 Legal; Permits; Review Fees by other agencies, cities, etc. | | 5,850 | - | 5,850 | | | | |
| 80.07 Surveys, Testing, Investigation, Inspection | | 14,008 | - | 14,008 | | | | |
| 80.08 Agency Force Account Work | | 30,152 | - | 30,152 | | | | |
| **Subtotal (10-80)** | **16.59** | **753,040** | **168,898** | **921,938** | **55,572** | | **83%** | **1,171,753** |
| **90 UNALLOCATED CONTINGENCY** | | | | **184,388** | | | **17%** | **234,351** |
| **Subtotal (10-90)** | **16.59** | | | **1,106,326** | **66,686** | | **100%** | **1,406,103** |
| **100 FINANCE CHARGES** | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | **16.59** | | | **1,106,326** | **66,686** | | **100%** | **1,406,103** |
| Total Allocated Contingency as % of Base Year Estimate | | | | 22% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | 353,286 | | | | |
| Total Contingency as % of Base Year Estimate | | | | 47% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | 32% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | 32% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | 45,943 |
| Forecast Year Total Project Cost per Mile | | | | | | | | **84,756** |
| Professional Services as % of Construction | | | | 25% | | | | |

| Major Capital Project Costs - Main Worksheet | | (Rev. 6, Feb 7, 2006) |
|---|---|---|
| Project | Southwest Transitway - Alternative LRT 4C | Date: 10/17/06 |
| Location | Hennepin County, MN | Base Year: 2006 |
| Project ID | | |
| (AA, PE, FD, Bid/Award, Construction, Rev Ops) Phase | AA | Revenue Ops: 2015 |
| (Design Bid Build, Design Build, CM at Risk, etc) Contracting Method | Design Bid Build | Forecast Year: 2015 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) | Base Year Total (X000) | Base Year Unit Cost (X000) | Base Year Percentage of Construction | Base Year Percentage of Project Total | Forecast Year Total (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **9.96** | **105,933** | **31,780** | **137,714** | **13,827** | **35%** | **20%** | **175,029** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | | | |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 5.42 | 9,879 | 2,964 | 12,843 | 2,369 | | | |
| 10.03 | Guideway: At-grade in mixed traffic | 1.40 | 1,661 | 498 | 2,159 | 1,544 | | | |
| 10.04 | Guideway: Aerial structure | 0.53 | 16,232 | 4,870 | 21,102 | 39,524 | | | |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | | | |
| 10.06 | Guideway: Underground cut & cover | 0.59 | 38,988 | 11,696 | 50,684 | 85,664 | | | |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | | | |
| 10.08 | Guideway: Retained cut or fill | 2.02 | 12,018 | 3,605 | 15,623 | 7,753 | | | |
| 10.09 | Track: Direct fixation | | 4,348 | 1,304 | 5,652 | | | | |
| 10.10 | Track: Embedded | | 7,496 | 2,249 | 9,744 | | | | |
| 10.11 | Track: Ballasted | | 11,414 | 3,424 | 14,839 | | | | |
| 10.12 | Track: Special (switches, turnouts) | | 3,898 | 1,169 | 5,067 | | | | |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | | | | |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **14** | **20,740** | **6,222** | **26,962** | **1,926** | **7%** | **4%** | **34,268** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 12 | 13,200 | 3,960 | 17,160 | 1,430 | | | |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 | 2,860 | 1,430 | | | |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | | | |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | | | |
| 20.05 | Joint development | | - | - | - | | | | |
| 20.06 | Automobile parking multi-story structure | | - | - | - | | | | |
| 20.07 | Elevators, escalators | | 5,340 | 1,602 | 6,942 | | | | |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **9.96** | **38,995** | **11,699** | **50,694** | **5,090** | **13%** | **7%** | **64,430** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | | | | |
| 30.02 | Light Maintenance Facility | | 25,997 | 7,799 | 33,796 | | | | |
| 30.03 | Heavy Maintenance Facility | | - | - | - | | | | |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | | | | |
| 30.05 | Yard and Yard Track | | 12,998 | 3,900 | 16,898 | | | | |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **9.96** | **73,744** | **22,123** | **95,867** | **9,625** | **24%** | **14%** | **121,843** |
| 40.01 | Demolition, Clearing, Earthwork | | 7,000 | 2,100 | 9,100 | | | | |
| 40.02 | Site Utilities, Utility Relocation | | 17,566 | 5,270 | 22,836 | | | | |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 263 | 79 | 342 | | | | |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 426 | 128 | 553 | | | | |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | | | | |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 14,391 | 4,317 | 18,708 | | | | |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 34,098 | 10,229 | 44,327 | | | | |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | | | | |
| **50 SYSTEMS** | | **9.96** | **61,852** | **18,555** | **80,407** | **8,073** | **21%** | **11%** | **102,195** |
| 50.01 | Train control and signals | | 18,669 | 5,601 | 24,270 | | | | |
| 50.02 | Traffic signals and crossing protection | | 7,420 | 2,226 | 9,646 | | | | |
| 50.03 | Traction power supply: substations | | 9,992 | 2,998 | 12,989 | | | | |
| 50.04 | Traction power distribution: catenary and third rail | | 13,755 | 4,126 | 17,881 | | | | |
| 50.05 | Communications | | 8,151 | 2,445 | 10,597 | | | | |
| 50.06 | Fare collection system and equipment | | 2,550 | 765 | 3,315 | | | | |
| 50.07 | Central Control | | 1,315 | 394 | 1,709 | | | | |
| **Construction Subtotal (10-50)** | | **9.96** | **301,264** | **90,379** | **391,643** | **39,321** | **100%** | **56%** | **497,765** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **9.96** | **7,231** | **7,231** | **14,461** | **1,452** | | **2%** | **18,380** |
| 60.01 | Purchase or lease of real estate | | 7,231 | 7,231 | 14,461 | | | | |
| 60.02 | Relocation (freight railroad traffic) | | - | - | - | | | | |
| **70 VEHICLES (number)** | | **61** | **76,568** | **3,828** | **80,396** | **1,318** | | **11%** | **102,180** |
| 70.01 | Light Rail | 17 | 51,000 | 2,550 | 53,550 | 3,150 | | | |
| 70.02 | Heavy Rail | - | - | - | - | - | | | |
| 70.03 | Commuter Rail | - | - | - | - | - | | | |
| 70.04 | Bus | 44 | 15,490 | 774 | 16,264 | 370 | | | |
| 70.05 | Other | - | - | - | - | - | | | |
| 70.06 | Non-revenue vehicles | | 1,578 | 79 | 1,657 | - | | | |
| 70.07 | Spare parts | | 8,500 | 425 | 8,925 | | | | |
| **80 PROFESSIONAL SERVICES** | | **9.96** | **96,377** | **-** | **96,377** | **9,676** | | **14%** | **122,492** |
| 80.01 | Preliminary Engineering | | 6,025 | - | 6,025 | | | | |
| 80.02 | Final Design | | 16,667 | - | 16,667 | | | | |
| 80.03 | Project Management for Design and Construction | | 7,008 | - | 7,008 | | | | |
| 80.04 | Construction Administration & Management | | 24,173 | - | 24,173 | | | | |
| 80.05 | Insurance | | 12,051 | - | 12,051 | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 3,374 | - | 3,374 | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 8,280 | - | 8,280 | | | | |
| 80.08 | Agency Force Account Work | | 18,799 | - | 18,799 | | | | |
| **Subtotal (10-80)** | | **9.96** | **481,439** | **101,438** | **582,877** | **58,522** | | **83%** | **740,818** |
| **90 UNALLOCATED CONTINGENCY** | | | | | **116,575** | | | **17%** | **148,164** |
| **Subtotal (10-90)** | | **9.96** | | | **699,453** | **70,226** | | **100%** | **888,981** |
| **100 FINANCE CHARGES** | | | | | **-** | | | **0%** | **-** |
| **Total Project Cost (10-100)** | | **9.96** | | | **699,453** | **70,226** | | **100%** | **888,981** |
| Total Allocated Contingency as % of Base Year Estimate | | | | | 21% | | | | |
| Total Contingency (Allocated and Unallocated) | | | | | 218,014 | | | | |
| Total Contingency as % of Base Year Estimate | | | | | 45% | | | | |
| Total Contingency as % of Base Year Total (w/o Finance Charges) | | | | | 31% | | | | |
| Total Contingency as % of Base Year Total Project Cost | | | | | 31% | | | | |
| Forecast Year Construction Cost per Mile | | | | | | | | | 49,976 |
| Forecast Year Total Project Cost per Mile | | | | | | | | | **89,255** |
| Professional Services as % of Construction | | | | | 25% | | | | |

| Major Capital Project Costs - By Segment | | (Rev. 6, Feb 7, 2006) | | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 1-1 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 2.20 |
| | | | Stations | 1 |

| | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **2.20** | **8,299** | **2,490** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 2.11 | 2,518 | 756 |
| 10.03 Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 Guideway: Aerial structure | 0.03 | 900 | 270 |
| 10.05 Guideway: Built-up fill | - | - | - |
| 10.06 Guideway: Underground cut & cover | - | - | - |
| 10.07 Guideway: Underground tunnel | - | - | - |
| 10.08 Guideway: Retained cut or fill | 0.06 | 315 | 94 |
| 10.09 Track: Direct fixation | | - | - |
| 10.10 Track: Embedded | | - | - |
| 10.11 Track: Ballasted | | 3,719 | 1,116 |
| 10.12 Track: Special (switches, turnouts) | | 847 | 254 |
| 10.13 Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **1** | **1,100** | **330** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 Joint development | | - | - |
| 20.06 Automobile parking multi-story structure | | - | - |
| 20.07 Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **-** | **-** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 Light Maintenance Facility | | | - |
| 30.03 Heavy Maintenance Facility | | | - |
| 30.04 Storage or Maintenance of Way Building | | | - |
| 30.05 Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **7,603** | **2,281** |
| 40.01 Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 Site Utilities, Utility Relocation | | 2,324 | 697 |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 58 | 17 |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 58 | 17 |
| 40.05 Site structures including retaining walls, sound walls | | - | - |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 2,656 | 797 |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 2,007 | 602 |
| 40.08 Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | **11,867** | **3,560** |
| 50.01 Train control and signals | | 4,125 | 1,238 |
| 50.02 Traffic signals and crossing protection | | 250 | 75 |
| 50.03 Traction power supply: substations | | 2,208 | 662 |
| 50.04 Traction power distribution: catenary and third rail | | 3,021 | 906 |
| 50.05 Communications | | 1,801 | 540 |
| 50.06 Fare collection system and equipment | | 170 | 51 |
| 50.07 Central Control | | 291 | 87 |
| **Construction Subtotal (10-50)** | | **28,869** | **8,661** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **1,083** | **1,083** |
| 60.01 Purchase or lease of real estate | | 1,083 | 1,083 |
| 60.02 Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 1-2 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 0.99 |
| | | | Stations | 1 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **0.99** | **5,287** | **1,586** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.72 | 861 | 258 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | - | - | - |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.26 | 2,210 | 663 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 1,670 | 501 |
| 10.12 | Track: Special (switches, turnouts) | | 547 | 164 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **1** | **1,100** | **330** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **3,618** | **1,085** |
| 40.01 | Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 | Site Utilities, Utility Relocation | | 1,044 | 313 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 26 | 8 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 26 | 8 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 1,066 | 320 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 956 | 287 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **5,811** | **1,743** |
| 50.01 | Train control and signals | | 1,853 | 556 |
| 50.02 | Traffic signals and crossing protection | | 500 | 150 |
| 50.03 | Traction power supply: substations | | 992 | 297 |
| 50.04 | Traction power distribution: catenary and third rail | | 1,357 | 407 |
| 50.05 | Communications | | 809 | 243 |
| 50.06 | Fare collection system and equipment | | 170 | 51 |
| 50.07 | Central Control | | 130 | 39 |
| **Construction Subtotal (10-50)** | | | **15,816** | **4,745** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **1,083** | **1,083** |
| 60.01 | Purchase or lease of real estate | | 1,083 | 1,083 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 1-3 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 1.55 |
| | | | Stations | 1 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **1.55** | **5,601** | **1,680** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 1.38 | 1,739 | 522 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | - | - | - |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.18 | 736 | 221 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 2,623 | 787 |
| 10.12 | Track: Special (switches, turnouts) | | 503 | 151 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **1** | **1,100** | **330** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **5,222** | **1,567** |
| 40.01 | Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 | Site Utilities, Utility Relocation | | 1,639 | 492 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 41 | 12 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 41 | 12 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 1,747 | 524 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 1,254 | 376 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **8,744** | **2,623** |
| 50.01 | Train control and signals | | 2,910 | 873 |
| 50.02 | Traffic signals and crossing protection | | 500 | 150 |
| 50.03 | Traction power supply: substations | | 1,557 | 467 |
| 50.04 | Traction power distribution: catenary and third rail | | 2,131 | 639 |
| 50.05 | Communications | | 1,271 | 381 |
| 50.06 | Fare collection system and equipment | | 170 | 51 |
| 50.07 | Central Control | | 205 | 61 |
| **Construction Subtotal (10-50)** | | | **20,667** | **6,200** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **1,083** | **1,083** |
| 60.01 | Purchase or lease of real estate | | 1,083 | 1,083 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 1-4 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 2.60 |
| | | | Stations | 2 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **2.60** | **13,841** | **4,152** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 2.22 | 5,743 | 1,723 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | 0.03 | 753 | 226 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.36 | 2,145 | 643 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 4,401 | 1,320 |
| 10.12 | Track: Special (switches, turnouts) | | 800 | 240 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **2** | **2,200** | **660** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **7,757** | **2,327** |
| 40.01 | Demolition, Clearing, Earthwork | | 1,000 | 300 |
| 40.02 | Site Utilities, Utility Relocation | | 2,751 | 825 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 69 | 21 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 69 | 21 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 1,842 | 553 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 2,026 | 608 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **14,638** | **4,391** |
| 50.01 | Train control and signals | | 4,883 | 1,465 |
| 50.02 | Traffic signals and crossing protection | | 750 | 225 |
| 50.03 | Traction power supply: substations | | 2,613 | 784 |
| 50.04 | Traction power distribution: catenary and third rail | | 3,576 | 1,073 |
| 50.05 | Communications | | 2,132 | 640 |
| 50.06 | Fare collection system and equipment | | 340 | 102 |
| 50.07 | Central Control | | 344 | 103 |
| **Construction Subtotal (10-50)** | | | **38,436** | **11,531** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **7,115** | **7,115** |
| 60.01 | Purchase or lease of real estate | | 7,115 | 7,115 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | (Rev. 6, Feb 7, 2006) | | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 2-1 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 1.10 |
| | | | Stations | 2 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **1.10** | **4,482** | **1,345** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.89 | 1,161 | 348 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | - | - | - |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.21 | 865 | 260 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 1,856 | 557 |
| 10.12 | Track: Special (switches, turnouts) | | 600 | 180 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **2** | **2,200** | **660** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **5,804** | **1,741** |
| 40.01 | Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 | Site Utilities, Utility Relocation | | 2,262 | 679 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 116 | 35 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 29 | 9 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 620 | 186 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 2,278 | 683 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **7,028** | **2,108** |
| 50.01 | Train control and signals | | 2,059 | 618 |
| 50.02 | Traffic signals and crossing protection | | 975 | 293 |
| 50.03 | Traction power supply: substations | | 1,102 | 331 |
| 50.04 | Traction power distribution: catenary and third rail | | 1,508 | 452 |
| 50.05 | Communications | | 899 | 270 |
| 50.06 | Fare collection system and equipment | | 340 | 102 |
| 50.07 | Central Control | | 145 | 44 |
| **Construction Subtotal (10-50)** | | | **19,514** | **5,854** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **2,329** | **2,329** |
| 60.01 | Purchase or lease of real estate | | 2,329 | 2,329 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 2-2 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 3.42 |
| | | | Stations | 2 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **3.42** | **30,420** | **9,126** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 1.28 | 1,722 | 516 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | 0.32 | 10,128 | 3,038 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | 0.04 | 2,292 | 688 |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 1.79 | 9,269 | 2,781 |
| 10.09 | Track: Direct fixation | | 1,138 | 341 |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 5,258 | 1,577 |
| 10.12 | Track: Special (switches, turnouts) | | 613 | 184 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **2** | **2,200** | **660** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **12,385** | **3,715** |
| 40.01 | Demolition, Clearing, Earthwork | | 1,000 | 300 |
| 40.02 | Site Utilities, Utility Relocation | | 7,042 | 2,113 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 90 | 27 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 90 | 27 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 1,867 | 560 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 2,295 | 688 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **18,351** | **5,505** |
| 50.01 | Train control and signals | | 6,410 | 1,923 |
| 50.02 | Traffic signals and crossing protection | | 225 | 68 |
| 50.03 | Traction power supply: substations | | 3,431 | 1,029 |
| 50.04 | Traction power distribution: catenary and third rail | | 4,695 | 1,408 |
| 50.05 | Communications | | 2,799 | 840 |
| 50.06 | Fare collection system and equipment | | 340 | 102 |
| 50.07 | Central Control | | 451 | 135 |
| **Construction Subtotal (10-50)** | | | **63,356** | **19,007** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **2,672** | **2,672** |
| 60.01 | Purchase or lease of real estate | | 2,672 | 2,672 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 3-1 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 1.34 |
| | | | Stations | 1 |
| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **1.34** | **9,341** | **2,802** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.75 | 1,001 | 300 |
| 10.03 | Guideway: At-grade in mixed traffic | 0.20 | 237 | 71 |
| 10.04 | Guideway: Aerial structure | 0.04 | 1,110 | 333 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | 0.03 | 1,656 | 497 |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.33 | 1,975 | 592 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | 736 | 221 |
| 10.11 | Track: Ballasted | | 1,923 | 577 |
| 10.12 | Track: Special (switches, turnouts) | | 704 | 211 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **1** | **1,100** | **330** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **10,191** | **3,057** |
| 40.01 | Demolition, Clearing, Earthwork | | 500 | 150 |
| 40.02 | Site Utilities, Utility Relocation | | 2,754 | 826 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 141 | 42 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 141 | 42 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 1,271 | 381 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 5,383 | 1,615 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **10,085** | **3,026** |
| 50.01 | Train control and signals | | 2,507 | 752 |
| 50.02 | Traffic signals and crossing protection | | 2,960 | 888 |
| 50.03 | Traction power supply: substations | | 1,342 | 402 |
| 50.04 | Traction power distribution: catenary and third rail | | 1,836 | 551 |
| 50.05 | Communications | | 1,094 | 328 |
| 50.06 | Fare collection system and equipment | | 170 | 51 |
| 50.07 | Central Control | | 177 | 53 |
| **Construction Subtotal (10-50)** | | | **30,717** | **9,215** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **3,653** | **3,653** |
| 60.01 | Purchase or lease of real estate | | 3,653 | 3,653 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 3-2 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 4.26 |
| | | | Stations | 3 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **4.26** | **42,320** | **12,696** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 1.73 | 2,089 | 627 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | 0.58 | 18,348 | 5,504 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | 0.02 | 1,152 | 346 |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 1.94 | 11,005 | 3,302 |
| 10.09 | Track: Direct fixation | | 2,123 | 637 |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 6,302 | 1,891 |
| 10.12 | Track: Special (switches, turnouts) | | 1,300 | 390 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **3** | **3,300** | **990** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 3 | 3,300 | 990 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **21,008** | **6,302** |
| 40.01 | Demolition, Clearing, Earthwork | | 1,500 | 450 |
| 40.02 | Site Utilities, Utility Relocation | | 8,864 | 2,659 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 455 | 136 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 455 | 136 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 3,007 | 902 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 6,729 | 2,019 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **25,096** | **7,529** |
| 50.01 | Train control and signals | | 8,068 | 2,420 |
| 50.02 | Traffic signals and crossing protection | | 2,200 | 660 |
| 50.03 | Traction power supply: substations | | 4,318 | 1,295 |
| 50.04 | Traction power distribution: catenary and third rail | | 5,909 | 1,773 |
| 50.05 | Communications | | 3,523 | 1,057 |
| 50.06 | Fare collection system and equipment | | 510 | 153 |
| 50.07 | Central Control | | 568 | 170 |
| **Construction Subtotal (10-50)** | | | **91,724** | **27,517** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **11,522** | **11,522** |
| 60.01 | Purchase or lease of real estate | | 11,522 | 11,522 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 3-3 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 1.16 |
| | | | Stations | - |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **1.16** | **12,126** | **3,638** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.63 | 784 | 235 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | 0.13 | 4,152 | 1,246 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | 0.04 | 2,340 | 702 |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.36 | 2,121 | 636 |
| 10.09 | Track: Direct fixation | | 465 | 140 |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 1,752 | 526 |
| 10.12 | Track: Special (switches, turnouts) | | 513 | 154 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **-** | **-** | **-** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **7,220** | **2,166** |
| 40.01 | Demolition, Clearing, Earthwork | | - | - |
| 40.02 | Site Utilities, Utility Relocation | | 2,395 | 718 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 123 | 37 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 123 | 37 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 804 | 241 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 3,775 | 1,133 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **7,723** | **2,317** |
| 50.01 | Train control and signals | | 2,180 | 654 |
| 50.02 | Traffic signals and crossing protection | | 1,675 | 503 |
| 50.03 | Traction power supply: substations | | 1,167 | 350 |
| 50.04 | Traction power distribution: catenary and third rail | | 1,596 | 479 |
| 50.05 | Communications | | 952 | 286 |
| 50.06 | Fare collection system and equipment | | - | - |
| 50.07 | Central Control | | 154 | 46 |
| **Construction Subtotal (10-50)** | | | **27,069** | **8,121** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **2,235** | **2,235** |
| 60.01 | Purchase or lease of real estate | | 2,235 | 2,235 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 4-1 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 0.07 |
| | | | Stations | - |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **0.07** | **187** | **56** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 0.07 | 77 | 23 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | - | - | - |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | - | - | - |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 110 | 33 |
| 10.12 | Track: Special (switches, turnouts) | | - | - |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **-** | **-** | **-** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **220** | **66** |
| 40.01 | Demolition, Clearing, Earthwork | | - | - |
| 40.02 | Site Utilities, Utility Relocation | | 69 | 21 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 2 | 1 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 2 | 1 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 113 | 34 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 34 | 10 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **339** | **102** |
| 50.01 | Train control and signals | | 122 | 37 |
| 50.02 | Traffic signals and crossing protection | | - | - |
| 50.03 | Traction power supply: substations | | 65 | 20 |
| 50.04 | Traction power distribution: catenary and third rail | | 89 | 27 |
| 50.05 | Communications | | 53 | 16 |
| 50.06 | Fare collection system and equipment | | - | - |
| 50.07 | Central Control | | 9 | 3 |
| **Construction Subtotal (10-50)** | | | **746** | **224** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **-** | **-** |
| 60.01 | Purchase or lease of real estate | | - | - |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT 4-2 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 2.71 |
| | | | Stations | 3 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **2.71** | **15,359** | **4,608** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 2.24 | 3,131 | 939 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | 0.13 | 4,134 | 1,240 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.34 | 2,316 | 695 |
| 10.09 | Track: Direct fixation | | 420 | 126 |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 4,381 | 1,314 |
| 10.12 | Track: Special (switches, turnouts) | | 977 | 293 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **3** | **3,300** | **990** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 3 | 3,300 | 990 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **12,012** | **3,604** |
| 40.01 | Demolition, Clearing, Earthwork | | 1,500 | 450 |
| 40.02 | Site Utilities, Utility Relocation | | 2,858 | 858 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 71 | 21 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 71 | 21 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 3,304 | 991 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 4,207 | 1,262 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **16,513** | **4,954** |
| 50.01 | Train control and signals | | 5,074 | 1,522 |
| 50.02 | Traffic signals and crossing protection | | 1,925 | 578 |
| 50.03 | Traction power supply: substations | | 2,715 | 815 |
| 50.04 | Traction power distribution: catenary and third rail | | 3,716 | 1,115 |
| 50.05 | Communications | | 2,215 | 665 |
| 50.06 | Fare collection system and equipment | | 510 | 153 |
| 50.07 | Central Control | | 357 | 107 |
| **Construction Subtotal (10-50)** | | | **47,183** | **14,155** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **3,250** | **3,250** |
| 60.01 | Purchase or lease of real estate | | 3,250 | 3,250 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | (Rev. 6, Feb 7, 2006) | | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT A-1 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 4.40 |
| | | | Stations | 6 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **4.40** | **15,319** | **4,596** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 4.23 | 5,304 | 1,591 |
| 10.03 | Guideway: At-grade in mixed traffic | - | - | - |
| 10.04 | Guideway: Aerial structure | 0.08 | 935 | 281 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.08 | 345 | 103 |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | - | - |
| 10.11 | Track: Ballasted | | 7,429 | 2,229 |
| 10.12 | Track: Special (switches, turnouts) | | 1,307 | 392 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **6** | **8,380** | **2,514** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 5 | 5,500 | 1,650 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,100 | 330 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | 1,780 | 534 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **16,710** | **5,013** |
| 40.01 | Demolition, Clearing, Earthwork | | 3,000 | 900 |
| 40.02 | Site Utilities, Utility Relocation | | 4,643 | 1,393 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 116 | 35 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 116 | 35 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 5,162 | 1,549 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 3,673 | 1,102 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **22,319** | **6,696** |
| 50.01 | Train control and signals | | 8,241 | 2,472 |
| 50.02 | Traffic signals and crossing protection | | 1,450 | 435 |
| 50.03 | Traction power supply: substations | | 4,411 | 1,323 |
| 50.04 | Traction power distribution: catenary and third rail | | 6,036 | 1,811 |
| 50.05 | Communications | | 580 | 174 |
| 50.06 | Fare collection system and equipment | | 1,020 | 306 |
| 50.07 | Central Control | | 580 | 174 |
| **Construction Subtotal (10-50)** | | | **62,728** | **18,818** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **8,118** | **8,118** |
| 60.01 | Purchase or lease of real estate | | 3,250 | 3,250 |
| 60.02 | Relocation (freight railroad traffic) | | 4,868 | 4,868 |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT A-2 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 1.93 |
| | | | Stations | 2 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **1.93** | **13,204** | **3,961** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 1.14 | 1,361 | 408 |
| 10.03 | Guideway: At-grade in mixed traffic | 0.23 | 279 | 84 |
| 10.04 | Guideway: Aerial structure | 0.10 | 3,042 | 913 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | 0.02 | 1,056 | 317 |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 0.44 | 2,505 | 751 |
| 10.09 | Track: Direct fixation | | 355 | 106 |
| 10.10 | Track: Embedded | | 867 | 260 |
| 10.11 | Track: Ballasted | | 2,750 | 825 |
| 10.12 | Track: Special (switches, turnouts) | | 990 | 297 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **2** | **2,200** | **660** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **16,284** | **4,885** |
| 40.01 | Demolition, Clearing, Earthwork | | 1,000 | 300 |
| 40.02 | Site Utilities, Utility Relocation | | 2,620 | 786 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 51 | 15 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 51 | 15 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 1,889 | 567 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 10,673 | 3,202 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **12,222** | **3,667** |
| 50.01 | Train control and signals | | 3,617 | 1,085 |
| 50.02 | Traffic signals and crossing protection | | 1,845 | 554 |
| 50.03 | Traction power supply: substations | | 1,936 | 581 |
| 50.04 | Traction power distribution: catenary and third rail | | 2,649 | 795 |
| 50.05 | Communications | | 1,579 | 474 |
| 50.06 | Fare collection system and equipment | | 340 | 102 |
| 50.07 | Central Control | | 255 | 76 |
| **Construction Subtotal (10-50)** | | | **43,910** | **13,173** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **2,374** | **2,374** |
| 60.01 | Purchase or lease of real estate | | 2,374 | 2,374 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT A-3 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 1.95 |
| | | | Stations | 3 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **1.95** | **8,760** | **2,628** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 1.03 | 1,300 | 390 |
| 10.03 | Guideway: At-grade in mixed traffic | 0.92 | 1,096 | 329 |
| 10.04 | Guideway: Aerial structure | - | - | - |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | - | - | - |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | 3,411 | 1,023 |
| 10.11 | Track: Ballasted | | 1,734 | 520 |
| 10.12 | Track: Special (switches, turnouts) | | 1,219 | 366 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **3** | **3,300** | **990** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 3 | 3,300 | 990 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **24,575** | **7,372** |
| 40.01 | Demolition, Clearing, Earthwork | | 1,500 | 450 |
| 40.02 | Site Utilities, Utility Relocation | | 5,378 | 1,613 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 51 | 15 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 103 | 31 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 2,477 | 743 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 15,065 | 4,519 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **13,280** | **3,984** |
| 50.01 | Train control and signals | | 3,653 | 1,096 |
| 50.02 | Traffic signals and crossing protection | | 2,560 | 768 |
| 50.03 | Traction power supply: substations | | 1,955 | 587 |
| 50.04 | Traction power distribution: catenary and third rail | | 2,749 | 825 |
| 50.05 | Communications | | 1,595 | 479 |
| 50.06 | Fare collection system and equipment | | 510 | 153 |
| 50.07 | Central Control | | 257 | 77 |
| **Construction Subtotal (10-50)** | | | **49,914** | **14,974** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **3,192** | **3,192** |
| 60.01 | Purchase or lease of real estate | | 3,192 | 3,192 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | (Rev. 6, Feb 7, 2006) | | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT C-1 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 6.16 |
| | | | Stations | 8 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **6.16** | **83,889** | **25,167** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 3.12 | 6,671 | 2,001 |
| 10.03 | Guideway: At-grade in mixed traffic | 0.37 | 440 | 132 |
| 10.04 | Guideway: Aerial structure | 0.40 | 12,098 | 3,630 |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | 0.59 | 38,988 | 11,696 |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | 1.68 | 9,702 | 2,911 |
| 10.09 | Track: Direct fixation | | 3,928 | 1,178 |
| 10.10 | Track: Embedded | | 3,698 | 1,109 |
| 10.11 | Track: Ballasted | | 6,923 | 2,077 |
| 10.12 | Track: Special (switches, turnouts) | | 1,441 | 432 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **8** | **14,140** | **4,242** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 6 | 6,600 | 1,980 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | 5,340 | 1,602 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **42,323** | **12,697** |
| 40.01 | Demolition, Clearing, Earthwork | | 4,000 | 1,200 |
| 40.02 | Site Utilities, Utility Relocation | | 11,004 | 3,301 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 163 | 49 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 325 | 98 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 7,583 | 2,275 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 19,247 | 5,774 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **37,745** | **11,324** |
| 50.01 | Train control and signals | | 11,547 | 3,464 |
| 50.02 | Traffic signals and crossing protection | | 4,175 | 1,253 |
| 50.03 | Traction power supply: substations | | 6,180 | 1,854 |
| 50.04 | Traction power distribution: catenary and third rail | | 8,457 | 2,537 |
| 50.05 | Communications | | 5,042 | 1,513 |
| 50.06 | Fare collection system and equipment | | 1,530 | 459 |
| 50.07 | Central Control | | 813 | 244 |
| **Construction Subtotal (10-50)** | | | **178,097** | **53,429** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **3,829** | **3,829** |
| 60.01 | Purchase or lease of real estate | | 3,829 | 3,829 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT C-2 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 1.03 |
| | | | Stations | 3 |

| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **1.03** | **6,498** | **1,949** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | - | - | - |
| 10.03 | Guideway: At-grade in mixed traffic | 1.03 | 1,221 | 366 |
| 10.04 | Guideway: Aerial structure | - | - | - |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | - | - | - |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | 3,798 | 1,139 |
| 10.11 | Track: Ballasted | | - | - |
| 10.12 | Track: Special (switches, turnouts) | | 1,480 | 444 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **3** | **3,300** | **990** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 3 | 3,300 | 990 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **14,059** | **4,218** |
| 40.01 | Demolition, Clearing, Earthwork | | 1,500 | 450 |
| 40.02 | Site Utilities, Utility Relocation | | 3,635 | 1,090 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 27 | 8 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 27 | 8 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 3,391 | 1,017 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 5,479 | 1,644 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **7,255** | **2,177** |
| 50.01 | Train control and signals | | 1,926 | 578 |
| 50.02 | Traffic signals and crossing protection | | 1,320 | 396 |
| 50.03 | Traction power supply: substations | | 1,031 | 309 |
| 50.04 | Traction power distribution: catenary and third rail | | 1,492 | 448 |
| 50.05 | Communications | | 841 | 252 |
| 50.06 | Fare collection system and equipment | | 510 | 153 |
| 50.07 | Central Control | | 136 | 41 |
| **Construction Subtotal (10-50)** | | | **31,112** | **9,334** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **152** | **152** |
| 60.01 | Purchase or lease of real estate | | 152 | 152 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

| Major Capital Project Costs - By Segment | | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|---|
| Project | Southwest Transitway - Segment LRT C-3 | | Date | 10/17/06 |
| Location | Hennepin County, MN | | Base Year | 2006 |
| Project ID | | | | |
| | | | Route Miles | 1.62 |
| | | | Stations | 2 |
| | | Quantity | Base Year Estimate (X000) | Base Year Allocated Contingency (X000) |
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **1.62** | **5,969** | **1,791** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | - | - | - |
| 10.03 | Guideway: At-grade in mixed traffic | 1.62 | 1,926 | 578 |
| 10.04 | Guideway: Aerial structure | - | - | - |
| 10.05 | Guideway: Built-up fill | - | - | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - |
| 10.07 | Guideway: Underground tunnel | - | - | - |
| 10.08 | Guideway: Retained cut or fill | - | - | - |
| 10.09 | Track: Direct fixation | | - | - |
| 10.10 | Track: Embedded | | 3,253 | 976 |
| 10.11 | Track: Ballasted | | - | - |
| 10.12 | Track: Special (switches, turnouts) | | 790 | 237 |
| 10.13 | Track: Vibration and noise dampening | | - | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **2** | **2,200** | **660** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 2 | 2,200 | 660 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - |
| 20.05 | Joint development | | - | - |
| 20.06 | Automobile parking multi-story structure | | - | - |
| 20.07 | Elevators, escalators | | - | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **-** | **-** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | | - |
| 30.02 | Light Maintenance Facility | | | - |
| 30.03 | Heavy Maintenance Facility | | | - |
| 30.04 | Storage or Maintenance of Way Building | | | - |
| 30.05 | Yard and Yard Track | | | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **23,096** | **6,929** |
| 40.01 | Demolition, Clearing, Earthwork | | 2,000 | 600 |
| 40.02 | Site Utilities, Utility Relocation | | 5,736 | 1,721 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 43 | 13 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 43 | 13 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 2,782 | 835 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 12,492 | 3,748 |
| 40.08 | Temporary facilities and other indirect costs during construction | | - | - |
| **50 SYSTEMS** | | | **11,561** | **3,468** |
| 50.01 | Train control and signals | | 3,039 | 912 |
| 50.02 | Traffic signals and crossing protection | | 2,320 | 696 |
| 50.03 | Traction power supply: substations | | 1,627 | 488 |
| 50.04 | Traction power distribution: catenary and third rail | | 2,354 | 706 |
| 50.05 | Communications | | 1,327 | 398 |
| 50.06 | Fare collection system and equipment | | 680 | 204 |
| 50.07 | Central Control | | 214 | 64 |
| **Construction Subtotal (10-50)** | | | **42,826** | **12,848** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **130** | **130** |
| 60.01 | Purchase or lease of real estate | | 130 | 130 |
| 60.02 | Relocation (freight railroad traffic) | | - | - |

# Appendix F: Annualized Capital Costs

**Major Capital Project Costs - Annualized Cost** (Rev. 6, Feb 7, 2006)

Project: **Southwest Transitway - Enhanced Bus Baseline** Date: 10/17/06

Location: Hennepin County, MN Base Year: 2006

| | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **16.00** | **-** | | **-** | **-** | | | **-** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | - | - | - | - | - | 30 | 0.0806 | - |
| 10.03 Guideway: At-grade in mixed traffic | 16.00 | - | - | - | - | 20 | 0.0944 | - |
| 10.04 Guideway: Aerial structure | - | - | - | - | - | 80 | 0.0703 | - |
| 10.05 Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 Guideway: Underground cut & cover | - | - | - | - | - | 70 | 0.0706 | - |
| 10.07 Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 Guideway: Retained cut or fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.09 Track: Direct fixation | | - | - | - | - | 30 | 0.0806 | - |
| 10.10 Track: Embedded | | - | - | - | - | 20 | 0.0944 | - |
| 10.11 Track: Ballasted | | - | - | - | - | 35 | 0.0772 | - |
| 10.12 Track: Special (switches, turnouts) | | - | - | - | - | 30 | 0.0806 | - |
| 10.13 Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **13** | **11,915** | | **2,715** | **19,121** | | | **1,384** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 13 | 507 | 191 | 116 | 814 | 70 | 0.0706 | 57 |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 Automobile parking multi-story structure | | 11,408 | 4,300 | 2,600 | 18,307 | 50 | 0.0725 | 1,327 |
| 20.07 Elevators, escalators | | - | - | - | - | 30 | 0.0806 | - |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **-** | | **-** | **-** | | | **-** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 Light Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.03 Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 Yard and Yard Track | | - | - | - | - | 80 | 0.0703 | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **5,018** | | **1,144** | **8,053** | | | **659** |
| 40.01 Demolition, Clearing, Earthwork | | 2,600 | 980 | 593 | 4,173 | 100 | 0.0701 | 292 |
| 40.02 Site Utilities, Utility Relocation | | - | - | - | - | 100 | 0.0701 | - |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | - | - | - | - | 100 | 0.0701 | - |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | - | - | - | - | 100 | 0.0701 | - |
| 40.05 Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | - | - | - | - | 20 | 0.0944 | - |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 2,418 | 911 | 551 | 3,881 | 20 | 0.0944 | 366 |
| 40.08 Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | **85** | | **19** | **136** | | | **13** |
| 50.01 Train control and signals | | - | - | - | - | 30 | 0.0806 | - |
| 50.02 Traffic signals and crossing protection | | - | - | - | - | 30 | 0.0806 | - |
| 50.03 Traction power supply: substations | | - | - | - | - | 40 | 0.0750 | - |
| 50.04 Traction power distribution: catenary and third rail | | - | - | - | - | 30 | 0.0806 | - |
| 50.05 Communications | | 85 | 32 | 19 | 136 | 20 | 0.0944 | 13 |
| 50.06 Fare collection system and equipment | | - | - | - | - | 20 | 0.0944 | - |
| 50.07 Central Control | | - | - | - | - | 30 | 0.0806 | - |
| **Construction Subtotal (10-50)** | | **17,017** | | **3,878** | **27,310** | | | **2,056** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **10,832** | | **2,469** | **13,301** | | | **932** |
| 60.01 Purchase or lease of real estate | | 10,832 | | 2,469 | 13,301 | 100 | 0.0701 | 932 |
| 60.02 Relocation (freight railroad traffic) | | - | | - | - | 100 | 0.0701 | - |
| **70 VEHICLES (number)** | **49** | **18,113** | | **4,128** | **22,241** | | | **2,800** |
| 70.01 Light Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.02 Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 Bus | 49 | 18,113 | | 4,128 | 22,241 | 12 | 0.1259 | 2,800 |
| 70.05 Other | - | - | | - | - | 12 | 0.1259 | - |
| 70.06 Non-revenue vehicles | | - | | - | - | 12 | 0.1259 | - |
| 70.07 Spare parts | | - | | - | - | 12 | 0.1259 | - |
| **80 PROFESSIONAL SERVICES** | | **6,414** | | | | | | |
| 80.01 Preliminary Engineering | | 262 | | | | | | |
| 80.02 Final Design | | 1,054 | | | | | | |
| 80.03 Project Management for Design and Construction | | 597 | | | | | | |
| 80.04 Construction Administration & Management | | 1,101 | | | | | | |
| 80.05 Insurance | | 524 | | | | | | |
| 80.06 Legal; Permits; Review Fees by other agencies, cities, etc. | | 402 | | | | | | |
| 80.07 Surveys, Testing, Investigation, Inspection | | 1,148 | | | | | | |
| 80.08 Agency Force Account Work | | 1,327 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | **10,475** | | | | | | |
| **Subtotal (10-90)** | | **62,851** | **6,414** | **10,475** | **62,851** | | | **5,788** |

**Major Capital Project Costs - Annualized Cost** (Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | **Southwest Transitway - Alternative BRT 1** | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |

| | | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **13.86** | **70,596** | | **16,994** | **105,861** | | | **8,264** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 11.29 | 51,010 | 13,202 | 12,279 | 76,491 | 30 | 0.0806 | 6,164 |
| 10.03 | Guideway: At-grade in mixed traffic | 1.41 | 965 | 250 | 232 | 1,447 | 20 | 0.0944 | 137 |
| 10.04 | Guideway: Aerial structure | 0.24 | 8,259 | 2,137 | 1,988 | 12,384 | 80 | 0.0703 | 871 |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 | Guideway: Underground cut & cover | - | - | - | - | - | 70 | 0.0706 | - |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 | Guideway: Retained cut or fill | 0.92 | 10,362 | 2,682 | 2,494 | 15,539 | 80 | 0.0703 | 1,093 |
| 10.09 | Track: Direct fixation | | - | - | - | - | 30 | 0.0806 | - |
| 10.10 | Track: Embedded | | - | - | - | - | 20 | 0.0944 | - |
| 10.11 | Track: Ballasted | | - | - | - | - | 35 | 0.0772 | - |
| 10.12 | Track: Special (switches, turnouts) | | - | - | - | - | 30 | 0.0806 | - |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **16** | **38,461** | | **9,258** | **57,673** | | | **4,144** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 15 | 21,450 | 5,551 | 5,164 | 32,165 | 70 | 0.0706 | 2,271 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,430 | 370 | 344 | 2,144 | 70 | 0.0706 | 151 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 | Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 | Automobile parking multi-story structure | | 13,267 | 3,433 | 3,194 | 19,893 | 50 | 0.0725 | 1,441 |
| 20.07 | Elevators, escalators | | 2,314 | 599 | 557 | 3,470 | 30 | 0.0806 | 280 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **14,269** | | **3,435** | **21,397** | | | **1,550** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 | Light Maintenance Facility | | 14,269 | 3,693 | 3,435 | 21,397 | 50 | 0.0725 | 1,550 |
| 30.03 | Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 | Yard and Yard Track | | - | - | - | - | 80 | 0.0703 | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **80,564** | | **19,394** | **120,808** | | | **10,226** |
| 40.01 | Demolition, Clearing, Earthwork | | 10,400 | 2,692 | 2,504 | 15,595 | 100 | 0.0701 | 1,093 |
| 40.02 | Site Utilities, Utility Relocation | | 20,923 | 5,415 | 5,037 | 31,375 | 100 | 0.0701 | 2,199 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 476 | 123 | 114 | 713 | 100 | 0.0701 | 50 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 497 | 129 | 120 | 745 | 100 | 0.0701 | 52 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 21,204 | 5,488 | 5,104 | 31,796 | 20 | 0.0944 | 3,001 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 27,064 | 7,004 | 6,515 | 40,583 | 20 | 0.0944 | 3,831 |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | | **27,542** | | **6,630** | **41,301** | | | **3,720** |
| 50.01 | Train control and signals | | - | - | - | - | 30 | 0.0806 | - |
| 50.02 | Traffic signals and crossing protection | | 6,221 | 1,610 | 1,497 | 9,328 | 30 | 0.0806 | 752 |
| 50.03 | Traction power supply: substations | | - | - | - | - | 40 | 0.0750 | - |
| 50.04 | Traction power distribution: catenary and third rail | | - | - | - | - | 30 | 0.0806 | - |
| 50.05 | Communications | | 14,745 | 3,816 | 3,549 | 22,110 | 20 | 0.0944 | 2,087 |
| 50.06 | Fare collection system and equipment | | 4,199 | 1,087 | 1,011 | 6,297 | 20 | 0.0944 | 594 |
| 50.07 | Central Control | | 2,378 | 615 | 572 | 3,566 | 30 | 0.0806 | 287 |
| **Construction Subtotal (10-50)** | | | **231,432** | | **55,711** | **347,039** | | | **27,905** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **34,196** | | **8,232** | **42,428** | | | **2,973** |
| 60.01 | Purchase or lease of real estate | | 24,460 | | 5,888 | 30,348 | 100 | 0.0701 | 2,127 |
| 60.02 | Relocation (freight railroad traffic) | | 9,736 | | 2,344 | 12,080 | 100 | 0.0701 | 847 |
| **70 VEHICLES (number)** | | **54** | **28,534** | | **6,869** | **35,402** | | | **4,457** |
| 70.01 | Light Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.02 | Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 | Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 | Bus | 39 | 14,416 | | 3,470 | 17,886 | 12 | 0.1259 | 2,252 |
| 70.05 | Other (BRT) | 15 | 10,238 | | 2,464 | 12,702 | 12 | 0.1259 | 1,599 |
| 70.06 | Non-revenue vehicles | | 2,305 | | 555 | 2,860 | 12 | 0.1259 | 360 |
| 70.07 | Spare parts | | 1,575 | | 379 | 1,954 | 12 | 0.1259 | 246 |
| **80 PROFESSIONAL SERVICES** | | | **59,896** | | | | | | |
| 80.01 | Preliminary Engineering | | 3,560 | | | | | | |
| 80.02 | Final Design | | 9,616 | | | | | | |
| 80.03 | Project Management for Design and Construction | | 4,345 | | | | | | |
| 80.04 | Construction Administration & Management | | 14,413 | | | | | | |
| 80.05 | Insurance | | 7,121 | | | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 2,635 | | | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 5,814 | | | | | | |
| 80.08 | Agency Force Account Work | | 12,391 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | | **70,811** | | | | | | |
| **Subtotal (10-80)** | | | **424,869** | **59,896** | **70,811** | **424,869** | | | **35,336** |

## Major Capital Project Costs - Annualized Cost

(Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | Southwest Transitway - Alternative BRT 2 | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |

| | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | **18.31** | **106,511** | | **25,741** | **159,068** | | | **12,039** |
| 10.01 Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 Guideway: At-grade semi-exclusive (allows cross-traffic) | 8.36 | 38,040 | 9,577 | 9,193 | 56,810 | 30 | 0.0806 | 4,578 |
| 10.03 Guideway: At-grade in mixed traffic | 7.58 | 7,534 | 1,897 | 1,821 | 11,252 | 20 | 0.0944 | 1,062 |
| 10.04 Guideway: Aerial structure | 0.87 | 42,647 | 10,737 | 10,307 | 63,690 | 80 | 0.0703 | 4,478 |
| 10.05 Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 Guideway: Underground cut & cover | - | - | - | - | - | 70 | 0.0706 | - |
| 10.07 Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 Guideway: Retained cut or fill | 1.51 | 18,290 | 4,605 | 4,420 | 27,316 | 80 | 0.0703 | 1,921 |
| 10.09 Track: Direct fixation | | - | - | - | - | 30 | 0.0806 | - |
| 10.10 Track: Embedded | | - | - | - | - | 20 | 0.0944 | - |
| 10.11 Track: Ballasted | | - | - | - | - | 35 | 0.0772 | - |
| 10.12 Track: Special (switches, turnouts) | | - | - | - | - | 30 | 0.0806 | - |
| 10.13 Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | **19** | **55,595** | | **13,436** | **83,027** | | | **5,970** |
| 20.01 At-grade station, stop, shelter, mall, terminal, platform | 18 | 25,740 | 6,480 | 6,221 | 38,441 | 70 | 0.0706 | 2,715 |
| 20.02 Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,430 | 360 | 346 | 2,136 | 70 | 0.0706 | 151 |
| 20.03 Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 Automobile parking multi-story structure | | 26,111 | 6,574 | 6,310 | 38,994 | 50 | 0.0725 | 2,826 |
| 20.07 Elevators, escalators | | 2,314 | 583 | 559 | 3,456 | 30 | 0.0806 | 278 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | **18,856** | | **4,557** | **28,159** | | | **2,040** |
| 30.01 Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 Light Maintenance Facility | | 18,856 | 4,747 | 4,557 | 28,159 | 50 | 0.0725 | 2,040 |
| 30.03 Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 Yard and Yard Track | | - | - | - | - | 80 | 0.0703 | - |
| **40 SITEWORK & SPECIAL CONDITIONS** | | **97,888** | | **23,657** | **146,190** | | | **12,309** |
| 40.01 Demolition, Clearing, Earthwork | | 12,350 | 3,109 | 2,985 | 18,444 | 100 | 0.0701 | 1,293 |
| 40.02 Site Utilities, Utility Relocation | | 26,895 | 6,771 | 6,500 | 40,165 | 100 | 0.0701 | 2,815 |
| 40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 787 | 198 | 190 | 1,176 | 100 | 0.0701 | 82 |
| 40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 1,010 | 254 | 244 | 1,508 | 100 | 0.0701 | 106 |
| 40.05 Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 Pedestrian / bike access and accommodation, landscaping | | 20,390 | 5,133 | 4,928 | 30,451 | 20 | 0.0944 | 2,874 |
| 40.07 Automobile, bus, van accessways including roads, parking lots | | 36,457 | 9,178 | 8,811 | 54,446 | 20 | 0.0944 | 5,139 |
| 40.08 Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | **37,302** | | **9,015** | **55,709** | | | **4,996** |
| 50.01 Train control and signals | | - | - | - | - | 30 | 0.0806 | - |
| 50.02 Traffic signals and crossing protection | | 9,594 | 2,415 | 2,319 | 14,328 | 30 | 0.0806 | 1,155 |
| 50.03 Traction power supply: substations | | - | - | - | - | 40 | 0.0750 | - |
| 50.04 Traction power distribution: catenary and third rail | | - | - | - | - | 30 | 0.0806 | - |
| 50.05 Communications | | 19,483 | 4,905 | 4,708 | 29,096 | 20 | 0.0944 | 2,746 |
| 50.06 Fare collection system and equipment | | 5,083 | 1,280 | 1,228 | 7,591 | 20 | 0.0944 | 717 |
| 50.07 Central Control | | 3,143 | 791 | 759 | 4,693 | 30 | 0.0806 | 378 |
| **Construction Subtotal (10-50)** | | **316,152** | | **76,406** | **472,152** | | | **37,354** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | **34,196** | | **8,264** | **42,461** | | | **2,976** |
| 60.01 Purchase or lease of real estate | | 24,460 | | 5,911 | 30,372 | 100 | 0.0701 | 2,128 |
| 60.02 Relocation (freight railroad traffic) | | 9,736 | | 2,353 | 12,089 | 100 | 0.0701 | 847 |
| **70 VEHICLES (number)** | **57** | **31,637** | | **7,646** | **39,283** | | | **4,946** |
| 70.01 Light Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.02 Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 Bus | 39 | 14,416 | | 3,484 | 17,900 | 12 | 0.1259 | 2,254 |
| 70.05 Other (BRT) | 18 | 12,285 | | 2,969 | 15,254 | 12 | 0.1259 | 1,921 |
| 70.06 Non-revenue vehicles | | 3,046 | | 736 | 3,782 | 12 | 0.1259 | 476 |
| 70.07 Spare parts | | 1,890 | | 457 | 2,347 | 12 | 0.1259 | 295 |
| **80 PROFESSIONAL SERVICES** | | **79,594** | | | | | | |
| 80.01 Preliminary Engineering | | 4,864 | | | | | | |
| 80.02 Final Design | | 12,933 | | | | | | |
| 80.03 Project Management for Design and Construction | | 5,678 | | | | | | |
| 80.04 Construction Administration & Management | | 19,627 | | | | | | |
| 80.05 Insurance | | 9,728 | | | | | | |
| 80.06 Legal; Permits; Review Fees by other agencies, cities, etc. | | 3,287 | | | | | | |
| 80.07 Surveys, Testing, Investigation, Inspection | | 7,176 | | | | | | |
| 80.08 Agency Force Account Work | | 16,301 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | **92,316** | | | | | | |
| **Subtotal (10-80)** | | **553,896** | **79,594** | **92,316** | **553,896** | | | **45,276** |

| Major Capital Project Costs - Annualized Cost | | (Rev. 6, Feb 7, 2006) | |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 1A | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |

| | | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **13.78** | **81,991** | | **19,544** | **122,578** | | | **9,393** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 11.82 | 19,389 | 4,976 | 4,622 | 28,986 | 30 | 0.0806 | 2,336 |
| 10.03 | Guideway: At-grade in mixed traffic | 0.23 | 362 | 93 | 86 | 541 | 20 | 0.0944 | 51 |
| 10.04 | Guideway: Aerial structure | 0.34 | 11,714 | 3,007 | 2,792 | 17,513 | 80 | 0.0703 | 1,231 |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 | Guideway: Underground cut & cover | 0.02 | 1,373 | 352 | 327 | 2,052 | 70 | 0.0706 | 145 |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 | Guideway: Retained cut or fill | 1.37 | 10,953 | 2,811 | 2,611 | 16,375 | 80 | 0.0703 | 1,151 |
| 10.09 | Track: Direct fixation | | 1,007 | 259 | 240 | 1,506 | 30 | 0.0806 | 121 |
| 10.10 | Track: Embedded | | 1,127 | 289 | 269 | 1,684 | 20 | 0.0944 | 159 |
| 10.11 | Track: Ballasted | | 29,344 | 7,531 | 6,995 | 43,870 | 35 | 0.0772 | 3,388 |
| 10.12 | Track: Special (switches, turnouts) | | 6,722 | 1,725 | 1,602 | 10,050 | 30 | 0.0806 | 810 |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **14** | **35,601** | | **8,486** | **53,223** | | | **3,830** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 13 | 18,590 | 4,771 | 4,431 | 27,792 | 70 | 0.0706 | 1,963 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,430 | 367 | 341 | 2,138 | 70 | 0.0706 | 151 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 | Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 | Automobile parking multi-story structure | | 13,267 | 3,405 | 3,162 | 19,834 | 50 | 0.0725 | 1,437 |
| 20.07 | Elevators, escalators | | 2,314 | 594 | 552 | 3,459 | 30 | 0.0806 | 279 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **50,694** | | **12,084** | **75,789** | | | **5,437** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 | Light Maintenance Facility | | 33,796 | 8,674 | 8,056 | 50,526 | 50 | 0.0725 | 3,661 |
| 30.03 | Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 | Yard and Yard Track | | 16,898 | 4,337 | 4,028 | 25,263 | 80 | 0.0703 | 1,776 |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **86,417** | | **20,599** | **129,195** | | | **11,115** |
| 40.01 | Demolition, Clearing, Earthwork | | 9,100 | 2,336 | 2,169 | 13,605 | 100 | 0.0701 | 953 |
| 40.02 | Site Utilities, Utility Relocation | | 19,667 | 5,048 | 4,688 | 29,403 | 100 | 0.0701 | 2,061 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 473 | 121 | 113 | 707 | 100 | 0.0701 | 50 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 473 | 121 | 113 | 707 | 100 | 0.0701 | 50 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 20,572 | 5,280 | 4,904 | 30,756 | 20 | 0.0944 | 2,903 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 36,132 | 9,273 | 8,613 | 54,018 | 20 | 0.0944 | 5,099 |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | | **100,718** | | **24,007** | **150,575** | | | **12,270** |
| 50.01 | Train control and signals | | 33,567 | 8,615 | 8,001 | 50,183 | 30 | 0.0806 | 4,044 |
| 50.02 | Traffic signals and crossing protection | | 8,411 | 2,159 | 2,005 | 12,575 | 30 | 0.0806 | 1,013 |
| 50.03 | Traction power supply: substations | | 17,965 | 4,611 | 4,282 | 26,858 | 40 | 0.0750 | 2,015 |
| 50.04 | Traction power distribution: catenary and third rail | | 24,584 | 6,310 | 5,860 | 36,754 | 30 | 0.0806 | 2,962 |
| 50.05 | Communications | | 10,733 | 2,755 | 2,558 | 16,045 | 20 | 0.0944 | 1,515 |
| 50.06 | Fare collection system and equipment | | 3,094 | 794 | 737 | 4,626 | 20 | 0.0944 | 437 |
| 50.07 | Central Control | | 2,364 | 607 | 563 | 3,534 | 30 | 0.0806 | 285 |
| **Construction Subtotal (10-50)** | | | **355,420** | | **84,719** | **531,360** | | | **42,045** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **33,982** | | **8,100** | **42,083** | | | **2,949** |
| 60.01 | Purchase or lease of real estate | | 24,247 | | 5,779 | 30,026 | 100 | 0.0701 | 2,104 |
| 60.02 | Relocation (freight railroad traffic) | | 9,736 | | 2,321 | 12,057 | 100 | 0.0701 | 845 |
| **70 VEHICLES (number)** | | **57** | **86,163** | | **20,538** | **106,701** | | | **10,462** |
| 70.01 | Light Rail | 19 | 59,850 | | 14,266 | 74,116 | 25 | 0.0858 | 6,360 |
| 70.02 | Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 | Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 | Bus | 38 | 14,046 | | 3,348 | 17,395 | 12 | 0.1259 | 2,190 |
| 70.05 | Other | - | - | | - | - | 12 | 0.1259 | - |
| 70.06 | Non-revenue vehicles | | 2,291 | | 546 | 2,837 | 12 | 0.1259 | 357 |
| 70.07 | Spare parts | | 9,975 | | 2,370 | 12,353 | 12 | 0.1259 | 1,555 |
| **80 PROFESSIONAL SERVICES** | | | **91,220** | | | | | | |
| 80.01 | Preliminary Engineering | | 5,468 | | | | | | |
| 80.02 | Final Design | | 15,481 | | | | | | |
| 80.03 | Project Management for Design and Construction | | 6,798 | | | | | | |
| 80.04 | Construction Administration & Management | | 22,042 | | | | | | |
| 80.05 | Insurance | | 10,936 | | | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 3,584 | | | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 8,808 | | | | | | |
| 80.08 | Agency Force Account Work | | 18,103 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | | **113,357** | | | | | | |
| **Subtotal (10-90)** | | | **680,143** | **91,220** | **113,357** | **680,143** | | | **55,457** |

**Major Capital Project Costs - Annualized Cost** (Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 2A | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |

| | | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **15.10** | **109,701** | | **26,175** | **163,995** | | | **12,339** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 11.16 | 18,742 | 4,804 | 4,472 | 28,019 | 30 | 0.0806 | 2,258 |
| 10.03 | Guideway: At-grade in mixed traffic | 0.23 | 362 | 93 | 86 | 541 | 20 | 0.0944 | 51 |
| 10.04 | Guideway: Aerial structure | 0.63 | 23,711 | 6,078 | 5,657 | 35,446 | 80 | 0.0703 | 2,492 |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 | Guideway: Underground cut & cover | 0.05 | 4,352 | 1,116 | 1,038 | 6,507 | 70 | 0.0706 | 459 |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 | Guideway: Retained cut or fill | 3.04 | 20,846 | 5,343 | 4,974 | 31,163 | 80 | 0.0703 | 2,191 |
| 10.09 | Track: Direct fixation | | 2,487 | 637 | 593 | 3,718 | 30 | 0.0806 | 300 |
| 10.10 | Track: Embedded | | 1,127 | 289 | 269 | 1,684 | 20 | 0.0944 | 159 |
| 10.11 | Track: Ballasted | | 31,587 | 8,097 | 7,537 | 47,220 | 35 | 0.0772 | 3,647 |
| 10.12 | Track: Special (switches, turnouts) | | 6,487 | 1,663 | 1,548 | 9,697 | 30 | 0.0806 | 781 |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **16** | **41,334** | | **9,862** | **61,791** | | | **4,443** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 15 | 21,450 | 5,498 | 5,118 | 32,066 | 70 | 0.0706 | 2,265 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,430 | 367 | 341 | 2,138 | 70 | 0.0706 | 151 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 | Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 | Automobile parking multi-story structure | | 16,140 | 4,137 | 3,851 | 24,127 | 50 | 0.0725 | 1,748 |
| 20.07 | Elevators, escalators | | 2,314 | 593 | 552 | 3,459 | 30 | 0.0806 | 279 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **50,694** | | **12,096** | **75,784** | | | **5,437** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 | Light Maintenance Facility | | 33,796 | 8,663 | 8,064 | 50,523 | 50 | 0.0725 | 3,661 |
| 30.03 | Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 | Yard and Yard Track | | 16,898 | 4,331 | 4,032 | 25,261 | 80 | 0.0703 | 1,776 |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **96,235** | | **22,962** | **143,864** | | | **12,188** |
| 40.01 | Demolition, Clearing, Earthwork | | 9,750 | 2,499 | 2,326 | 14,576 | 100 | 0.0701 | 1,021 |
| 40.02 | Site Utilities, Utility Relocation | | 27,384 | 7,019 | 6,534 | 40,938 | 100 | 0.0701 | 2,869 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 631 | 162 | 151 | 944 | 100 | 0.0701 | 66 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 518 | 133 | 124 | 775 | 100 | 0.0701 | 54 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 18,966 | 4,861 | 4,525 | 28,352 | 20 | 0.0944 | 2,676 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 38,985 | 9,993 | 9,302 | 58,280 | 20 | 0.0944 | 5,501 |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | | **110,730** | | **26,420** | **165,533** | | | **13,499** |
| 50.01 | Train control and signals | | 36,805 | 9,434 | 8,782 | 55,021 | 30 | 0.0806 | 4,434 |
| 50.02 | Traffic signals and crossing protection | | 8,996 | 2,306 | 2,146 | 13,448 | 30 | 0.0806 | 1,084 |
| 50.03 | Traction power supply: substations | | 19,698 | 5,049 | 4,700 | 29,448 | 40 | 0.0750 | 2,209 |
| 50.04 | Traction power distribution: catenary and third rail | | 26,956 | 6,910 | 6,432 | 40,297 | 30 | 0.0806 | 3,247 |
| 50.05 | Communications | | 12,146 | 3,114 | 2,898 | 18,158 | 20 | 0.0944 | 1,714 |
| 50.06 | Fare collection system and equipment | | 3,536 | 906 | 844 | 5,286 | 20 | 0.0944 | 499 |
| 50.07 | Central Control | | 2,592 | 664 | 618 | 3,875 | 30 | 0.0806 | 312 |
| **Construction Subtotal (10-50)** | | | **408,693** | | **97,514** | **610,967** | | | **47,906** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **39,651** | | **9,461** | **49,112** | | | **3,442** |
| 60.01 | Purchase or lease of real estate | | 29,915 | | 7,138 | 37,053 | 100 | 0.0701 | 2,597 |
| 60.02 | Relocation (freight railroad traffic) | | 9,736 | | 2,323 | 12,059 | 100 | 0.0701 | 845 |
| **70 VEHICLES (number)** | | **61** | **94,473** | | **22,541** | **117,014** | | | **11,447** |
| 70.01 | Light Rail | 21 | 66,150 | | 15,783 | 81,933 | 25 | 0.0858 | 7,031 |
| 70.02 | Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 | Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 | Bus | 40 | 14,786 | | 3,528 | 18,314 | 12 | 0.1259 | 2,306 |
| 70.05 | Other | - | - | | - | - | 12 | 0.1259 | - |
| 70.06 | Non-revenue vehicles | | 2,512 | | 599 | 3,112 | 12 | 0.1259 | 392 |
| 70.07 | Spare parts | | 11,025 | | 2,631 | 13,656 | 12 | 0.1259 | 1,719 |
| **80 PROFESSIONAL SERVICES** | | | **104,760** | | | | | | |
| 80.01 | Preliminary Engineering | | 6,288 | | | | | | |
| 80.02 | Final Design | | 17,717 | | | | | | |
| 80.03 | Project Management for Design and Construction | | 7,782 | | | | | | |
| 80.04 | Construction Administration & Management | | 25,349 | | | | | | |
| 80.05 | Insurance | | 12,575 | | | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 4,135 | | | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 10,070 | | | | | | |
| 80.08 | Agency Force Account Work | | 20,845 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | | **129,516** | | | | | | |
| **Subtotal (10-90)** | | | **777,093** | **104,760** | **129,516** | **777,093** | | | **62,795** |

**Major Capital Project Costs - Annualized Cost** (Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 3A | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |

| | | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **15.73** | **130,033** | | **31,006** | **195,061** | | | **14,607** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 10.98 | 18,260 | 4,778 | 4,354 | 27,392 | 30 | 0.0806 | 2,207 |
| 10.03 | Guideway: At-grade in mixed traffic | 0.43 | 670 | 175 | 160 | 1,005 | 20 | 0.0944 | 95 |
| 10.04 | Guideway: Aerial structure | 0.92 | 35,840 | 9,377 | 8,546 | 53,763 | 80 | 0.0703 | 3,780 |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 | Guideway: Underground cut & cover | 0.06 | 5,023 | 1,314 | 1,198 | 7,535 | 70 | 0.0706 | 532 |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 | Guideway: Retained cut or fill | 3.34 | 24,714 | 6,466 | 5,893 | 37,073 | 80 | 0.0703 | 2,607 |
| 10.09 | Track: Direct fixation | | 3,767 | 986 | 898 | 5,651 | 30 | 0.0806 | 455 |
| 10.10 | Track: Embedded | | 2,083 | 545 | 497 | 3,125 | 20 | 0.0944 | 295 |
| 10.11 | Track: Ballasted | | 32,034 | 8,382 | 7,639 | 48,054 | 35 | 0.0772 | 3,711 |
| 10.12 | Track: Special (switches, turnouts) | | 7,641 | 1,999 | 1,822 | 11,462 | 30 | 0.0806 | 924 |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **17** | **52,735** | | **12,574** | **79,106** | | | **5,693** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 16 | 22,880 | 5,986 | 5,456 | 34,322 | 70 | 0.0706 | 2,424 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,430 | 374 | 341 | 2,145 | 70 | 0.0706 | 151 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 | Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 | Automobile parking multi-story structure | | 26,111 | 6,832 | 6,226 | 39,168 | 50 | 0.0725 | 2,838 |
| 20.07 | Elevators, escalators | | 2,314 | 605 | 552 | 3,471 | 30 | 0.0806 | 280 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **50,694** | | **12,088** | **76,046** | | | **5,456** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 | Light Maintenance Facility | | 33,796 | 8,842 | 8,059 | 50,697 | 50 | 0.0725 | 3,674 |
| 30.03 | Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 | Yard and Yard Track | | 16,898 | 4,421 | 4,029 | 25,349 | 80 | 0.0703 | 1,782 |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **112,949** | | **26,932** | **169,433** | | | **14,390** |
| 40.01 | Demolition, Clearing, Earthwork | | 10,400 | 2,721 | 2,480 | 15,601 | 100 | 0.0701 | 1,093 |
| 40.02 | Site Utilities, Utility Relocation | | 31,201 | 8,163 | 7,440 | 46,804 | 100 | 0.0701 | 3,280 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 1,235 | 323 | 295 | 1,853 | 100 | 0.0701 | 130 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 1,122 | 294 | 268 | 1,683 | 100 | 0.0701 | 118 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 19,828 | 5,188 | 4,728 | 29,744 | 20 | 0.0944 | 2,808 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 49,163 | 12,863 | 11,723 | 73,748 | 20 | 0.0944 | 6,961 |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | | **121,242** | | **28,910** | **181,873** | | | **14,829** |
| 50.01 | Train control and signals | | 38,436 | 10,056 | 9,165 | 57,657 | 30 | 0.0806 | 4,646 |
| 50.02 | Traffic signals and crossing protection | | 14,762 | 3,862 | 3,520 | 22,144 | 30 | 0.0806 | 1,784 |
| 50.03 | Traction power supply: substations | | 20,571 | 5,382 | 4,905 | 30,859 | 40 | 0.0750 | 2,315 |
| 50.04 | Traction power distribution: catenary and third rail | | 28,150 | 7,365 | 6,712 | 42,228 | 30 | 0.0806 | 3,403 |
| 50.05 | Communications | | 12,859 | 3,364 | 3,066 | 19,289 | 20 | 0.0944 | 1,821 |
| 50.06 | Fare collection system and equipment | | 3,757 | 983 | 896 | 5,636 | 20 | 0.0944 | 532 |
| 50.07 | Central Control | | 2,707 | 708 | 645 | 4,060 | 30 | 0.0806 | 327 |
| **Construction Subtotal (10-50)** | | | **467,652** | | **111,511** | **701,520** | | | **54,975** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **62,492** | | **14,901** | **77,393** | | | **5,424** |
| 60.01 | Purchase or lease of real estate | | 52,756 | | 12,580 | 65,336 | 100 | 0.0701 | 4,579 |
| 60.02 | Relocation (freight railroad traffic) | | 9,736 | | 2,321 | 12,057 | 100 | 0.0701 | 845 |
| **70 VEHICLES (number)** | | **66** | **106,341** | | **25,357** | **131,698** | | | **12,827** |
| 70.01 | Light Rail | 24 | 75,600 | | 18,027 | 93,627 | 25 | 0.0858 | 8,034 |
| 70.02 | Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 | Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 | Bus | 42 | 15,525 | | 3,702 | 19,227 | 12 | 0.1259 | 2,421 |
| 70.05 | Other | - | - | | - | - | 12 | 0.1259 | - |
| 70.06 | Non-revenue vehicles | | 2,616 | | 624 | 3,240 | 12 | 0.1259 | 408 |
| 70.07 | Spare parts | | 12,600 | | 3,004 | 15,604 | 12 | 0.1259 | 1,965 |
| **80 PROFESSIONAL SERVICES** | | | **122,357** | | | | | | |
| 80.01 | Preliminary Engineering | | 7,195 | | | | | | |
| 80.02 | Final Design | | 20,325 | | | | | | |
| 80.03 | Project Management for Design and Construction | | 9,145 | | | | | | |
| 80.04 | Construction Administration & Management | | 29,091 | | | | | | |
| 80.05 | Insurance | | 14,309 | | | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 5,160 | | | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 12,345 | | | | | | |
| 80.08 | Agency Force Account Work | | 24,709 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | | **151,768** | | | | | | |
| **Subtotal (10-90)** | | | **910,611** | **122,357** | **151,768** | **910,611** | | | **73,226** |

## Major Capital Project Costs - Annualized Cost

(Rev. 6, Feb 7, 2006)

| Project | Southwest Transitway - Alternative LRT 4A | Date | 10/17/06 |
|---|---|---|---|
| Location | Hennepin County, MN | Base Year | 2006 |

| | | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **9.10** | **57,291** | | **13,656** | **85,733** | | | **6,558** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 7.68 | 12,835 | 3,312 | 3,059 | 19,207 | 30 | 0.0806 | 1,548 |
| 10.03 | Guideway: At-grade in mixed traffic | 0.23 | 362 | 93 | 86 | 542 | 20 | 0.0944 | 51 |
| 10.04 | Guideway: Aerial structure | 0.31 | 10,544 | 2,721 | 2,513 | 15,779 | 80 | 0.0703 | 1,109 |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 | Guideway: Underground cut & cover | 0.02 | 1,373 | 354 | 327 | 2,054 | 70 | 0.0706 | 145 |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 | Guideway: Retained cut or fill | 0.86 | 6,715 | 1,733 | 1,601 | 10,049 | 80 | 0.0703 | 707 |
| 10.09 | Track: Direct fixation | | 1,007 | 260 | 240 | 1,507 | 30 | 0.0806 | 121 |
| 10.10 | Track: Embedded | | 1,127 | 291 | 269 | 1,686 | 20 | 0.0944 | 159 |
| 10.11 | Track: Ballasted | | 19,072 | 4,922 | 4,546 | 28,540 | 35 | 0.0772 | 2,204 |
| 10.12 | Track: Special (switches, turnouts) | | 4,255 | 1,098 | 1,014 | 6,368 | 30 | 0.0806 | 513 |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **11** | **18,044** | | **4,301** | **27,002** | | | **1,941** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 10 | 14,300 | 3,691 | 3,409 | 21,399 | 70 | 0.0706 | 1,511 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 1 | 1,430 | 369 | 341 | 2,140 | 70 | 0.0706 | 151 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 | Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 | Automobile parking multi-story structure | | - | - | - | - | 50 | 0.0725 | - |
| 20.07 | Elevators, escalators | | 2,314 | 597 | 552 | 3,463 | 30 | 0.0806 | 279 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **50,694** | | **12,084** | **75,861** | | | **5,443** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 | Light Maintenance Facility | | 33,796 | 8,722 | 8,056 | 50,574 | 50 | 0.0725 | 3,665 |
| 30.03 | Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 | Yard and Yard Track | | 16,898 | 4,361 | 4,028 | 25,287 | 80 | 0.0703 | 1,778 |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **65,969** | | **15,725** | **98,720** | | | **8,554** |
| 40.01 | Demolition, Clearing, Earthwork | | 7,150 | 1,845 | 1,704 | 10,700 | 100 | 0.0701 | 750 |
| 40.02 | Site Utilities, Utility Relocation | | 13,247 | 3,419 | 3,158 | 19,824 | 100 | 0.0701 | 1,389 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 312 | 81 | 74 | 467 | 100 | 0.0701 | 33 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 312 | 81 | 74 | 467 | 100 | 0.0701 | 33 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 13,609 | 3,512 | 3,244 | 20,365 | 20 | 0.0944 | 1,922 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 31,339 | 8,088 | 7,470 | 46,897 | 20 | 0.0944 | 4,427 |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | | **66,810** | | **15,925** | **99,978** | | | **8,127** |
| 50.01 | Train control and signals | | 22,171 | 5,722 | 5,285 | 33,178 | 30 | 0.0806 | 2,674 |
| 50.02 | Traffic signals and crossing protection | | 6,786 | 1,751 | 1,618 | 10,155 | 30 | 0.0806 | 818 |
| 50.03 | Traction power supply: substations | | 11,866 | 3,062 | 2,829 | 17,757 | 40 | 0.0750 | 1,332 |
| 50.04 | Traction power distribution: catenary and third rail | | 16,238 | 4,191 | 3,871 | 24,299 | 30 | 0.0806 | 1,958 |
| 50.05 | Communications | | 5,757 | 1,486 | 1,372 | 8,615 | 20 | 0.0944 | 813 |
| 50.06 | Fare collection system and equipment | | 2,431 | 627 | 579 | 3,638 | 20 | 0.0944 | 343 |
| 50.07 | Central Control | | 1,561 | 403 | 372 | 2,336 | 30 | 0.0806 | 188 |
| **Construction Subtotal (10-50)** | | | **258,808** | | **61,692** | **387,294** | | | **30,623** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **27,483** | | **6,551** | **34,034** | | | **2,385** |
| 60.01 | Purchase or lease of real estate | | 17,747 | | 4,230 | 21,978 | 100 | 0.0701 | 1,540 |
| 60.02 | Relocation (freight railroad traffic) | | 9,736 | | 2,321 | 12,057 | 100 | 0.0701 | 845 |
| **70 VEHICLES (number)** | | **56** | **61,878** | | **14,750** | **76,627** | | | **7,771** |
| 70.01 | Light Rail | 12 | 37,000 | | 9,010 | 46,810 | 25 | 0.0858 | 4,017 |
| 70.02 | Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 | Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 | Bus | 44 | 16,264 | | 3,877 | 20,141 | 12 | 0.1259 | 2,536 |
| 70.05 | Other | - | - | | - | - | 12 | 0.1259 | - |
| 70.06 | Non-revenue vehicles | | 1,513 | | 361 | 1,874 | 12 | 0.1259 | 236 |
| 70.07 | Spare parts | | 6,300 | | 1,502 | 7,802 | 12 | 0.1259 | 982 |
| **80 PROFESSIONAL SERVICES** | | | **66,794** | | | | | | |
| 80.01 | Preliminary Engineering | | 3,982 | | | | | | |
| 80.02 | Final Design | | 11,270 | | | | | | |
| 80.03 | Project Management for Design and Construction | | 4,983 | | | | | | |
| 80.04 | Construction Administration & Management | | 16,064 | | | | | | |
| 80.05 | Insurance | | 7,963 | | | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 2,678 | | | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 6,534 | | | | | | |
| 80.08 | Agency Force Account Work | | 13,319 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | | **82,993** | | | | | | |
| **Subtotal (10-90)** | | | **497,956** | **66,794** | **82,993** | **497,956** | | | **40,779** |

## Major Capital Project Costs - Annualized Cost

(Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 1C | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |

| | | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **14.64** | **162,414** | | **38,872** | **241,478** | | | **18,184** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 9.56 | 19,397 | 4,800 | 4,642 | 28,839 | 30 | 0.0806 | 2,324 |
| 10.03 | Guideway: At-grade in mixed traffic | 1.40 | 2,159 | 534 | 517 | 3,209 | 20 | 0.0944 | 303 |
| 10.04 | Guideway: Aerial structure | 0.56 | 22,272 | 5,512 | 5,331 | 33,114 | 80 | 0.0703 | 2,328 |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 | Guideway: Underground cut & cover | 0.59 | 50,684 | 12,543 | 12,131 | 75,358 | 70 | 0.0706 | 5,322 |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 | Guideway: Retained cut or fill | 2.52 | 19,861 | 4,915 | 4,754 | 29,530 | 80 | 0.0703 | 2,076 |
| 10.09 | Track: Direct fixation | | 5,652 | 1,399 | 1,353 | 8,403 | 30 | 0.0806 | 677 |
| 10.10 | Track: Embedded | | 9,744 | 2,411 | 2,332 | 14,488 | 20 | 0.0944 | 1,368 |
| 10.11 | Track: Ballasted | | 25,111 | 6,214 | 6,010 | 37,335 | 35 | 0.0772 | 2,884 |
| 10.12 | Track: Special (switches, turnouts) | | 7,533 | 1,864 | 1,803 | 11,201 | 30 | 0.0806 | 903 |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **17** | **43,082** | | **10,311** | **64,055** | | | **4,659** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 15 | 21,450 | 5,308 | 5,134 | 31,892 | 70 | 0.0706 | 2,252 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 2 | 2,860 | 708 | 685 | 4,252 | 70 | 0.0706 | 300 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 | Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 | Automobile parking multi-story structure | | 11,830 | 2,928 | 2,831 | 17,589 | 50 | 0.0725 | 1,274 |
| 20.07 | Elevators, escalators | | 6,942 | 1,718 | 1,661 | 10,321 | 30 | 0.0806 | 832 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **50,694** | | **12,133** | **75,372** | | | **5,408** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 | Light Maintenance Facility | | 33,796 | 8,363 | 8,089 | 50,248 | 50 | 0.0725 | 3,641 |
| 30.03 | Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 | Yard and Yard Track | | 16,898 | 4,182 | 4,044 | 25,124 | 80 | 0.0703 | 1,767 |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **116,295** | | **27,834** | **172,908** | | | **14,820** |
| 40.01 | Demolition, Clearing, Earthwork | | 11,050 | 2,735 | 2,645 | 16,429 | 100 | 0.0701 | 1,151 |
| 40.02 | Site Utilities, Utility Relocation | | 29,256 | 7,240 | 7,002 | 43,499 | 100 | 0.0701 | 3,048 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 502 | 124 | 120 | 747 | 100 | 0.0701 | 52 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 714 | 177 | 171 | 1,061 | 100 | 0.0701 | 74 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 25,672 | 6,353 | 6,144 | 38,169 | 20 | 0.0944 | 3,603 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 49,100 | 12,151 | 11,752 | 73,003 | 20 | 0.0944 | 6,891 |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | | **114,314** | | **27,360** | **169,964** | | | **13,940** |
| 50.01 | Train control and signals | | 35,666 | 8,826 | 8,536 | 53,028 | 30 | 0.0806 | 4,273 |
| 50.02 | Traffic signals and crossing protection | | 11,271 | 2,789 | 2,698 | 16,758 | 30 | 0.0806 | 1,350 |
| 50.03 | Traction power supply: substations | | 19,089 | 4,724 | 4,569 | 28,381 | 40 | 0.0750 | 2,129 |
| 50.04 | Traction power distribution: catenary and third rail | | 26,227 | 6,490 | 6,277 | 38,995 | 30 | 0.0806 | 3,142 |
| 50.05 | Communications | | 15,572 | 3,854 | 3,727 | 23,153 | 20 | 0.0944 | 2,185 |
| 50.06 | Fare collection system and equipment | | 3,978 | 984 | 952 | 5,915 | 20 | 0.0944 | 558 |
| 50.07 | Central Control | | 2,512 | 622 | 601 | 3,734 | 30 | 0.0806 | 301 |
| **Construction Subtotal (10-50)** | | | **486,799** | | **116,511** | **723,777** | | | **57,011** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **20,961** | | **5,017** | **25,977** | | | **1,821** |
| 60.01 | Purchase or lease of real estate | | 20,961 | | 5,017 | 25,977 | 100 | 0.0701 | 1,821 |
| 60.02 | Relocation (freight railroad traffic) | | - | | - | - | 100 | 0.0701 | - |
| **70 VEHICLES (number)** | | **62** | **104,681** | | **25,054** | **129,735** | | | **12,578** |
| 70.01 | Light Rail | 24 | 75,600 | | 18,094 | 93,694 | 25 | 0.0858 | 8,040 |
| 70.02 | Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 | Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 | Bus | 38 | 14,046 | | 3,362 | 17,408 | 12 | 0.1259 | 2,192 |
| 70.05 | Other | - | - | | - | - | 12 | 0.1259 | - |
| 70.06 | Non-revenue vehicles | | 2,434 | | 583 | 3,017 | 12 | 0.1259 | 380 |
| 70.07 | Spare parts | | 12,600 | | 3,016 | 15,616 | 12 | 0.1259 | 1,966 |
| **80 PROFESSIONAL SERVICES** | | | **120,467** | | | | | | |
| 80.01 | Preliminary Engineering | | 7,489 | | | | | | |
| 80.02 | Final Design | | 20,822 | | | | | | |
| 80.03 | Project Management for Design and Construction | | 8,801 | | | | | | |
| 80.04 | Construction Administration & Management | | 30,062 | | | | | | |
| 80.05 | Insurance | | 14,978 | | | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 4,269 | | | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 10,531 | | | | | | |
| 80.08 | Agency Force Account Work | | 23,516 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | | **146,582** | | | | | | |
| **Subtotal (10-80)** | | | **879,490** | **120,467** | **146,582** | **879,490** | | | **71,409** |

**Major Capital Project Costs - Annualized Cost** (Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | **Southwest Transitway - Alternative LRT 2C** | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |

| | | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **15.97** | **190,124** | | **45,523** | **282,817** | | | **21,125** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 8.90 | 18,751 | 4,652 | 4,490 | 27,892 | 30 | 0.0806 | 2,248 |
| 10.03 | Guideway: At-grade in mixed traffic | 1.40 | 2,159 | 536 | 517 | 3,211 | 20 | 0.0944 | 303 |
| 10.04 | Guideway: Aerial structure | 0.85 | 34,269 | 8,502 | 8,205 | 50,976 | 80 | 0.0703 | 3,584 |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 | Guideway: Underground cut & cover | 0.63 | 53,664 | 13,314 | 12,849 | 79,827 | 70 | 0.0706 | 5,637 |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 | Guideway: Retained cut or fill | 4.19 | 29,754 | 7,382 | 7,124 | 44,260 | 80 | 0.0703 | 3,112 |
| 10.09 | Track: Direct fixation | | 7,132 | 1,769 | 1,708 | 10,609 | 30 | 0.0806 | 855 |
| 10.10 | Track: Embedded | | 9,744 | 2,418 | 2,333 | 14,495 | 20 | 0.0944 | 1,368 |
| 10.11 | Track: Ballasted | | 27,354 | 6,787 | 6,550 | 40,690 | 35 | 0.0772 | 3,143 |
| 10.12 | Track: Special (switches, turnouts) | | 7,298 | 1,811 | 1,747 | 10,856 | 30 | 0.0806 | 875 |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **19** | **49,660** | | **11,891** | **73,871** | | | **5,362** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 17 | 24,310 | 6,031 | 5,821 | 36,162 | 70 | 0.0706 | 2,554 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 2 | 2,860 | 710 | 685 | 4,254 | 70 | 0.0706 | 300 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 | Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 | Automobile parking multi-story structure | | 15,548 | 3,857 | 3,723 | 23,128 | 50 | 0.0725 | 1,676 |
| 20.07 | Elevators, escalators | | 6,942 | 1,722 | 1,662 | 10,327 | 30 | 0.0806 | 832 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **50,694** | | **12,138** | **75,410** | | | **5,410** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 | Light Maintenance Facility | | 33,796 | 8,385 | 8,092 | 50,273 | 50 | 0.0725 | 3,643 |
| 30.03 | Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 | Yard and Yard Track | | 16,898 | 4,192 | 4,046 | 25,137 | 80 | 0.0703 | 1,767 |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **126,074** | | **30,187** | **187,540** | | | **15,891** |
| 40.01 | Demolition, Clearing, Earthwork | | 11,700 | 2,903 | 2,801 | 17,404 | 100 | 0.0701 | 1,220 |
| 40.02 | Site Utilities, Utility Relocation | | 36,974 | 9,173 | 8,853 | 55,000 | 100 | 0.0701 | 3,854 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 661 | 164 | 158 | 983 | 100 | 0.0701 | 69 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 759 | 188 | 182 | 1,130 | 100 | 0.0701 | 79 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 24,065 | 5,971 | 5,762 | 35,798 | 20 | 0.0944 | 3,379 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 51,914 | 12,880 | 12,430 | 77,225 | 20 | 0.0944 | 7,289 |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | | **124,327** | | **29,769** | **184,941** | | | **15,171** |
| 50.01 | Train control and signals | | 38,904 | 9,652 | 9,315 | 57,871 | 30 | 0.0806 | 4,664 |
| 50.02 | Traffic signals and crossing protection | | 11,856 | 2,941 | 2,839 | 17,636 | 30 | 0.0806 | 1,421 |
| 50.03 | Traction power supply: substations | | 20,822 | 5,166 | 4,986 | 30,973 | 40 | 0.0750 | 2,323 |
| 50.04 | Traction power distribution: catenary and third rail | | 28,599 | 7,095 | 6,848 | 42,542 | 30 | 0.0806 | 3,428 |
| 50.05 | Communications | | 16,986 | 4,214 | 4,067 | 25,268 | 20 | 0.0944 | 2,385 |
| 50.06 | Fare collection system and equipment | | 4,420 | 1,097 | 1,058 | 6,575 | 20 | 0.0944 | 621 |
| 50.07 | Central Control | | 2,740 | 680 | 656 | 4,075 | 30 | 0.0806 | 328 |
| **Construction Subtotal (10-50)** | | | **540,878** | | **129,508** | **804,579** | | | **62,959** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **26,629** | | **6,376** | **33,006** | | | **2,313** |
| 60.01 | Purchase or lease of real estate | | 26,629 | | 6,376 | 33,006 | 100 | 0.0701 | 2,313 |
| 60.02 | Relocation (freight railroad traffic) | | - | | - | - | 100 | 0.0701 | - |
| **70 VEHICLES (number)** | | **66** | **112,991** | | **27,055** | **140,046** | | | **13,562** |
| 70.01 | Light Rail | 26 | 81,900 | | 19,610 | 101,510 | 25 | 0.0858 | 8,711 |
| 70.02 | Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 | Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 | Bus | 40 | 14,786 | | 3,540 | 18,326 | 12 | 0.1259 | 2,307 |
| 70.05 | Other | - | - | | - | - | 12 | 0.1259 | - |
| 70.06 | Non-revenue vehicles | | 2,655 | | 636 | 3,291 | 12 | 0.1259 | 414 |
| 70.07 | Spare parts | | 13,650 | | 3,268 | 16,918 | 12 | 0.1259 | 2,130 |
| **80 PROFESSIONAL SERVICES** | | | **134,193** | | | | | | |
| 80.01 | Preliminary Engineering | | 8,321 | | | | | | |
| 80.02 | Final Design | | 23,088 | | | | | | |
| 80.03 | Project Management for Design and Construction | | 9,797 | | | | | | |
| 80.04 | Construction Administration & Management | | 33,418 | | | | | | |
| 80.05 | Insurance | | 16,642 | | | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 4,826 | | | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 11,805 | | | | | | |
| 80.08 | Agency Force Account Work | | 26,295 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | | **162,938** | | | | | | |
| **Subtotal (10-90)** | | | **977,630** | **134,193** | **162,938** | **977,630** | | | **78,835** |

**Major Capital Project Costs - Annualized Cost** (Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | **Southwest Transitway - Alternative LRT 3C** | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |

| | | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **16.59** | **210,455** | | **50,373** | **314,025** | | | **23,404** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 8.72 | 18,269 | 4,618 | 4,373 | 27,259 | 30 | 0.0806 | 2,197 |
| 10.03 | Guideway: At-grade in mixed traffic | 1.60 | 2,466 | 623 | 590 | 3,680 | 20 | 0.0944 | 347 |
| 10.04 | Guideway: Aerial structure | 1.15 | 46,398 | 11,728 | 11,105 | 69,231 | 80 | 0.0703 | 4,868 |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 | Guideway: Underground cut & cover | 0.64 | 54,335 | 13,734 | 13,005 | 81,074 | 70 | 0.0706 | 5,725 |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 | Guideway: Retained cut or fill | 4.49 | 33,622 | 8,498 | 8,048 | 50,168 | 80 | 0.0703 | 3,527 |
| 10.09 | Track: Direct fixation | | 8,412 | 2,126 | 2,013 | 12,552 | 30 | 0.0806 | 1,012 |
| 10.10 | Track: Embedded | | 10,701 | 2,705 | 2,561 | 15,967 | 20 | 0.0944 | 1,507 |
| 10.11 | Track: Ballasted | | 27,801 | 7,027 | 6,654 | 41,483 | 35 | 0.0772 | 3,204 |
| 10.12 | Track: Special (switches, turnouts) | | 8,452 | 2,136 | 2,023 | 12,612 | 30 | 0.0806 | 1,016 |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **20** | **60,808** | | **14,555** | **90,732** | | | **6,580** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 18 | 25,740 | 6,506 | 6,161 | 38,407 | 70 | 0.0706 | 2,712 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 2 | 2,860 | 723 | 685 | 4,267 | 70 | 0.0706 | 301 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 | Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 | Automobile parking multi-story structure | | 25,266 | 6,386 | 6,047 | 37,699 | 50 | 0.0725 | 2,732 |
| 20.07 | Elevators, escalators | | 6,942 | 1,755 | 1,662 | 10,358 | 30 | 0.0806 | 835 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **50,694** | | **12,134** | **75,642** | | | **5,427** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 | Light Maintenance Facility | | 33,796 | 8,542 | 8,089 | 50,428 | 50 | 0.0725 | 3,654 |
| 30.03 | Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 | Yard and Yard Track | | 16,898 | 4,271 | 4,045 | 25,214 | 80 | 0.0703 | 1,773 |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **142,905** | | **34,205** | **213,231** | | | **18,104** |
| 40.01 | Demolition, Clearing, Earthwork | | 12,350 | 3,122 | 2,956 | 18,428 | 100 | 0.0701 | 1,291 |
| 40.02 | Site Utilities, Utility Relocation | | 40,790 | 10,310 | 9,763 | 60,864 | 100 | 0.0701 | 4,265 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 1,265 | 320 | 303 | 1,887 | 100 | 0.0701 | 132 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 1,363 | 345 | 326 | 2,034 | 100 | 0.0701 | 143 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 24,928 | 6,301 | 5,967 | 37,195 | 20 | 0.0944 | 3,511 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 62,209 | 15,724 | 14,890 | 92,823 | 20 | 0.0944 | 8,762 |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | | **134,838** | | **32,274** | **201,195** | | | **16,493** |
| 50.01 | Train control and signals | | 40,535 | 10,246 | 9,702 | 60,483 | 30 | 0.0806 | 4,874 |
| 50.02 | Traffic signals and crossing protection | | 17,622 | 4,454 | 4,218 | 26,293 | 30 | 0.0806 | 2,119 |
| 50.03 | Traction power supply: substations | | 21,695 | 5,484 | 5,193 | 32,371 | 40 | 0.0750 | 2,428 |
| 50.04 | Traction power distribution: catenary and third rail | | 29,793 | 7,531 | 7,131 | 44,455 | 30 | 0.0806 | 3,582 |
| 50.05 | Communications | | 17,698 | 4,474 | 4,236 | 26,408 | 20 | 0.0944 | 2,493 |
| 50.06 | Fare collection system and equipment | | 4,641 | 1,173 | 1,111 | 6,925 | 20 | 0.0944 | 654 |
| 50.07 | Central Control | | 2,855 | 722 | 683 | 4,259 | 30 | 0.0806 | 343 |
| **Construction Subtotal (10-50)** | | | **599,700** | | **143,541** | **894,825** | | | **70,008** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **49,470** | | **11,841** | **61,311** | | | **4,297** |
| 60.01 | Purchase or lease of real estate | | 49,470 | | 11,841 | 61,311 | 100 | 0.0701 | 4,297 |
| 60.02 | Relocation (freight railroad traffic) | | - | | - | - | 100 | 0.0701 | - |
| **70 VEHICLES (number)** | | **70** | **121,184** | | **29,006** | **150,190** | | | **14,527** |
| 70.01 | Light Rail | 28 | 88,200 | | 21,111 | 109,311 | 25 | 0.0858 | 9,380 |
| 70.02 | Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 | Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 | Bus | 42 | 15,525 | | 3,716 | 19,241 | 12 | 0.1259 | 2,422 |
| 70.05 | Other | - | - | | - | - | 12 | 0.1259 | - |
| 70.06 | Non-revenue vehicles | | 2,759 | | 660 | 3,420 | 12 | 0.1259 | 431 |
| 70.07 | Spare parts | | 14,700 | | 3,519 | 18,219 | 12 | 0.1259 | 2,294 |
| **80 PROFESSIONAL SERVICES** | | | **151,584** | | | | | | |
| 80.01 | Preliminary Engineering | | 9,226 | | | | | | |
| 80.02 | Final Design | | 25,621 | | | | | | |
| 80.03 | Project Management for Design and Construction | | 11,122 | | | | | | |
| 80.04 | Construction Administration & Management | | 37,152 | | | | | | |
| 80.05 | Insurance | | 18,452 | | | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 5,850 | | | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 14,008 | | | | | | |
| 80.08 | Agency Force Account Work | | 30,152 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | | **184,388** | | | | | | |
| **Subtotal (10-90)** | | | **1,106,326** | **151,584** | **184,388** | **1,106,326** | | | **88,832** |

## Major Capital Project Costs - Annualized Cost

(Rev. 6, Feb 7, 2006)

| | | | |
|---|---|---|---|
| Project | Southwest Transitway - Alternative LRT 4C | Date | 10/17/06 |
| Location | Hennepin County, MN | Base Year | 2006 |

| | | Quantity | Base Year Estimate (X000) | Distributed Professional Services (X000) | Distributed Unallocated Contingency (X000) | Base Year Total (X000) | Years of Usefull Life | Annualization Factor (7% rate) | Annualized Cost (X000) |
|---|---|---|---|---|---|---|---|---|---|
| **10 GUIDEWAY & TRACK ELEMENTS (route miles)** | | **9.96** | **137,714** | | **32,999** | **204,601** | | | **15,347** |
| 10.01 | Guideway: At-grade exclusive right-of-way | - | - | - | - | - | 80 | 0.0703 | - |
| 10.02 | Guideway: At-grade semi-exclusive (allows cross-traffic) | 5.42 | 12,843 | 3,160 | 3,077 | 19,081 | 30 | 0.0806 | 1,538 |
| 10.03 | Guideway: At-grade in mixed traffic | 1.40 | 2,159 | 531 | 517 | 3,207 | 20 | 0.0944 | 303 |
| 10.04 | Guideway: Aerial structure | 0.53 | 21,102 | 5,193 | 5,056 | 31,351 | 80 | 0.0703 | 2,204 |
| 10.05 | Guideway: Built-up fill | - | - | - | - | - | 80 | 0.0703 | - |
| 10.06 | Guideway: Underground cut & cover | 0.59 | 50,684 | 12,473 | 12,145 | 75,302 | 70 | 0.0706 | 5,318 |
| 10.07 | Guideway: Underground tunnel | - | - | - | - | - | 70 | 0.0706 | - |
| 10.08 | Guideway: Retained cut or fill | 2.02 | 15,623 | 3,845 | 3,744 | 23,212 | 80 | 0.0703 | 1,632 |
| 10.09 | Track: Direct fixation | | 5,652 | 1,391 | 1,354 | 8,397 | 30 | 0.0806 | 677 |
| 10.10 | Track: Embedded | | 9,744 | 2,398 | 2,335 | 14,477 | 20 | 0.0944 | 1,367 |
| 10.11 | Track: Ballasted | | 14,839 | 3,652 | 3,556 | 22,046 | 35 | 0.0772 | 1,703 |
| 10.12 | Track: Special (switches, turnouts) | | 5,067 | 1,247 | 1,214 | 7,528 | 30 | 0.0806 | 607 |
| 10.13 | Track: Vibration and noise dampening | | - | - | - | - | 30 | 0.0806 | - |
| **20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)** | | **14** | **26,962** | | **6,461** | **40,058** | | | **2,932** |
| 20.01 | At-grade station, stop, shelter, mall, terminal, platform | 12 | 17,160 | 4,223 | 4,112 | 25,495 | 70 | 0.0706 | 1,800 |
| 20.02 | Aerial station, stop, shelter, mall, terminal, platform | 2 | 2,860 | 704 | 685 | 4,249 | 70 | 0.0706 | 300 |
| 20.03 | Underground station, stop, shelter, mall, terminal, platform | - | - | - | - | - | 70 | 0.0706 | - |
| 20.04 | Other stations, landings, terminals: Intermodal, ferry, trolley, etc. | - | - | - | - | - | 70 | 0.0706 | - |
| 20.05 | Joint development | | - | - | - | - | 70 | 0.0706 | - |
| 20.06 | Automobile parking multi-story structure | | - | - | - | - | 50 | 0.0725 | - |
| 20.07 | Elevators, escalators | | 6,942 | 1,708 | 1,663 | 10,314 | 30 | 0.0806 | 831 |
| **30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS** | | | **50,694** | | **12,147** | **75,316** | | | **5,404** |
| 30.01 | Administration Building: Office, sales, storage, revenue counting | | - | - | - | - | 50 | 0.0725 | - |
| 30.02 | Light Maintenance Facility | | 33,796 | 8,317 | 8,098 | 50,211 | 50 | 0.0725 | 3,638 |
| 30.03 | Heavy Maintenance Facility | | - | - | - | - | 50 | 0.0725 | - |
| 30.04 | Storage or Maintenance of Way Building | | - | - | - | - | 50 | 0.0725 | - |
| 30.05 | Yard and Yard Track | | 16,898 | 4,158 | 4,049 | 25,105 | 80 | 0.0703 | 1,765 |
| **40 SITEWORK & SPECIAL CONDITIONS** | | | **95,867** | | **22,972** | **142,430** | | | **12,258** |
| 40.01 | Demolition, Clearing, Earthwork | | 9,100 | 2,239 | 2,181 | 13,520 | 100 | 0.0701 | 947 |
| 40.02 | Site Utilities, Utility Relocation | | 22,836 | 5,620 | 5,472 | 33,928 | 100 | 0.0701 | 2,378 |
| 40.03 | Haz. mat'l, contam'd soil removal/mitigation, ground water treatments | | 342 | 84 | 82 | 508 | 100 | 0.0701 | 36 |
| 40.04 | Environmental mitigation, e.g. wetlands, historic/archeologic, parks | | 553 | 136 | 133 | 822 | 100 | 0.0701 | 58 |
| 40.05 | Site structures including retaining walls, sound walls | | - | - | - | - | 80 | 0.0703 | - |
| 40.06 | Pedestrian / bike access and accommodation, landscaping | | 18,708 | 4,604 | 4,483 | 27,795 | 20 | 0.0944 | 2,624 |
| 40.07 | Automobile, bus, van accessways including roads, parking lots | | 44,327 | 10,908 | 10,622 | 65,857 | 20 | 0.0944 | 6,216 |
| 40.08 | Temporary Facilities and other indirect costs during construction | | - | - | - | - | 100 | 0.0701 | - |
| **50 SYSTEMS** | | | **80,407** | | **19,267** | **119,461** | | | **9,805** |
| 50.01 | Train control and signals | | 24,270 | 5,972 | 5,816 | 36,058 | 30 | 0.0806 | 2,906 |
| 50.02 | Traffic signals and crossing protection | | 9,646 | 2,374 | 2,311 | 14,331 | 30 | 0.0806 | 1,155 |
| 50.03 | Traction power supply: substations | | 12,989 | 3,196 | 3,113 | 19,299 | 40 | 0.0750 | 1,448 |
| 50.04 | Traction power distribution: catenary and third rail | | 17,881 | 4,400 | 4,285 | 26,566 | 30 | 0.0806 | 2,141 |
| 50.05 | Communications | | 10,597 | 2,608 | 2,539 | 15,744 | 20 | 0.0944 | 1,486 |
| 50.06 | Fare collection system and equipment | | 3,315 | 816 | 794 | 4,925 | 20 | 0.0944 | 465 |
| 50.07 | Central Control | | 1,709 | 421 | 410 | 2,539 | 30 | 0.0806 | 205 |
| **Construction Subtotal (10-50)** | | | **391,643** | | **93,846** | **581,866** | | | **45,746** |
| **60 ROW, LAND, EXISTING IMPROVEMENTS** | | | **14,461** | | **3,465** | **17,927** | | | **1,256** |
| 60.01 | Purchase or lease of real estate | | 14,461 | | 3,465 | 17,927 | 100 | 0.0701 | 1,256 |
| 60.02 | Relocation (freight railroad traffic) | | - | | - | - | 100 | 0.0701 | - |
| **70 VEHICLES (number)** | | **61** | **80,396** | | **19,264** | **99,660** | | | **9,886** |
| 70.01 | Light Rail | 17 | 53,550 | | 12,832 | 66,382 | 25 | 0.0858 | 5,696 |
| 70.02 | Heavy Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.03 | Commuter Rail | - | - | | - | - | 25 | 0.0858 | - |
| 70.04 | Bus | 44 | 16,264 | | 3,897 | 20,162 | 12 | 0.1259 | 2,530 |
| 70.05 | Other | - | - | | - | - | 12 | 0.1259 | - |
| 70.06 | Non-revenue vehicles | | 1,657 | | 397 | 2,053 | 12 | 0.1259 | 259 |
| 70.07 | Spare parts | | 8,925 | | 2,139 | 11,064 | 12 | 0.1259 | 1,393 |
| **80 PROFESSIONAL SERVICES** | | | **96,377** | | | | | | |
| 80.01 | Preliminary Engineering | | 6,025 | | | | | | |
| 80.02 | Final Design | | 16,667 | | | | | | |
| 80.03 | Project Management for Design and Construction | | 7,008 | | | | | | |
| 80.04 | Construction Administration & Management | | 24,173 | | | | | | |
| 80.05 | Insurance | | 12,051 | | | | | | |
| 80.06 | Legal; Permits; Review Fees by other agencies, cities, etc. | | 3,374 | | | | | | |
| 80.07 | Surveys, Testing, Investigation, Inspection | | 8,280 | | | | | | |
| 80.08 | Agency Force Account Work | | 18,799 | | | | | | |
| **90 UNALLOCATED CONTINGENCY** | | | **116,575** | | | | | | |
| **Subtotal (10-90)** | | | **699,453** | **96,377** | **116,575** | **699,453** | | | **56,888** |

# Southwest Transitway Alternatives Analysis

# Technical Memorandum No. 6
# Travel Demand Forecasting Methodology & Ridership Results

*Prepared for*
*Hennepin County Regional Railroad Authority*

*Prepared by:*

*PB Americas, Inc. (PB)*

*January, 2007*

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## Appendix Tables



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## Appendix Figures

# 1. Introduction

This technical memorandum documents the methodology, assumptions and results of the travel demand forecasting task for the Southwest Transitway Alternatives Analysis (Southwest Transitway AA).

The travel demand forecasts help support subsequent analyses, including cost effectiveness evaluations, design considerations and operational refinements. This document discusses the model itself, input assumptions, network coding, alternative testing strategy and the results from the modeling work.

Near the conclusion of the Southwest Transitway AA, forecasts for select alternatives were revised based upon the results of the LRT 3A model run and the final review of the models. These revisions are documented in Appendix A and Appendix B of this technical memorandum.

# 2. Regional Model Background

A travel demand model is used to estimate transit ridership and auto traffic volumes given a set of input assumptions that describe the population, the level of commercial development (in terms of employment) and the roadway and transit system. The model allows the testing of various alternatives, and is therefore a very useful tool to estimate the impact of new transit improvements, such as those being considered in the Southwest Transitway AA. It is also useful in that the model can be used to estimate future demand for transit and other modes, including auto and non-motorized modes such as walk and bike.

The Twin Cities Regional Travel Demand Model will be used in this analysis as the “tool” for estimating travel demand for the Southwest Transitway AA Study. There are several good reasons for using the regional model, including:

- It covers the entire region and is therefore comprehensive in geography and trip-making
- It is the model used for long range planning by the Metropolitan Council
- It is the model used by the Central Corridor and Northstar planning studies to estimate demand for Federal and State review.
- It has been reviewed by the FTA for compliance with standard planning model practices
- It is structured to permit a full multi-modal demand estimation.

The accuracy of future year forecasts is dependent upon the accuracy of the input assumptions and the statistical variance of the model parameters themselves. This report sets forth the assumptions used for the Southwest Transitway AA.

The Twin Cities regional model is a traditional 4-step travel demand model, which includes Trip Generation, Trip Distribution, Mode Choice and Assignment steps.

The model is maintained and updated by the Metropolitan Council.

**Trip Generation** - The first step in forecasting travel is trip generation. During this step, the model estimates the number of trips that will be made throughout the modeled area based upon socio-economic information including households, employment and other land uses (i.e., shopping centers, hospitals/clinics, schools, etc.).

**Trip Distribution** - The second step is trip distribution. During this step, the model determines the origins/destinations for the trips estimated from the trip generation step.

**Mode Choice** - The third step is mode choice. During this step, the mode of transportation (i.e., auto, bus, light rail transit, bicycle, walk, etc.) for the trips is determined. The choice of mode is based upon a number of factors including: relative travel time, travel cost, parking availability and cost, auto ownership and income.

**Traffic Assignment -** The fourth step is traffic assignment. During this step, the trips are assigned to particular routes. The routes factor in distance as well as projected congestion, and then assign the trip to the quickest route.

The model is expressed in terms of mathematical relationships that describe the many aspects of how travel decisions are made. For example, the trip generation model employs a set of trip rates which, when multiplied by the number of households of a given type, provide an estimate of the number of trips generated from a small geographic area known as a zone. These mathematical relationships are encoded within a series of computer programs which do the work of carrying out these calculations.

While traditional in basic form, the Twin Cities model does contain many features that are generally accepted as “best practice” in model design, including:

- Time of Day stratification (peak and off-peak) for distribution and mode choice
- Proper representation of travelers’ sensitivities to transit, auto and non-motorized choices
- Sensitivity to household composition, including size, income and auto ownership
- Sensitivity to the role of both auto and transit in choice of trip destinations
- Transit modes stratified by access and line-haul modes, including local bus, express bus, LRT, Commuter Rail and Premium services.
- Market segmentation by transit accessibility, auto ownership and household size.

The regional model includes the 7-county area served by the Metropolitan Council. In addition, the model also encompasses the 13 county “ring” surrounding the 7-county area. It was developed based on data collected in 2001 and 2002 from a comprehensive Home-Interview Survey of over 6,000 households, and an extensive survey of travelers entering and leaving the region. The model has also made use of ridership data from the Hiawatha LRT to validate the model.

## 3. FTA Involvement

Since its original development, the model has been refined to better reflect observed data, through a review process which involved the Federal Transit Administration (FTA), during the recent planning work for the Central Corridor. This review process enhances the credibility of the model results for the Southwest Transitway AA analyses. The FTA’s involvement in this kind of model review has become a routine procedure in virtually all transit proposals that will eventually apply for federal funding assistance through the “New Starts” federal program.

There is heavy competition for limited federal funds provided under this program. Therefore, the FTA (following Congressional and legislative requirements) seeks to ensure that all technical data is presented fairly and consistently among competing proposals. Since the models are key tools used to estimate transit ridership, it is important that they use industry "best practices", and be able to rationally describe the observed travel behavior of each region.

This review and revision process has largely taken place through the recent Central Corridor planning work, so it is important that the Southwest Transitway AA follows many of the same modeling assumptions and procedures, as appropriate, that have been established for the Central Corridor forecasts.

One important addition allowed by the FTA in the Twin Cities regional travel model is to let it recognize – during the off-peak period – additional attractiveness (or preference of travelers) to choose to use rail over equally effective bus service. Known as a "mode specific constant," this factor for rail preference helps the model recognize a greater level of off-peak travel on the LRT alternatives than would otherwise be the case..

# 4. Model Inputs and Assumptions

The two major categories of input data to the model are demand data (who's traveling) and transportation supply data (physical highway and transit routes and capacity). The former consists of:

- Socioeconomic data including population, households, retail and non-retail employment by small areas (called traffic analysis zones or TAZs).
- External travel demand, represented by future year traffic volumes at the periphery of the modeled "ring" (13- county) area.
- Forecasts for enplanements at the Minneapolis-St. Paul International Airport (MSP Airport).

Transportation supply data is represented as "highway" (i.e., surface street) networks and transit networks. Highway networks consist of all principal and major arterials and collectors in the 7-county region. A sparser network is included for the ring counties. Networks contain information on free-flow speed and capacity. The 2030 network also represents the planned and programmed improvements included in the Metropolitan Council's long range transportation plan known as the *Transportation Policy Plan 2030.* It is the same network used for the current Central Corridor and Northstar Commuter Rail planning studies. There are no changes to the highway network among transit alternatives.

Transit networks are also based on the Metropolitan Council's long range transit plan, with an important component known as the *Transit 2030 Plan*. The transit networks include (for year 2030) the Northstar, Rush Line and Red Rock Commuter Rail lines, the Central Corridor and Hiawatha Light Rail Transit (LRT) lines and the three bus rapid transit (BRT) systems: I-35W, Cedar and Bottineau.. Transit networks, of course, will vary between alternatives, reflecting the No-Build, Enhanced Bus and variations of the LRT and BRT alternatives. In addition to the LRT or BRT guideways themselves, the alternatives will also be defined by the system of feeder bus and compatible local bus services provided within each alternative.

## Service Plan Assumptions

The following assumptions were made for a LRT or BRT Southwest Transitway:

**Hours of Service -** The hours of service for the build alternatives (the BRT and LRT alternatives) are assumed to be the same as for the Hiawatha LRT line, which operates from 4:30 AM to 12:30 AM.

**Frequency** - The service frequency for the LRT alternatives is assumed to be the same as for the Hiawatha LRT line.

- AM and PM Peak Period: 6:30 AM - 9:00 AM and 3:30 PM - 6:00 PM -- 7.5 minutes
- Base Period: 6:00 AM - 6:30 AM and 9:00 AM - 3:30 PM -- 10 minutes
- Evening: 6:00 PM - 9:00 PM 15 minutes; Early morning/Late Evening 4:30 AM - 6:00 AM, 9:00 PM - 12:30 AM -- 30 minutes

The BRT alternatives feature two limited stop routes: an "A" Limited Stop that runs along the exclusive guideway between Eden Prairie and Downtown Minneapolis, and a shorter "B" Limited Stop route that runs along the exclusive guideway between Minnetonka and Downtown Minneapolis. The following frequencies are assumed for each of the two limited stop routes:

- AM and PM Peak Period: 6:30 AM - 9:00 AM and 3:30 PM - 6:00 PM -- 15 minutes
- Base Period 6:00 AM - 6:30 AM and 9:00 AM - 3:30 PM -- 20 minutes
- Evening: 9:00 PM – 2:00 AM -- 30 minutes; Early morning: 4:00 AM - 6:00 AM -- 20 minutes

In the BRT alternatives, a number of express buses also use the exclusive guideway. Typically, these express busses are assumed to have peak headways of between 15-60 minutes and off-peak headways of 60 minutes, or greater.

The Enhanced Bus alternative also consists of "A" and "B" limited stop routes. These routes are similar to the BRT limited stops, but run on surface streets instead of an exclusive guideway. For these routes, the assumed frequencies are the same as those used for the BRT limited stop routes.

In the Enhanced Bus, the frequencies for many of the other express buses have been increased to between 15-30 minutes for peak periods, and 60-120 minutes for off-peak periods. Most of these express services have been retained in the build alternatives.

**Park-and-Ride Lots** – Park-and-ride lots are assumed to exist for LRT at all stations from West Lake to TH 5 for the "C" alignments, and additionally at Penn Avenue and 21st Street on the LRT "A" and BRT Alignments.

**Feeder Bus Routes** - All major LRT and BRT stations will be served by feeder buses that will circulate throughout the study area cities to provide access to/from the stations. Transfers between the feeder buses and the rail or BRT line are assumed to be free, as is the current policy..

**Fares** - The transit fares for LRT and BRT are assumed to be the same as were modeled in the Central Corridor Study. The future year cost level is implicitly inflation-adjusted.

**Express Bus Service** - For purposes of this analysis, the SouthWest Metro Express Bus service to downtown Minneapolis is assumed to remain in operation. It is also assumed that most Metro Transit Express Bus service from the study area cities to downtown Minneapolis will also remain in operation. In the BRT alternatives, many of the express buses use the exclusive guideway.

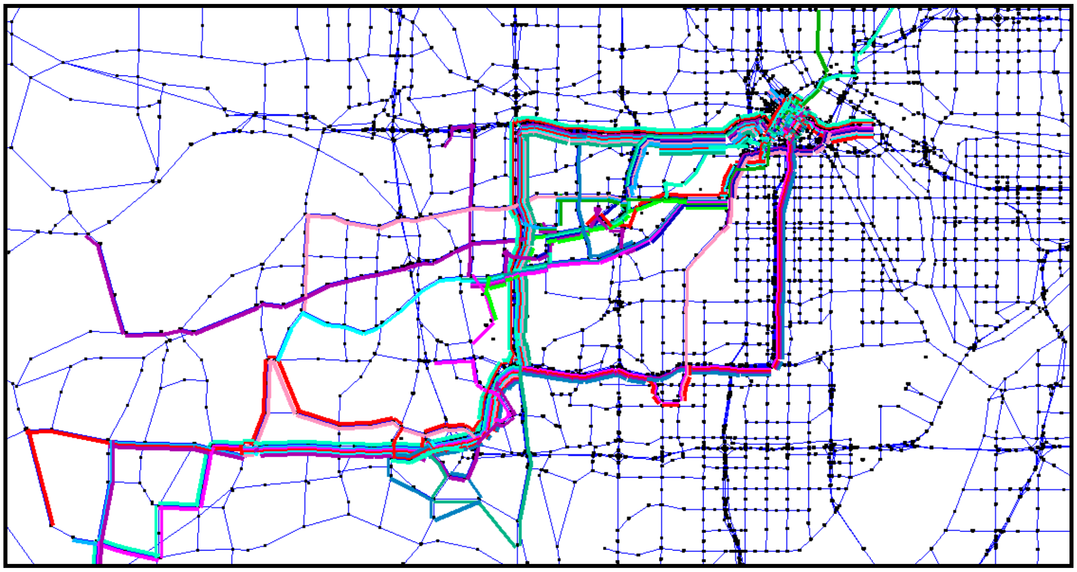
**Hiawatha/Central LRT Connection** - The LRT options for a Southwest rail transit line on the “A” alignments are assumed to be "interlined" with the Hiawatha line (i.e., to operate on the same tracks and as part of the Hiawatha line through downtown Minneapolis, to MSP Airport and the Mall of America). The “C” alignment alternatives would not interline with either the Hiawatha or Central Corridor lines.

## 5. Network Coding

Representing the alternatives in the model is done through a process called network coding. The objective of this process is to represent the service level provided by each alternative. This is done through the following elements:

1. Route Sequence Coding
   The path of each transit route is coded by identifying a sequence of nodes in the highway network that represent the routing and bus stops (or rail stations) provided by that route. Since all streets are not coded, the route stops are condensed, but the level of detail is consistent with that of the zone system and the coded highway network. Transit speeds are an attribute of each link, and are based on observed, scheduled bus time. Where an exclusive guideway is provided, such as with LRT or BRT, a separate travel time is computed based on operating performance, station dwell times and assumed cruise speed limits. The run times for exclusive guideways are summarized in Table 1.

**Figure 1 Enhanced Bus Route Coding**



*Source: Parsons Brinckerhoff, 2006.*

The above graphic, which shows the Enhanced Bus routes, illustrates the coding of transit routes in the highway network. The thin-blue lines represent highway links and the black dots represent nodes. The thicker, multi-colored lines represent bus routes. For clarity, only one direction of each bus route is shown.

### Table 1  Guideway Run Times from Downtown Station to TH 5/Mitchell Stations

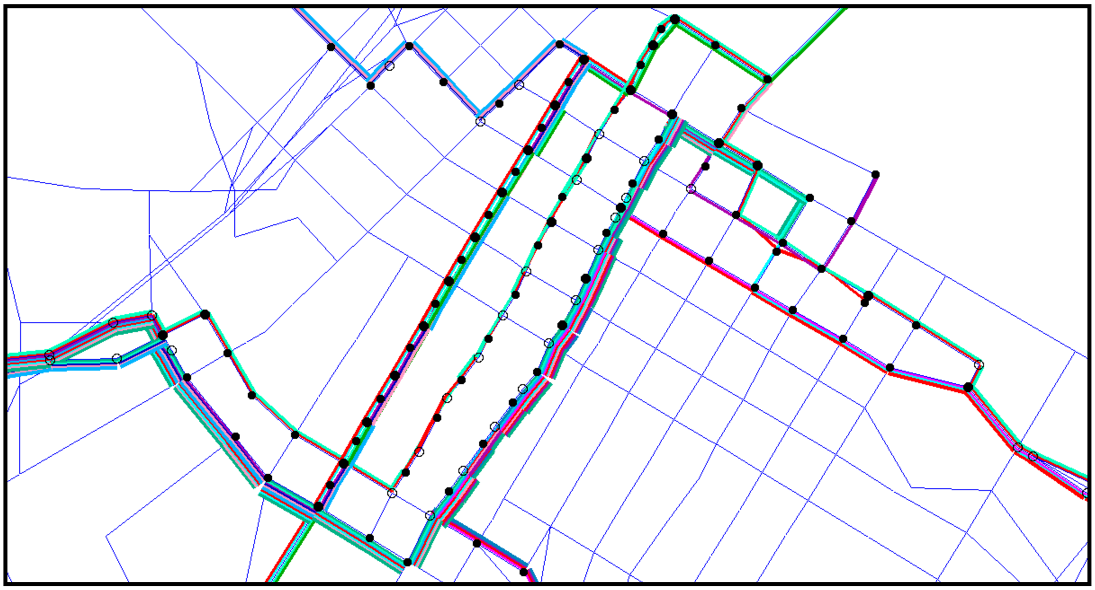
| Downtown Station Used | Nicollett Mall | | 4th Street Station | | | |
|---|---|---|---|---|---|---|
| | Cumulative Run Times (in Minutes)* | | | | | |
| **To Station** | **LRT 1A** | **LRT 4A** | **LRT 1C** | **LRT 2C** | **LRT 3C** | **BRT 1** |
| Hennepin/Warehouse | 2.0 | 2.0 | | | | |
| 8th Street | | | 1.1 | 1.1 | 1.1 | 1.7[°] |
| Intermodal | 3.0 | 3.0 | | | | |
| Royalston Avenue | 6.5 | 6.5 | | | | |
| 12th Street | | | 2.6 | 2.6 | 2.6 | 3.2[°] |
| Van White  Boulevard | 8.4 | 8.4 | | | | 7.0[°] |
| Franklin Street | | | 5.0 | 5.0 | 5.0 | |
| Penn Avenue | 9.9 | 9.9 | | | | 9.2 |
| 28th Street | | | 6.5 | 6.5 | 6.5 | |
| 21st Street | 11.2 | 11.2 | | | | 11.0 |
| Lyndale | | | 8.0 | 8.0 | 8.0 | |
| Uptown | | | 9.2 | 9.2 | 9.2 | |
| West Lake Street | 13.3 | 13.3 | 11.5 | 11.5 | 11.5 | 13.5 |
| Beltline Boulevard | 14.9 | 14.9 | 13.1 | 13.1 | 13.1 | 15.6 |
| Wooddale Road | 16.5 | 16.5 | 14.7 | 14.7 | 14.7 | 17.7 |
| Louisiana Avenue | 18.0 | 18.0 | 16.2 | 16.2 | 16.2 | 19.7 |
| Blake Road | 19.7 | 19.7 | 17.9 | 17.9 | 17.9 | 21.9 |
| Hopkins | 22.1 | 22.1 | 20.3 | 20.3 | 20.3 | 25.1 |
| Shady Oak Road | 23.6 | 23.6 | 21.8 | 21.8 | 21.8 | 27.2 |
| Rowland Road | 26.5 | | 24.7 | 24.7 | | 30.8 |
| Opus | | | | | 24.5 | |
| TH 62 | 28.2 | | 26.4 | 26.5 | | 33.0 |
| City West | | | | | 25.9 | |
| Valley View | | | | 29.2 | | |
| Golden Triangle | | | | | 27.7 | |
| Eden Prairie Town Center | | | | | 30.7 | |
| SouthWest | | | | 30.8 | 32.2 | |
| TH 5 / Mitchell | 31.7 | | 30.0 | 32.9 | 34.3 | 37.3 |

*Source:  Parsons Brinckerhoff, 2006.*

Note: This table shows data only for the modeled alternatives

*Times in the table include station dwell times.
°Between the 4th Street Station and the Van White Blvd Station, the Bus Rapid Transit service runs along the roadway network, using the transit travel times associated with each roadway link.

**Figure 2  Enhanced Bus Route Node Coding**



*Source:  Parsons Brinckerhoff, 2006*

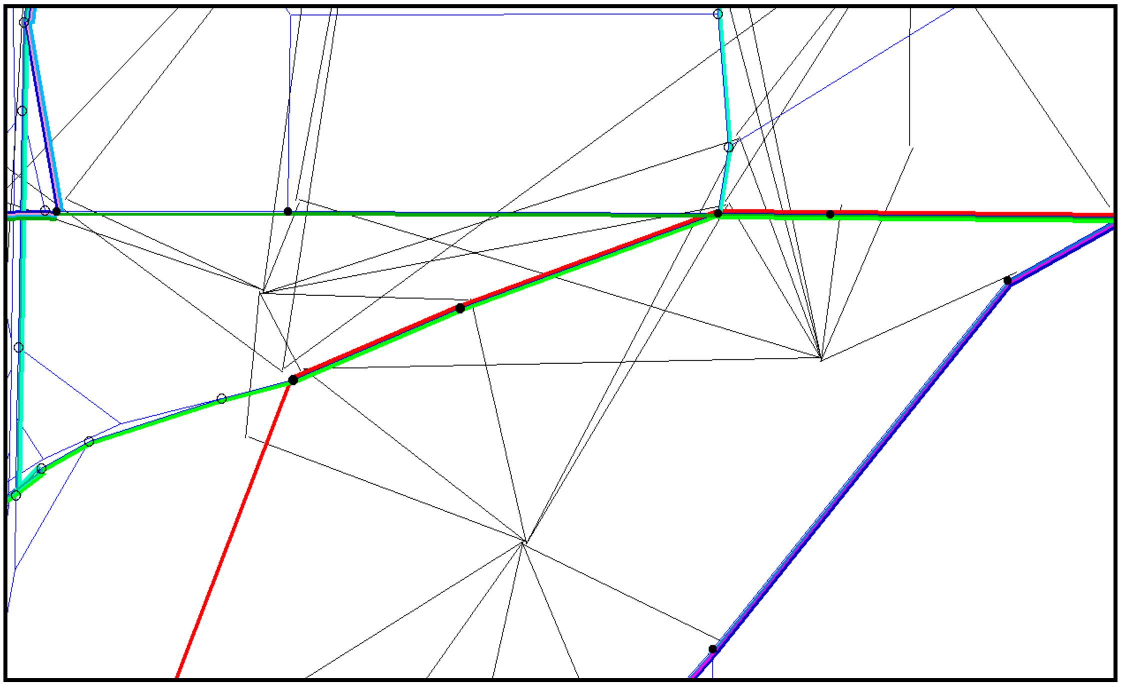
Each node along a transit route is coded as either as a transit stop (shown as filled black circles in the above graphic) or a non-stop (hollow black circles).

2. Route Headway Coding
   Each route is assigned a headway, or time between buses or trains.  Headways are defined for the AM, midday, PM and night-time periods, and are used to determine average wait times, which are nominally considered as ½ of the headway.

3. Access Coding
   Access coding represents the walk or drive time involved in getting to and egressing from the transit system.  It also includes potential transfers.  Walk access coding is provided from every TAZ that has some portion within 1 mile of a transit stop.  Drive access coding is provided to park-and-ride lots that allow patrons to drive and park their cars to access the transit system.  Drive access times vary depending upon the location of the particular park-and-ride lot, with lots at the end of the line, or those with few competing lots, commanding a larger travel shed.  As a rule of thumb, drive access should not exceed about ¼ to 1/3 of the total travel time for a trip.

4. Transit Market Definition
   Each zone is assigned a short (1/3 mile) and long (1 mile) transit access market share.  Specifically, this represents the portion of the zone within 1/3 and within 1 mile of a transit stop.  This information is used in the model to segment the transit travel market into short, long and no-walk geographies, which have different sensitivities to transit service.

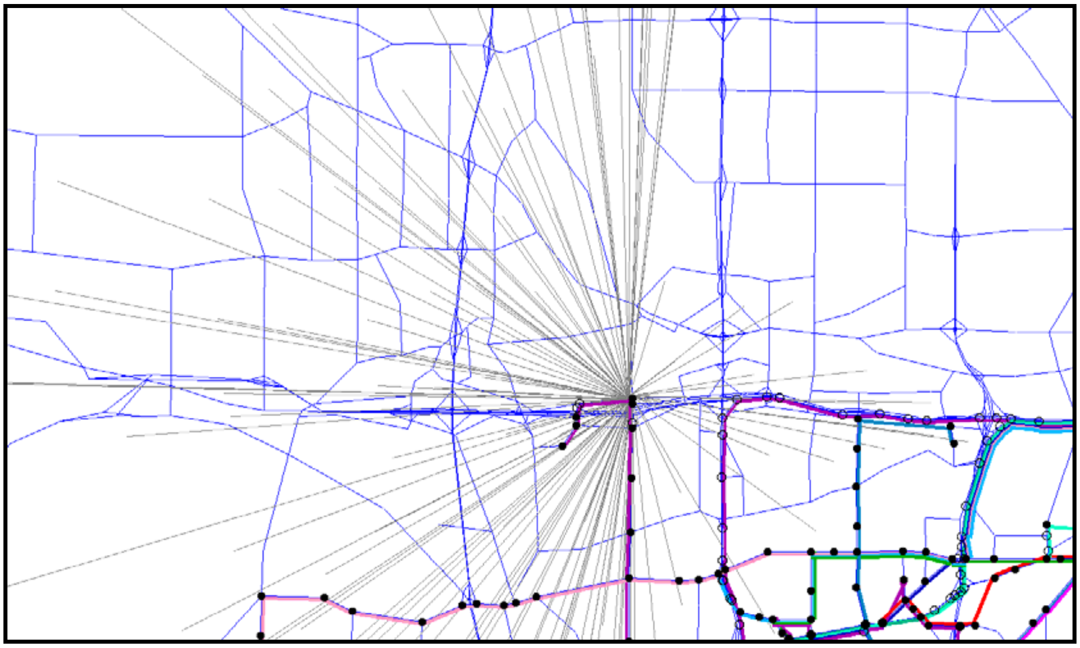
**Figure 3 Walk Access Links**



*Source: Parsons Brinckerhoff, 2006.*

Walk access links (shown as the grey lines above) represent the walk times required to travel to and from transit stops (stations) for the adjacent zones.

**Figure 4 Drive Access Links**



*Source: Parsons Brinckerhoff, 2006.*

Drive access links (also shown as grey lines) represent the drive times required to travel to and from park-and-rides lots for zones within a given travel shed.

# 6. Alternative Modeling Strategy

In order to assure a fair comparison between alternatives, it is important that only those changes specified for each alternative be reflected in each model run. With regard to the network, or supply inputs, this means that the network outside the corridor remains unchanged, and only corridor network changes are reflected. On the demand side, the model alternatives must use a common set of person-trip tables, which defines the overall demand for travel, regardless of mode. These tables were established from the Enhanced Bus alternative model run.[1]

# 7. Model Result Format and User Benefits

The model produces travel demand results in the following formats for each of the modeled alternatives:

- Daily transit boardings by route (alternative)
- Daily station boardings and alightings
- Daily transit segment ridership
- Level of service by TAZ

The latter measure is used to determine "user benefits", which is a measure of overall time and cost savings that result from the alternative, compared with the Enhanced Bus alternative. The measure is expressed in terms of time saved by travelers. Therefore, user benefits are a function of both ridership increases and increased time and cost savings. The overall hours of user benefits (annualized) divided by the change in annualized cost determines the cost effectiveness index, which is an important FTA measure in the overall evaluation of the alternatives for potential federal funding.

The formula for computing cost effectiveness is:

$$\frac{\text{Change in Annualized Cost (capital and operating cost)}}{\text{Change in annual hours of User Benefits}}$$

The change is measured against the TSM, which in the Southwest Transitway AA is represented by the Enhanced Bus option.

# 8. Modeled Alternatives

In order to have a set of "base data," the No-Build Alternative was modeled. Then, a total of 7 alternatives have been modeled to date, including:

---

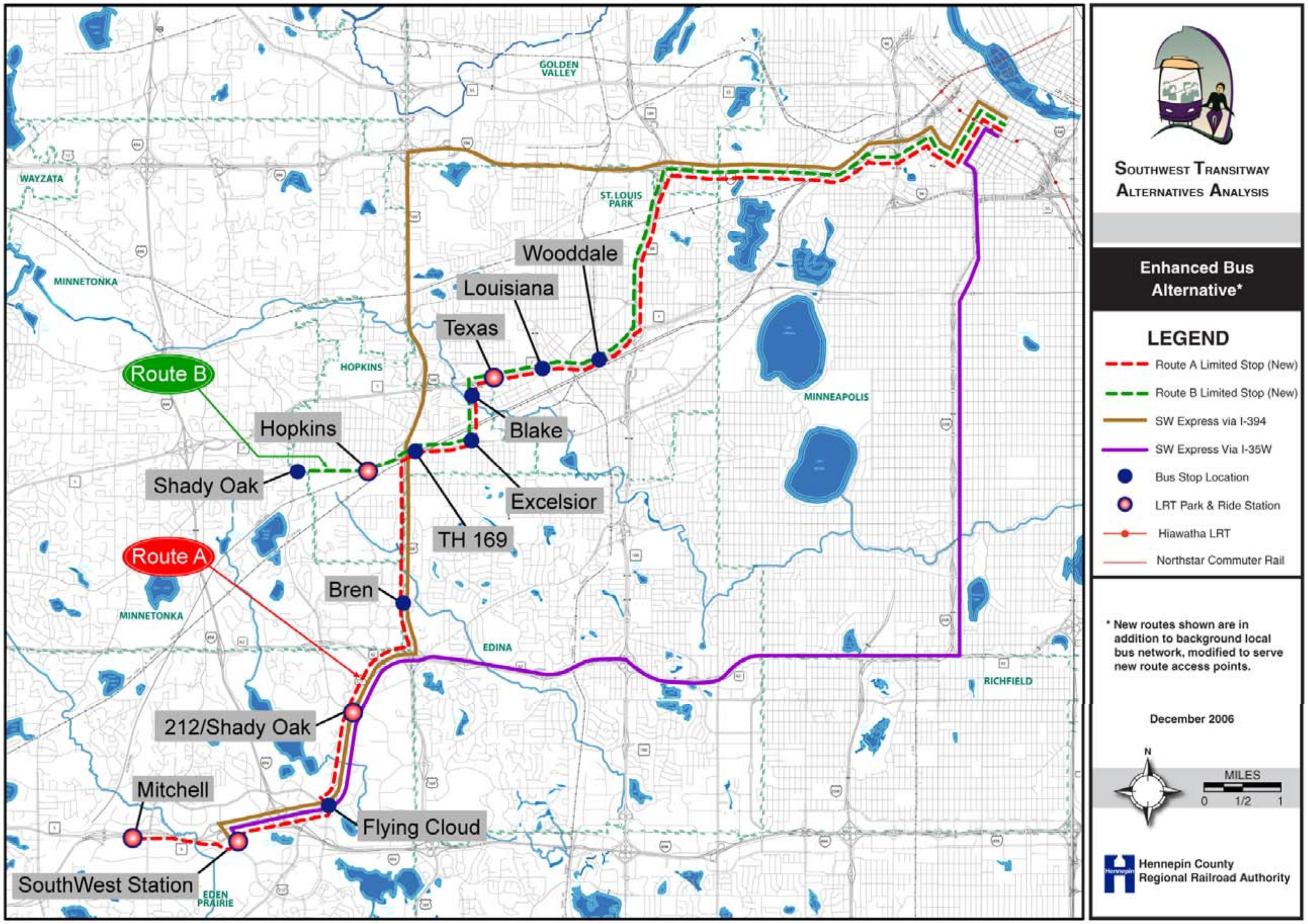
[1] Subsequent to the enhanced bus model run, all other alternatives use the same person-trip tables (by trip purpose) as input to the mode choice model. In this way, each alternative is presented with the same travel market, and any changes in mode-specific demand (i.e., bus, LRT, auto or non-motorized) results solely from differences in the attractiveness, based on the coded level of service. The level of service is based on time, (in and out of vehicle, access and wait times), cost (operating cost, parking and transit fare) and number of transfers.

1. Enhanced Bus
2. LRT 1A:  Royalston Routing
3. LRT 1C:  Nicollet Mall Routing
4. LRT 2C:  Nicollet Mall Routing
5. LRT 3C:  Nicollet Mall Routing
6. LRT 4A:  Royalston Routing
7. BRT 1
8. An additional alternative, to be determined later, will also be modeled.

By modeling LRT 1A and 1C, the travel differences between the A and C routes into downtown Minneapolis can be assessed.  By modeling three alternatives which differ only at the west end (1C, 2C and 3C), the differences in the 1, 2, and 3 alignments are identified.  Ridership estimates for the Hennepin Avenue alignment options were developed “off-line” (i.e. interpolated outside the model itself) based on changes in travel time, and market accessibility.  The BRT 2 alternative was estimated “off-line” by comparing the difference between the LRT1 and LRT3 alignment’s demand and added that to the BRT 1 modeled data.  These alternatives, plus subsequent sensitivity testing, provided us with a means of summarizing demand directly or indirectly by “bracketing” other component combinations.

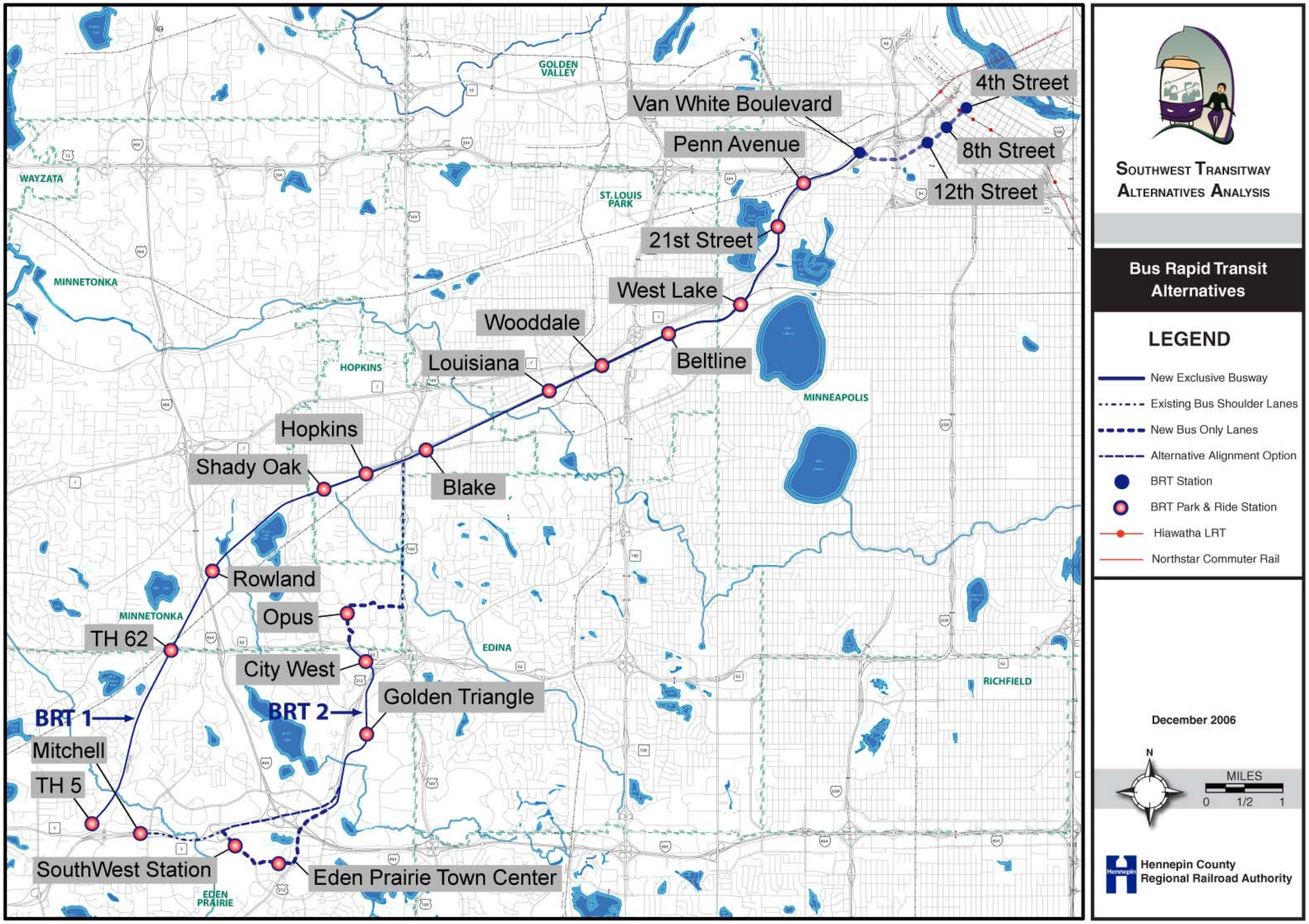
The maps which follow illustrate the Enhanced Bus, BRT and LRT alternatives.

**Figure 5 Enhanced Bus Alternative**



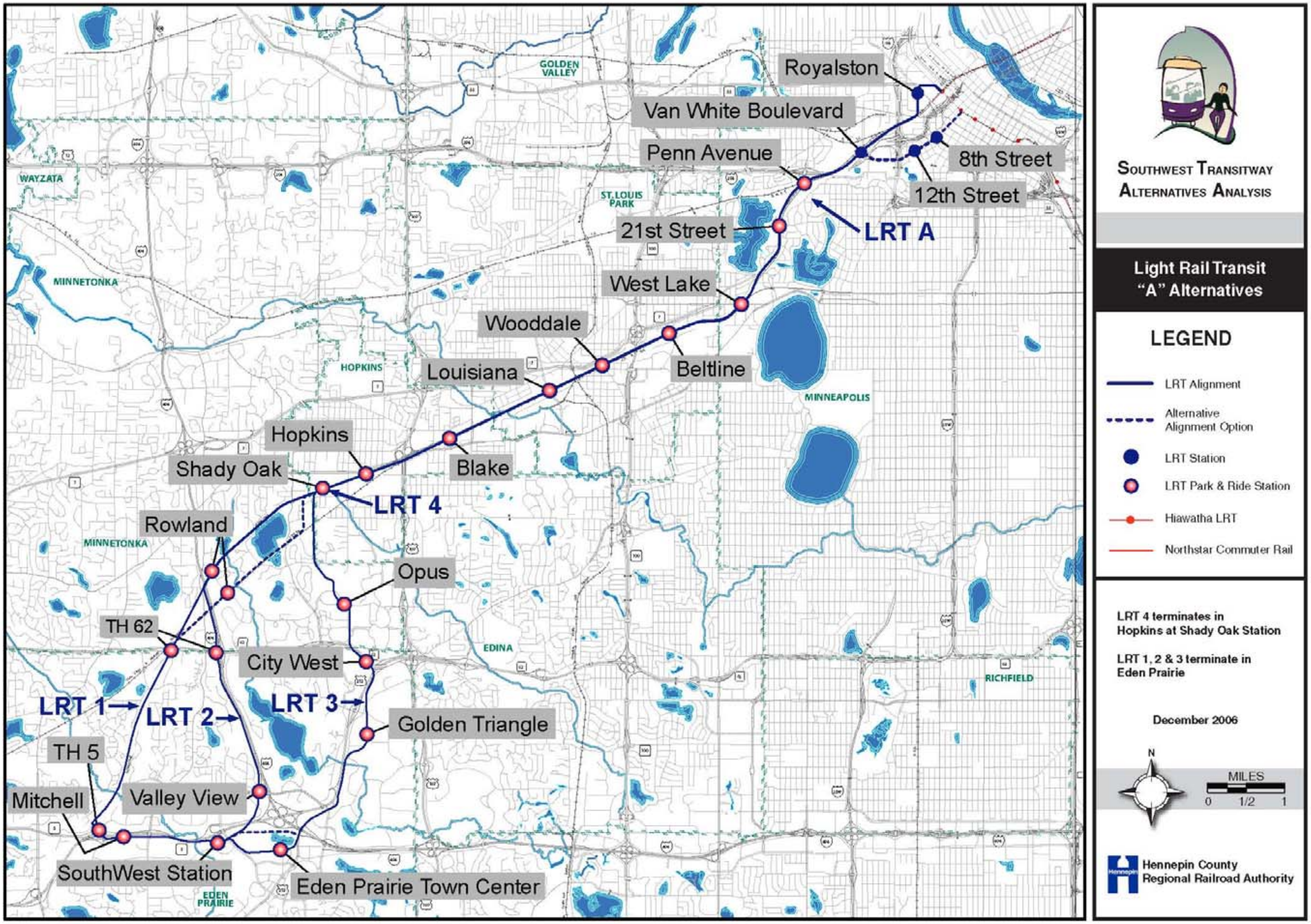

*Source: Parsons Brinckerhoff, 2006.*

## Figure 6 Bus Rapid Transit Alternatives



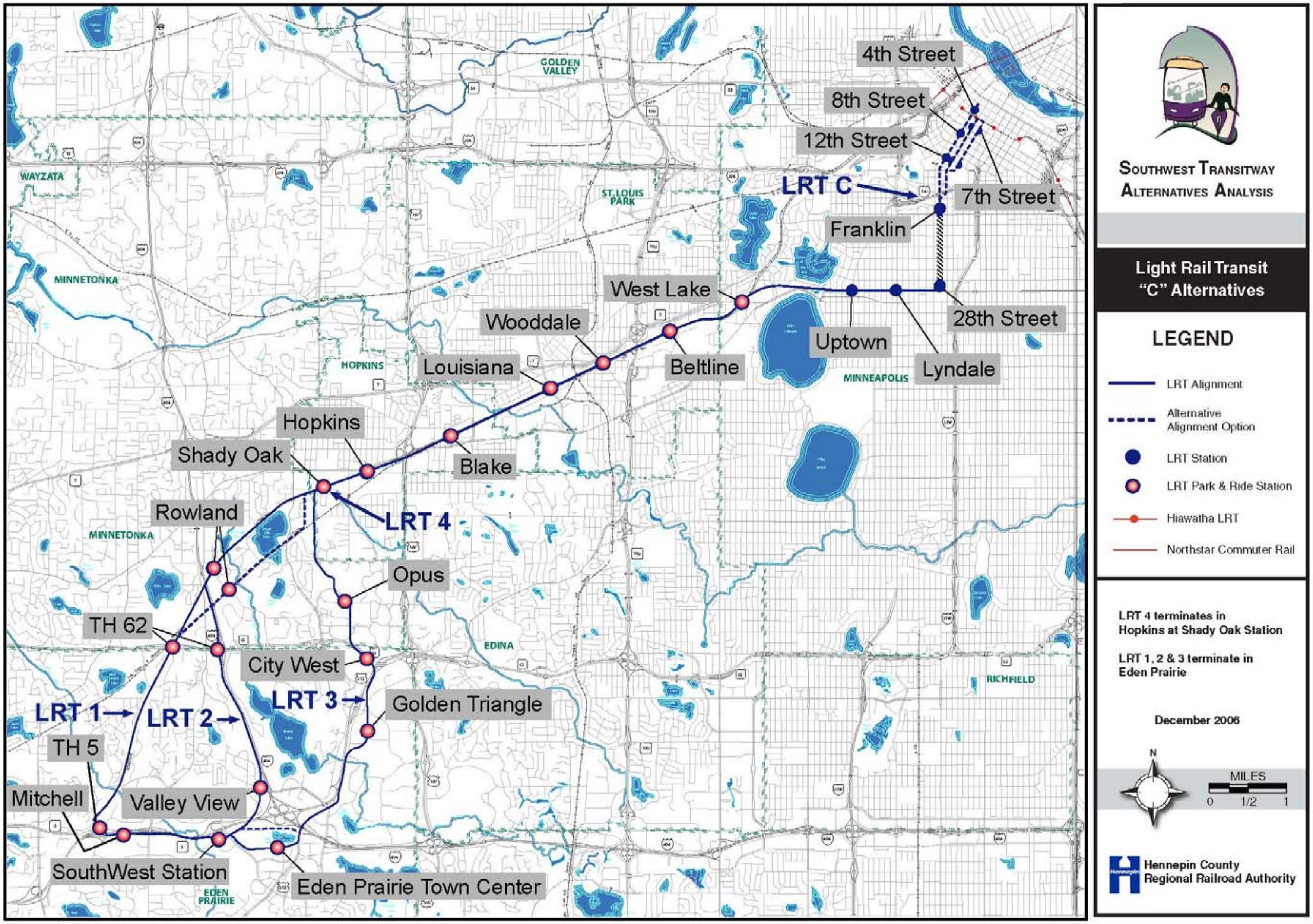

*Source: Parsons Brinckerhoff, 2006.*

## Figure 7 LRT A Alternatives




*Source: Parsons Brinckerhoff, 2006.*

**Figure 8 LRT C Alternatives**




Source: Parsons Brinckerhoff, 2006.

# 9. Region and Study Area Level Travel Demand Forecasts

This section presents the results of the travel demand forecasts at the regional and study area level. Measures include both total transit linked and total unlinked trips. Unlinked trips are equivalent to the sum of one boarding for each segment of a trip,(i.e. including any transfers.) Linked trips count only complete trips from origin to destination once, and do not include transfers. Regional vehicle-miles and vehicle hours of travel are also included.

The unlinked and linked regional trips (Figures 9 and 11) show the No-Build with the lowest number of both linked and unlinked trips, followed by the Enhanced Bus option.

Based on the linked trip data in Figure 11, the Enhanced Bus option adds about 5,000 new transit trips representing an increase of 1.3% of the regional total transit trips. The LRT 1 alignment options add approximately 3,800 to 4,500 new transit trips above the Enhanced Bus option. The LRT 2 alignments add between 4,900 and 5,600 new transit trips over the Enhanced Bus option, while the LRT 3 options add between 6,800 – 7,500 new transit trips, primarily due to additional market access in the southern area.

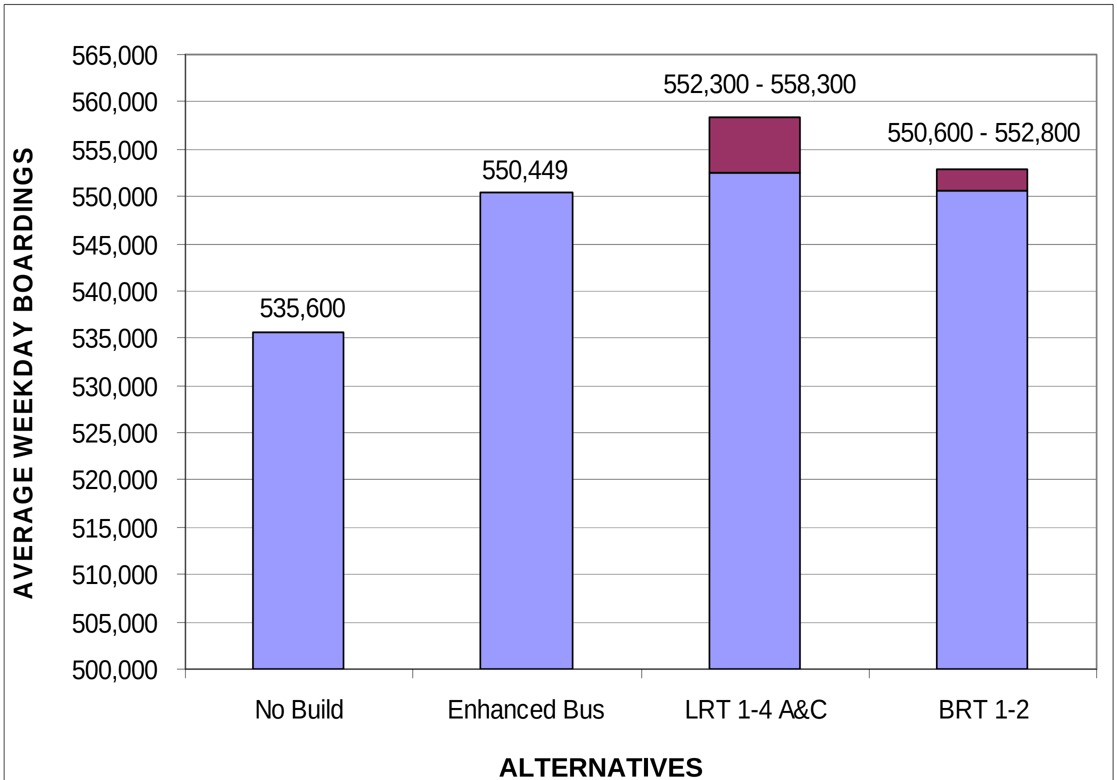
The truncated LRT 4 options add between 2,400 to 3,100 new transit trips, as the market area is somewhat smaller.

The new transit trips for the BRT options are much less than even the LRT 4 options, though the BRT 2 alignment may have some potential for up to 2,300 new transit trips.

The LRT A and LRT C alignments are roughly equivalent in overall new transit trips, with the longer travel time for the LRT C alignments reducing longer trips, while the better access and larger markets served south of downtown increasing the demand.

Regional unlinked trips (i.e., boardings) generally follow the same pattern in Figure 9, as do study area unlinked trips in Figure 10.

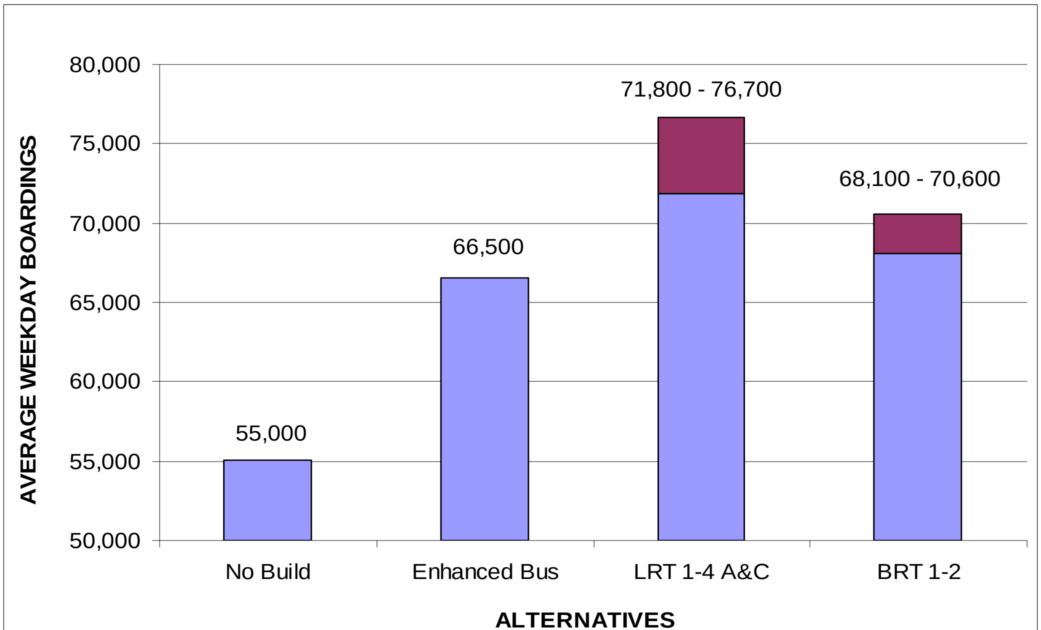
**Figure 9 Regional Average Weekday Boardings, Year 2030 (7-County Transit Boardings Including Transfers)**




Note: In order to highlight differences between alternatives, boardings axis starts at 500,000.

*Source: Parsons Brinckerhoff, 2006.*

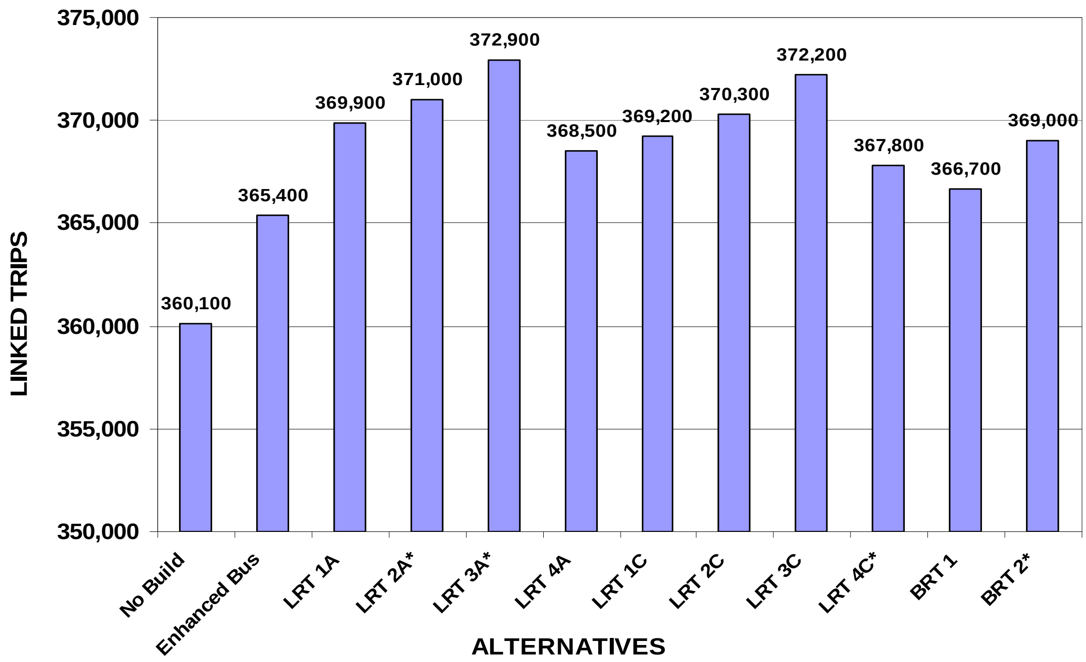
**Figure 10 Study Area Average Weekday Boardings, Year 2030 (Transit Boardings Including Transfers)**




Note: In order to highlight differences between alternatives, boardings axis starts at 50,000.

*Source: Parsons Brinckerhoff, 2006.*

**Figure 11 Average Weekday Regional Linked Trips, Year 2030 (Including New Transit Riders on Southwest Transitway AA – BRT and LRT Alternatives)**




*Estimated, Not Forecasted

Note: In order to highlight differences between alternatives, boardings axis starts at 350,000.

*Source: Parsons Brinckerhoff, 2006.*

# 10. Route Level Travel Demand Forecasts

This section presents the results of the travel demand forecasts at the route level, showing total daily boardings for the LRT and BRT lines. A general summary of findings indicates that boardings on the LRT lines increase from the LRT 1 alignments to the LRT 3 alignments, increasing from about 24,000 to 28,000 daily boardings, with the LRT 2 alignments at about 25,000 boardings per day. This change is primarily because of greater market accessibility for the LRT 3 alignment. A small increase also occurs between the LRT A to the corresponding LRT C alignments, with the LRT C alignments exhibiting about 1,000 more trips than the corresponding LRT A alignment.

Overall travel times on the LRT A and C alignments are very similar, while the LRT C alignment serves the uptown area more effectively than the LRT A alignments, but lacks the interline advantage with the current Hiawatha line. The LRT 4 alignments show a drop in boardings to about 19,000-20,000, as expected because of the smaller market served.

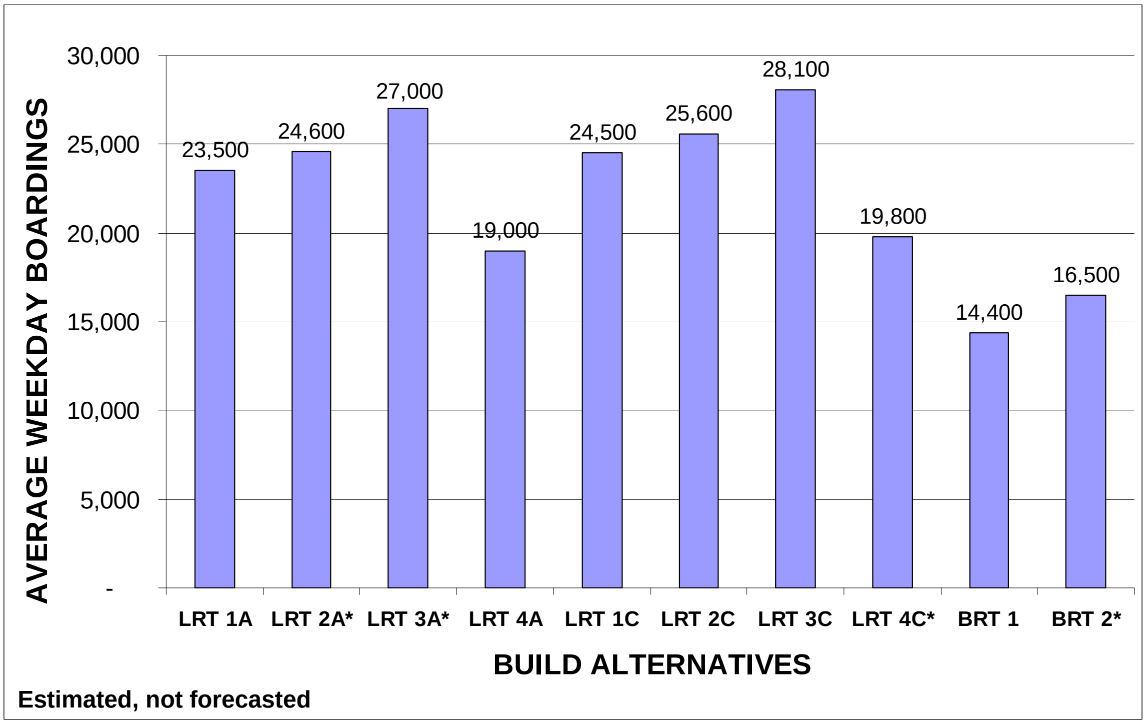
Boardings for the interpolated LRT alternatives fall within the range of boardings for modeled alternatives; all of which is shown on Figure 12.

The BRT boardings represent only the station-to-station limited stop BRT bus lines that use the BRT guideway, and do not include other express lines that may use portions of the exclusive guideway. The BRT limited stop boardings range from 14,400 for the BRT 1 alternative to 16,500 for the BRT 2 alignment.

An alignment variant to the "A" alternatives involves entering downtown Minneapolis via Hennepin Avenue from the Van White Boulevard Station, dropping the Royalston Station and by-passing the proposed Intermodal Station. New downtown Minneapolis stations would be at 12th and 8th streets, and this alignment would remain interlined with Hiawatha, serving __through Metrodome stations though not serving the Warehouse and proposed Intermodal Stations. Off-Model demand estimates included considerations of travel time (somewhat longer than the Royalston alignment), loss of station access (at Royalston, Intermodal and 1st Avenue) and gain of downtown accessibility (at 12th and 8th Streets). Based on this general analysis, there is no net change in demand, as demand is lost due to the longer travel time and loss of Royalston, Intermodal and 1st Avenue Stations, but gained due to better downtown accessibility

The BRT boardings represent only the station-to-station limited stop BRT bus lines that use the BRT guideway, and do not include other express lines that may use portions of the exclusive guideway.

**Figure 12 Average Weekday LRT and BRT Boardings, Year 2030**




*Source: Parsons Brinckerhoff, 2006.*

# 11. Station Boardings and Alightings

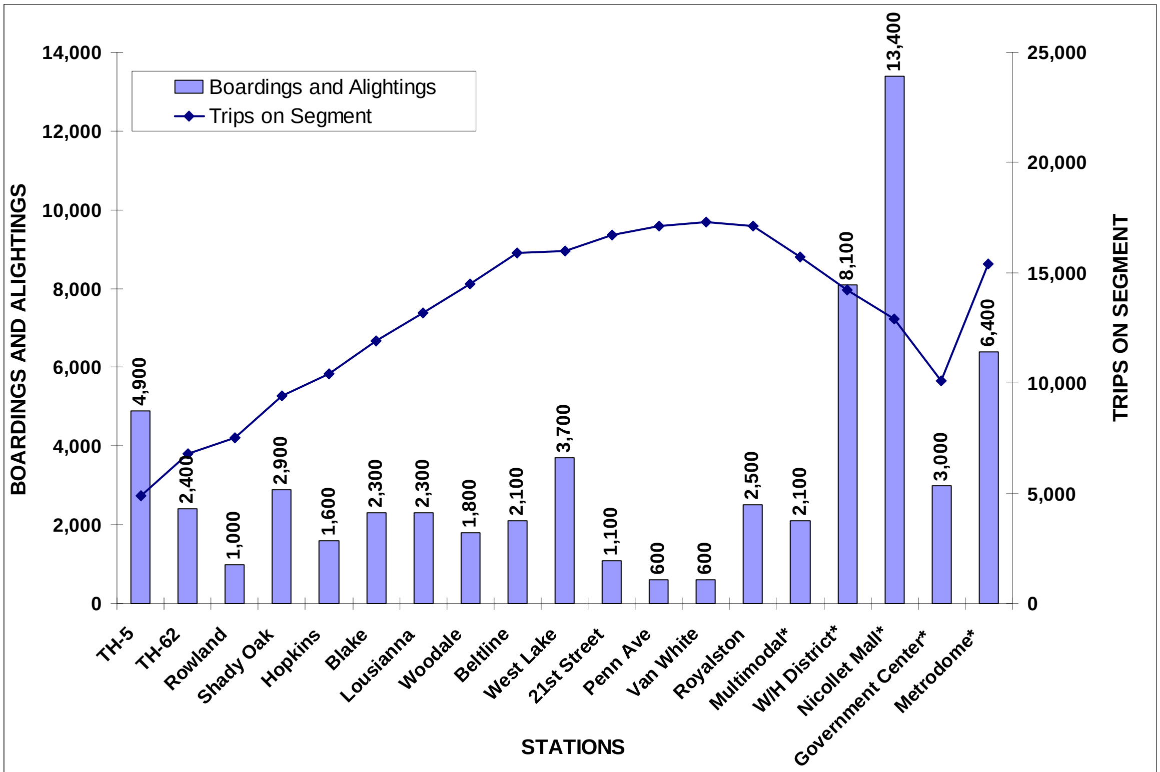
This section presents the results of the travel demand forecasts at the station level for the LRT alternatives. Key observations from these charts include:

- The TH 5 Station for the LRT 1 alternatives shows the greatest single station demand; this is substantially decreased with the Mitchell Station in LRT 2 and 3 alternatives.

- The LRT 2 alternative attracts large demand at the SouthWest Station.
- The LRT 3 alternative stations at Eden Prairie Center, Golden Triangle and Opus show substantial boardings and alightings, which contributes to the overall increase in ridership vs. the 1 and 2 alignments.
- Downtown station activity focuses on the 8th Street and 4th Street Stations.
- The LRT 4 alternatives show a large increase at the Shady Oak Station activity, in relation to the 1, 2 or 3 alignment alternatives.
- Penn Avenue and Van White Boulevard on the A alignment alternatives show low boarding and alighting activity.
- Peak loads for the A alignment alternatives occurs between Van White and Royalston.
- Peak loads for the C alignment alternatives occurs between West Lake and Uptown Stations.

Figures 13-22 show the boardings and alightings at each station for the LRT alternatives. For each alternative, the first chart shows the total boardings and alightings at for each station; the second chart shows the mode of access (i.e. walk, park-and-ride, passenger drop-off, or transit transfer) for the LRT boardings.

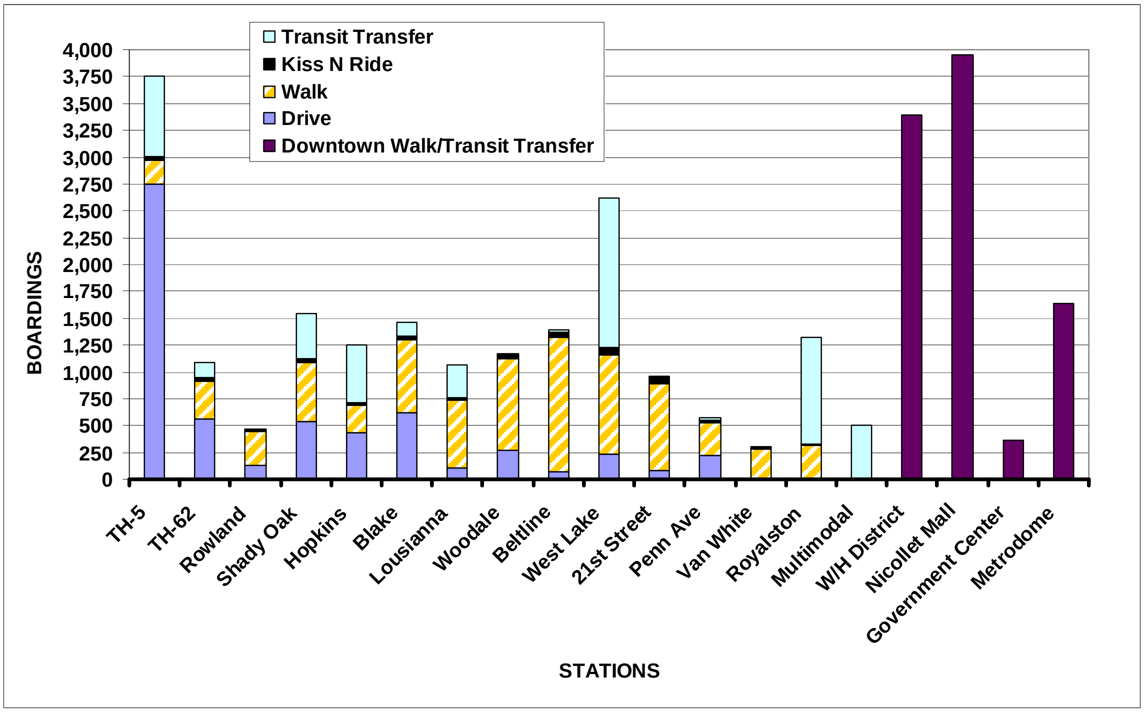
**Figure 13 LRT 1A Average Weekday Boardings and Alightings per Station / Passengers on Each Segment between Stations, Year 2030**




**Indicates stations that interline with existing Hiawatha Line*

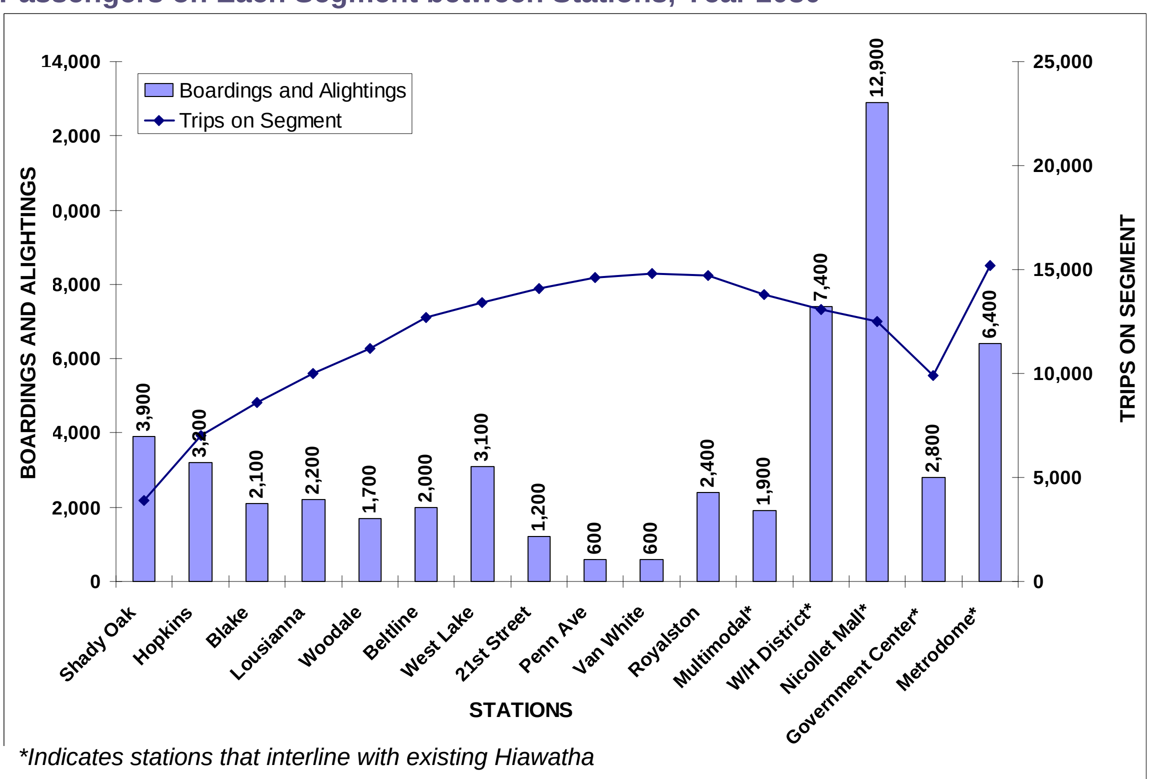
*Source: Parsons Brinckerhoff, 2006.*

**Figure 14 LRT 1A Average Weekday Boardings By Mode of Access for Each Station, Year 2030**



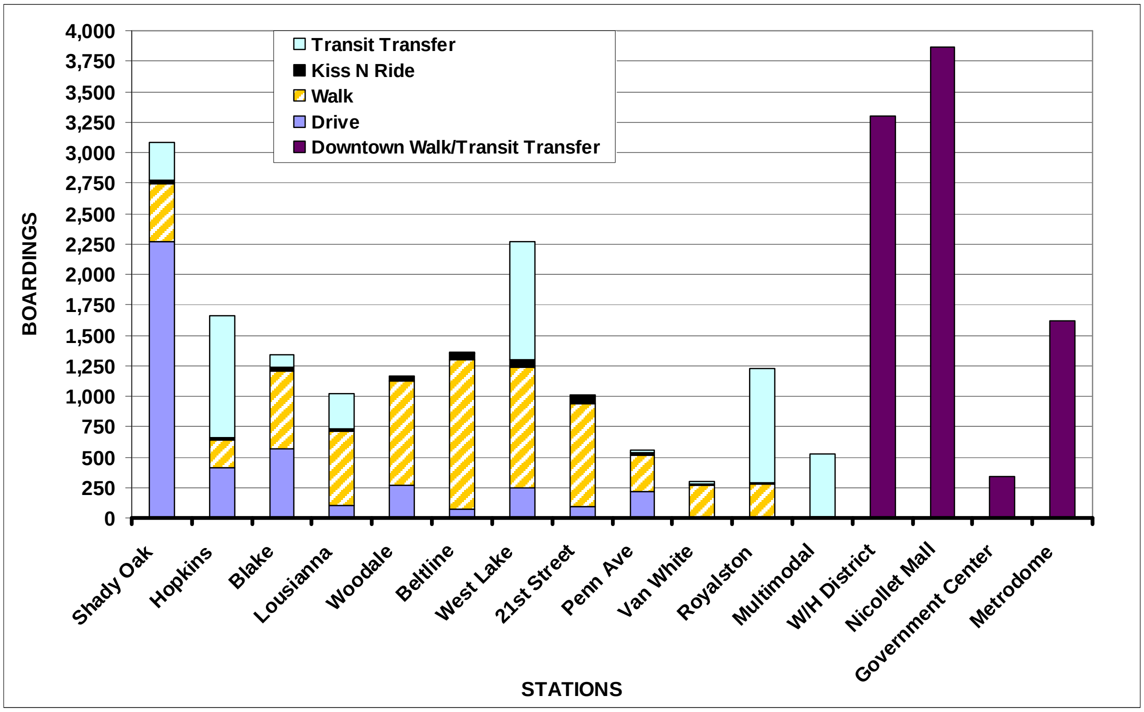

*Source: Parsons Brinckerhoff, 2006.*

**Figure 15 LRT 4A Average Weekday Boardings and Alightings per Station / Passengers on Each Segment between Stations, Year 2030**



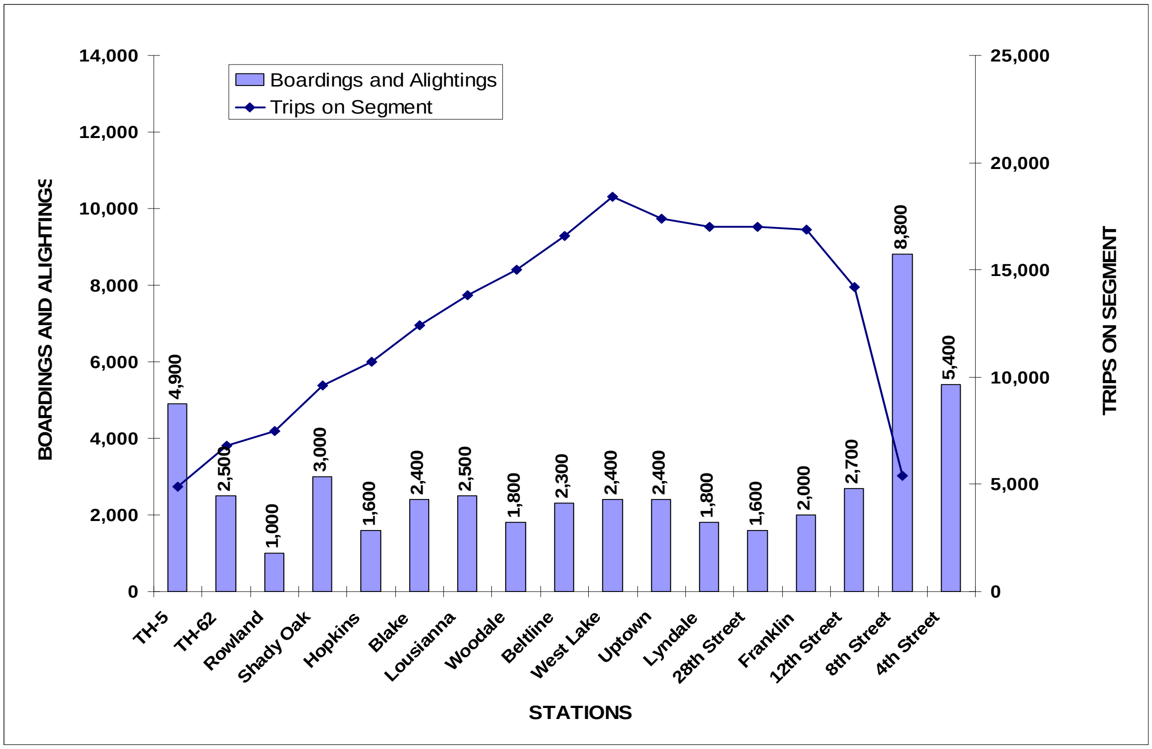

*Source: Parsons Brinckerhoff, 2006.*

## Figure 16 LRT 4A Average Weekday Boardings By Mode of Access for Each Station, Year 2030



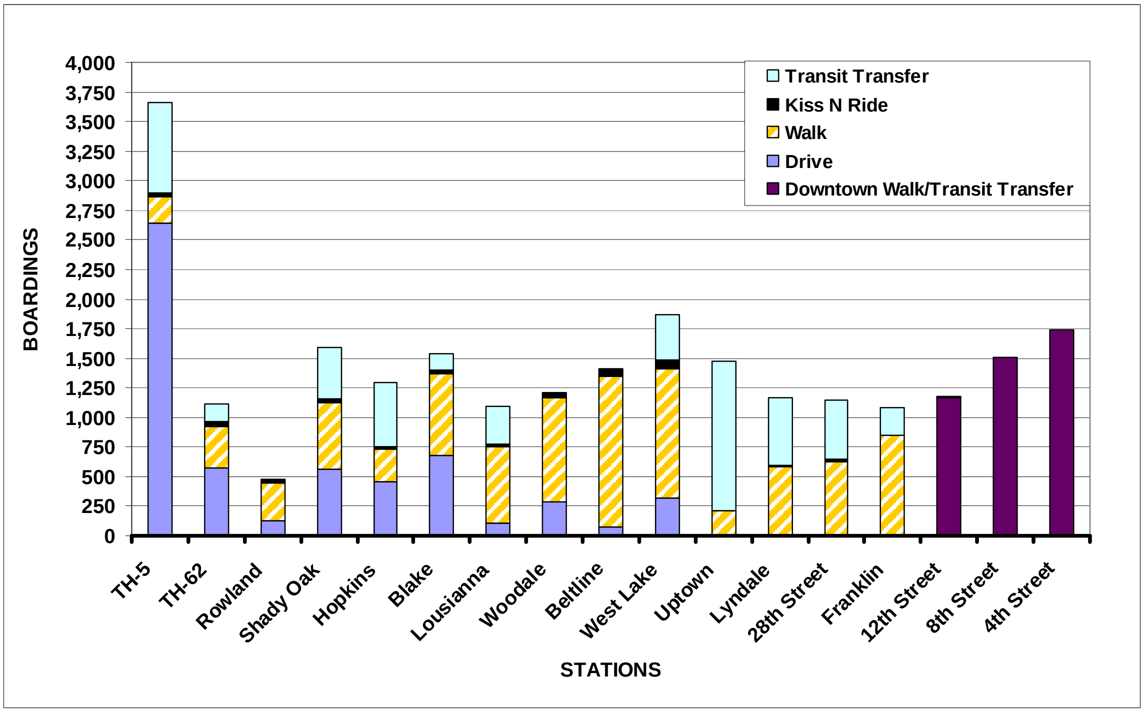

Source: *Parsons Brinckerhoff, 2006.*

## Figure 17 LRT 1C Average Weekday Boardings and Alightings per Station / Passengers on Each Segment between Stations, Year 2030



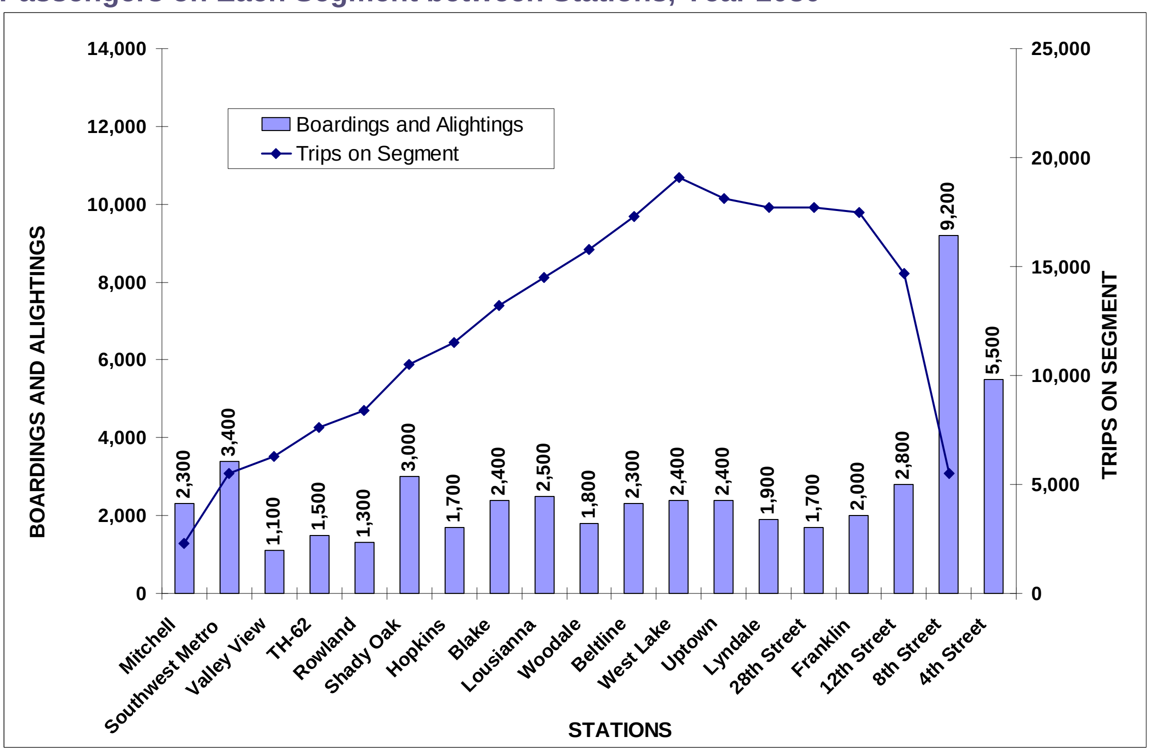

Source: *Parsons Brinckerhoff, 2006.*

### Figure 18 LRT 1C Average Weekday Boardings By Mode of Access for Each Station, Year 2030



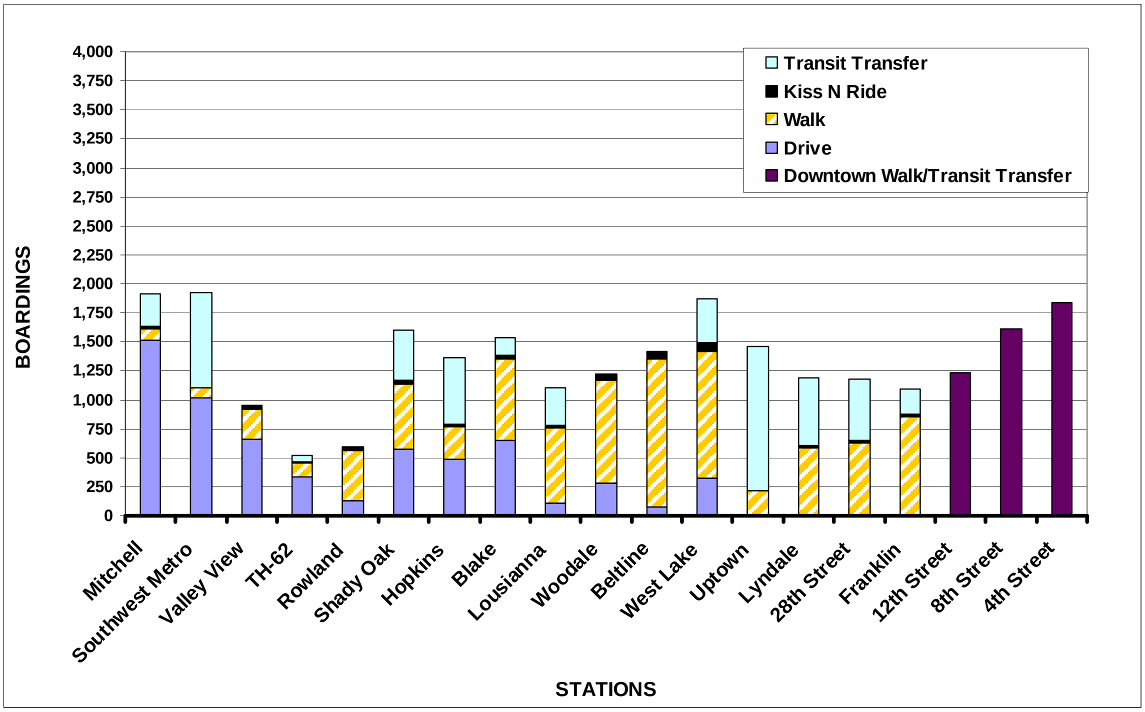

*Source: Parsons Brinckerhoff, 2006.*

### Figure 19 LRT 2C Average Weekday Boardings and Alightings per Station / Passengers on Each Segment between Stations, Year 2030



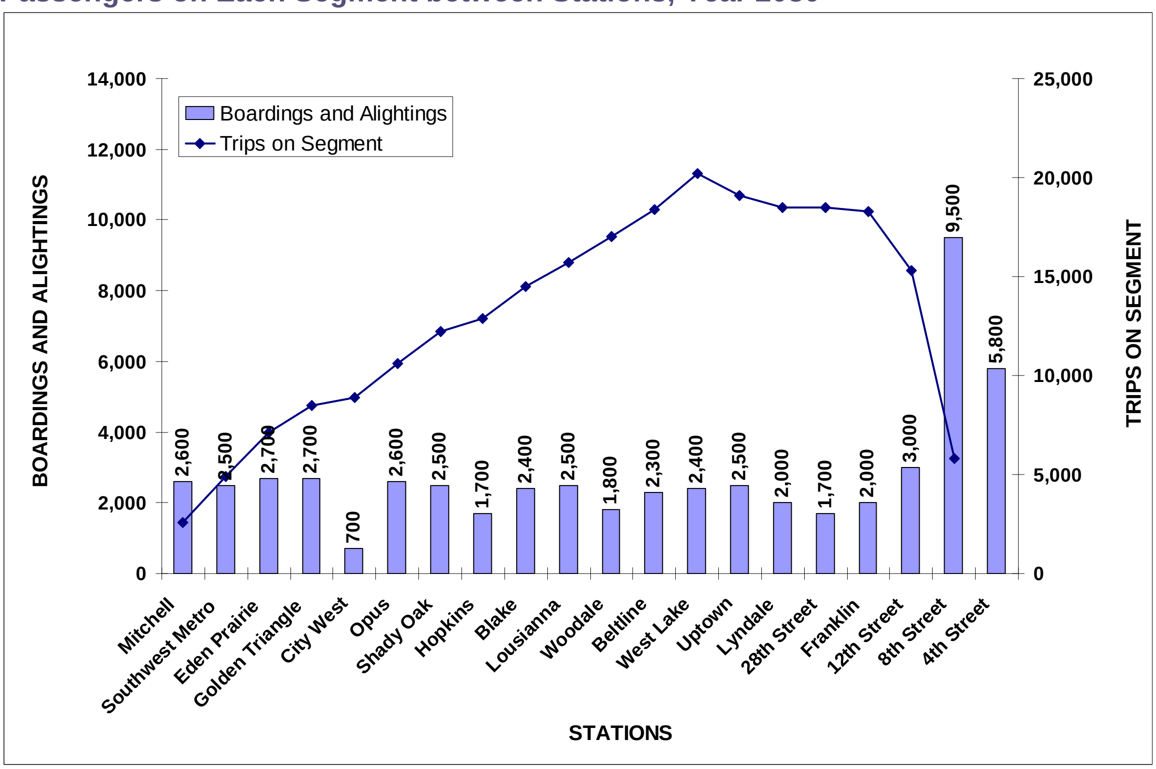

*Source: Parsons Brinckerhoff, 2006.*

## Figure 20 LRT 2C Average Weekday Boardings By Mode of Access for Each Station, Year 2030



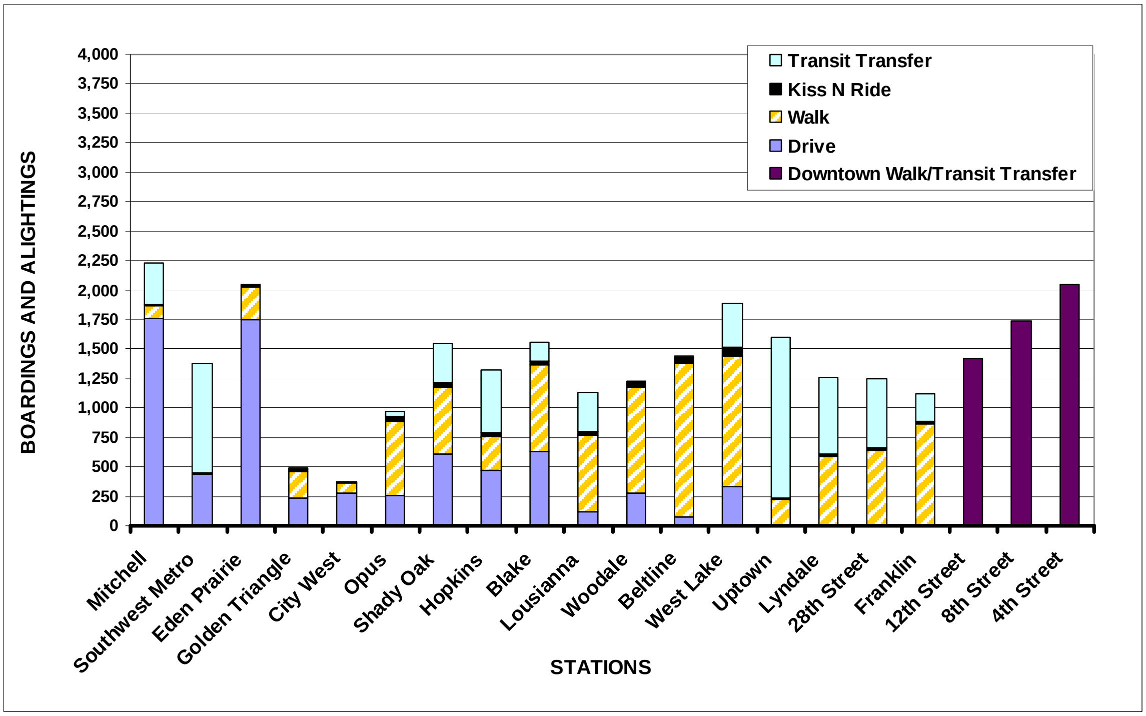

*Source: Parsons Brinckerhoff, 2006.*

## Figure 21 LRT 3C Average Weekday Boardings and Alightings per Station / Passengers on Each Segment between Stations, Year 2030




*Source: Parsons Brinckerhoff, 2006.*

**Figure 22 LRT 3C Average Weekday Boardings By Mode of Access for Each Station, Year 2030**




*Source: Parsons Brinckerhoff, 2006.*

## 12. Park-and-Ride Station Demand

This section presents the results of the forecasted demand for parking spaces for each park-and-ride station for each alternative. The parking spaces demand is determined by taking the number of drive access trips to each transit station, and dividing this number by an automobile occupancy rate of 1.1 (without accounting for daily turnover of spaces.) The results are summarized in Table 2. Key observations from this table include:

- In all alternatives, the southern most stations show the largest demand for parking spaces consistent with their larger catchment areas.
- In LRT 1 alternatives, the TH 5 park-and-ride lot has the largest demand for spaces.
- In LRT 2 and 3 alternatives, the demand for parking spaces is more evenly spread across the southern stations, such as the SouthWest, Mitchell, and (in LRT 3) the Eden Prairie Center Stations.
- The Penn Ave and 21st Street Stations for the LRT A alternatives show the lowest demand for parking spaces.
- The Shady Oak Station shows more parking demand in the LRT 4 alternatives than in alternatives LRT 1-3. This is likely due to the fact the Shady Oak Station is the beginning of the LRT line in Alternative 4, but is an intermediate station in the other LRT alternatives.

**Table 2 Park-and-Ride Spaces Demand, Year 2030**

| Station | EB | 1A | 2A* | 3A* | 4A | 1C | 2C | 3C | 4C* | BRT1 |
|---|---|---|---|---|---|---|---|---|---|---|
| Penn Avenue | | 70 | 70 | 70 | 70 | | | | | 60 |
| 21st Street | | 30 | 30 | 30 | 30 | | | | | 50 |
| West Lake | | 140 | 150 | 140 | 110 | 150 | 150 | 140 | 120 | 90 |
| Beltline | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 40 |
| Wooddale | | 80 | 80 | 90 | 80 | 90 | 90 | 90 | 90 | 80 |
| Louisiana | | 40 | 40 | 40 | 30 | 40 | 40 | 40 | 40 | 30 |
| Texas | 160 | | | | | | | | | |
| Blake | | 210 | 200 | 200 | 190 | 220 | 210 | 200 | 190 | 200 |
| Hopkins | 190 | 190 | 200 | 210 | 230 | 200 | 210 | 210 | 230 | 280 |
| Shady Oak | 30 | 220 | 230 | 240 | 880 | 230 | 230 | 250 | 900 | 20 |
| Rowland | | 50 | 50 | | | 50 | 50 | | | 30 |
| TH 62 | | 200 | 110 | | | 200 | 110 | | | 50 |
| Valley View | | | 210 | | | | 210 | | | |
| Opus | | | | 80 | | | | 80 | | |
| City West | | | | 90 | | | | 100 | | |
| Golden Triangle | | | | 70 | | | | 70 | | |
| Eden Prairie | | | | 630 | | | | 640 | | |
| SouthWest | 670 | | 590 | 350 | | | 600 | 360 | | |
| Mitchell Station (Limited Stop A Route) | 230 | | | | | | | | | |
| TH 5/Mitchell | | 1,180 | 700 | 780 | | 1,120 | 710 | 790 | | 1,190 |
| **Total** | **1,280** | **2,430** | **2,680** | **3,040** | **1,640** | **2,320** | **2,630** | **2,990** | **1,590** | **2,120** |

*Source: Parsons Brinckerhoff, 2006.*

# Appendix A:  Updated Travel Demand Forecasts For LRT Alternatives

Near the conclusion of the Southwest Transitway AA Study, two additional light-rail transit alternatives were modeled: the LRT 3A alternative and the LRT 1A alternative with the addition of new streetcar service along the Midtown Greenway Corridor.

As a result of this work, LRT 3A, which was previously estimated, now has a forecast based on an actual model run.  Also, a review of the Midtown Greenway Corridor Streetcar model results revealed the existence of duplicate walk access links – with different walk times – in the transit network at the 28th Hiawatha LRT Station.  As a result of this review, walk access links in the LRT 1C and LRT 2C networks were adjusted to achieve consistency with the other alternatives.  These changes did not affect light-rail ridership within the Southwest Transitway study area; however, the adjustments have resulted in a revision to system-wide measures, specifically the “New Transit Trip” measure.

The results of the LRT 1A with the Midtown Greenway Corridor Streetcar modeling are described in *Technical Memorandum on Travel Demand Forecasting for LRT 1A with Midtown Streetcar.*

This memorandum discusses the results of the LRT 3A model run, as well as the revised system-wide measures for the alternatives affected by changes to the Hiawatha 28th Street Station walk access links.

## New Transit Trips

The changes to the walk access links for the 28th Station lead to increased Hiawatha LRT ridership for LRT 1C and LRT 2C.  Because these changes occurred on the Hiawatha line, LRT ridership within the Southwest Transitway did not change for the LRT 1C and LRT 2C alternatives.

Increases in the Hiawatha LRT line, however, did change the number of new transit trips for LRT 1C and LRT 2C, since this measure includes the difference in ***regional*** transit trips between each build alternative and the Enhanced Bus alternative.

In the updated model runs, the number of new transit trips (described as *New Riders* in the evaluation measures) increased from 3,100 to 3,800 for LRT 1C, and from 4,730 to 4,900 for LRT 2C.

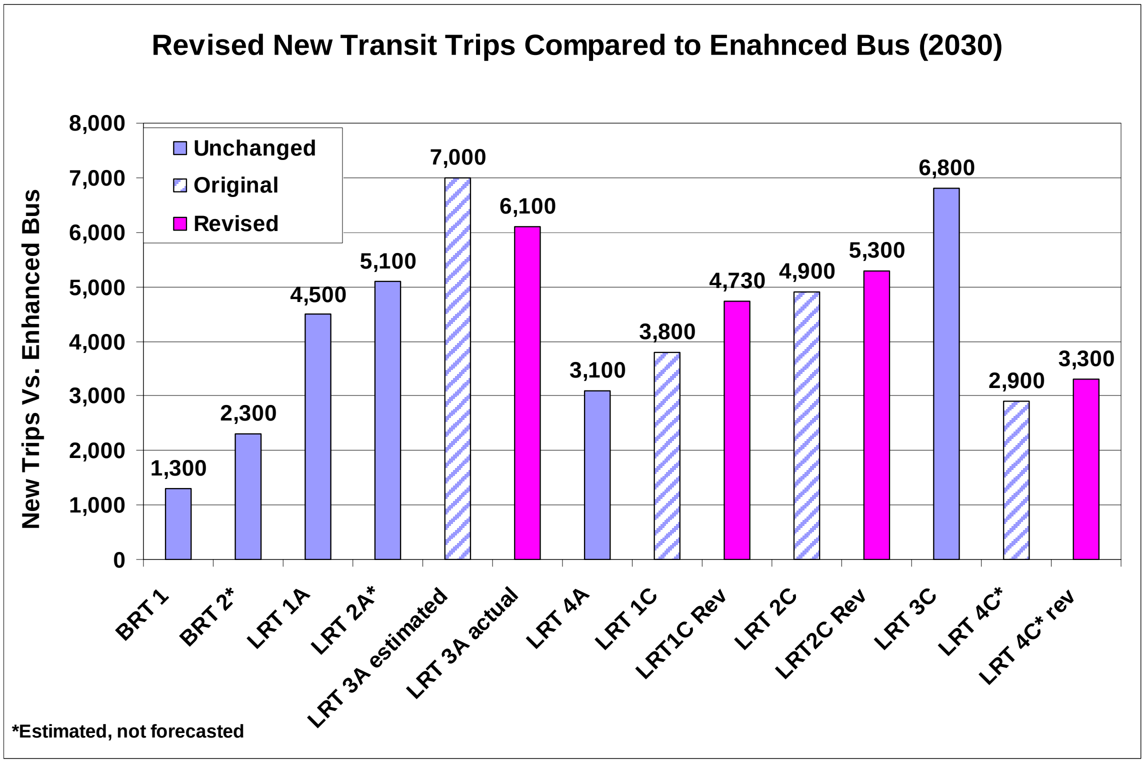
The increase in LRT 1C also affected LRT 4C new transit trips, which were estimated using the ratio of LRT 1C to LRT 1A.  New transit trips for LRT 4C increased from 2,900 to 3,300.

The actual modeled LRT 3A new transit trips were lower than the original estimated value: 6,100 new transit trips versus 7,000 new transit trips.  Originally, the LRT 3A new transit trips were estimated using the ratio of LRT 3C new transit trips to LRT 1C new transit trips; consequently, the original LRT 3A estimate was high due to the lower value of LRT 1C new transit trips prior to revisions to the 28th Street Station walk access links.

As stated above, these changes in new transit riders resulted from increases in the Hiawatha LRT; transit ridership within the Southwest Transitway remained the same.

Figure 1 summarizes the revised new transit trips for each of the LRT and BRT alternatives.

**Figure A-1: Revised New Transit Trips Compared to Enhanced Bus (2030)**




## Southwest Corridor Boardings

The actual modeled boardings for LRT 3A changed only slightly from the previously estimated boardings. The original estimate for LRT 3A average weekday boardings was 27,000. The modeled value was 26,000 average weekday boardings, about 1,000 lower.

Figure 2 shows the revised average boardings for each alternative.

The boardings and alightings at each LRT 3A station were similar to their equivalent stations on the LRT 3C or LRT 1A stations. Southwest of the Beltline Station, the boardings and alightings were nearly the same as those for LRT 3C stations. As was the case with LRT 3C, boardings and alightings were evenly distributed across the southern-most stations of Mitchell, SouthWest, Eden Prairie, and the Golden Triangle; this pattern contrasted with the LRT 1 and LRT 2 alternatives, where boardings and alightings in the southwest were more concentrated at one or two stations.

Northeast of the Beltline Station, boardings and alightings were very similar to those for LRT 1A stations, with high boardings and alightings at the West Lake Station and the downtown stations.

Figure 3 summarizes the average weekday boardings and alightings for LRT 3A.

Figure A-2: Revised Average Weekday LRT and BRT Boardings (2030)

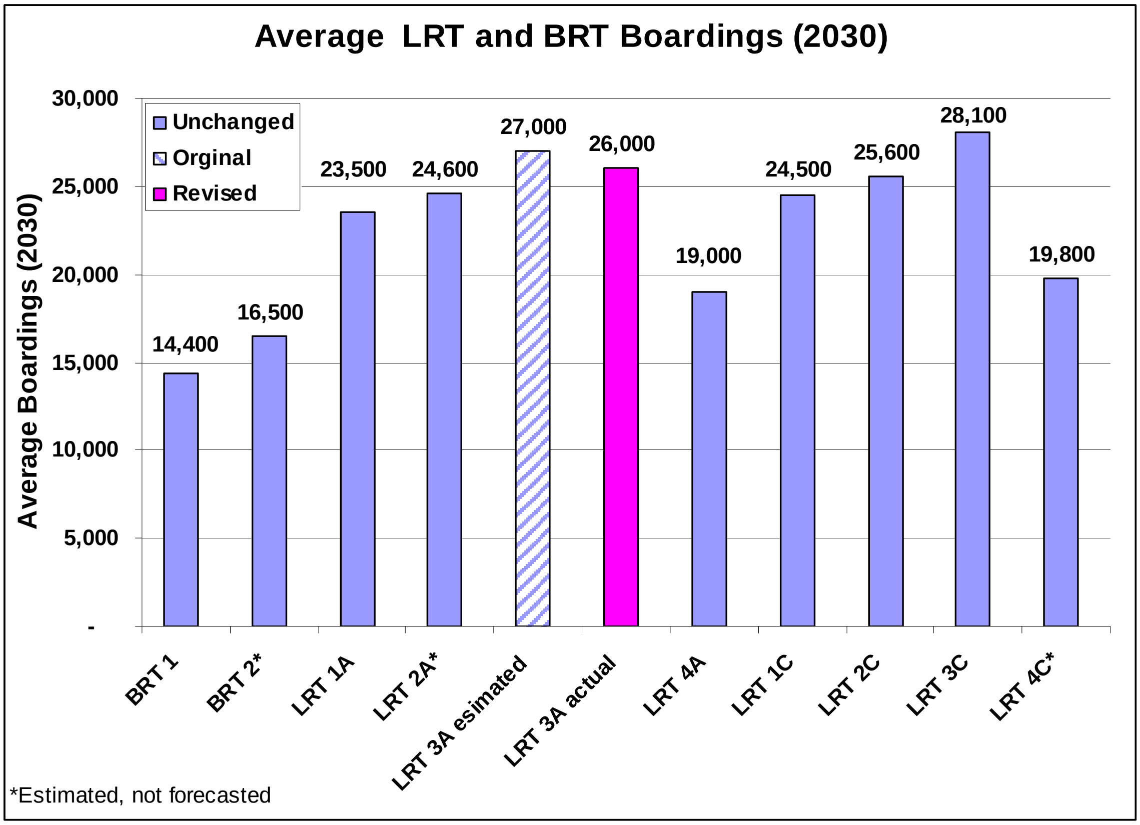



Figure A-3: LRT 3A Average Daily Boardings and Alightings (2030)

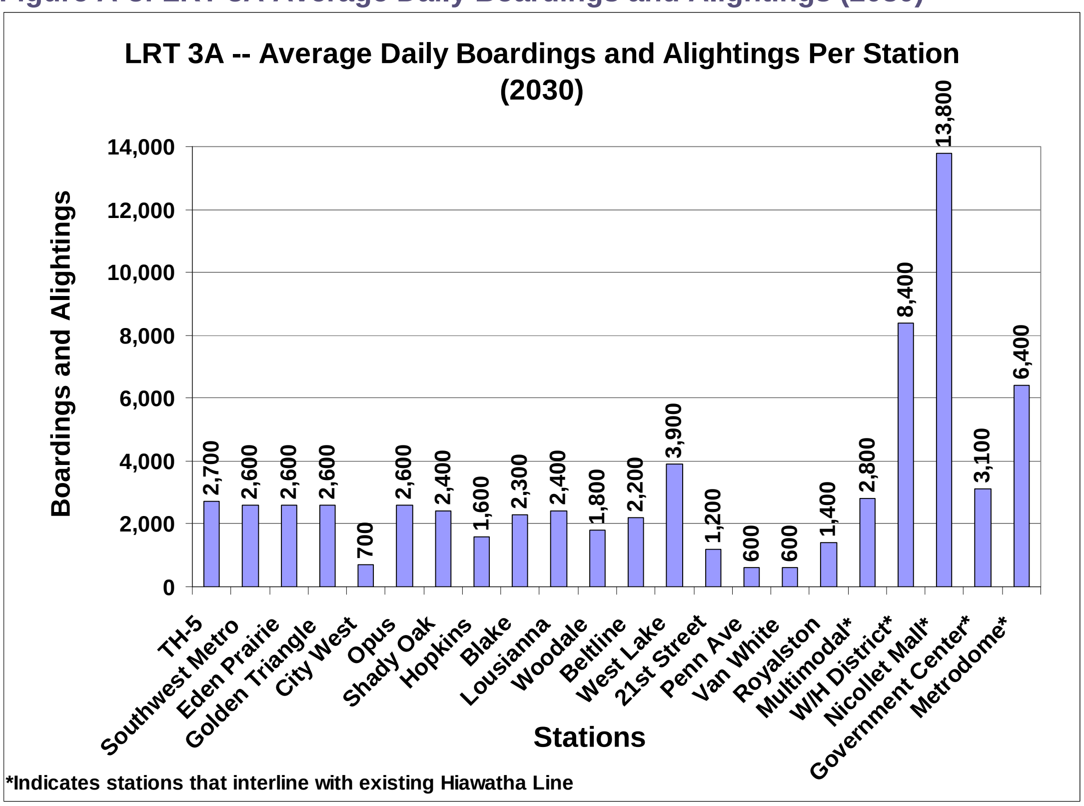
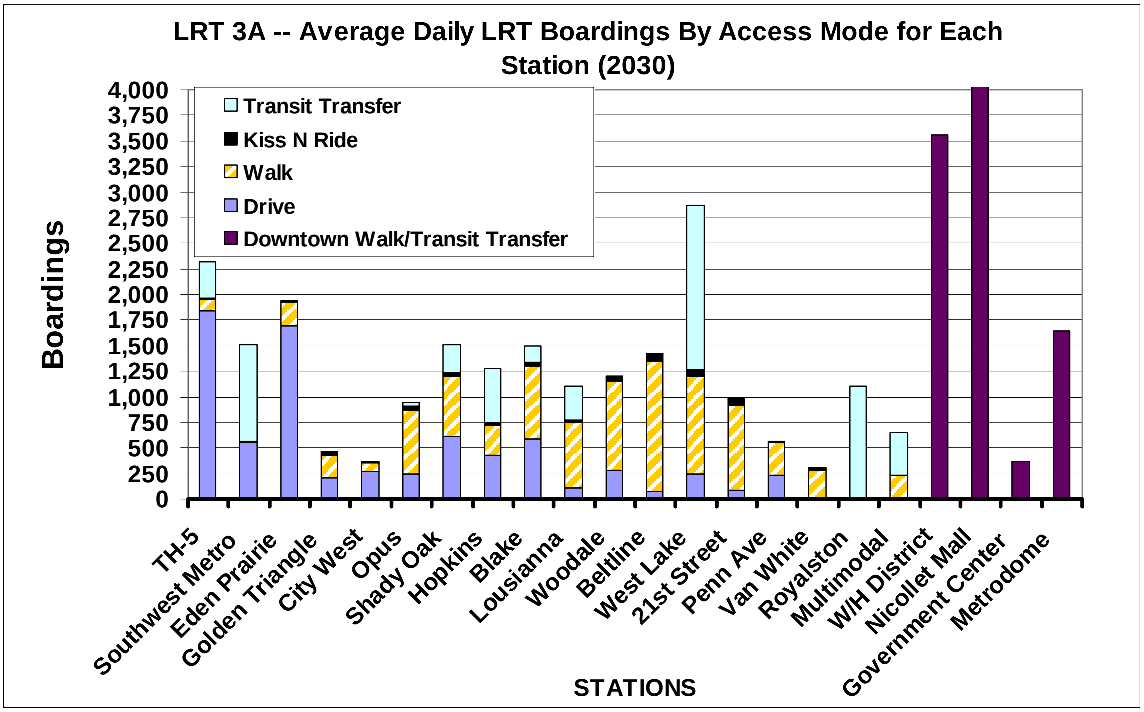


Figure 4 breaks down the average weekday boardings for LRT 3A stations by mode of access (i.e. walk, park-and-ride, passenger drop-off).

Parking demand for LRT 3A park-and-ride stations is also similar to the demand at equivalent park-and-ride stations in the LRT 1A and LRT 3C alternatives. LRT 3A parking demand was originally estimated using the demand for LRT 1A and LRT 3C stations. The actual modeled LRT 3A total parking demand was within approximately 50 spaces of the estimated demand, and the differences between individual stations was within 10 spaces. Table 1 compares the original estimated parking demand for LRT 3A with the actual modeled demand.

**Figure A-4: LRT 3A Average Daily LRT Boardings By Access Mode (2030)**




## Preliminary Cost-Effectiveness Index

Since systemwide transit ridership also affect the cost-effectiveness index, the preliminary CEI's for LRT 1C and LRT 2C also decreased with the added Hiawatha LRT ridership. Due to the changes to the Hiawatha LRT 28$^{th}$ Street Station, the LRT 1C preliminary CEI decreased from $37 to $33. The revised LRT 2C preliminary CEI decreased $38 to $35.

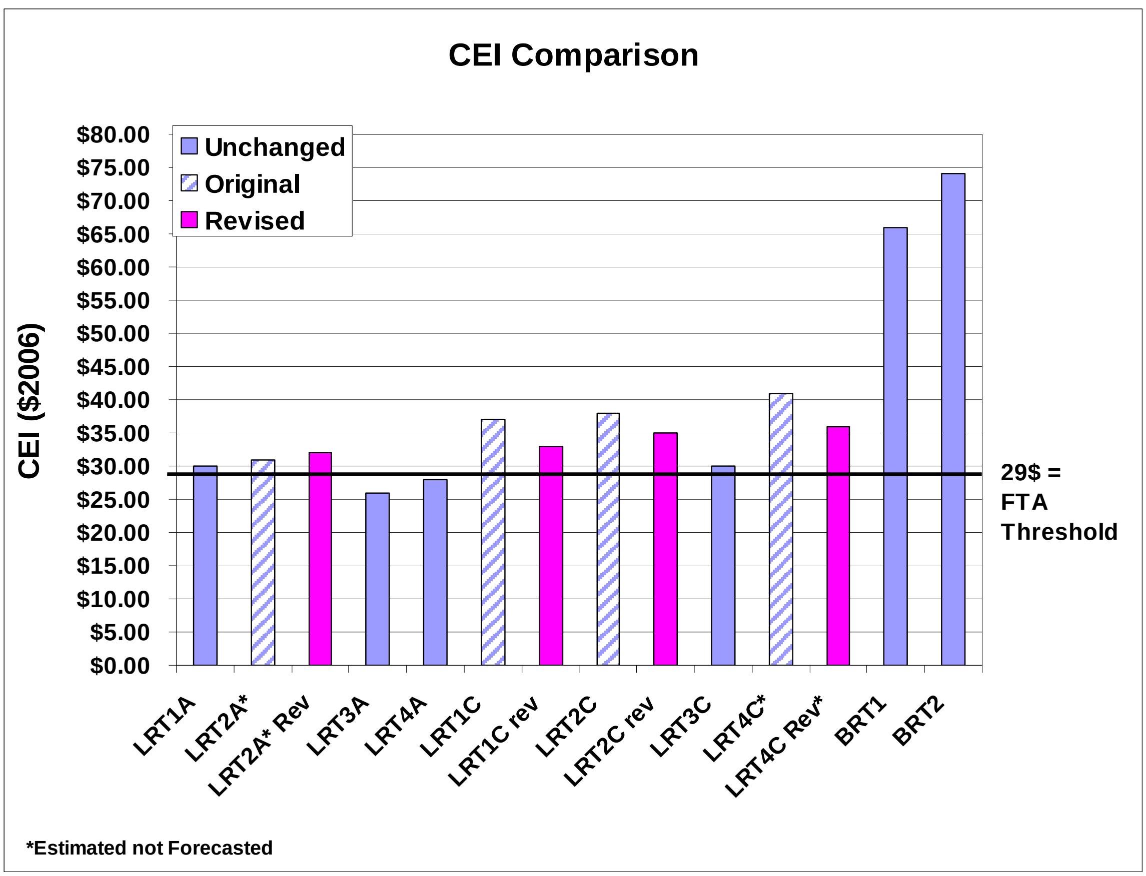
Changes to the LRT 1C and LRT 2C Hiawatha ridership also changed the estimated preliminary CEI's for the non-modeled LRT 2A and LRT 4C alternatives. After revisions, LRT 2A preliminary CEI rose from $31 to $32, and LRT 4C dropped from $41 to $36.

The preliminary CEI for LRT 3A did not change; the actual LRT 3A preliminary CEI of $26 was the same as the original estimated value.

### Table A-1: Actual Versus Estimated Park-and-Ride Demand For LRT 3A Park-and-Ride Stations

| Station | 3A Estimated | 3A Actual | Difference |
|---|---|---|---|
| Penn Avenue | 70 | 70 | 0 |
| 21st Street | 30 | 30 | 0 |
| West Lake | 140 | 140 | 0 |
| Beltline | 20 | 20 | 0 |
| Wooddale | 90 | 90 | 0 |
| Louisiana | 40 | 40 | 0 |
| Blake | 200 | 200 | 0 |
| Hopkins | 210 | 210 | 0 |
| Shady Oak | 240 | 250 | +10 |
| Opus | 80 | 80 | 0 |
| City West | 90 | 100 | +10 |
| Golden Triangle | 70 | 70 | 0 |
| Eden Prairie | 630 | 640 | +10 |
| SouthWest | 350 | 360 | +10 |
| TH 5/Mitchell | 780 | 790 | +10 |
| **Total** | **3,040** | **3,090** | **+50** |

### Figure A-5: Revised Cost Effectiveness Index



# Appendix B:  Updated Travel Demand Forecasts For BRT Alternatives

A final review of the BRT 1 model results showed that the travel time for the Northbound Limited Stop A route was approximately two minutes slower than for the Southbound Limited Stop A route.  The Limited Stop A route is one of two limited stop routes that run along the exclusive busway and stop at each BRT station in the BRT 1 alternative.

As a result this review, the travel time for the northbound direction of this route was revised to match the southbound direction, and another model run was conducted for BRT 1.  This appendix documents the results of this updated model run.

## Results of Updated Model Run

The lower travel time for the Northbound Limited Stop A route lead to a slight increase in the number of average weekday boardings for the BRT 1 alternative, from 14,400 boardings to 14,800 boardings.  Since BRT 2 boardings were estimated using the output from the BRT 1 model run, the BRT 2 average weekday boardings also increased; estimated BRT 2 rose from 16,500 to 17,000 boardings.

Revisions to the Northbound Limited Stop A route also resulted in slightly decreased preliminary cost-effectiveness indices for the BRT 1 and BRT 2 alternatives.  The preliminary CEI for BRT 1 decreased from $68 to $61 dollars, and from $73 to $66 for BRT 2.

The number of new riders did not change in the updated model runs.

Table B-1 summarizes the differences between the updated and the revised BRT model runs.

### Table B-1: Original and Updated BRT Model Results

| | Alternative | Original Model Run | Updated Model Run | Difference |
|---|---|---|---|---|
| **Average Weekday Boardings** | BRT 1 | 14,400 | 14,800 | +400 |
| | BRT 2 | 16,500 | 17,000 | +500 |
| **Preliminary CEI** | BRT 1 | $66 | $61 | -$5 |
| | BRT 2 | $73 | $68 | -$5 |

## *Southwest Transitway Alternatives Analysis*

# *Technical Memorandum No. 5*
# *Operating Plans*

***Prepared for***
***Hennepin County Regional Railroad Authority***

***Prepared by:***

***PB Americas, Inc. (PB)***

***January 2007***

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# List of Tables



# List of Figures

# 1. Introduction

This technical memorandum documents the methodology, assumptions, and results of the Operations Planning task for the Southwest Transitway Alternatives Analysis (Southwest Transitway AA).

The task of developing the operating plans followed the selection of appropriate transit modes and the development of alignments (stations and routes). That process resulted in an Enhanced Bus alternative, two BRT alternatives, and eight LRT alternatives. Operating plans were developed for all eleven alternatives.

# 2. Background

Development of operating plans for the various Southwest Transitway AA alternatives began with a review of current and planned transit infrastructure and service within both the study area and the region. Additions to the current and planned transit service were identified for each alternative beginning with the Enhanced Bus alternative. The operating plans for the BRT and LRT alternative are built upon the operating plan developed for the Enhanced Bus alternative. The changes included in the Enhanced Bus alternative form the basis for the bus service enhancements included in the “build” (BRT and LRT) alternatives.

### *Study Area Existing Transit Service*

Metropolitan Council, Metro Transit, and SouthWest Metro Transit are the primary transit operators in the study area. Metro Transit operates twenty-two routes within the study area: seven local, two limited stop, and thirteen express routes. SouthWest Metro Transit operates a total of twenty-three routes: eleven local and twelve express routes. In addition, Metropolitan Council contracts for services on several routes serving the area, such as Routes 604 and 615. Operating plans developed for the Southwest Transitway alternatives assume the future (2030) service network will closely resemble the dense route structure and extensive facilities of the existing system, with route additions (in other, non-Southwest Transitway areas of the region) reflected in the regional travel model maintained by the Metropolitan Council. The following paragraph details these route additions.

### *Transit 2030 Plan*

The Metropolitan Council produces a long-range transit plan for the region called the Transit 2030 Plan. This plan is part of the Metropolitan Council’s Transportation Policy Plan (TPP), which is updated every four years and submitted to the Federal Transit Administration (FTA). This plan assumes the region will double the current transit ridership by 2030 through bus service expansion and the implementation of transitways including the Southwest Transitway. Other transitways included in the Transit 2030 plan are the Hiawatha light rail transit (LRT) line, the Northstar commuter rail service between Big Lake and Minneapolis, the Central Corridor LRT service between downtown Minneapolis, the University of Minnesota, and downtown St. Paul, the Bottineau Boulevard BRT service between Rogers and downtown Minneapolis, the I-35W BRT service from Lakeville to downtown Minneapolis, the Cedar Avenue BRT service from Lakeville to downtown Minneapolis, the Red Rock commuter rail service between Hastings and St. Paul, and the Rush Line transitway between Pine County and St. Paul.

### *Transit Infrastructure Advantages*

Through a partnership called Team Transit, Minnesota Department of Transportation (Mn/DOT,) the Metropolitan Council, transit agencies, cities and counties cooperate to provide a system of advantages for transit vehicles on the region's roadway system. These advantages include authorized use of shoulders for bus operations during congested periods, ramp meter bypasses, bus-only freeway ramps, and High Occupancy Vehicle (HOV) lanes. Currently, there are 223 miles of shoulder bus operations, 88 ramp meter bypasses, at least 4 bus-only freeway ramps, and HOV lanes on I-394 and I-35W.

Operating plans for each of the alternatives maximize the use of these travel advantages.

## 3. Methodology and Assumptions

Operating plans for each alternative were developed in a series of meetings with Metropolitan Council, Metro Transit, and SouthWest Metro Transit. The service concept for all of the alternatives is to provide high frequency, line-haul transit service to serve the transit travel needs of the study area. Based upon the transit travel needs of the study area, documented in *Technical Memorandum No.1, Purpose and Need Statemen*t, the study area warrants high frequency, line-haul transit service similar to that which exists in the I-394, I-35 W and the Hiawatha corridors. Overall service headways and hours of service included in the operating plans are on par with Hiawatha LRT operations which are 7.5 minutes peak headways and 10-20 minutes off-peak and weekends, with operations extending from approximately 4:00 a.m. to 2:00 a.m. (21-22 hours) daily. The operating plans for the Enhanced Bus, BRT, and LRT alternatives are intended to provide a comparable level of service in the Southwest Transitway area.

The first step in developing the operating plans was to identify enhancements to the existing transit system to accommodate the high volume of service warranted in the study area. This new service package evolved into the Enhanced Bus alternative. The Enhanced Bus alternative includes lengthening or truncating some existing transit routes to better connect to transit stations, increasing route frequencies, and in a few cases, adding new routes or reinstating recently discontinued routes to provide an adequate level of service to accommodate the transit travel demand.

Once the Enhanced Bus alternative was developed and reviewed by Metro Transit and SouthWest Metro Transit staff, it became the route structure basis for the BRT and LRT alternatives. In a limited number of cases under the BRT and LRT alternatives, bus routes currently operating into downtown Minneapolis were truncated at stations, which would require passengers to transfer from the feeder bus to the BRT or LRT service to complete their trips downtown. On BRT alternatives, a limited number of routes would be rerouted onto the BRT exclusive guideway into downtown Minneapolis. However, existing bus routes which offer faster service to downtown Minneapolis than could be achieved through transferring at BRT or LRT stations, or routing on the BRT alignment, would continue to operate through to downtown Minneapolis on their highway alignments, to provide maximum benefit to all transit users. Where these conditions occur, the buses may not connect at a station. In addition, at a number of stations where feeder bus service was not seen as beneficial or necessary and where coverage is provided by buses feeding adjacent stations, no feeder bus service was provided.

The study did not recommend specific service increases (in terms of frequency, or changes in alignments or travel times) on Saturday, Sunday, or during the holidays for corridor bus routes.

However, the study assumed that Saturday, Sunday and holiday service volumes increase over existing levels proportionally with the significant weekday service volume increases found within bus operating plans for the Enhanced Bus, LRT and BRT alternatives. This assumption was carried out in the operating and maintenance (O&M) annualization factor.

The annualization factor converted Saturdays, Sundays and holidays into weekday equivalents used to estimate annual O&M costs; to perform this conversion, the annualization factor applied increases in weekday service volume to the lower overall weekend service. Using this methodology, the annualization factor captured the estimated O&M costs of an increased weekend service volumes. *Technical Memorandum 8, Operating and Maintenance Costs*, provides greater detail about this annualization methodology.

# 4. Operating Plans

The operation of each alternative is described in the material which follows.

## *A. Enhanced Bus Alternative*

The Federal Transit Administration (FTA) requires the development of a baseline bus option for inclusion in an alternatives analysis study. The FTA web site defines baseline bus as:

> *… the best that can be done for mobility without constructing a new transit guideway. An acceptable baseline alternative emphasizes transportation system upgrades such as intersection improvement, minor road widening, traffic engineering actions, bus route restructuring, shortened bus headways, expanded use of articulated buses, reserved bus lanes, contra-flow lanes for buses and High Occupancy Vehicle (HOVs) on freeways, special bus ramps on freeways, expanded park/ride facilities, express and limited-stop service, signalization improvement, and timed-transfer operations.*[1]

The Enhanced Bus option is used as the basis for comparison to the build alternatives, which are defined as BRT and LRT for this study.

### Description

The Enhanced Bus alternative includes two new limited stop routes serving the study area, minor modifications to the existing express service, and restructuring of the local bus service to provide access to the two new limited stop routes. The two new limited stop routes provide bi-directional service from Eden Prairie to downtown Minneapolis on a combined frequency of 7.5 minutes during the peak periods. The new limited stop routes serve selected stops (similar to the station locations in the BRT and LRT alternatives), then travel non-stop on the regional highways using bus shoulder lanes and/or the I-394 HOV lane into downtown Minneapolis. This allows the limited stop services to offer more attractive travel times, and increases options for commuters in the corridor than operations on regular routes.

In addition to the new routes, the Enhanced Bus alternative includes increases in service frequency for many Metro Transit and SouthWest Metro Transit bus routes to improve the overall level of transit service in the corridor. These changes form the basis for the bus service enhancements recommended in all the alternatives, and in most cases are carried through as elements of all of the

[1] http://www.fta.gov

"build" alternatives.  There are also several new routes, mostly shuttle or circulator routes that operate as neighborhood circulators and feeders to the longer distance routes in the enhanced bus alternative, and function as feeder-distributor routes for the rail or bus alternatives under the BRT and LRT alternatives.

## Existing Express Bus Routes

### *SouthWest Station Express Route 690 via I-394*

Starting from SouthWest Station in Eden Prairie, this route uses TH 5, TH 212, and TH 169, using shoulder lanes on TH 169 where available, to access the I-394 HOV lane.  Buses exit I-394 at 12th Street to enter downtown Minneapolis, where buses would make multiple downtown stops at locations to be determined at a later stage of project development.

### *SouthWest Station Express Route 681 via I-35W*

Starting from SouthWest Station in Eden Prairie, this route uses TH 5, TH 212, and TH 62, using shoulder lanes where available, to access the I-35W HOV lane.  Buses exit I-35W at 11th Street to enter downtown Minneapolis, where buses would make multiple downtown stops at locations to be determined at a later stage of project development.

SouthWest Metro Transit is considering future changes to its express routes, including eliminating the off-highway portions of Route 681 and its routing through Uptown Station.  Routes 681 and 690 will continue to operate as high-frequency express routes between SouthWest Station and downtown Minneapolis, although exact routings may change.

## New Limited Stop Routes

### *Limited-Stop Route "A" – Eden Prairie, Hopkins, St. Louis Park to Downtown Minneapolis*

This route begins at the park-and-ride lot at Mitchell Road and Technology Drive.  The route enters TH 5 to SouthWest Station on Technology Drive to Singletree Lane to Prairie Center Drive to Flying Cloud Drive to the bus-only shoulder lanes on TH 212.  From the bus-only shoulder lanes of TH 212 the route enters the bus-only shoulder lanes on TH 169 to Excelsior Boulevard in Hopkins.  The route continues in mixed traffic along Excelsior Boulevard then northbound in mixed traffic on Blake Road to TH 7.  The route continues in mixed traffic along TH 7 to TH 100.  From TH 100 the route enters the I-394 High Occupancy Vehicle (HOV) lanes to downtown Minneapolis, where buses would make multiple stops at locations to be determined at a later stage of project development.
.

Stops occur at the following locations:

- Mitchell Road/TH 5 (park-and-ride lot), Eden Prairie
- SouthWest Station (park-and-ride lot), Eden Prairie
- Flying Cloud Drive, Eden Prairie
- TH 212 at Shady Oak Road (park-and-ride lot), Eden Prairie
- TH 169 at Bren Road, Minnetonka
- TH 169 at Excelsior Boulevard, Hopkins
- Excelsior Boulevard at Blake Road, Hopkins
- Blake Road just south of TH 7, Hopkins
- TH 7 at Texas Avenue (park-and-ride lot), Louisiana Avenue and Wooddale Avenue, St. Louis Park.

### *Limited-Stop Route "B" – Minnetonka, Hopkins, St. Louis Park to Downtown Minneapolis*

This route begins at the intersection of Shady Oak Road and Excelsior Boulevard. The route then travels in mixed traffic along Excelsior Boulevard to Blake Road. From Blake Road the route travels north to TH 7, then westbound on TH 7 to TH 100. From TH 100 the route enters the I-394 High Occupancy Vehicle (HOV) lanes to downtown Minneapolis, where buses make multiple stops at locations to be determined at a later stage of project development.

Stops occur at the following locations:

- Shady Oak Road and Excelsior Boulevard, Minnetonka
- Excelsior Boulevard at 8th Avenue/downtown Hopkins (park-and-ride lot)
- Excelsior Boulevard at TH 169, Hopkins
- Excelsior Boulevard at Blake Road, Hopkins
- Blake Road at TH 7, Hopkins
- TH 7 at Texas Avenue, St. Louis Park (park-and-ride lot)
- TH 7 at Louisiana Avenue, St. Louis Park
- TH 7 at Wooddale Avenue, St. Louis Park

The approximate line length between the Hopkins Transit Center and the edge of downtown Minneapolis is 9.5 miles.

## Service Plan

The weekday service frequencies are listed below. When combined for the overlapping segment from Hopkins to downtown Minneapolis, the resulting frequencies are 10 minutes in the early morning, 7.5 minutes during the morning peak, 10 minutes for the mid-day, 7.5 minutes during afternoon peak, and 15 minutes during the evening.

### Table 1 Enhanced Bus Service Plan

| **Weekdays** | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Route "A" | 20 | 15 | 20 | 15 | 30 |
| Route "B" | 20 | 15 | 20 | 15 | 30 |
| Combined | 10 | 7.5 | 10 | 7.5 | 15 |
| **Weekends** | 20-60 minutes | 20-60 minutes | 20-60 minutes | 20-60 minutes | 20-60 minutes |

*Source: Parsons Brinckerhoff, 2006.*

### *Connecting Transit Service – Enhanced Bus Alternative*

The following analysis identifies those routes that intersect with Limited Stop Routes A and B at the stops specified between Eden Prairie and downtown Minneapolis, and indicates changes to those routes recommended under the Enhanced Bus alternative.

**Mitchell Road/TH 5:** Route 631 connects to this park-and ride lot.

Route 631 is a circulator that connects Eden Prairie and surrounding communities to Eden Prairie Town Center and SouthWest Stations. (Note: the City of Eden Prairie requested in September 2006 that "Town" be added to this station name.) Service on route 631 increases from an hourly service to a frequency of 15 minutes during peak periods, and operates hourly in the evenings until 10:00 PM.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A connect with Limited Stop Route A at this transit park-and-ride station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which currently operates only in the clockwise direction, operates in both directions under the Enhanced Bus operating plan, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also changes to bi-directional serves with an hourly headway in the evenings until 10:00 PM.

Changes to Route 631 are described above under Mitchell Road/TH-5.

Route 636 is a circulator servicing Eden Prairie. Route 636 remains unchanged during peak periods, and midday service is eliminated.

Route 680 is not changed under this alternative.

Route 681 combines with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis. The off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Routes 690, 690A and 690B are combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. Connecting with the Limited Stop Route A at the SouthWest Station allows these bus routes to take advantage of the bus only ramp that connects eastbound TH-5 with the station. In addition to 681 and 690, SouthWest Metro Transit Express Routes 685, 685A, 691, 694, 698, and 699A operate between SouthWest Station and Downtown Minneapolis.

**Flying Cloud Drive**: Route 685 connects with Limited Stop Route A at this stop. Route 685 is not changed under this alternative.

**TH 212/Shady Oak**: Route 681 connects with Limited Stop Route A at this stop. Route 681 is described above under SouthWest Station.

**Bren**: Route 568 connects with Limited Stop Route A at this stop. This route is not changed under this alternative.

**Shady Oak**: Route 664 connects with Limited Stop Route B at this stop. Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. Under the Enhanced Bus alternative, the route alternative operates on its former alignment and schedule.

**Hopkins**: Routes 12, 615, 661, 664 and 665 connect with Limited Stop Route B at this park-and-ride lot station.

Service frequencies on route 12 are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

Peak service frequency on route 615 increase from 60 to 30 minutes, and off peak frequency is 60 minutes.  The route operates to midnight

Route 661 is a recently discontinued Metro Transit route that is reinstated in the Enhanced Bus alternative with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency.  The route operates at a 30 minute headway in each direction during each peak period and a 120 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 664 are described under Shady Oak.

Service frequency on Route 665 is increased from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**TH 169**: Limited Stop Routes A and B connect to Route 12, Changes to these Route 12 are described above under Hopkins.

**Excelsior at Blake**: Limited Stop Routes A and B connect to Routes 12, 17 and 668 at this stop.

Changes to these Route 12 are described above under Hopkins.

Route 17 Lake Street branch is extended to Blake and Excelsior to serve this stop.  Service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Route 668 is extended to connect to Excelsior and Blake and the Library-Lane loop is eliminated.

**Blake at TH 7**:  Limited Stop Routes A and B connect to Routes 17.

Route 17 Lake Street branch serves the stop.  Changes to Route 17 are described under Excelsior at Blake.

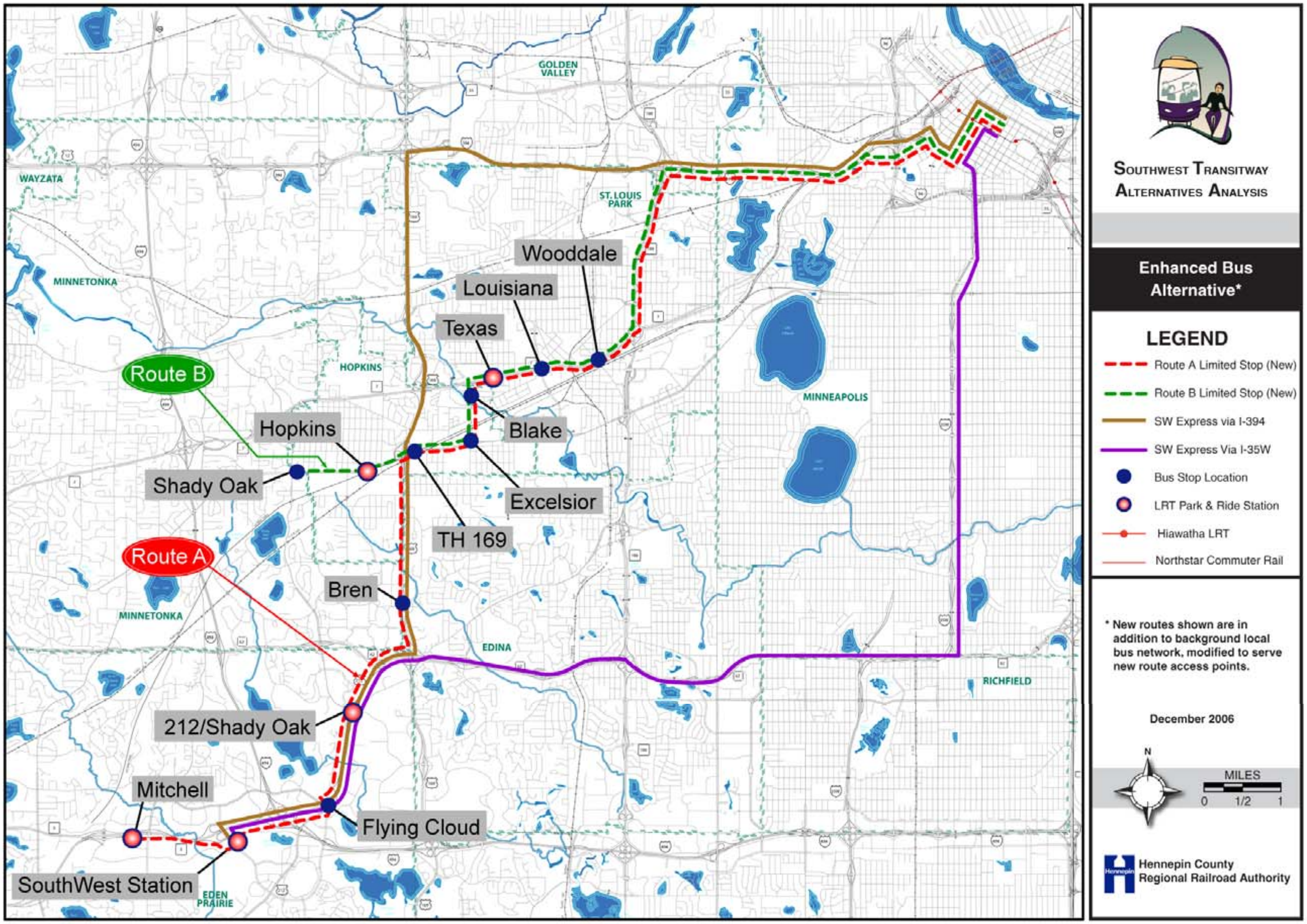
**Texas**:  Limited Stop Routes A and B would connect to Route 668 at this stop.

Route 668 connects to the stop at Blake and TH 7 and the Library-Lane loop is eliminated. Changes to Route 668 are described under Excelsior at Blake.

**Louisiana**: Limited Stop Routes A and B connect with route 604 at this stop.  Route 604 is increased in service frequency under this alternative, from 2 trips in each direction during each peak period to a 30-minute headway (6 trips) in each direction during each peak period.

**Wooddale**: Route 615 connects to Limited Stop Routes A and B at this location.  Changes to Route 615 are described under Hopkins.

## Figure 1: Enhanced Bus




Source: Parsons Brinckerhoff, 2006.

## B. Build Alternatives

### *1. Bus Rapid Transit (BRT) Alternatives*

The Southwest Transitway Alternatives Analysis BRT is assumed to include the following characteristics:

- High-frequency, bi-directional, limited-stop bus service.
- Exclusive (bus-only) guideway, with grade separations at major intersecting facilities. (Segments which serve key destinations but for which exclusive right-of-way is not feasible may be included as "exception segments".)
- On-line, high-amenity stations with platforms designed to accommodate both standard and low-floor buses. Stations provide bus pull-outs, with passing lanes, access for pedestrians, cyclists, and local buses, drop-off points for autos, with park-and-ride lots sized to accommodate projected passenger demand.
- Vehicles with a unique paint scheme to "brand" Southwest BRT buses as distinctive. Low-floor vehicles are used for the guideway line-haul service. However, all Twin Cities buses are accommodated within the guideway, to leverage maximum efficiency from the guideway investment.
- Intelligent Transportation Systems (ITS) technologies including traffic signal priority at signalized intersections where feasible, automatic transit vehicle location, and real-time passenger information at stations.
- Off-vehicle "proof of payment" fare collection and fare media options consistent with the Hiawatha LRT transit service.

Characteristics of the service which affect its operation include route length, route structure, service span, service frequency, and station spacing. These elements are reflected in the operating plans of the Southwest Transitway AA BRT alternatives:

- Line-haul buses operate on the exclusive guideway and all stop at all stations
- All stations are on-line
- Express bus routes that operate the initial and terminal portions of their alignments on local streets access the guideway for some express segments of their alignments
- Service span and frequency consistent with Hiawatha LRT service: 7 ½ minute peak period headways, 10 minute midday headways, 15 minute evening headways
- Service span consistent with Hiawatha LRT (5:00 am to 2:00 am)
- Station spacing 1-2 miles in second ring suburban communities and ¼ - 1 mile apart in first ring suburban communities and Minneapolis.

The two primary routes under the Enhanced Bus alternative, Limited Stop Routes "A" and "B" operate as the principal BRT routes under the BRT alternatives. In addition, a number of South West Metro Transit and Metro Transit express routes use the BRT alignment for portions of their routes.

## BRT 1: HCRRA Right-of-Way, TH 5 to Downtown Minneapolis

The BRT 1 alignment runs from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. BRT 1 uses a new two-lane roadway located in existing HCRRA right-of-way to bus-only lanes in downtown Minneapolis.

BRT 1 begins at SouthWest Station, proceeding west via TH 5 on bus shoulder lanes, exiting at Mitchell Road to follow local streets to the intersection of Highway 5 and the HCRRA's Southwest Corridor From that point the route enters a new exclusive (bus-only) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive BRT guideway in the HCRRA's Cedar Lakes Corridor. When it reaches the new Van White Boulevard, the route exits the exclusive guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis, where buses would make multiple stops at locations to be determined at a later stage of project development. .

### *Service Plan*

**Table 2 BRT 1 Service Plan**

| **Weekdays** | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Route "A" | 20 | 15 | 20 | 15 | 30 |
| Route "B" | 20 | 15 | 20 | 15 | 30 |
| Combined | 10 | 7.5 | 10 | 7.5 (to 7:30 pm) | 15 |
| **Weekends** | | | | | |
| Route "A" | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Route "B" | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Combined | 15-30 | 15-30 | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

### *Connecting Transit Service - BRT 1*

**TH 5 Station**: Routes 631, 636 681, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and surrounding communities to Eden Prairie Town Center and SouthWest Stations. (Note: the City of Eden Prairie requested in September 2006 that "Town" be added to this station name.) Service on route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service will be eliminated.

SouthWest Metro Transit Express Routes 681, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A operate from the existing SouthWest Station via TH 5 shoulder lanes to enter the BRT right-of-way at TH 5 station.

**TH 62 Station**: Routes 661, 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) in the BRT 1 alternative and operates at a 30 minute peak/60 minute off-peak service frequency.  The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 681 Circulator is a proposed new route serving Eden Prairie and Golden Triangle, replacing part of the alignment of existing route 681, which will not operate from SouthWest Station on TH 212.  The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Rowland Station**: No routes serve this station.

**Shady Oak Station**:  Route 12 serves this station.  Changes to route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615,661, 664 and 665 serve this station.

Changes to Route 12 are described below under West Lake Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand).  Peak frequency increases from 60 to 30 minutes, and off peak frequency is be 60 minutes.  The route operates to midnight.

Changes to Route 661 are described above under TH 62 Station.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612.  Route 664 will offer an off-peak service similar to the discontinued 612.  Peak period service operates on the BRT alignment between Hopkins Station and downtown Minneapolis. Off-peak service operates between Hopkins Station and the terminal on CR 101.  Off-peak riders with destinations east of Hopkins Station transfer to other services at the Hopkins Station.  The route operates on the BRT alignment between Hopkins Station and downtown Minneapolis.

Route 665 is rerouted from its current highway alignment and enters the BRT alignment at Hopkins Station for its connection to downtown Minneapolis.  Service frequency be increases from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, 664, 665, 668 and 670 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Routes 615, 664 and 665 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated. The route operates on the BRT right-of-way between West Lake Station and downtown Minneapolis.

Route 670 is rerouted to operate on the BRT alignment between Blake Station and downtown Minneapolis. The route, which now operates as a peak period, peak direction route on a one hour peak period headway, operates bi-directionally at half hour headways in the BRT 1 alternative and is given midday and evening (to midnight) service at a one hour headway.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of route 17 and Route 615 serve this station. Changes to route 17 are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of route 17, route 604 and route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

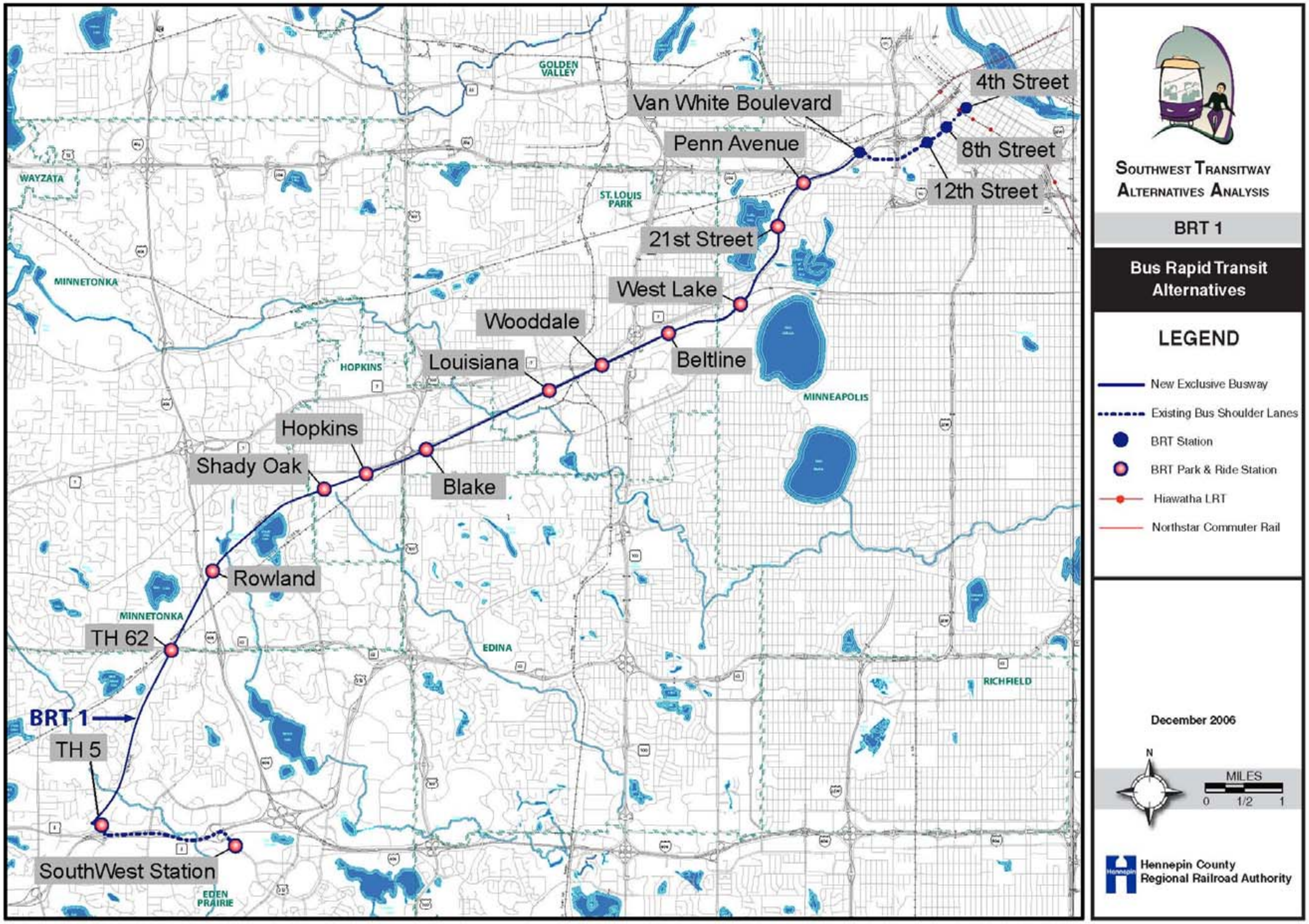
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station**: Route 25 connects to this station. Changes to Route 25 are described above under West Lake Station.

## Figure 2 BRT 1




*Source: Parsons Brinckerhoff, 2006.*

## BRT 2: Mitchell Road/Eden Prairie Town Center/Golden Triangle/Opus/ Hopkins, HCRRA Right-of-Way to Downtown Minneapolis

BRT 2 operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The BRT 2 alignment begins at TH 5 Station and proceeds east on the bus shoulder lanes on TH 5 to SouthWest Station. From there it follows a new bus only lane through the Eden Prairie Town Center along Prairie Center Drive. The bus lane converts to an exclusive busway alignment at US 212 at Valley View Parkway and proceeds north along TH 212 to the Golden Triangle Station, south of Shady Oak Road. An alternate alignment in this area bypasses Eden Prairie Town Center and follows the shoulder lanes on TH 5 to TH 212 through the interchange of those two highways with I-494 in Eden Prairie.

The alignment continues north on dedicated guideway to the City West station, near the TH 212-TH 62 interchange. The BRT then crosses TH 62 and continues north along a bus only lane along internal roadways in the Opus development to the Opus Station on Bren Road. The alignment then turns east as a bus only lane along Bren Road to TH 169, where the alignment follows a bus shoulder Lane north to the HCRRA's Southwest Corridor alignment. From that point the route enters a new exclusive bus-only guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis.

Just north of West Lake Street the route enters an exclusive bus-only guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lakes Corridor. When it reaches the new Van White Boulevard, the route exits the exclusive bus-only guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis, where it makes multiple stops.

### *Service Plan*

**Table 3 BRT 2 Service Plan**

| **Weekdays** | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Route "A" | 20 | 15 | 20 | 15 | 30 |
| Route "B" | 20 | 15 | 20 | 15 | 30 |
| Combined | 10 | 7.5 | 10 | 7.5 | 15 |
| **Weekends** | | | | (to 7:30 pm) | |
| Route "A" | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Route "B" | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Combined | 15-30 | 15-30 | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

## *Connecting Transit Service - BRT 2*

**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Stations.  Service on route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service would operate hourly in the evenings until 10:00 PM.  Route 636 remains unchanged during peak periods, and midday service is eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Route 680 is not changed under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center.  The circulator, which currently operates only in the clockwise direction, operates in both directions in the BRT 2 alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency.  Service also operates bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to Routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via the BRT alignment, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing Route 681 serving the Golden Triangle area.  The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, Routes 690, 690A and 690B are combined with Route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis via the BRT alignment.  In addition to 681 and 690, SouthWest Metro Transit Express Routes 685, 685A, 691, 694, 698, and 699A operate on the BRT alignment between SouthWest Station and Downtown Minneapolis.

**Eden Prairie Town Center Station**: Routes 636 and 681 Circulator serve this station.  Route 636 is described above under TH5 Station.  Route 681 is described above under SouthWest Station.

**Golden Triangle Station**: Routes 631 and 681 Circulator serve this station.  Route 631 is described above under TH 5 Station.  Route 681 is described above under SouthWest Station.

**City West Station**: No bus routes serve this station.

**Opus Station**: Routes 12 and 661 serve this station.  Changes to Route 12 are described below under West Lake Station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency.  The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Shady Oak Station**: Route 12 serves this station.  Changes to route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station.  Changes to route 12 are described below under West Lake Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand) in the BRT 2 alternative.  Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes.  The route operates to midnight.

Changes to route 661 are described above under TH 62 Station.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612.  Route 664 will offer an off-peak service similar to the discontinued 612.  Peak period service operates on the BRT alignment between Hopkins Station and downtown Minneapolis. Off-peak service operates between Hopkins Station and the terminal on CR 101.  Off-peak riders with destinations east of Hopkins Station transfer to other services at the Hopkins Station.  The route operates on the BRT alignment between Hopkins Station and downtown Minneapolis.

Route 665 is rerouted from its current highway alignment and enters the BRT alignment at Hopkins Station for its connection to downtown Minneapolis.  Service frequency is increased from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, 664, 665, 668 and 670 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to routes 615, 664 and 665 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.  The route would operate on the BRT guideway between West Lake station and downtown Minneapolis.

Route 670 is rerouted to operate on the BRT guideway between Blake Station and downtown Minneapolis.  The route, which now operates as a peak period, peak direction route on a one hour peak period headway, operates bi-directionally at half hour headways and operates midday and evening (to midnight) service at a one hour headway.

**Louisiana Avenue Station**: Route 604 serves this station. Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station. Changes to Route 17 are described above under Blake Station. Changes to Route 17 are described under Hopkins Station.

Changes to route 615 are described above under Blake station.

**Beltline Station**: The 36th Street branch of route 17, route 604 and route 615 serves this station. Changes to route 17 are described above under Blake Station.

Changes to route 604 are described above under Louisiana Avenue Station.

Changes to route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies increase slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

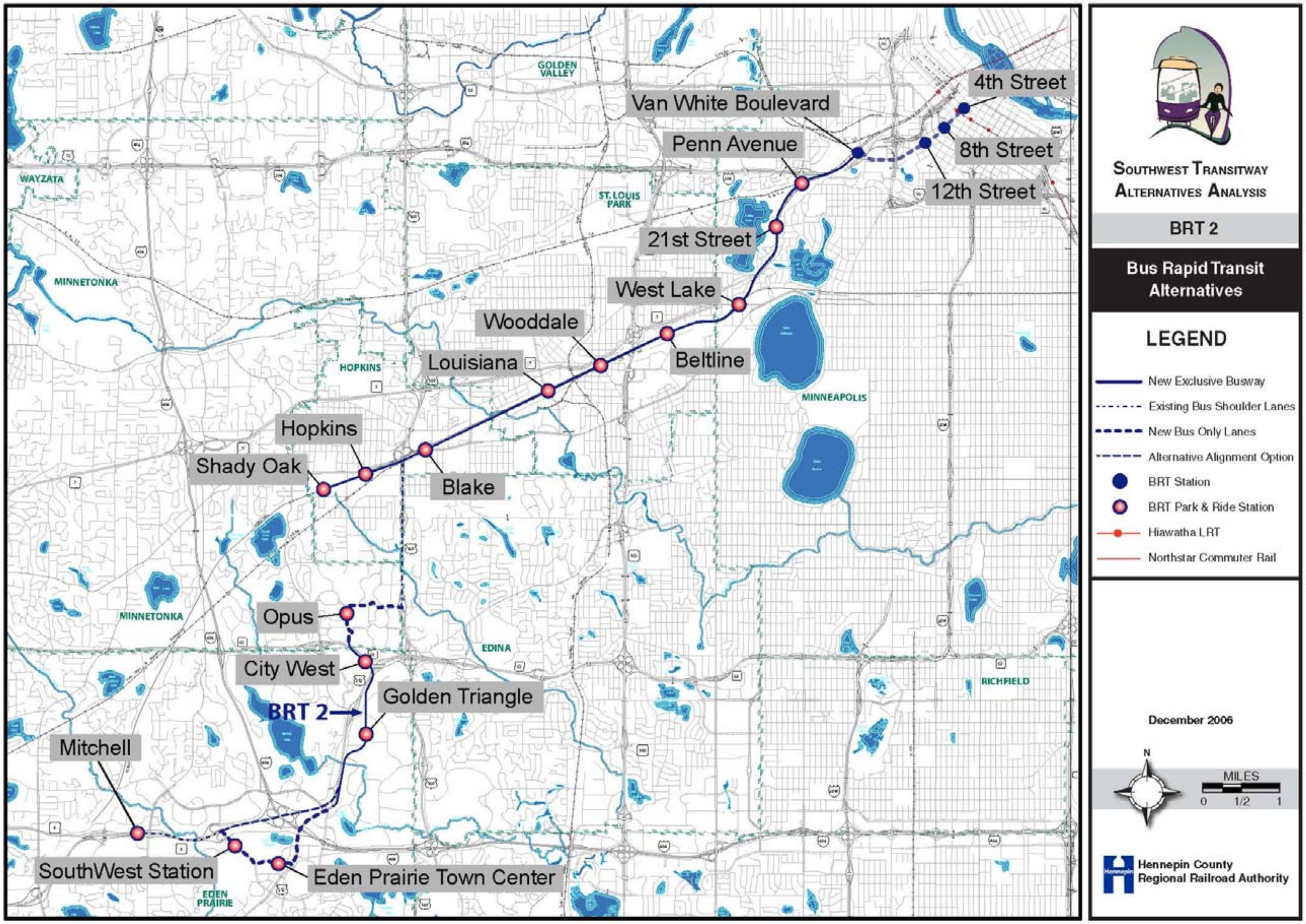
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station**: Route 25 connects to this station. Changes to route 25 are described above under West Lake Station.

Figure 3  BRT 2




*Source: Parsons Brinckerhoff, 2006.*

## 2. Light Rail Transit (LRT) Alternatives

Light rail transit service is also characterized by service that is frequent, direct, easy to understand, comfortable, reliable, operationally efficient, and rapid.

Southwest Transitway AA LRT alternatives are assumed to include the following characteristics:

- High-frequency, bi-directional service.
- Exclusive rail-only guideway, with grade separation at major intersecting facilities outside the Minneapolis central business district.
- On-line, high-amenity stations. Stations provide bus drop off areas, access for pedestrians, cyclists, and local buses, drop-off points for autos, with park-and-ride facilities sized to accommodate projected passenger demand.
- Low-floor Vehicles consistent with the Hiawatha LRT service.
- Intelligent Transportation Systems (ITS) technologies including traffic signal priority at signalized intersections where feasible, automatic transit vehicle location, and real-time passenger information at stations.
- Off-vehicle "proof of payment" fare collection and fare media options consistent with the Hiawatha LRT transit service.

Characteristics of the service which affect LRT operation include route length, route structure, service span, service frequency, and station spacing. Southwest Corridor LRT operating plans are based on the existing Hiawatha LRT service, and feature:

- Exclusive guideway with the exception of downtown Minneapolis sections of the various routes, where LRT operates within city streets.
- All stations are on-line, and all LRT alternatives stop at all stations
- Feeder bus route lengths vary based on local markets served before transferring passengers to LRT at stations
- Service frequency is consistent with Hiawatha LRT service: 7 ½ minute peak period headways, 10 minute midday headways, 15 minute evening headways
- Service span is consistent with Hiawatha LRT (5:00 am to 1:00 am)
- Station spacing 1-2 miles in second ring suburban communities and ¼ - 1 mile apart in first ring suburban communities and in Minneapolis.

LRT alternatives are defined using a combination of two designations: 1, 2, 3 or 4; and A or C (e.g. 1A, 2A, 1C, 2C, etc.). The numbers designate the four possible routings west of Louisiana Avenue Station in St. Louis Park. The letters (A or C) designate the two possible routes east of Louisiana Avenue Station in St. Louis Park.

Alternatives numbered "1" designate routes that use the HCRRA's Southwest Corridor exclusively through Eden Prairie, Minnetonka, Hopkins, and St. Louis Park. Alternatives numbered "2" designate routes that use TH 5 and I-494 right-of-way predominantly in Eden Prairie and Minnetonka, and then use HCRRA's Southwest Corridor through Hopkins and St. Louis Park. Alternatives numbered "3" use a combination of new exclusive rights-of-way through Eden Prairie, Minnetonka and part of Hopkins, and then use the HCRRA's Southwest Corridor through Hopkins and St. Louis Park. Alternatives numbered 4 use the HCRRA's Southwest Corridor and terminate at Shady Oak Station.

The letter “A” designates routes that use the HCRRA’s Southwest Corridor through St. Louis Park, and the HCRRA’s Kenilworth and Cedar Lake Corridors in Minneapolis. The letter “C” designates routes that use the HCRRA’s Southwest Corridor in St. Louis Park, the HCRRA’s Midtown Corridor in Minneapolis, and a shallow tunnel under Nicollet Avenue between 29th Street and Franklin Avenue in Minneapolis. LRT “A” alternatives connect to the Intermodal station, planned to be constructed by the Northstar Commuter Rail service and Hiawatha LRT line extension.

The service plans of the LRT alternatives are summarized in the following paragraphs and illustrated in the figures which follow.

## LRT 1A

The LRT 1A alternative operates from TH 5 Station in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Service Plan*

**Table 4 LRT1A Service Plan**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| **Saturday** | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| **Sunday/ Holiday** | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

### *Connecting Transit Service - LRT 1A*

**TH 5 Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service is eliminated.

**TH 62 Station**: Routes 661 and 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing part of the alignment of existing route 681, which will not operate from SouthWest Station on TH 212. The route separates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Rowland Station**: No routes serve this station.

**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 661, 615, 664 and 665 serve this station. Changes to Route 12 are described below under West Lake Station. Changes to route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand) in the LRT 1A alternative. Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 is increased in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station. Changes to Route 17 are described above under Blake Station. Changes to Route 17 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of is Route 17, Route 604 and Route 615 would serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and would operate from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

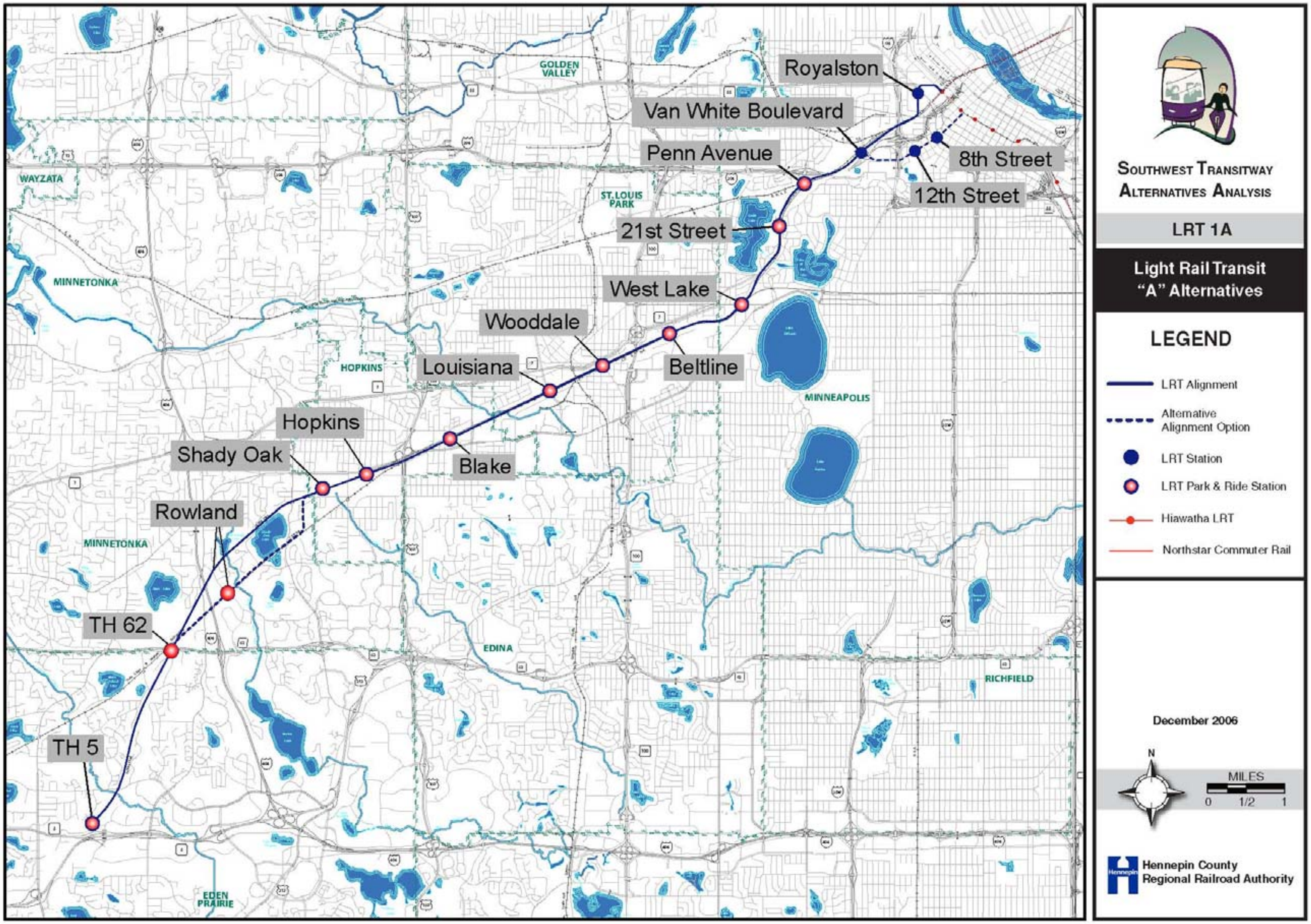
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station:** Route 25 connects to this station. Changes to route 25 are described above under West Lake Station.

## Figure 4 LRT 1A




*Source: Parsons Brinckerhoff, 2006.*

## LRT 2A

LRT 2A operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Service Plan*

**Table 5 LRT 2A Service Plan**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| **Saturday** | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| **Sunday/ Holiday** | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

### *Connecting Transit Service - LRT 2A*

**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service is eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit’s bus operations.

Routes 680, 685, 685A, 691, 694, 698 and 699A are not changed under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which now operates only in the clockwise direction, operates in both directions in the LRT 2A alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also operates bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to Routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via TH 212, TH 62, and I-35W, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, Route 690, 690A and 690B are combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. 690 continues to use its existing alignment of TH 212 to TH 169 and I-394.

**Valley View Station**: Routes 685 and 685A serve this station. Apart from a stop at the station, these routes are not changed under this alternative.

**TH 62 Station**: Routes 661 and the 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

The 681 Circulator is described above under SouthWest Station.

**Rowland Station**: No routes serve this station.

**Shady Oak Station**: Route 12 serves this station. Changes to route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station. Changes to route 12 are described below under West Lake Station. Changes to route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency would be 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station. Changes to Route 17 are described above under Blake Station. Changes to Route 17 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale Station and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and would operate from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis would be eliminated. Service frequency increases slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

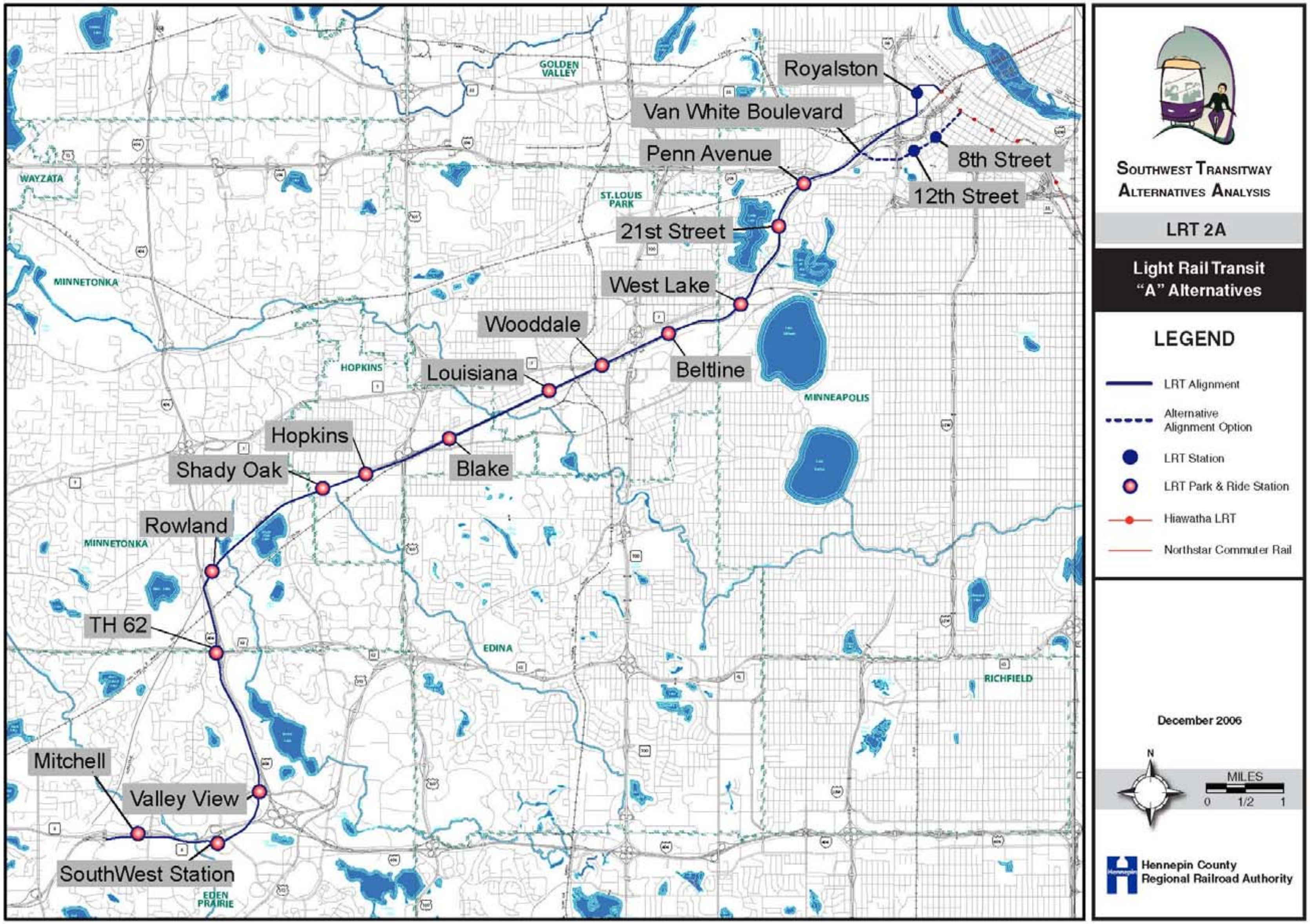
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station:** Route 25 connects to this station. Changes to route 25 are described above under West Lake Station.

**Figure 5 LRT 2A**




*Source: Parsons Brinckerhoff, 2006.*

## LRT 3A

LRT 3A operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Service Plan*

### Table 6 LRT 3A Service Plan

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| **Saturday** | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| **Sunday/ Holiday** | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

### *Connecting Transit Service - LRT 3A*

**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service will be eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Routes 680, 685, 685A, 691, 694, 698 and 699A are changed under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which now operates only in the clockwise direction, operates in both directions in the LRT 3A alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also is operates bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via TH 212, TH 62, and I-35W, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, routes 690, 690A and 690B are combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. Route 690 continues to use its existing alignment of TH 212 to TH 169 and I-394.

**Eden Prairie Town Center Station**: Routes 636 and 681 Circulator serve this station. Route 636 is described above under TH5 Station. Route 681 is described above under SouthWest Station.

**Golden Triangle Station**: Routes 631 and 681 Circulator serve this station. Route 631 is described above under TH5 Station. Route 681 is described above under SouthWest Station.

**City West Station**: No bus routes serve this station.

**Opus Station**: Routes 12 and 661 serve this station. Changes to Route 12 are described below under West Lake Station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Shady Oak Station**: Route 12 serve this station. Changes to route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station. Changes to Route 12 are described below under West Lake Station. Changes to route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36$^{th}$ Street branch of Route 17 and Route 615 serve this station.  Changes to Route 17 are described above under Blake Station.  Changes to Route 17 are described under Hopkins Station.

**Beltline Station**: The 36$^{th}$ Street branch of Route 17, Route 604 and Route 615 would serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale Station and the West Lake Station.  The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remains unchanged).

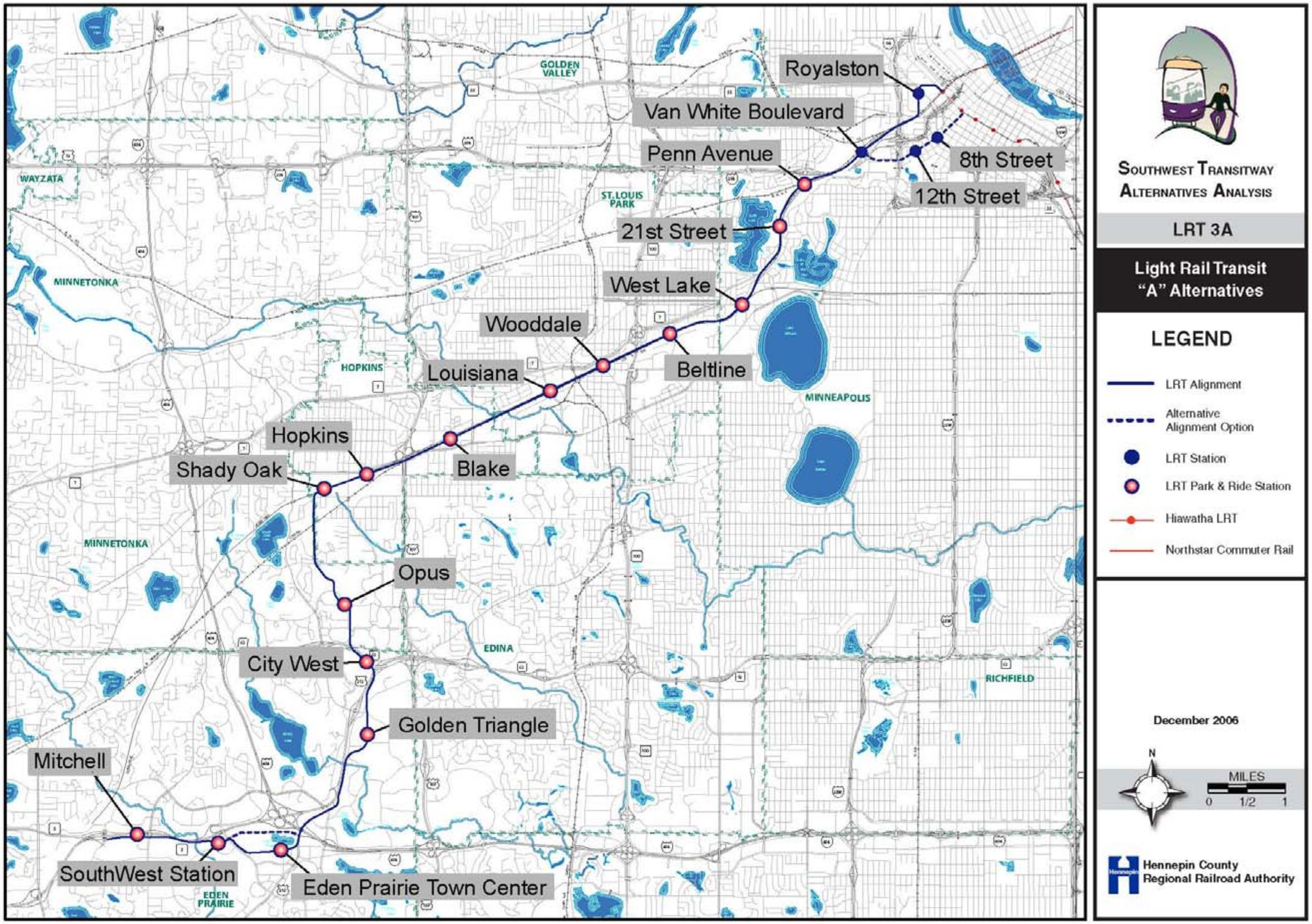
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21$^{st}$ Street Station:** Route 25 connects to this station.  Changes to Route 25 are described above under West Lake Station.

## Figure 6  LRT 3A




*Source: Parsons Brinckerhoff, 2006.*

## LRT 4A

The LRT 4A alternative is assumed to operate from Shady Oak Road in Minnetonka to downtown Minneapolis, providing service to Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Service Plan*

### Table 7 LRT 4A Service Plan

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| **Saturday** | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| **Sunday/ Holiday** | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

Source: Parsons Brinckerhoff, 2006

### *Connecting Transit Service - LRT 4A*

**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615, 661, 664, 665 and Limited Stop Route “A” serve this station. Changes to route 12 are described below under West Lake Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand) in the LRT 4A alternative. Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued Route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and would operate at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 665 is increased in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

Limited Stop Route “A” is a version of the new long-distance service route from Eden Prairie that features as one of the key new routes in the Enhanced Bus and BRT alternatives. In this alternative, the route terminates at Hopkins Station. Travelers to downtown Minneapolis transfer there to the light rail line. The route operates from the TH 5 park-and-ride at Wallace Road to

Hopkins via TH 5, TH 212, and TH 169. The route essentially meets every other LRT trip, operating at a 20 minute headway early morning and midday, 15 minutes during the peak periods and 30 minutes in the evenings.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency would increase from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station. Changes to Route 17 are described above under Blake Station. Changes to Route 17 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale Station and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remains unchanged).

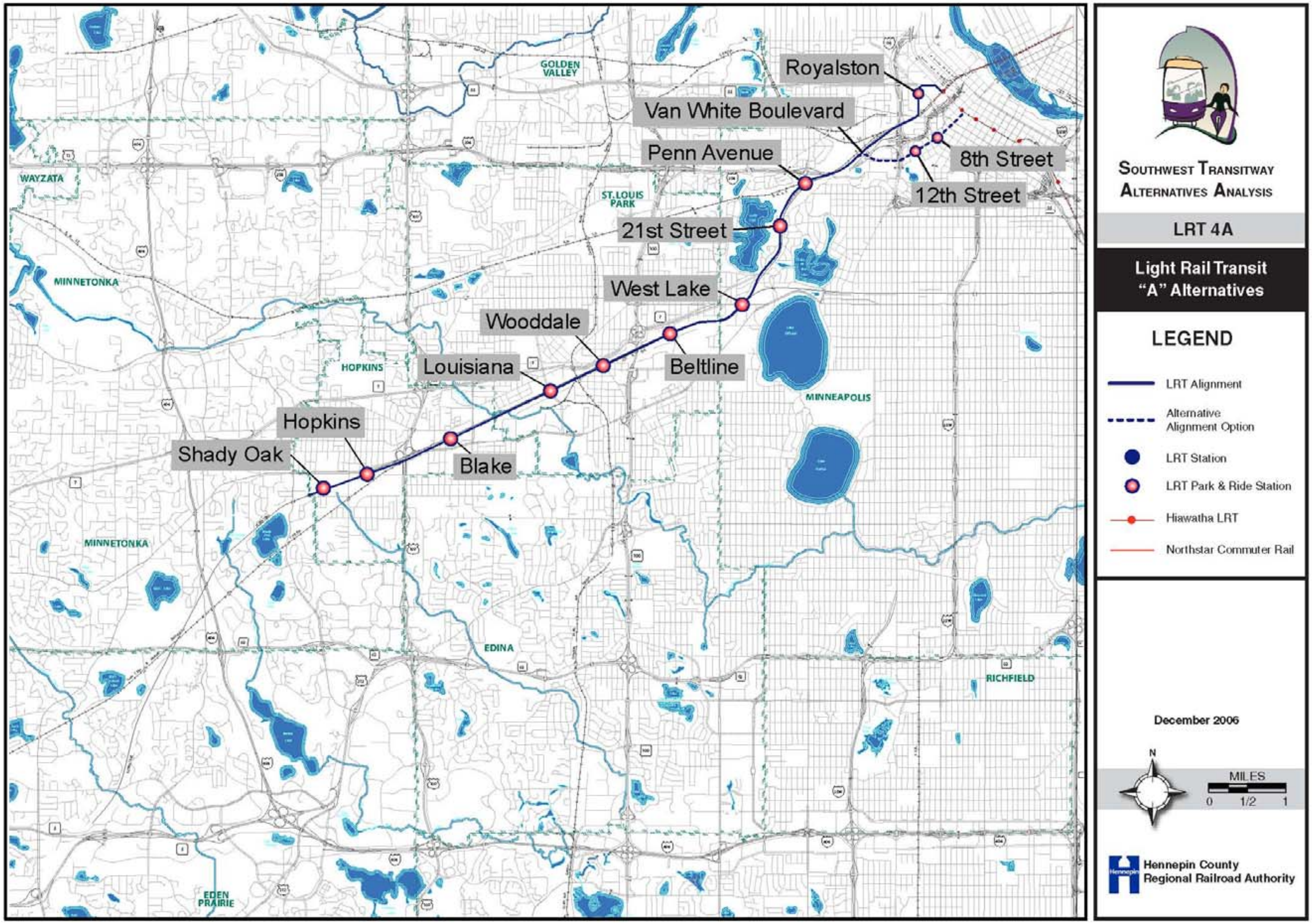
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station**: Route 25 connects to this station. Changes to route 25 are described above under West Lake Station.

**Figure 7 LRT 4A**




*Source: Parsons Brinckerhoff, 2006.*

## LRT 1C

LRT 1C operates from Highway 5 in Eden Prairie to downtown Minneapolis, providing service t Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Service Plan*

### Table 8 LRT 1C Service Plan

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| **Saturday** | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| **Sunday/ Holiday** | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

Source: Parsons Brinckerhoff, 2006

### *Connecting Transit Service - LRT 1C*

**TH 5 Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 increases from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service will be eliminated.

**TH 62 Station**: Routes 661, 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) in the LRT 1C alternative and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing part of the alignment of existing route 681, which will not operate from SouthWest Station on TH 212. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Rowland Station**: No routes serve this station.

**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under Uptown Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station. Changes to Route 12 are described below under Uptown Station. Changes to route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the light rail line.

Route 665 is increased in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station. Changes to Route 17 are described above under Blake Station. Changes to Route 17 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, and 25 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 12 are described below under Uptown Station.

Changes to Route 17 are described above under Blake Station.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**Uptown Station**: Routes 6, 12, 17, 21, 23, 53, 114, and 115 serve this station. Routes 6, 21, 23, 53, 114 and 115 are unchanged under this alternative.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remains unchanged).

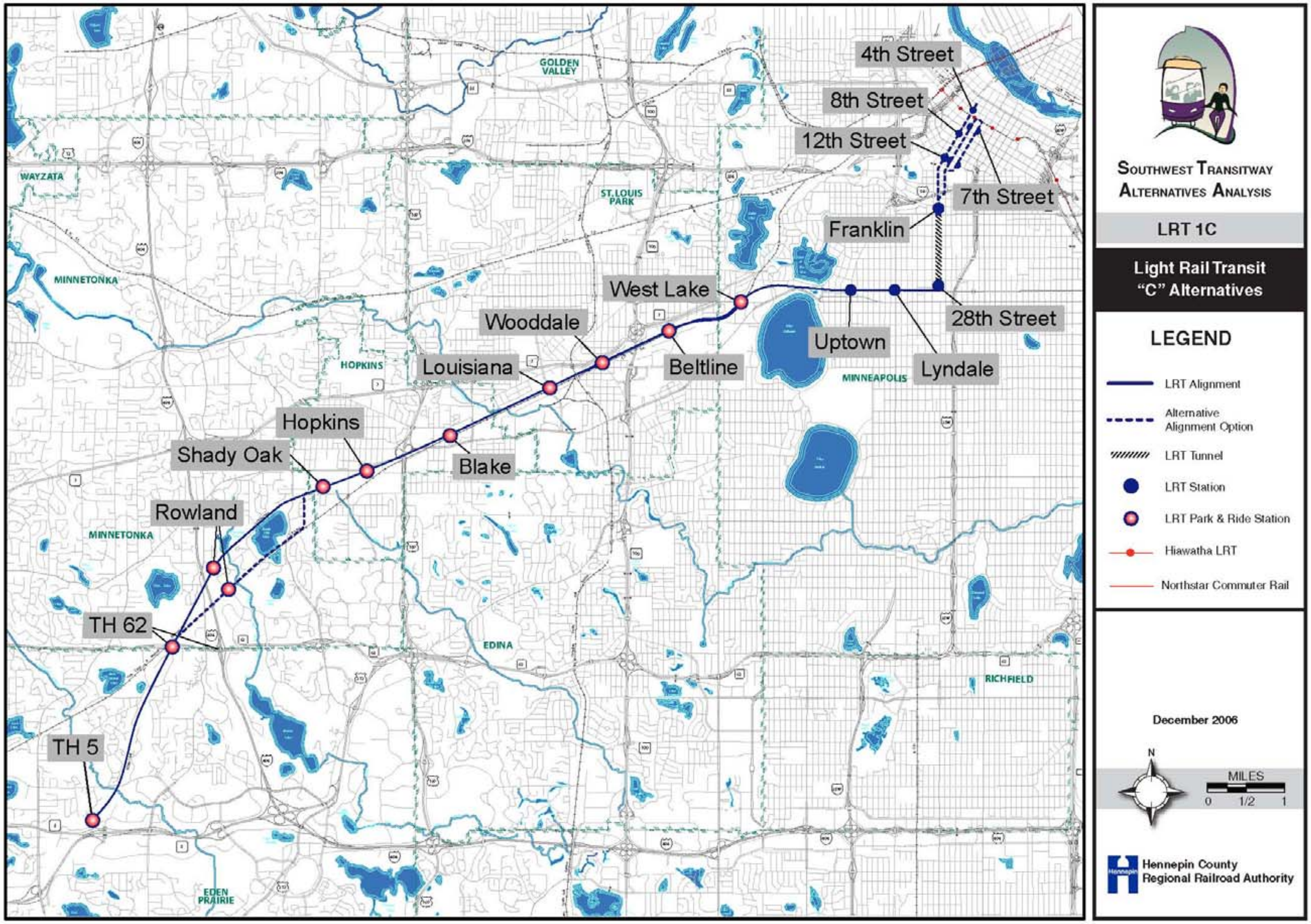
Changes to Route 17 are described above under Blake Station.

**Lyndale Station**: Routes 4, 21, 53, and 113 serve this station. These routes are unchanged under the alternative.

**28th Street Station**: Routes 18, 21, 53 and 568 serve this station. These routes are unchanged under the alternative.

**Franklin Station**: Routes 2, 18, 53 and 568 serve this station. These routes are unchanged under the alternative.

**Figure 8  LRT 1C**




*Source: Parsons Brinckerhoff, 2006*.

## LRT 2C

LRT 2C operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Service Plan*

### Table 9 LRT 2C Service Plan

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| **Saturday** | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| **Sunday/ Holiday** | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

### *Connecting Transit Service - LRT 2C*

**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 increases from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service is eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Routes 680, 685, 685A, 691, 694, 698 and 699A are unchanged under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which now operates only in the clockwise direction, is operated in both directions in the LRT 2C alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also is operated bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to Routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via TH 212, TH 62, and I-35W, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing Route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, route 690, 690A and 690B is combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. 690 continues to use its existing alignment of TH 212 to TH 169 and I-394.

**Valley View Station**: Routes 685 and 685A. Apart from a stop at the station, these routes are not changed under this alternative.

**TH 62 Station**: Routes 661 and the 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that would be reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and would operate at a 30 minute peak/60 minute off-peak service frequency. The route would operate at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and would operate from 6:00 am to midnight.

The 681 Circulator is described above under SouthWest Station.

**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under Uptown Station.

**Rowland Station**: No routes serve this station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station.

Changes to Route 12 are described below under Uptown Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route would operate to midnight.

Changes to Route 661 are described above under TH 62 Station.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station.  Changes to Route 17 are described above under Blake Station.  Changes to Route 17 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, and 25 serve this station.

The 6 Shuttle is a new route operates along France Avenue serving Edina between Southdale and the West Lake Station.  The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 12 are described below under Uptown Station.

Changes to Route 17 are described above under Blake Station.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**Uptown Station**: Routes 6, 12, 17, 21, 23, 53, 114, and 115 serve this station.  Routes 6, 21, 23, 53, 114 and 115 are unchanged under this alternative.
Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remains unchanged).

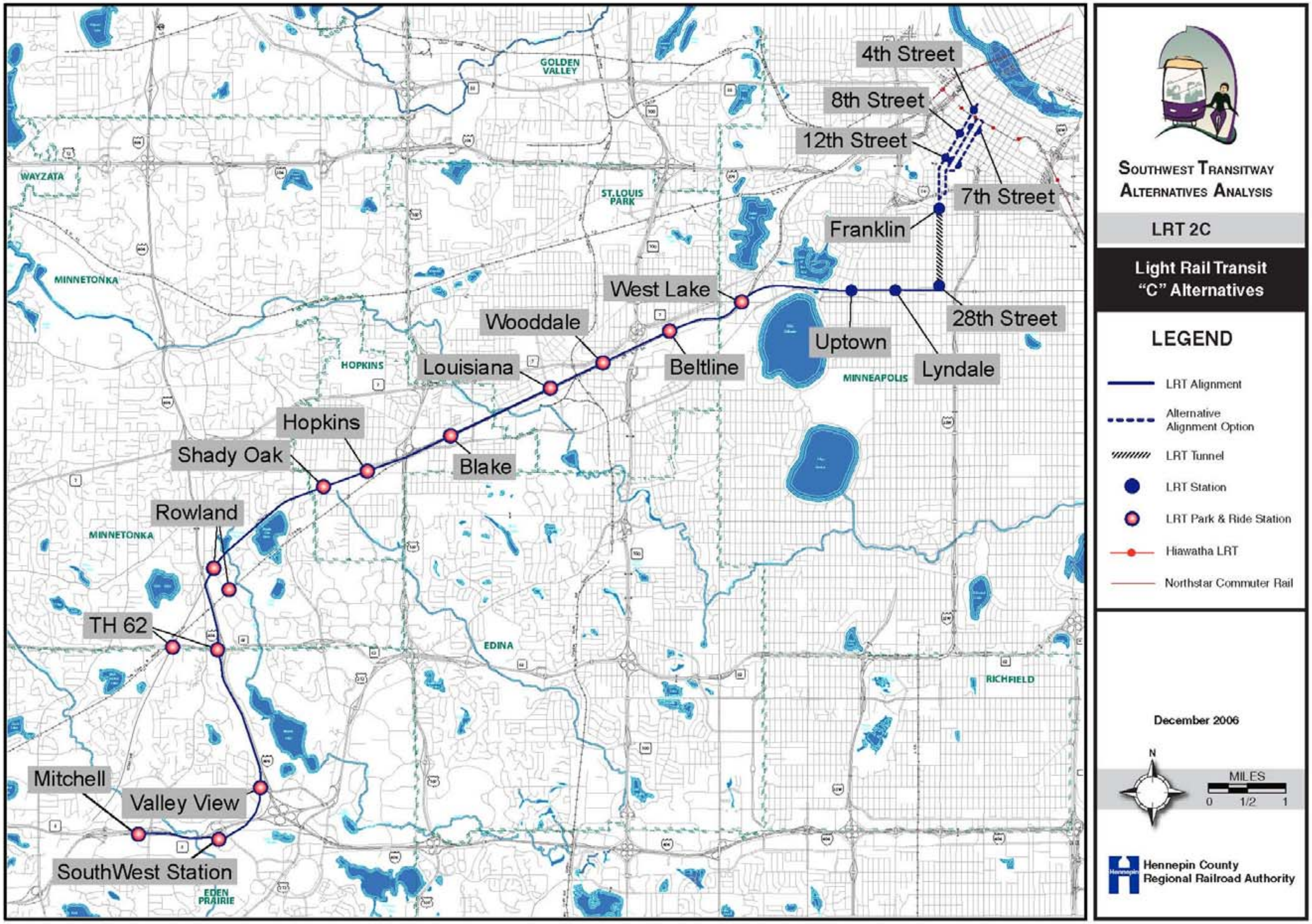
Changes to Route 17 are described above under Blake Station.

**Lyndale Station**: Routes 4, 21, 53, and 113 serve this station.  These routes are unchanged under the alternative.

**28th Street Station**: Routes 18, 21, 53 and 568 serve this station.  These routes are be unchanged under the alternative.

**Franklin Station**: Routes 2, 18, 53 and 568 serve this station.  These routes are unchanged under the alternative.

## Figure 9 LRT 2C




*Source: Parsons Brinckerhoff, 2006.*

## LRT 3C

LRT 3C operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Service Plan*

**Table 10 LRT 3C Service Plan**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| **Saturday** | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| **Sunday/ Holiday** | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

### *Connecting Transit Service - LRT 3C*

**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Stations. Service on Route 631 increases from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service is eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Routes 680, 685, 685A, 691, 694, 698 and 699A are unchanged under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which now operates only in the clockwise direction, operates in both directions in the LRT 3C alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also is operated bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to Routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via TH 212, TH 62, and I-35W, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, Routes 690, 690A and 690B are combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. 690 continues to use its existing alignment of TH 212 to TH 169 and I-394.

**Eden Prairie Town Center Station**: Routes 636 and 681 Circulator serve this station. Route 636 is described above under TH5 Station. Route 681 is described above under SouthWest Station.

**Golden Triangle Station**: Routes 631 and 681 Circulator would serve this station. Route 631 is described above under TH5 Station. Route 681 is described above under SouthWest Station.

**City West Station**: No bus routes serve this station.

**Opus Station**: Routes 12 and 661 serve this station. Changes to Route 12 are described below under Uptown Station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under Uptown Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station. Changes to Route 12 are described below under Uptown Station. Changes to Route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued Route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the light rail line.

Route 665 be increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station. Changes to Route 17 are described above under Blake Station. Changes to Route 17 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, and 25 serve this station.

The 6 Shuttle is a new route t operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 12 are described below under Uptown Station.

Changes to Route 17 are described above under Blake Station.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**Uptown Station**: Routes 6, 12, 17, 21, 23, 53, 114, and 115 serve this station. Routes 6, 21, 23, 53, 114 and 115 are unchanged under this alternative.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies increase slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

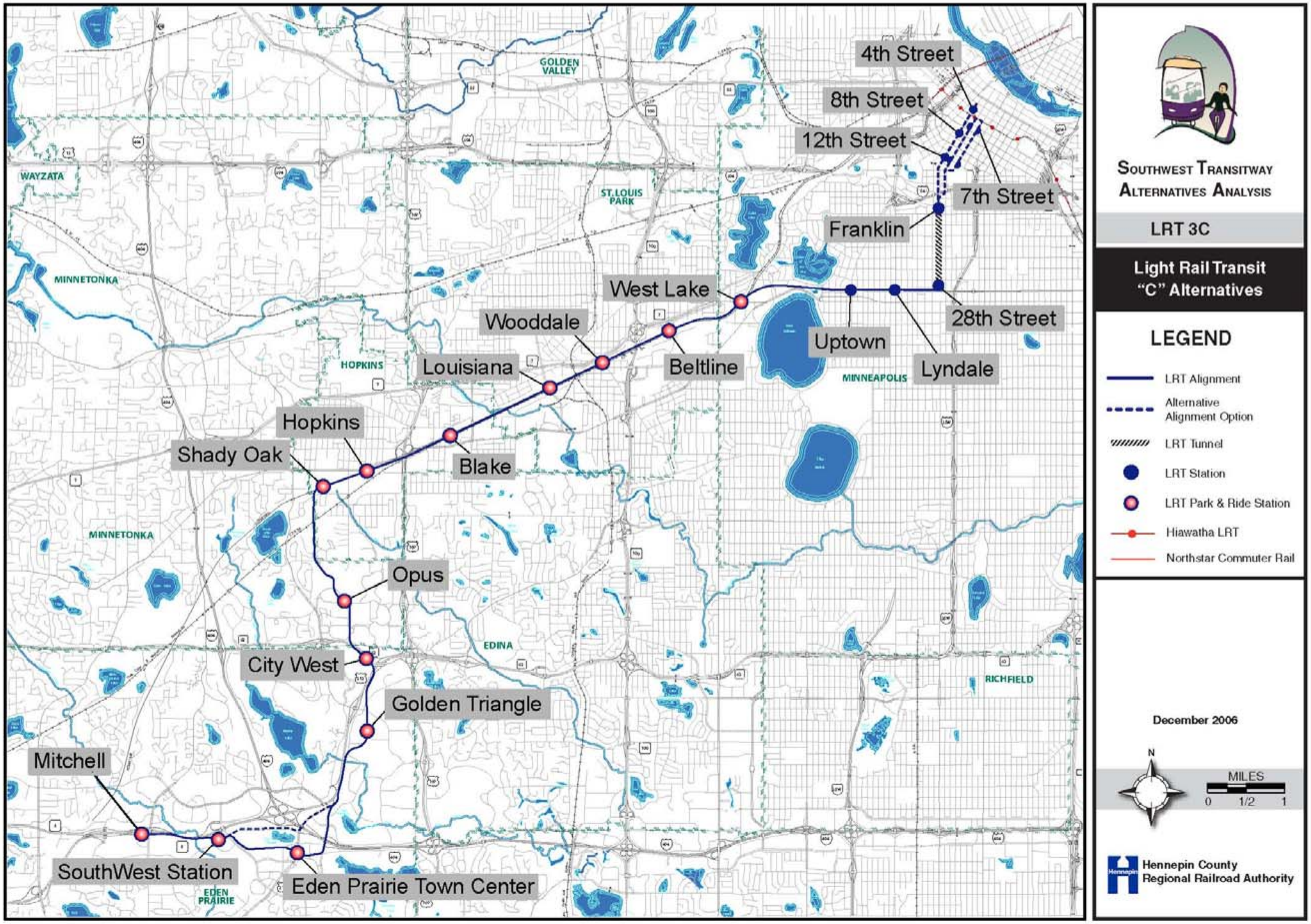
Changes to Route 17 are described above under Blake Station.

**Lyndale Station**: Routes 4, 21, 53, and 113 serve this station. These routes are unchanged under the alternative.

**28th Street Station**: Routes 18, 21, 53 and 568 serve this station. These routes are unchanged under the alternative.

**Franklin Station**: Routes 2, 18, 53 and 568 serve this station. These routes are unchanged under the alternative.

**Figure 10  LRT 3C**




*Source: Parsons Brinckerhoff, 2006.*

## LRT 4C

LRT 4C operates from Shady Oak Road in Minnetonka to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Service Plan*

### Table 11 LRT 4C Service Plan

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| **Saturday** | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| **Sunday/ Holiday** | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

### *Connecting Transit Service - LRT 4C*

**Shady Oak Station**: Route 12 serves this station. Changes to route 12 are described below under Uptown Station.

**Hopkins Station**: Routes 12, 615, 661, 664, 665 and Limited Stop Route “A” serve this station. Changes to route 12 are described below under Uptown Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

Limited Stop Route “A” is a version of the new long-distance service route from Eden Prairie that features as one of the key new routes in the Enhanced Bus and BRT alternatives. In this alternative, the route terminates at Hopkins Station. Travelers to downtown Minneapolis transfer there to the light rail line. The route operates from the TH 5 park-and-ride at Wallace Road to

Hopkins Station via TH 5, TH 212, and TH 169. The route would essentially meet every other LRT trip, operating at a 20 minute headway early morning and midday, 15 minutes during the peak periods and 30 minutes in the evenings.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station. Changes to Route 17 are described above under Blake Station. Changes to Route 17 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 would serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and routes 12, 17, and 25 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale Station and the West Park Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 12 are described below under Uptown Station.

Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**Uptown Station**: Routes 6, 12, 17, 21, 23, 53, 114, and 115 serve this station. Routes 6, 21, 23, 53, 114 and 115 are unchanged under this alternative.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies increase slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

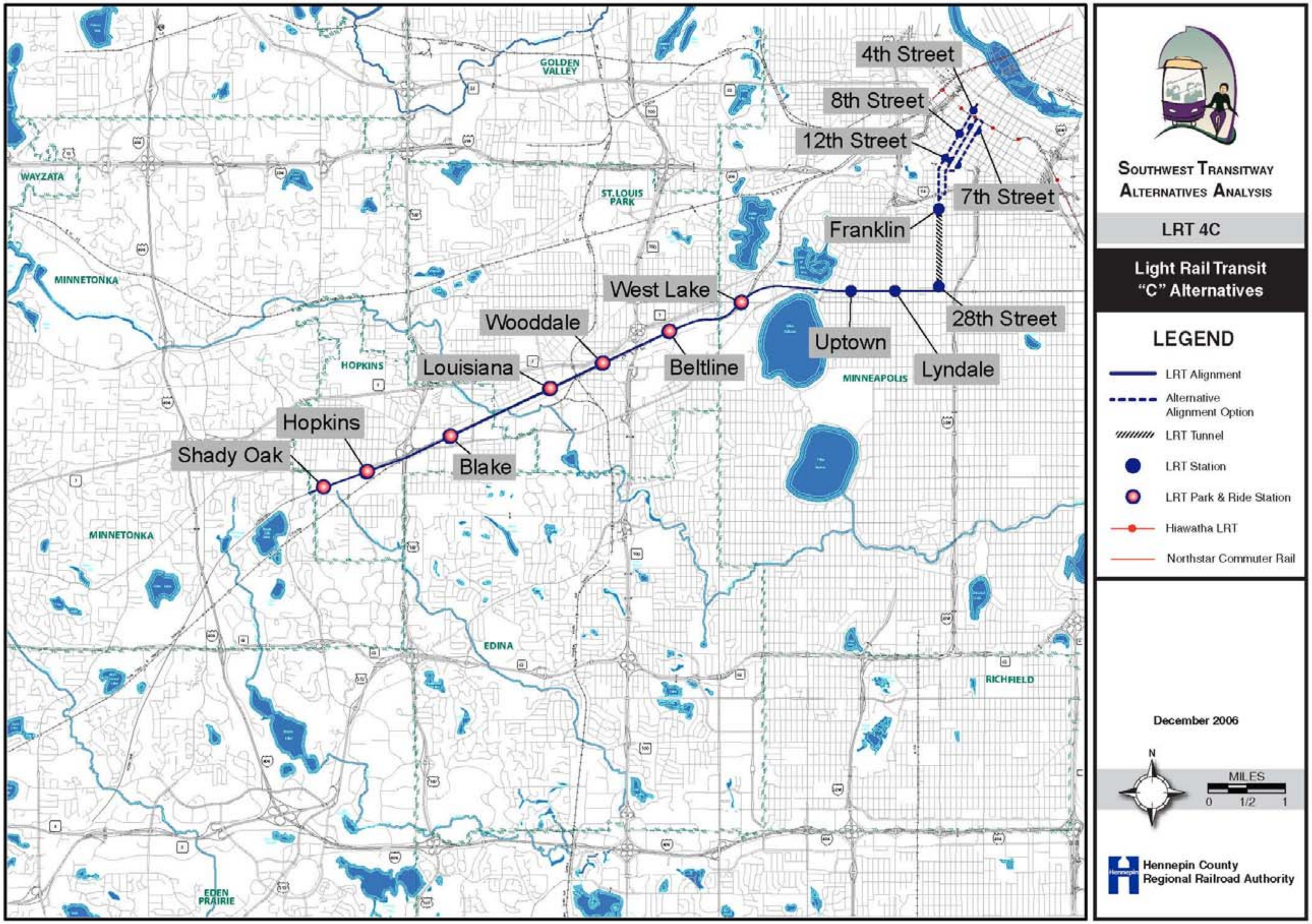
Changes to Route 17 are described above under Blake Station.

**Lyndale Station**: Routes 4, 21, 53, and 113 serve this station. These routes are unchanged under the alternative.

**28$^{th}$ Street Station**: Routes 18, 21, 53 and 568 serve this station. These routes are unchanged under the alternative.

**Franklin Station**: Routes 2, 18, 53 and 568 serve this station. These routes are unchanged under the alternative.

## Figure 11  LRT 4C




*Source: Parsons Brinckerhoff, 2006.*

# Southwest Transitway Alternatives Analysis

# Technical Memorandum No. 4
# Evaluation Process and Results

**Prepared for:**
**Hennepin County Regional Railroad Authority**

**Prepared by:**

**PB Americas, Inc. (PB)**

**January 2007**

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## Appendix Tables



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## Appendix Figures

# 1. Introduction

This technical memorandum documents the methodology, assumptions and results of the Evaluation of Alternatives task prepared for the Southwest Transitway Alternatives Analysis Study (Southwest Transitway AA).

The purpose of the evaluation process is to identify key benefits, costs and impacts of each alternative in order to identify those alternatives that are most likely to successfully address the Southwest Transitway AA goals, which were adopted by the Southwest Policy Advisory Committee on March 2, 2005. The alternatives identified as most likely to meet the Southwest Transitway AA goals are recommended for more intense study during further steps in the project development process.

# 2. Background and Assumptions

In developing the Southwest Transitway AA evaluation measures the Southwest Transitway Technical and Policy Advisory Committees first reviewed the Federal Transit Administration's (FTA) New Starts Evaluation Criteria. The intent was to develop local evaluation measures that address the adopted Southwest Transitway AA goals, but also are consistent with the FTA New Starts Evaluation Criteria.

# 3. Methodology

### FTA New Starts Evaluation Process

For transitway projects requesting Federal Transit Administration (FTA) New Starts funds there is a set of guidelines and an evaluation process used by the FTA. Projects seeking FTA New Starts funding are "rated" in a phased process.

Currently, the FTA gives New Starts candidate projects three ratings:
1. Project Justification Rating
2. Local Financial Commitment Rating
3. Overall Project Rating

Both the Project Justification and Local Financial Commitment ratings consist of five categories: high, medium-high, medium, medium-low, and low. The FTA then combines the Project Justification rating and the Local Financial Commitment rating to determine an Overall Project Rating.

Project Justification Ratings consists of six criteria. These are known as the "FTA New Starts Criteria". They are listed and discussed below, as well as summarized in Table 1:
- Mobility Improvements
- Cost Effectiveness
- Operating Efficiencies
- Environmental Benefits
- Existing Land Use, Transit Supportive Land Use Policies, and Future Patterns
- Other

### Table 1 FTA New Starts Criteria (FY2007)

| FTA Project Justification New Starts Criteria | FTA New Starts Evaluation Measures | Threshold for Medium Rating |
|---|---|---|
| Mobility Improvements | • System User Benefits (travel time savings)Per Passenger Mile<br>• Jobs within 1/2 mile of stations<br>• Low income population within 1/2 mile of stations | Ranked relative to other New Starts Projects |
| Cost Effectiveness | • Incremental Cost per Hour of Transportation System User Benefit (travel time savings) | Cost effectiveness value below $22 |
| Operating Efficiencies | • Regional Transit System Operating Cost Per Passenger Mile | Compared to other relevant national systems |
| Environmental Benefits | • Change in emissions: CO, NOX, VOC, CO2, & PM10<br>• Change in EPA regional air quality designation<br>• Change in regional energy consumption in the forecast year | For attainment areas, demonstrated reduction in transportation-related pollutants |
| Existing Land Use, Transit Supportive Land Use Policies, and Future Patterns | • Existing Land Use<br>• Transit Supportive Plans and Policies<br>• Performance and Impact of Policies | Weighted average of these three evaluation measures a medium rating or above |
| Other | • Degree of Local Financial Commitment<br>• Degree that institutions are in place and are assumed in the forecasts<br>• Multi-modal emphasis of the locally preferred investment strategy<br>• Environmental justice considerations and equity issues<br>• Opportunities for increased access to employment for low income persons, and welfare to work initiatives | Potential special-case factors presented by project sponsor. |

*Source: Parsons Brinckerhoff, 2006.*

A comprehensive discussion of the FTA process for project rating is found at www.fta.gov at the site's Planning and Environment tab. The complete Federal evaluation process for the Southwest Transitway will need to occur during a future phase of project development; however, as discussed in the next subsection, many of the local evaluation measures mirror the FTA measures and the results for those items are reported in section 10 of this technical memorandum.

## Local Evaluation

After reviewing the FTA New Starts Criteria, the Southwest Transitway Technical and Policy Advisory Committee members developed local evaluation criteria that reflect the then current FTA criteria and the Southwest Transitway goals. In several cases, the evaluation criteria are the same, for example, ridership projected in the study year (2030), jobs and population within ½ mile of stations, and existing and projected development within ½ mile of stations. In other cases the local evaluation measures are more detailed and relevant to the goals established specifically for the Southwest Transitway. The local criteria are based on the approved project goals, and tie evaluation measures under each project goal to specific project objectives identified under each goal.

The Southwest Transitway AA goals are to:

1. Improve Mobility
2. Provide a Cost-Effective and Efficient Travel Option
3. Protect the Environment
4. Preserve the Quality of Life
5. Support Economic Development

The Southwest Transitway Policy Advisory Committee (PAC) divided the Southwest Transitway goals into two tiers. The first tier includes the Improve Mobility and Provide a Cost-effective and Efficient Travel Option goals, and are considered essential for a project to exist. The second tier includes the Protect the Environment, Preserve the Quality of Life, and Support Economic Development goals, and should be achieved assuming a project exists from the application of the tier one goals.

The evaluation criteria developed for the Southwest Transitway AA reflect the values of the Southwest communities, and incorporate critical evaluation measures of the FTA New Starts process. Such FTA measures are noted by an asterisk (*) in the material which follows. Where quantitative measures were available, such as ridership and cost, these measures were used. In other instances, qualitative measures were identified.

### Evaluation Measures

The following evaluation measures were approved by the Southwest Transitway Policy Advisory Committee (PAC) on March 2, 2005.

## Tier 1 Goals: Mobility and Cost Effective/Efficient Travel Option

### Goal 1 - Improve Mobility

- Provide a travel option competitive with other modes in terms of journey time.
- Provide a reliable travel option that improves mobility throughout the day.
- Provide a travel option that serves population and employment concentrations.
- Provide a travel option that adds capacity and access to the regional and local transportation system.
- Provide a travel option that serves the people who depend upon transit.
- Provide a travel option that enhances pedestrian and bicycle activity and access to community.

| Evaluation Measures |
|---|
| 1. Transit Ridership Forecast (year 2030)<br>2. New Transit Riders (year 2030)<br>3. Travel Time Savings (vehicle hours of travel) (Year 2030)<br>4. Transportation Capacity Provided (vehicle capacity & frequency of service)<br>5. Travel Time Competitiveness (transit vs. SOV travel time)<br>6. System Integration (connections to planned transitways & extensions)<br>7. Transit Dependent Populations (Elderly -65+, Youth under 16, disabled, low-income and zero car households) within ½ mile of stations (Year 2030)<br>8. Jobs and Population within 1/2 mile of station* (Year 2030) |

** Also an FTA New Starts Evaluation Measure*

### Goal 2 - Provide a cost-effective, efficient travel option

- Provide a travel option with acceptable capital and operating costs.
- Provide a travel option that efficiently and effectively moves people.
- Provide a travel option that integrates efficiently with other modes and avoids major negative impacts to the existing roadway system.
- Provide a travel option that supports regional transportation system efficiency.

| Evaluation Measures |
|---|
| 1. Capital Costs (year 2006 and 2015)<br>2. Operating Costs (year 2006 and 2015)<br>3. Operating costs/passenger mile* relative to comparable systems in U.S.<br>4. Operating cost/trip relative to comparable systems in U.S.<br>5. Operating cost/hour relative to comparable systems in U.S.<br>6. Passengers/hour relative to comparable systems in U.S.<br>7. Potential for travel time delays on adjacent and intersecting roadway network |

** Also an FTA New Starts Evaluation Measure*

## Tier 2: Environment, Quality of Life, and Economic Development

### Goal 3 - Protect the Environment

- Provide a travel option beneficial to the region's air quality.
- Provide a travel option that avoids or minimizes alterations to environmentally sensitive areas.
- Provide a travel option that supports efficient, compact land use that facilitates accessibility.
- Provide a travel option that avoids major environmental impacts on adjacent properties, such as noise and vibration.

| Evaluation Measures |
|---|
| 1. Change in vehicle miles of travel (VMT) (Year 2030)<br>2. Reduction in HCVOC, NOX, and CO in annual metric tons* (Year 2030)<br>3. Potentially affected natural environment (wetlands, water bodies, parklands & floodplains) within 100 feet of the proposed route<br>4. Potentially affected population (dwelling units within 100 feet) by noise or vibration<br>5. Inventory of efficient, compact land use at station locations (1/2 mile radius)<br>6. Potential for reduction in emissions at station locations |

** Also an FTA New Starts Evaluation Measure*

### Goal 4 - Preserve and protect the quality of life in the study area and region

- Provide a travel option that contributes to the economic health of the study area and region through improving mobility and access.
- Provide a travel option that is sensitively designed with respect to existing neighborhoods and property values.
- Provide a travel option that protects and enhances access to public services and recreational facilities.

- Provide a travel option that supports sound planning and design of transit stations and park and ride lots.
- Provide a travel option that enhances the image and use of transit services in the region.

| Evaluation Measures |
|---|
| 1. Anticipated impact of vehicle technology on property values based upon national studies<br>2. Access to community amenities (libraries, parks, trails) within ½ mile of station locations<br>3. Access to employment opportunities for low-income households, jobs and low-income households within ½ mile of stations (Year 2030)<br>4. Intermodal connections at station locations<br>5. Integration and documentation of transit oriented development (TOD) opportunities/plans in local comprehensive plans<br>6. Regional transit ridership in forecast year 2030 including new riders<br>7. National data regarding intensification of land use around stations by mode<br>8. Consistency with regional growth plans (i.e. Blueprint/Transit 2030) (qualitative)<br>9. Impact of park/ride lots on existing & planned development at stations<br>10. Access to and accommodation of the existing and future trail system |

### Goal 5 - Support Economic Development

- Provide a travel option that supports economic development and redevelopment with improved access to transit stations.
- Provide a travel option that supports local sustainable development/redevelopment goals
- Provide a transportation system element that facilitates more efficient land development patterns and saves infrastructure costs
- Provide a travel option that accommodates future regional growth in locations consistent with local plans and the potential for increased ridership

| Evaluation Measures |
|---|
| 1. Existing & Planned TOD potential at station locations (qualitative)<br>2. Existing & Planned Jobs within 1/2 mile of station* (Year 2030)<br>3. Existing & Planned Other generators (schools, medical facilities, entertainment venues, etc.) within ½ mile of stations<br>4. Consistency with local comprehensive plan goals regarding economic development & redevelopment at stations including park/ride sites |

** Also an FTA New Starts Evaluation Measure*

## 4. Summary Description of Alternatives

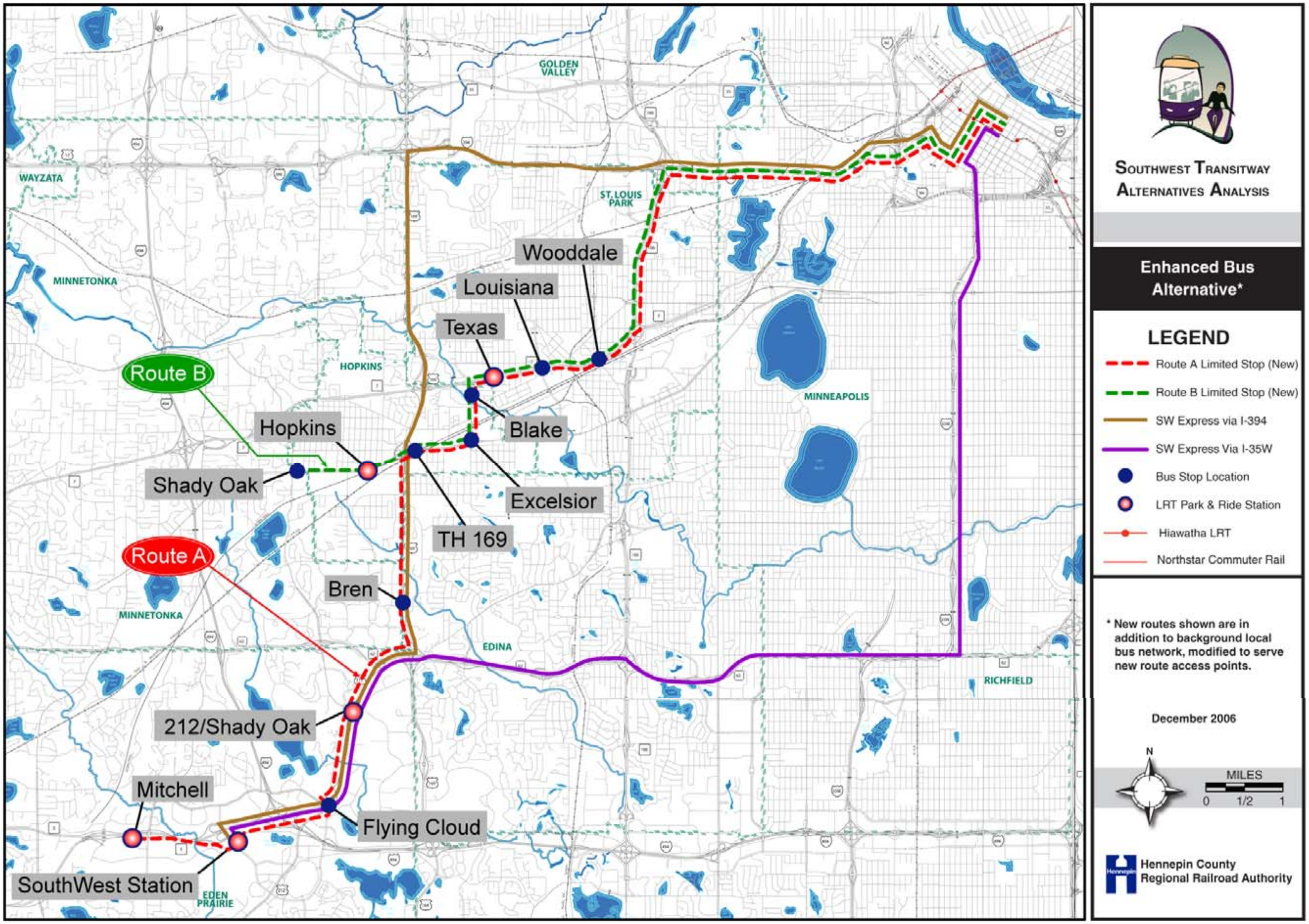
The Southwest Transitway study area extends from Trunk Highway 312 (TH 312) in Eden Prairie to downtown Minneapolis. It includes the Cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and portions of southwest Minneapolis as well as downtown Minneapolis. Alternatives developed to address Southwest Transitway needs are briefly described below and illustrated on the figures which follow each description. In developing the alternatives, the study team relied on previous studies conducted by

Hennepin County, Metro Transit, and the Minnesota Department of Transportation (MnDOT).  A more extensive description of each alternative is available in *Technical Memorandum No. 3, Definition of Alternatives*.

### Enhanced Bus Alternative

The Enhanced Bus alternative includes minor modifications to the existing express service, and augments Metro Transit and Southwest Metro Transit service with two limited-stop bus routes providing bi-directional service to Eden Prairie, Minnetonka, Hopkins and St. Louis Park.  Local service is restructured to provide access to the new limited stop service.  These routes would begin by serving selected stops, then travel non-stop on the regional highways using bus shoulder lanes and/or the I-394 HOV lane into downtown Minneapolis.  This allows the limited stop services to offer more attractive travel times, and increases options for commuters in the corridor.

**Figure 1 Enhanced Bus Alternative**



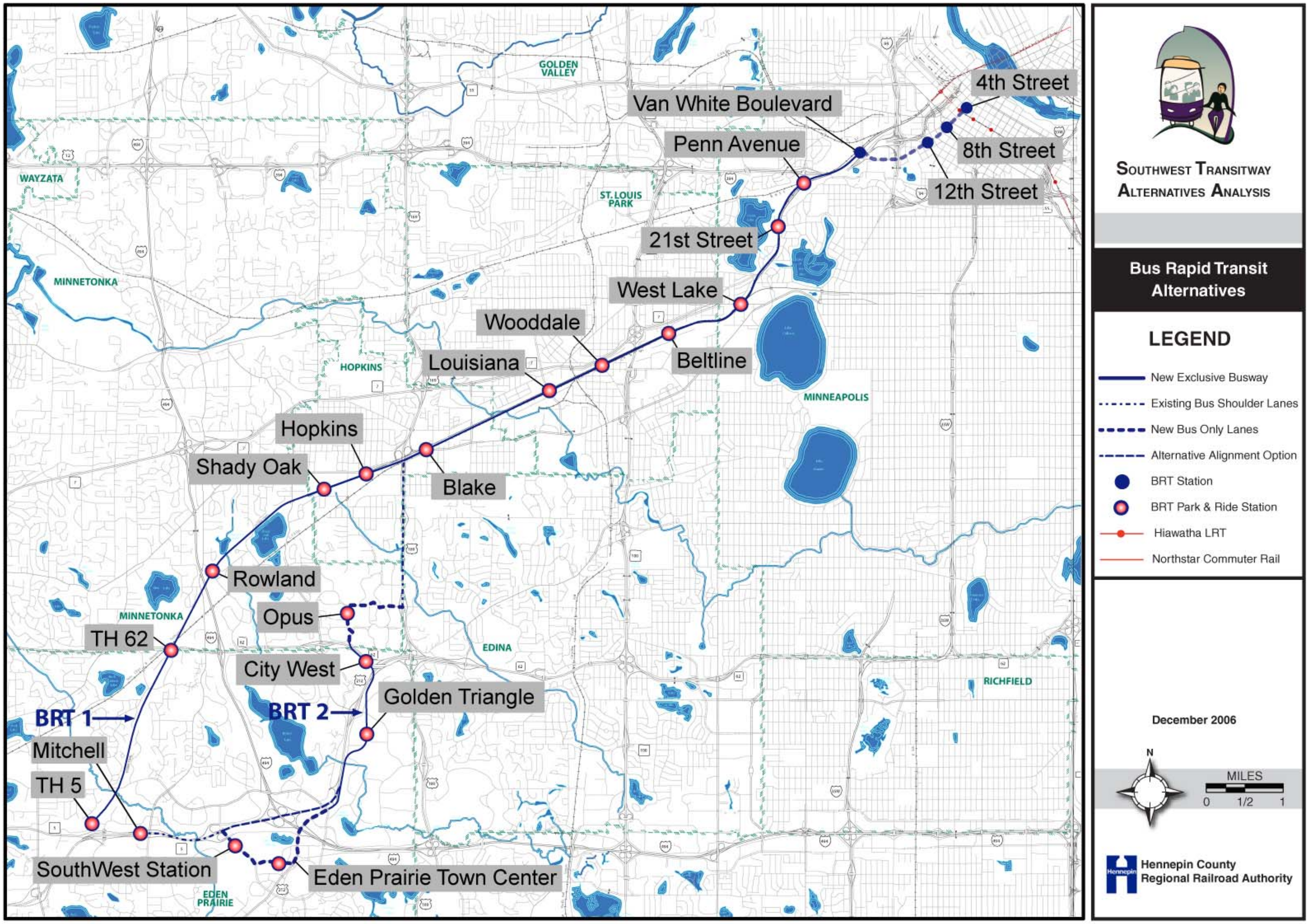

*Source: Parsons Brinckerhoff, 2006.*

### BRT Alternatives

BRT 1 provides an exclusive guideway for buses from Trunk Highway 5 (TH 5) in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. BRT 1 uses the Hennepin County Regional Railroad Authority (HCRRA) Southwest Corridor, entering downtown Minneapolis on existing streets near Dunwoody Avenue.

BRT 2 operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. BRT 2 uses a combination of existing streets and shoulder lanes between Eden Prairie and Hopkins, then enters the HCRRA Southwest Corridor as an exclusive guideway for buses, following the same route used by BRT 1 to enter downtown Minneapolis.

## Figure 2 BRT Alternatives




*Source: Parsons Brinckerhoff, 2006.*

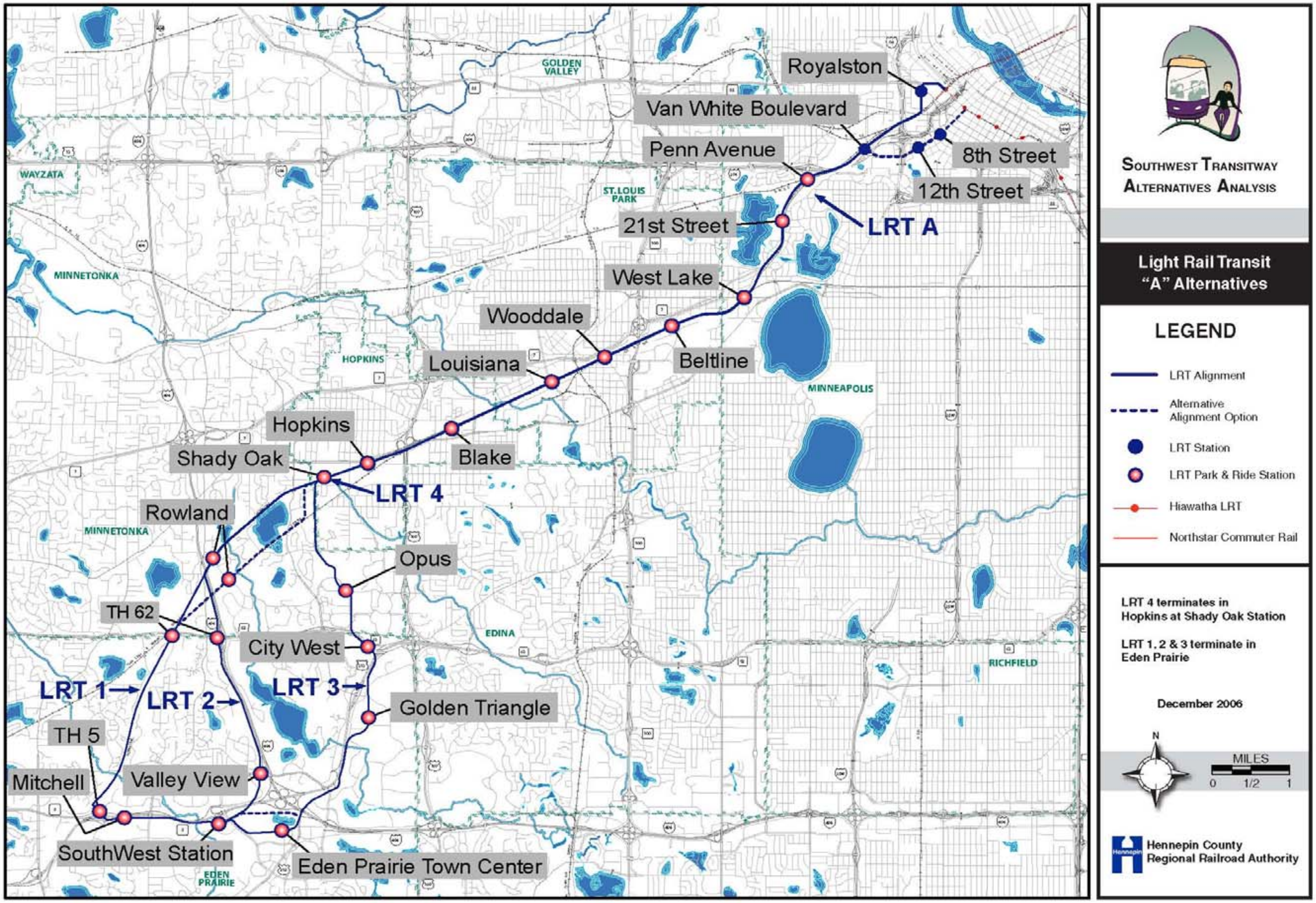
## LRT Alternatives

Eight LRT alternatives have been defined using a combination of two designations: 1, 2, 3 or 4; and A or C (e.g. 1A, 2A, 1C, 2C, etc.). The numbers designate the four possible routings west of Louisiana Avenue in St. Louis Park. The letters (A or C) designate the two possible routes east of Louisiana Avenue in St. Louis Park.

Alternatives numbered “1” designate routes that use the HCRRA’s Southwest Corridor exclusively through Eden Prairie, Minnetonka, Hopkins, and St. Louis Park. Alternatives numbered “2” designate routes that use TH 5 and I-494 right-of-way predominantly in Eden Prairie and Minnetonka, then use HCRRA’s Southwest Corridor through Hopkins and St. Louis Park. Alternatives numbered “3” use a combination of new exclusive rights of way through Eden Prairie, Minnetonka and part of Hopkins, then use the HCRRA’s Southwest Corridor through Hopkins and St. Louis Park.

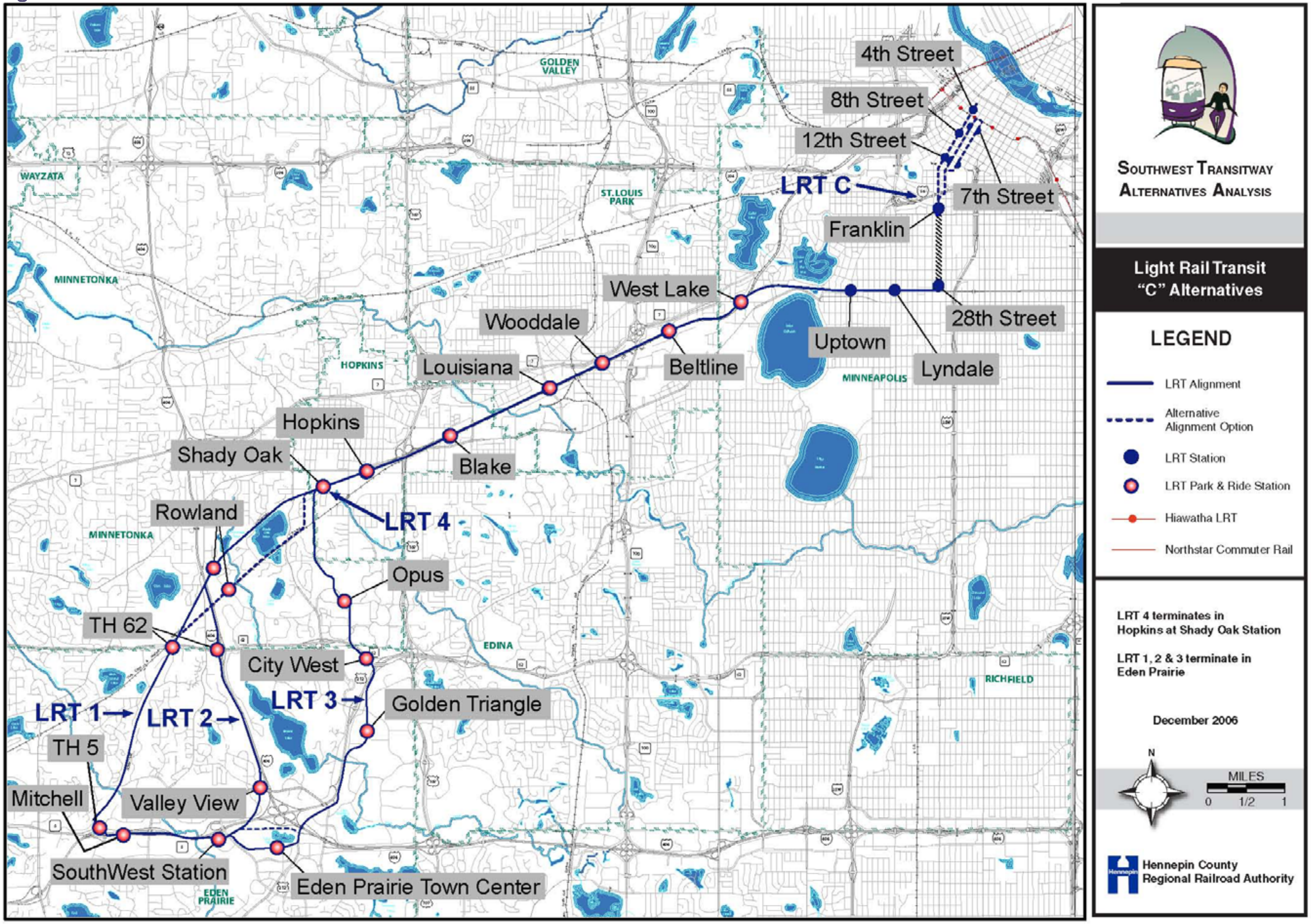
The letter “A” designates routes that use the HCRRA’s Southwest Corridor through St. Louis Park, and the HCRRA’s Kenilworth and Cedar Lake Corridors in Minneapolis. The letter “C” designates routes that use the HCRRA’s Southwest Corridor in St. Louis Park, the HCRRA’s Midtown Corridor in Minneapolis, and a shallow tunnel under Nicollet Avenue in Minneapolis. LRT “A” alternatives connect to the Intermodal Station, planned to be constructed by the Northstar commuter rail service and Hiawatha LRT line extension. That station is assumed to be already constructed prior to any Southwest Transitway development and is not included in the Southwest Transitway alternatives.

**Figure 3  LRT "A" Alternatives**




*Source: Parsons Brinckerhoff, 2006.*

Figure 4  LRT "C" Alternatives




*Source: Parsons Brinckerhoff, 2006.*

## Build Alternative Characteristics

*Technical Memorandum No. 3, Description of Alternatives,* discusses the evolution of the conceptual alternatives evaluated in the Southwest Transitway AA. Tables 2 and 3 identify route characteristics and station locations for each alternative.

### Table 2 Route Length and Number of Stations

| Alternative | Length (mi.) | Stations |
|---|---|---|
| **BRT 1** | 13.9 | 16 |
| **BRT 2** | 18.3 | 19 |
| **LRT 1A** | 13.8 | 14 |
| **LRT 2A** | 15.1 | 16 |
| **LRT 3A** | 15.7 | 17 |
| **LRT 4A** | 9.1 | 11 |
| **LRT 1C** | 14.6 | 17 |
| **LRT 2C** | 16.0 | 19 |
| **LRT 3C** | 16.6 | 20 |
| **LRT 4C** | 9.7 | 14 |

*Source: LTK, 2006.*

## Table 3 Stations

| Station (EB Stop) | Enhanced Bus Alternative | BRT Alternatives | | LRT Alternatives | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 1A | 2A | 3A | 4A | 1C | 2C | 3C | 4C |
| TH 5/HCRRA | | x | x | x | | | | x | | | |
| TH 5/Mitchell Rd. | x | | x | | x | x | | | x | x | |
| TH 62/HCRRA | | x | | x | | | | x | | | |
| TH 62/Baker Rd | | | | | x | | | | x | | |
| Southwest Station | x | | x | | x | x | | | x | x | |
| Valley View | | | | | x | | | | x | | |
| Eden Prairie Town Ctr. | | | x | | | x | | | | x | |
| Flying Cloud Dr/TH 212 | x | | | | | | | | | | |
| Golden Triangle | | | x | | | x | | | | x | |
| City West | | | x | | | x | | | | x | |
| Rowland Rd./HCRRA | | x | | x | x | | | x | x | | |
| Shady Oak Rd./TH-212 | x | | | | | | | | | | |
| Opus/Bren | x | | x | | | x | | | | X | |
| Shady Oak Rd./HCRRA | x | x | | x | x | x | x | x | x | x | x |
| 8th Ave./HCRRA | | x | | x | x | x | x | x | x | x | x |
| 8th Avenue | x | | | | | | | | | | |
| TH-169/Excelsior | x | | | | | | | | | | |
| Excelsior/Blake | x | | | | | | | | | | |
| Blake Road / TH-7 | x | | | | | | | | | | |
| Texas/TH 7 | x | | | | | | | | | | |
| Blake Road/HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Louisiana Av./HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Louisiana Ave/TH-7 | x | | | | | | | | | | |
| Wooddale Av/HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Wooddale Ave/TH-7 | x | | | | | | | | | | |
| Beltline Blvd./HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Beltline Blvd. | | | | | | | | | | | |
| West Lake St./HCRRA | | x | x | x | x | x | x | x | x | x | x |
| West Lake Street | | | | | | | | | | | |
| 21st St./HCRRA | | x | x | x | x | x | x | | | | |
| Penn Ave./HCRRA | | x | x | x | x | x | x | | | | |
| Van White Blvd/HCRRA | | x | x | x | x | x | x | | | | |
| Royalston Avenue | | | | x | x | x | x | | | | |
| Intermodal Station | | | | x | x | x | x | | | | |
| **Hennepin Ave. Route Option (replaces the Royalston & Intermodal Stations)** | | | | | | | | | | | |
| 12th/Hennepin | | x | x | | | | | | | | |
| 8th/Hennepin | | x | x | | | | | | | | |
| Uptown Station | | | | | | | | x | x | x | x |
| Lyndale/Midtown | | | | | | | | x | x | x | x |
| 28th/Nicollet | | | | | | | | x | x | x | x |
| Franklin/Nicollet | | | | | | | | x | x | x | x |
| 12th/ Nicollet or 2nd/Marquette | | | | | | | | x | x | x | x |
| 8th/Nicollet or 2nd/Marquette | | | | | | | | x | x | x | x |
| 4th Street | | x | x | | | | | x | x | x | x |

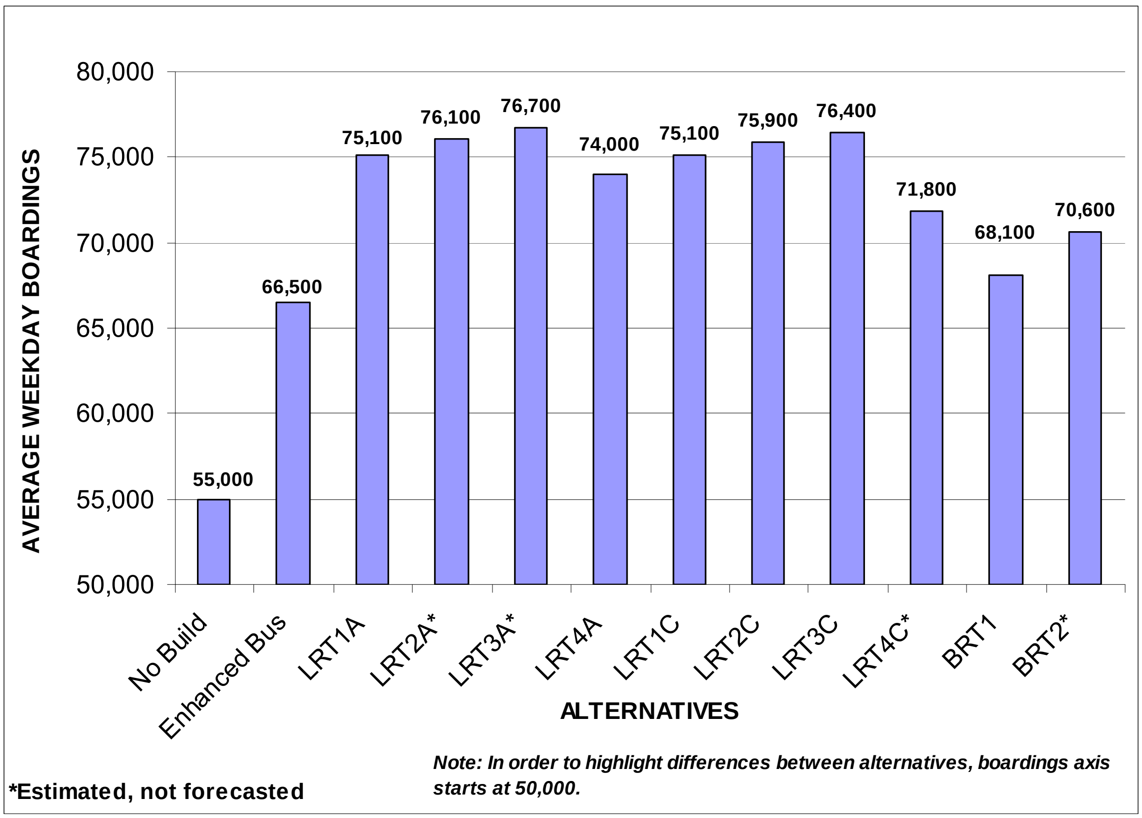
*Source: Parsons Brinckerhoff, 2006.*

# 5. Projected Ridership

The following three figures summarize the projected ridership information for each of the alternatives. The first figure has the total transit ridership information for the Southwest study area, and the second for the guideway - LRT and BRT - alternatives. The third figure indicates the number of new transit riders under each alternative. Detailed information is provided in *Technical Memorandum No. 6 Travel demand Forecasting Methodology and Ridership Results*.

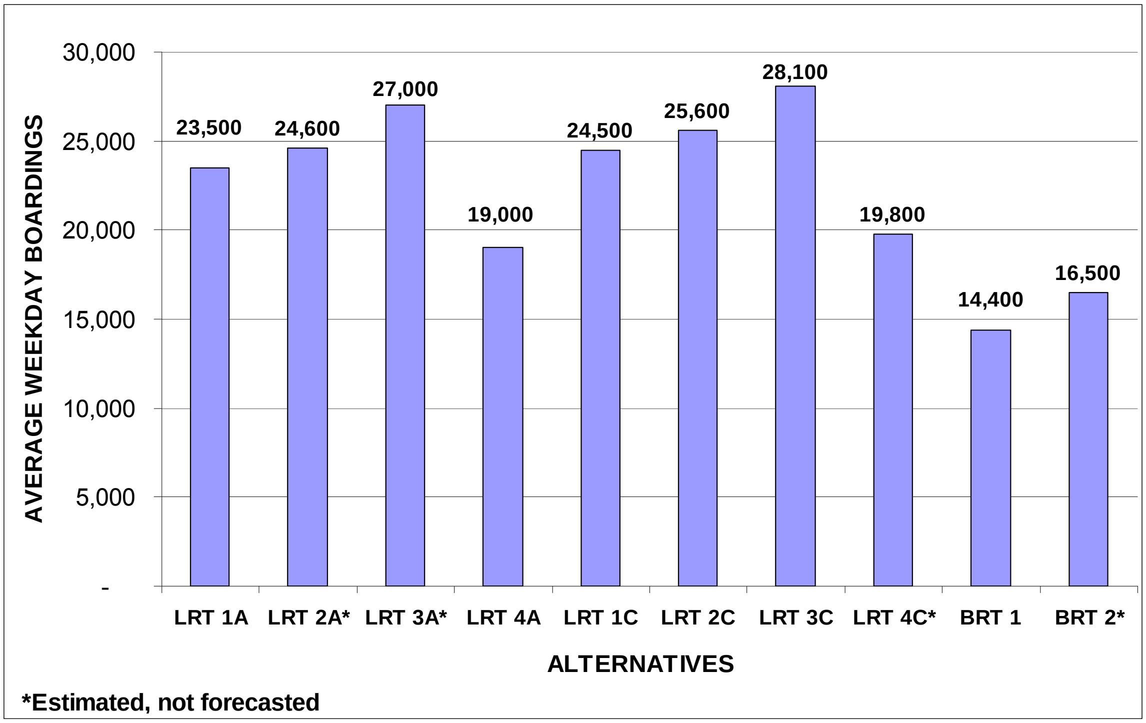
The regional travel demand model includes only land use plans that are currently in Comprehensive Plans approved by the Metropolitan Council, Metropolitan Planning Organization for the Twin Cities. More recent planning and development efforts underway in individual cities are not yet reflected in the model. The resulting development planned is expected to have a positive impact on ridership.

**Figure 5 Average Weekday Total Study Area Transit Boardings, Year 2030**



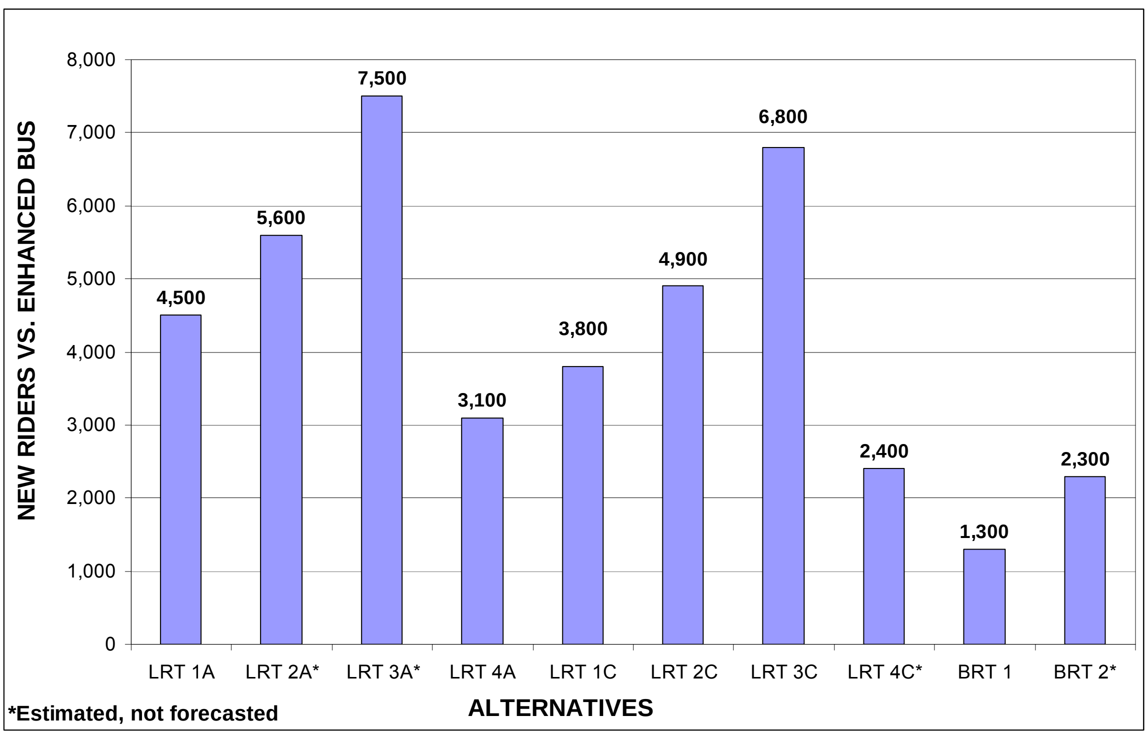

*Source: Parsons Brinckerhoff, 2006.*

## Figure 6  Average Weekday LRT and BRT Boardings, Year 2030




*Source: Parsons Brinckerhoff, 2006*

## Figure 7  New Riders - LRT and BRT Alternatives, Year 2030




*Source: Parsons Brinckerhoff, 2006*

# 6. Estimated Capital Costs

Capital cost estimates have been prepared using the format and procedures currently required for Federal project evaluation by the Federal Transit Administration (FTA). The FTA methodology includes the use of standard cost categories (SCC) and groupings for organization of the data, and detailed spreadsheets for development of forecast year estimates and annualized capital costs. Further information is found in *Technical Memorandum No. 7 Capital Cost Estimates.*

Capital cost estimates include the one-time expenditure to build the system and typically include guideways, tracks, stations, structures, signalization and communications systems, maintenance center and fleet storage yard, vehicles, right of way acquisition, and unallocated contingency. Also included are "soft costs" for items such as designs, construction services, insurance, and owner's costs.

Table 4 contains summaries of the total capital cost estimates for the Southwest Transitway alternatives. For each alternative the summaries include the Base Year (2006) total estimate, the unallocated contingency (20%), the Base Year (2006) project total, and the Forecast Year (2015) project total.

**Table 4 Summary of Total Capital Cost Estimates**

| Alternative | Year 2006 Estimate (thousands) | Unallocated Contingency (thousands) | Year 2006 Project Total (thousands) | Year 2015 Project Total (thousands) |
|---|---|---|---|---|
| Enhanced Bus | $ 52,376 | $ 10,475 | $ 62,851 | $ 79,882 |
| BRT 1 | $ 354,057 | $ 70,811 | $ 424,869 | $ 539,994 |
| BRT 2 | $ 461,580 | $ 92,316 | $ 553,896 | $ 703,983 |
| LRT 1A | $ 566,786 | $ 113,357 | $ 680,143 | $ 864,438 |
| LRT 2A | $ 647,578 | $ 129,516 | $ 777,093 | $ 987,659 |
| LRT 3A | $ 758,842 | $ 151,768 | $ 910,611 | $ 1,157,355 |
| LRT 4A | $ 414,963 | $ 82,993 | $ 497,956 | $ 632,885 |
| LRT 1C | $ 732,908 | $ 146,582 | $ 879,490 | $ 1,117,801 |
| LRT 2C | $ 814,692 | $ 162,938 | $ 977,630 | $ 1,242,535 |
| LRT 3C | $ 921,938 | $ 184,388 | $ 1,106,326 | $ 1,406,103 |
| LRT 4C | $ 582,877 | $ 116,575 | $ 699,453 | $ 888,981 |

*Source: LTK, 2006*

In addition to total project costs, the capital cost estimates have been computed on a per mile basis. Table 5 contains a summary of the estimated costs per mile for the BRT and LRT alternatives. The table lists the overall length of each alternative, the number of stations, the Base Year (2006) total project cost per mile, and the Forecast Year (2015) total project cost per mile.

### Table 5 Summary of Per Mile Capital Cost Estimates

| Alternative | Length (miles) | Stations | Capital Cost per Mile | |
|---|---|---|---|---|
| | | | Year 2006 (thousands) | Year 2015 (thousands) |
| BRT 1 | 13.9 | 16 | $ 30,657 | $ 38,964 |
| BRT 2 | 18.3 | 19 | $ 30,245 | $ 38,441 |
| LRT 1A | 13.8 | 14 | $ 49,374 | $ 62,752 |
| LRT 2A | 15.1 | 16 | $ 51,448 | $ 65,389 |
| LRT 3A | 15.7 | 17 | $ 57,895 | $ 73,583 |
| LRT 4A | 9.1 | 11 | $ 54,728 | $ 69,558 |
| LRT 1C | 14.6 | 17 | $ 60,088 | $ 76,370 |
| LRT 2C | 16.0 | 19 | $ 61,233 | $ 77,825 |
| LRT 3C | 16.6 | 20 | $ 66,686 | $ 84,756 |
| LRT 4C | 10.0 | 14 | $ 70,226 | $ 89,255 |

*Source: LTK, 2006.*

# 7. Estimated Operating and Maintenance Costs

Annual operating and maintenance (O&M) costs consist of the ongoing costs of operating, maintaining, and managing the regional transit system. These costs include:

- Labor costs (wages, fringe benefits, and other costs) for bus and rail operators, vehicle and facility maintainers, and other personnel directly engaged in providing transit service
- Fuel and electricity for motive power
- Parts, fluids and materials for maintaining the vehicles
- The non-labor operating costs of operating facilities (such as rail stations or bus park-and-ride lots) or maintenance facilities (such as bus and rail storage and maintenance facilities. These include utilities and materials for cleaning and maintaining the facilities.
- Administrative costs—labor and other costs associated with the management and direction of the transit agency.
- Insurance

The annual O&M cost estimates are developed on a system-wide basis, disaggregated into rail and bus services, to see that all changes to the transit system associated with a given alternative -- whether the change is in the addition or modification of the rail system, or is in the underlying bus transit system -- are reflected in the cost estimates.

This methodology is consistent with the requirements of the Federal Transit Administration's New Starts process, which requires that projected annual system-wide operating costs be a component in the calculation of user benefit statistics used by FTA for ranking potential projects seeking Federal funding support.

Full details of the estimated operating and maintenance costs are provided in *Technical Memorandum No. 8, Operating and Maintenance Cost Estimates*. To calculate the cost effectiveness index, the increment of additional cost above the future baseline alternative is used. Table 6 identifies the estimated incremental O&M costs above the Enhanced Bus alternative in Year 2015 dollars.

### Table 6 2015 Estimated Operating and Maintenance Cost, Increment over Enhanced Bus

| Alternative | Estimated Year 2015 Operating & Maintenance Cost<br>Increment over Enhanced Bus |
|---|---|
| **BRT 1** | $1.8 million |
| **BRT 2** | $2.5 million |
| **LRT 1A** | $11.5 million |
| **LRT 2A** | $14.8 million |
| **LRT 3A** | $15.9 million |
| **LRT 4A** | $7.6 million |
| **LRT 1C** | $13.3 million |
| **LRT 2C** | $15.5 million |
| **LRT 3C** | $17.1 million |
| **LRT 4C** | $8.5 million |

*Source: Parsons Brinckerhoff, 2006.*

# 8. Station Area Characteristics: Land Use

An analysis was conducted to identify the station area concept plans and land use characteristics evaluated in conjunction with project goals. The project team followed the process described in the August 29,2006 Land Use report to document and review station area planning and transit oriented development potential for the Southwest Transitway alternatives. In the process summarized below, the project team:

- Documented the station locations and reviewed the station evaluations from previous study alignments
- Reviewed the previous station locations with each municipality along the corridor, and identified new station locations along proposed alignment variations
- Reviewed and documented existing comprehensive plans and transit supportive policies of each affected community
- Reviewed, documented and discussed specific station area plans with each community and identified transit supportive development potential around station areas
- Developed station area concept plans consistent with community goals and technical criteria
- Documented the Local Evaluation Measures for land use criteria in a manner consistent with FTA New Starts criteria measures
- Developed land use evaluation measures in the overall evaluation

The adopted Comprehensive Plans of the affected cities along the proposed transitway are the enforceable policy instruments that guide land use. Transit supportive policies have been adopted by each city. A summary description of the policies is included in Appendix A of this memorandum.

The FTA's New Starts Land Use Criteria consider the following transit supportive land use categories and factors:

- Existing Land Use
- Transit Supportive Plans and Policies
- Performance and Impacts of Policies

The FTA takes into consideration the stage of project development, and identifies the planning and policy oriented factors as most relevant in early project development. FTA Land Use guidelines are addressed in Appendix B of this memorandum.

The evaluation methodology identified the quantifiable or qualitative measures and equated them with corresponding FTA New Starts criteria as applicable. Specific evaluation methodologies formed the basis of the land use and development evaluation measures.

# 9. Station Area Characteristics: Environment

An environmental screening was conducted to identify the social and natural environmental resources included in the evaluation measures which could potentially be affected by the project alternatives. These measures are listed below by study goal:

- Goal 1 – Improve Mobility
  - Measure 7 – Transit dependent populations within ½-mile of stations (Year 2000)
  - Measure 8 – Jobs and population within ½-mile of station (Year 2000 and 2030)
- Goal 3 – Protect the Environment
  - Measure 3 – Potentially affected natural environment (wetlands, water bodies, parklands, and floodplains) within 50 feet and 100 feet of centerline
  - Measure 4 – Potentially affected population (dwelling units within 100 feet) by noise and vibration
- Goal 4 – Preserve and protect the quality of life in the study area and region
  - Measure 2 – Access to community amenities (libraries, parks, trails) within ½-mile of station locations
  - Measure 3 – Access to employment opportunities for low-income households within ½-mile of stations (Year 2000 and 2030)
  - Measure 10 – Access to and accommodation of the existing and future trail system
- Goal 5 – Support Economic Development
  - Measure 2 – Existing and planned jobs within ½-mile of stations (Year 2000 and 2030).
  - Measure 3 – Existing and planned other generators (schools, medical facilities, entertainment venues, etc.) within ½-mile of stations

The GIS-based evaluation was based on existing data sources including information from Hennepin County, the Metropolitan Council, the Minnesota Department of Natural Resources, and the US Census. Metro GIS endorsed datasets where used whenever possible. Data sets that were used include:

- Metropolitan Council
  - Hennepin County Parcel Layer
  - 2000 Digital Orthophotos
  - Railroads
  - Transportation Analysis Zones; 1990 – 2000
  - Mississippi River Critical Area (MN DNR) and MNRRA (US NPS) Boundaries
  - Census Geography 2000 - TLG Aligned; Blocks, Block Groups & Tracts
  - Profile of General Demographic Characteristics for Census Tracts: 2000
  - Profile of Selected Social Characteristics for Census Tracts: 2000
  - Profile of Selected Economic Characteristics for Census Tracts: 2000
  - Profile of Selected Housing Characteristics for Census Tracts: 2000
  - Major Shopping Centers
  - Regional and State Trails - Existing and Proposed
  - Regionally Significant Ecological Areas
  - Lakes (from 1990 Land Use and Other Sources)
  - Water Features from 2000 Land Use Data
  - Streams Network
  - Rivers (from 1990 Land Use Layer)

- TLG Landmarks - Points of Interest
- TLG Landmarks - Lines of Interest
- TLG Landmarks - Areas of Interest
- Geographic Names Information System (USGS Place Names)
- Road Network
- Regional Parks, Parks, Open Space
- Official TAZ Forecasting Spreadsheet (Bob Paddock, Transportation Research)

- Minnesota Department of Natural Resources
  - National Wetlands Inventory Polygons
  - FEMA Floodways
- Hennepin County Library Website
  - Library Locations
- U. S. Bureau of the Census Website
  - Poverty Thresholds in 2000
- LTK Engineering Services
  - Alternative Alignments
  - Station Locations
  - Station Footprints

Recognizing the number of alternatives and evaluation measures, an approach was developed to facilitate the data assessment and presentation through using a series of matrices, included in the Appendix of this memorandum. A matrix was established for each study goal. Each of these matrices included the corresponding evaluation measures for the goal compared against the full range of potential alternatives. For Goals 1, 4, and 5, the information reflects data within ½-mile of each station. For Goal 3, the information is based on buffers built off the alignment centerline. For Measure #10 under Goal 4, the information is non-quantitative and, therefore, is represented graphically. Given the varied nature of the data sources in terms of level of refinement and age, this evaluation was used to identify trends and order of magnitude differences between alternatives as one component of the overall evaluation of alternatives.

To provide context and reference, graphics were established for each alternative highlighting the alignment, the station locations, and the ½-mile buffer radius used for compiling the data. The graphics, included in the Appendix, also illustrate existing and proposed trails in response to Measure #10 (access to and accommodations of the existing and future trail system).

Following FTA New Starts procedures, "build" alternatives (BRT 1 and 2, and all the LRT alternatives) are compared to the Enhanced Bus alternative -- which is assumed to become the FTA required "baseline" alternative during the next phase of project development. The Enhanced Bus alternative includes modifications to existing express bus service and new limited stop bus routes. This alternative uses existing roadways, shoulder lanes, and park and ride facilities in many cases already in place or planned for construction by others by 2030. Since the Enhanced Bus alternative does not include expansion of transit or highway facilities it does not introduce the potential for impacts to the social or natural environment and was not assessed in the comparison.

# 10. Evaluation Results

All of the data and qualitative information developed in defining the alternatives were summarized in matrix format. Tables 7 through 11 provide the quantitative or qualitative data for each goal's measures.

Using the data to compare the alternatives, the alternatives were then ranked according to how successfully each meets the project goals. Tables 12 through 16 rank the alternatives using the following categories:

- Does not support goal
- Supports goal
- Strongly supports goal

Both matrix evaluations were reviewed by the Technical and Policy Advisory Committees during August and September, 2006. Tables 7 through 16 follow. The findings and preliminary recommendation of the Technical and Policy Advisory Committees are presented in Section 11.

## A. Evaluation Data Matrices

### Table 7 Goal 1 Evaluation Data

| Alternatives | Forecast Southwest Transitway BRT and LRT Boardings (Year 2030) | New Transit Riders (Year 2030) | Travel Time Savings (vehicle hours of travel) (Year 2030) | Transitway Transportation Capacity Provided in Peak Hour | Travel Time Competitiveness vs. Auto (A) From (F) and To (T): F Southwest Metro Station 2 – T Minneapolis CBD (5th and Nicollet) 34 (A) | F Southwest Metro Station – T U of M Twin Cities (East Bank) 44 (A) | F Hopkins Station – T Minneapolis CBD (5th and Nicollet) 25 (A) | F Woodale Station – T Minneapolis-St. Paul Intern'l Airport 28 (A) | F Hopkins Station – T Uptown Station 22 (A) | System Integration (connections to planned transitways & extensions) | Transit Dependent Populations within 1/2 mile of stations (2000 Census)[3] | Jobs and Population within 1/2 mile of station[3,4] (Year 2030) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Enhanced Bus** (Baseline - includes Hiawatha, Central LRT) | N/A | Baseline for comparison to Build Alternatives | Baseline for comparison to Build Alternatives | 640 | 28 | 40 | 12 | 40 | 22 | Not interlined; Transfer required at north end | Low-Income Households: 1995<br>Population over age 65: n/a<br>Population under age 18: n/a<br>Zero-car households: n/a<br>Disabled population: n/a | Pop: 69,000<br>Emp: 255,000 |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | 14,400 | 1,300 | 0.05% Savings | 640 | 42 | 54 | 25 | 41 | 19 | Not interlined; Transfer required at north end | Low-Income Households: 2,120<br>Population over age 65: 5,410<br>Population under age 18: 6,790<br>Zero-car households: 4,100<br>Disabled population: 6,260 | Pop: 52,000<br>Emp: 190,000 |
| **BRT 2 -** Eden Prairie to Minneapolis, Golden Triangle/Opus/ TH 169/HCRRA | 16,500[1] | 2,300[1] | 0.06% Savings[1] | 640 | 36 | 48 | 25 | 41 | 19 | Not interlined; Transfer required at north end | Low-Income Households: 2,120<br>Population over age 65: 5,460<br>Population under age 18: 6,860<br>Zero-car households: 4,130<br>Disabled population: 6,280 | Pop: 52,000<br>Emp: 210,000 |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/Kenilworth/ Royalston | 23,500 | 4,500 | 0.04% Savings | 2796 | 36 | 48 | 21 | 38 | 17 | Interlined with Hiawatha LRT | Low-Income Households: 1,780<br>Population over age 65: 4,230<br>Population under age 18: 6,530<br>Zero-car households: 2,210<br>Disabled population: 4,960 | Pop: 42,000<br>Emp: 91,000 |
| **LRT 2A -** Eden Prairie to Minneapolis, I-494/ HCRRA /Kenilworth/ Royalston | 24,600[1] | 5,600[1] | 0.01% Savings [1] | 2796 | 32 | 43 | 21 | 38 | 17 | Interlined with Hiawatha LRT | Low-Income Households: 1,850<br>Population over age 65: 4,310<br>Population under age 18: 6,710<br>Zero-car households: 2,250<br>Disabled population: 5,020 | Pop: 44,000<br>Emp: 98,000 |
| **LRT 3A -** Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/ Kenilworth/Royalston | 27,000[1] | 7,500[1] | 0.05% Savings [1] | 2796 | 33 | 45 | 21 | 38 | 17 | Interlined with Hiawatha LRT | Low-Income Households: 1,830<br>Population over age 65: 4,280<br>Population under age 18: 6,540<br>Zero-car households: 2,250<br>Disabled population: 4,950 | Pop: 43,000<br>Emp: 114,000 |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/Royalston | 19,000[1] | 3,100 | 0.01 Savings% | 2796 | 35 | 47 | 21 | 38 | 17 | Not interlined; Transfer required at north end | Low-Income Households: 1,620<br>Population over age 65: 3,860<br>Population under age 18: 5,390<br>Zero-car households: 2,170<br>Disabled population: 4,460 | Pop: 37,000<br>Emp: 84,000 |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/Nicollet | 24,500 | 3,800 | 0.07 % Savings | 2796 | 35 | 47 | 20 | 42 | 11 | Not interlined; Transfer required at north end | Low-Income Households: 4,450<br>Population over age 65: 6,490<br>Population under age 18: 10,360<br>Zero-car households: 9,180<br>Disabled population: 11,050 | Pop: 82,000<br>Emp: 210,000 |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/HCRRA / Midtown/Nicollet | 25,600 | 4,900 | 0.02% Savings | 2796 | 31 | 43 | 20 | 42 | 11 | Not interlined; Transfer required at north end | Low-Income Households: 4,520<br>Population over age 65: 6,580<br>Population under age 18: 10,550<br>Zero-car households: 9,220<br>Disabled population: 11,110 | Pop: 84,000<br>Emp: 218,000 |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/Midtown/ Nicollet | 28,100 | 6,800 | 0.08% Savings | 2796 | 33 | 45 | 20 | 42 | 11 | Not interlined; Transfer required at north end | Low-Income Households: 4,500<br>Population over age 65: 6,550<br>Population under age 18: 10,380<br>Zero-car households: 9,220<br>Disabled population: 11,040 | Pop: 83,000<br>Emp: 233,000 |
| **LRT 4C -** Hopkins to Minneapolis, HCRRA/Midtown/ Nicollet | 19,800[1] | 2,400[1] | 0.02% Savings[1] | 2796 | 35 | 47 | 21 | 42 | 13 | Transfer required at north and south end | Low-Income Households: 4,280<br>Population over age 65: 6,120<br>Population under age 18: 9,230<br>Zero-car households: 9,140<br>Disabled population: 10,550 | Pop: 78,000<br>Emp: 203,000 |

[1] Estimated not forecasted

[2] LRT 1A requires bus transfer from SW Station before trip begins on LRT

[3] Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers.

[4] FTA New Starts Criterion

n/a = not available

*Source: Parsons Brinckerhoff, 2006.*

## Table 8 Goal 2 Evaluation Data

| Alternatives | Transitway Capital Cost (2015$) Total[1] | Transitway Capital Costs (2015) Per Mile[1] | Transitway Operating Costs (Increment over Enhanced Bus) (2015) | Preliminary Cost Effectiveness Index (CEI)[4] (2006$) | Operating cost/passenger mile[2] relative to comparable U.S. systems ($2004) | Operating cost/trip relative to comparable U.S. systems (unlinked) ($2004) | Operating cost/revenue vehicle hour relative to comparable U.S. systems ($2004) | Passengers/ hour relative to comparable U.S. systems | Intersections identified for analysis during EIS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | LRT Peer Range: $0.25-$1.30 (2004 NTDB) | LRT Peer Range: $1.60-$5.60 (2004 NTDB) | LRT Peer Range: $100-$330 (2004 NTDB) | LRT Peer Range: 50-100 (2004 NTDB) | |
| **Enhanced Bus** (Baseline) | $80m | n/a | $529m | n/a | n/a | n/a | n/a | n/a | Hopkins: Excelsior/8th Avenue |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | $540m | $39m | $1.8m | $66 | Cost within range | Cost within range | $106 | Passengers Above Range | Hopkins: 11th Avenue,Blake<br>St Louis Park: Woodale,Beltline<br>Minneapolis: 21st Street |
| **BRT 2[3] -** Eden Prairie to Minneapolis, Golden Triangle/Opus/TH | $704m | $38m | $2.5m | $74 | Cost within range | Cost within range | $106 | Passengers Above Range | St Louis Park: Woodale,Beltline<br>Minneapolis: 21st Street |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/Kenilworth/Royalston | $864m | $63m | $11.5m | $30 | Cost within range | Cost within range | $258 | Passengers Above Range | Hopkins: 11th Avenue,Blake<br>St Louis Park: Woodale,Beltline<br>Minneapolis: 21st Street, Cedar Lake Pkwy |
| **LRT 2A[3] -** Eden Prairie to Minneapolis, I-494/HCRRA / Kenilworth/Royalston | $988m | $65m | $14.8m | $31 | Cost within range | Cost within range | $259 | Passengers Above Range | Hopkins: 11th Avenue,Blake<br>St Louis Park: Woodale,Beltline<br>Minneapolis: 21st Street, Cedar Lake Pkwy |
| **LRT 3A[3] -** Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/ Kenilworth/Royalston | $1,157b | $74m | $15.9m | $26 | Cost within range | Cost within range | $260 | Passengers Above Range | Eden Prairie: Valley View<br>Hopkins: 11th Avenue,Blake<br>St Louis Park: Woodale,Beltline<br>Minneapolis: 21st Street, Cedar Lake Pkwy |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/Kenilworth/Royalston | $633m | $70m | $7.6m | $28 | Cost within range | Cost within range | $249 | Passengers Above Range | Hopkins: 11th Avenue,Blake<br>St Louis Park: Woodale,Beltline<br>Minneapolis: 21st Street, Cedar Lake Pkwy |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/Nicollet | $1,117b | $76m | $13.3m | $37 | Cost within range | Cost within range | $255 | Passengers Above Range | Hopkins: 11th Avenue,Blake<br>St Louis Park: Woodale,Beltline<br>Minneapolis: Humboldt, Irving, Franklin, 19th, 18th, 16th, Vineland, 13th, 12th, 11th, 10th, 9th, 8th, 7th, 6th |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/HCRRA /Midtown/Nicollet | $1,243b | $78m | $15.5m | $38 | Cost within range | Cost within range | $256 | Passengers Above Range | Hopkins: 11th Avenue,Blake<br>St Louis Park: Woodale,Beltline<br>Minneapolis: Humboldt, Irving, Franklin, 19th, 18th, 16th, Vineland, 13th, 12th, 11th, 10th, 9th, 8th, 7th, 6th |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/Midtown/ Nicollet | $1.1b/ $1,406b | $85m | $17.1m | $30 | Cost within range | Cost within range | $257 | Passengers Above Range | Eden Prairie: Valley View<br>Hopkins: 11th Avenue,Blake<br>St Louis Park: Woodale,Beltline<br>Minneapolis: Humboldt, Irving, Franklin, 19th, 18th, 16th, Vineland, 13th, 12th, 11th, 10th, 9th, 8th, 7th, 6th |
| **LRT 4C[3] -** Hopkins to Minneapolis, HCRRA/Midtown/Nicollet | $889m | $89m | $8.5m | $41 | Cost within range | Cost within range | $252 | Passengers Above Range | Hopkins: 11th Avenue,Blake<br>St Louis Park: Woodale,Beltline<br>Minneapolis: Humboldt, Irving, Franklin, 19th, 18th, 16th, Vineland, 13th, 12th, 11th, 10th, 9th, 8th, 7th, 6th |

[1] Includes unallocated contingency
[2] FTA New Starts Evaluation Measure
[3] Estimated not modeled
[4] Estimated for non-modeled alternatives

*Source: Parsons Brinckerhoff, LTK, SEH, 2006.*

## Table 9 Goal 3 Evaluation Data

| Alternatives | Change in vehicle miles of travel (VMT) (Year 2030) | Reduction in VOC, NOX, CO in annual metric tons[1] (Year 2030) | Potentially affected natural environment within 100 feet | Dwelling units potentially affected by noise or vibration | Inventory of efficient, compact land use at station locations (1/2 mile radius)[3,4] |
|---|---|---|---|---|---|
| **Enhanced Bus** (Baseline) | 108,686,994 | 42.2/41.2/750.1 | Wetlands: n/a<br>Parklands: n/a<br>Floodplain: n/a | n/a | Population density: 3,699<br>Employment : 255,256 |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | Down 0.05% | 0.04/0.03/0.49 | Wetlands: 15 acres<br>Parklands: 7 acres<br>Floodplain: 19 acres | 152 units | Population density: 4,403<br>Employment: 189,501 |
| **BRT 2[2] -** Eden Prairie to Minneapolis, Golden Triangle/Opus/TH 169/HCRRA | Down 0.06% | 0.05/0.04/0.07 | Wetlands: 27 acres<br>Parklands: 8 acres<br>Floodplain: 27 acres | 119 units | Population density: 4,135<br>Employment: 210,322 |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/Kenilworth/ Royalston | Down 0.04% | 0.01/0.01/.22 | Wetlands: 6 acres<br>Parklands: 7 acres<br>Floodplain: 17 acres | 162 units | Population density: 3,796<br>Employment: 91,299 |
| **LRT 2A[2] -** Eden Prairie to Minneapolis, I-494/HCRRA / Kenilworth/Royalston | Down 0.01% | 0.0/0.0/0.13 | Wetlands: 24 acres<br>Parklands: 7 acres<br>Floodplain: 22 acres | 146 units | Population density: 3,465<br>Employment: 98,447 |
| **LRT 3A[2] -** Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/ Kenilworth/Royalston | Down 0.05% | 0.01/0.01/0.30 | Wetlands: 39 acres<br>Parklands: 7 acres<br>Floodplain: 26 acres | 161 units | Population density: 3,191<br>Employment: 114,190 |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/Kenilworth/ Royalston | Down 0.01% | 0.0/0.0/0.0 | Wetlands: 1 acre<br>Parklands: 7 acres<br>Floodplain: 13 acres | 130 units | Population density: 4,324<br>Employment: 83,623 |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/Midtown/Nicollet | Down 0.07% | 0.04/0.03/0.51 | Wetlands: 7 acres<br>Parklands: 5 acres<br>Floodplain: 17 acres | 253 units | Population density: 6,961<br>Employment: 210,382 |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/HCRRA / Midtown/Nicollet | Down 0.02% | 0.01/0.02/0.31 | Wetlands: 25 acres<br>Parklands: 5 acres<br>Floodplain: 22 acres | 237 units | Population density: 6,277<br>Employment: 217,601 |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/ Midtown/ Nicollet | Down 0.08% | 0.05/0.04/0.69 | Wetlands: 40 acres<br>Parklands: 5 acres<br>Floodplain: 26 acres | 252 units | Population density: 5,862<br>Employment: 233,343 |
| **LRT 4C[1] -** Hopkins to Minneapolis, HCRRA/Midtown/Nicollet | Down 0.02% | 0.0/0.0/0.0 | Wetlands: 2 acres<br>Parklands: 5 acres<br>Floodplain: 13 acres | 221 units | Population density: 8,236<br>Employment: 202,777 |

[1]FTA New Starts Evaluation Measure. Note: HC, a component of VOC, not picked up separately by Mobile6 model

[2] Estimated not modeled

[3] Population density per square mile; length of corridor reduces density

[4] Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers.

*Source: Parsons Brinckerhoff, SEH, 2006.*

## Table 10 Goal 4 Evaluation Data

| Alternatives | Anticipated impact on property values[1] | Community amenities within 1/2 mile of stations[2] | Employment opportunities for low income households within 1/2 mile of stations[2,3] | Intermodal connections at stations | | | | Integration and documentation of TOD in local comprehensive plans | 2030 daily transit boardings | Intensification of land use around stations by mode | Consistency with regional growth plans (qualitative) | Impact of park/ride lots on development at stations[5] | Future and existing trail access and accommodation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Pedestrian | Bicycle | Other Transit | Auto | | | | | | |
| **Enhanced Bus** (Baseline) | No impact | Parks: 0<br>Libraries: n/a<br>Trail access: Low | Low Income Households 1,995 Jobs 255,000 | | | | | No | 11,500 | No impact | Yes until SW Corridor implemented - 2030 TPP | Unconstrained demand: 1,280 spaces | Very limited access to existing trail |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | If well designed fixed guideway, generally positive at stations but less than LRT | Parks: 46<br>Libraries: 2<br>Trail access: High | Households: 2,120<br>Jobs: 189,500 | High | High | Medium | Medium | Yes | 14,400 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 2,114 spaces | Full access to existing trails: SW, Midtown |
| **BRT 2[4] -** Eden Prairie to Minneapolis, Golden Triangle/Opus/TH 169/HCRRA | If well designed fixed guideway, generally positive at stations but less than LRT | Parks: 45<br>Libraries: 2<br>Trail access: Medium | Households: 2,163<br>Jobs: 210,300 | Medium | Lower | Medium | Medium | Yes | 16,500 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 2,645 spaces | Partial access to existing trails: SW, Midtown |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/Kenilworth/ Royalston | Positive at well-designed stations | Parks: 43<br>Libraries: 2<br>Trail access: High | Households: 1,783<br>Jobs: 91,200 | High | High | Medium | Medium | Yes | 23,500 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 2,430 spaces | Full access to existing trails: SW, Midtown |
| **LRT 2A[4] -** Eden Prairie to Minneapolis, I-494/HCRRA /Kenilworth/Royalston | Positive at well-designed stations | Parks: 45<br>Libraries: 2<br>Trail access: Medium | Households: 1,851<br>Jobs: 98,400 | Medium | Lower | Medium | Medium | Yes | 24,600 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 2,680 spaces | Partial access to existing trails: SW, Midtown |
| **LRT 3A[4] -** Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/ Kenilworth/Royalston | Positive at well-designed stations | Parks: 42<br>Libraries: 2<br>Trail access: Medium | Households: 1,831<br>Jobs 114,200 | Medium | Lower | Medium | Medium | Yes | 27,000 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 3,040 spaces | Partial access to existing trails: SW, Midtown |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/Kenilworth/ Royalston | Positive at well-designed stations | Parks: 38<br>Libraries: 2<br>Trail access: Medium | Households: 1,617<br>Jobs: 83,600 | High | High | High | Medium | Yes | 19,000 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 1,640 spaces | Partial access to existing trails: SW, Midtown |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/Midtown/Nicollet | Positive at well-designed stations | Parks: 44<br>Libraries: 3<br>Trail access: High | Households: 4,451<br>Jobs: 210,400 | High | High | Medium | n/a | Yes | 24,500 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 2,320 spaces | Full access to existing trails: SW, Midtown |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/HCRRA /Midtown/Nicollet | Positive at well-designed stations | Parks: 46<br>Libraries: 3<br>Trail access: Medium | Households: 4,518<br>Jobs: 217,600 | Medium | Lower | Medium | n/a | Yes | 25,600 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 2,630 spaces | Partial access to existing trails: SW, Midtown |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/ Midtown/ Nicollet | Positive at well-designed stations | Parks: 43<br>Libraries: 2<br>Trail access: Medium | Households: 4,499<br>Jobs: 233,300 | Medium | Lower | Medium | n/a | Yes | 28,100 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 2,990 spaces | Partial access to existing trails: SW, Midtown |
| **LRT 4C[4] -** Hopkins to Minneapolis, HCRRA/Midtown/Nicollet | Positive at well-designed stations | Parks: 39<br>Libraries: 2<br>Trail access: Medium | Households: 4,284<br>Jobs: 202,800 | High | High | High | n/a | Yes | 19,800 | Well designed fixed guideway generally promotes intensification | Yes - SW Corridor in 2030 TPP | Unconstrained demand: 1,590 spaces | Partial access to existing trails: SW, Midtown |

[1] Based on national studies or national data

[2] Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers.

[3] Low Income Households from 2000 Census; 2030 jobs from regional forecasts

[4] Estimated not modeled

[5] Exact location and integration of p/r lots with development to be addressed in station area master planning process

*Source: Parsons Brinckerhoff, SEH, LSA Design, 2006.*

## Table 11 Goal 5 Evaluation Data

| Alternatives | Existing & Planned TOD Potential at Station Locations (Qualitative) | Planned Jobs within 1/2 mile of station[1,2] (Year 2030) | Existing Other Generators within 1/2 mile of Stations[4] | Consistency with local comprehensive plan goals regarding economic development & redevelopment at stations |
|---|---|---|---|---|
| **Enhanced Bus** (Baseline) | n/a | 27,953 | n/a | n/a |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | Cities not planning for TOD west of West Hopkins/Shady Oak. Planning underway at Van White, Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak | 189,500 | Schools: 31<br>Medical Facilities: 2<br>Entertainment Venues: 16<br>Government Centers: 14<br>Major Shopping Centers: 20 | All station locations are consistent with all cities' Comprehensive Plans. Planning for redevelopment at stations not underway west of West Hopkins/Shady Oak station. |
| **BRT 2**[3] **-** Eden Prairie to Minneapolis, Golden Triangle/Opus/TH 169/HCRRA | Cities planning for TOD throughout corridor : Van White, Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak, Opus, Golden Triangle, Town Center | 210,300 | Schools: 30<br>Medical Facilities: 2<br>Entertainment Venues: 16<br>Government Centers: 14<br>Major Shopping Centers: 29 | All station locations are consistent with all cities' Comprehensive Plans. Planning for redevelopment at station locations underway in 3 alignments, and through Hopkins, St. Louis Park and Minneapolis. |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/Kenilworth/ Royalston | Cities not planning for TOD west of West Hopkins/Shady Oak. Planning underway at Van White, Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak | 91,200 | Schools: 21<br>Medical Facilities: 1<br>Entertainment Venues: 13<br>Government Centers: 11<br>Major Shopping Centers: 14 | All station locations are consistent with all cities' Comprehensive Plans. Planning for redevelopment at stations not underway west of West Hopkins/Shady Oak station. |
| **LRT 2A**[3] **-** Eden Prairie to Minneapolis, I-494/HCRRA / Kenilworth/Royalston | Cities not planning for TOD west of West Hopkins/Shady Oak. Planning underway at Van White, Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak | 98,400 | Schools: 20<br>Medical Facilities: 1<br>Entertainment Venues: 12<br>Government Centers: 15<br>Major Shopping Centers: 19 | All station locations are consistent with all cities' Comprehensive Plans. Planning for redevelopment at stations not underway west of West Hopkins/Shady Oak station. |
| **LRT 3A**[3] **-** Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/ Kenilworth/Royalston | Cities planning for TOD throughout corridor : Van White, Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak, Opus, Golden Triangle, Town Center | Jobs 114,200 | Schools: 19<br>Medical Facilities: 1<br>Entertainment Venues: 12<br>Government Centers: 15<br>Major Shopping Centers: 18 | All station locations are consistent with all cities' Comprehensive Plans. Planning for redevelopment at station locations underway in 3 alignments, and through Hopkins, St. Louis Park and Minneapolis. |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/Kenilworth/ Royalston | Cities planning for TOD throughout corridor : Van White, Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak | 83,600 | Schools: 18<br>Medical Facilities: 1<br>Entertainment Venues: 11<br>Government Centers: 10<br>Major Shopping Centers: 13 | All station locations are consistent with all cities' Comprehensive Plans. Planning for redevelopment at station locations underway through Hopkins, St. Louis Park and Minneapolis. |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/Midtown/Nicollet | Cities not planning for TOD west of West Hopkins/Shady Oak Station. Planning underway at Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak. TOD already in place in C segment | 210,400 | Schools: 36<br>Medical Facilities: 3<br>Entertainment Venues: 18<br>Government Centers: 14<br>Major Shopping Centers: 19 | All station locations are consistent with all cities' Comprehensive Plans. Planning for redevelopment at stations not underway west of West Hopkins/Shady Oak station. |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/HCRRA /Midtown/Nicollet | Cities not planning for TOD west of West Hopkins/Shady Oak Station. Planning underway at Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak. TOD already in place in C segment | 217,600 | Schools: 35<br>Medical Facilities: 3<br>Entertainment Venues: 17<br>Government Centers: 18<br>Major Shopping Centers: 24 | All station locations are consistent with all cities' Comprehensive Plans. Planning for redevelopment at stations not underway west of West Hopkins/Shady Oak station. |
| **LRT 3C** - Eden Prairie to Minneapolis, Golden Triangle/Opus/HCRRA/Midtown/ Nicollet | Cities planning for TOD throughout corridor : Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak, Opus, Golden Triangle, Town Center. TOD in place in C segment | 233,300 | Schools: 34<br>Medical Facilities: 3<br>Entertainment Venues: 17<br>Government Centers: 18<br>Major Shopping Centers: 23 | All station locations are consistent with all cities' Comprehensive Plans.; Planning for redevelopment at station locations underway in 3 alignments, and through Hopkins, St. Louis Park and Minneapolis. |
| **LRT 4C**[3] **-** Hopkins to Minneapolis, HCRRA/Midtown/Nicollet | Cities planning for TOD throughout corridor : Woodale, Blake, downtown Hopkins, West Hopkins/Shady Oak, Opus, Golden Triangle, Town Center. TOD in place in C segment | 202,800 | Schools: 33<br>Medical Facilities: 3<br>Entertainment Venues: 16<br>Government Centers: 13<br>Major Shopping Centers: 18 | All station locations are consistent with all cities' Comprehensive Plans. Planning for redevelopment at station locations underway through Hopkins, St. Louis Park and Minneapolis. |

[1] FTA New Starts Evaluation Measure

[2] Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers.

[3] Estimated not modeled

[4] See attached

*Source: Parsons Brinckerhoff, SEH, LSA Design, 2006.*

## B. Evaluation Ratings Matrices

### Table 12 Goal 1 Evaluation Ratings

| Alternatives | Forecast Ridership (2030) | New Transit Riders (2030) | Travel Time Savings (2030) | Transitway Transportation Capacity Provided in Peak Hour | Travel Time Competitiveness (Transit vs. Auto) | System Integration | Transit Dependent Populations | Population and Employment[2] (2030) | |
|---|---|---|---|---|---|---|---|---|---|
| **BRT 1** Eden Prairie to Minneapolis, HCRRA | ● | ● | ◑ | ● | ● | ● | ◑ | ◑ | ○ |
| **BRT 2**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/HCRRA | ◑ | ○ | ◑ | ● | ● | ● | ◑ | ◑ | ○ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/Kenilworth/ Royalston | ○ | ○ | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/HCRRA/ Kenilworth/Royalston | ○ | ○ | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/Royalston | ◑ | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ○ | ◑ | ◑ | ○ | ◑ | ◑ | ○ | ○ | ○ |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/HCRRA / Midtown/Nicollet | ○ | ○ | ◑ | ○ | ○ | ◑ | ○ | ○ | ○ |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/ Opus/HCRRA/ Midtown/Nicollet | ○ | ○ | ◑ | ○ | ◑ | ◑ | ○ | ○ | ○ |
| **LRT 4C**[1] **-** Hopkins to Minneapolis, HCRRA/Midtown/ Nicollet | ◑ | ◑ | ◑ | ○ | ◑ | ● | ○ | ○ | ○ |
| [1] Estimated not modeled | | | | | | | | | |
| [2]Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers. | | | | | | | | | |
| **Evaluation Breakpoints** | | | | | | | | | |
| ● Does not support goal | < 15 thousand | <2 thousand | Increased VHT | <1000 seats | >2 min slower than auto in 3 or more O/D pairs | Transfer required at north and south end | Below baseline alternative | <35 thousand | <75 thousand |
| ◑ Supports goal | 15-20 thousand | 2-4 thousand | 0-1% savings | 1000-2000 seats | Equivalent to auto (w/in 2 min) in 3 or more O/D pairs | Transfer required at either north or south end | Moderate improvement over baseline alternative | 35-70 thousand | 75-175 thousand |
| ○ Strongly supports goal | > 20 thousand | >4 thousand | >1% savings | >2000 seats | >2min faster than auto in 3 or more O/D pairs | Interlined with existing/planned transitway | Significant improvement over baseline alternative | >70 thousand | >175 thousand |

*Source: Parsons Brinckerhoff, SEH, 2006.*

## Table 13 Goal 2 Evaluation Ratings

| Alternatives | Transitway Capital Cost (2015) | | Transitway Operating Costs (Annual Increment over Enhanced Bus) (2015) | Preliminary Cost Effectiveness Index (CEI) (2006$)[1] | Peer City Comparison (2004) | | | | Intersections identified for analysis during EIS |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Per Mile | | | Operating cost / passenger mile[2] | Operating cost / trip | Operating cost / revenue vehicle hour | Passengers / hour | |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | ○ | ○ | ○ | ● | ◑ | ◑ | ◑ | ○ | ◑ |
| **BRT 2**[1]**-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/ HCRRA | ○ | ○ | ○ | ● | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/ HCRRA / Kenilworth/ Royalston | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ○ | ◑ | ○ | ○ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ○ | ● |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/ HCRRA / Midtown/ Nicollet | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ○ | ● |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ● |
| **LRT 4C**[1] **-** Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ○ | ● |

[1] Estimated not modeled

[2]FTA New Starts Evaluation Measure

**Evaluation Breakpoints**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ● Does not support goal | >$1.5 billion | >$90 million | >$23 million (2015) | >$35.00 Exceeds FTA New Starts Threshold by >20% | Cost above range of peer systems | Cost above range of peer systems | Cost above range of peer systems | Below range of peer systems | Potentially significant impact to street network |
| □ Supports goal | $750-1.5 billion | $40-90 million | $12 million - $23 million (2015) | $20-35 Within 20% of FTA New Starts Threshold | Cost within range of peer systems | Cost within range of peer systems | Cost within range of peer systems | Within range of peer systems | Some impact to street network likely |
| ○ Strongly supports goal | <$750 million | <$40 million | <$12 million (2015) | <$29.00 Consistent w/FTA New Starts Threshold | Cost below range of peer systems | Cost below range of peer systems | Cost below range of peer systems | Above range of peer systems | Avoids impact to street network |

*Source: Parsons Brinckerhoff, SEH, 2006.*

## Table 14 Goal 3 Evaluation Ratings

| Alternatives | Change in vehicle miles of travel (VMT) (Year 2030) | Reduction in VOC, NOX, CO in annual metric tons[2] (Year 2030) | Potentially affected natural environment within 100 feet | Dwelling units potentially affected by noise or vibration | Inventory of efficient, compact land use within 1/2 mile of stations FTA New Starts Criteria | |
|---|---|---|---|---|---|---|
| | | | | | Population Density per Square Mile | Employment[3] |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | ◑ | ◑ | ◑ | ◑ | ◑ | ○ |
| **BRT 2**[1]**-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/ HCRRA | ◑ | ◑ | ● | ◑ | ◑ | ○ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/ HCRRA / Kenilworth/ Royalston | ◑ | ◑ | ● | ◑ | ◑ | ◑ |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ● | ◑ | ● | ◑ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ● | ○ | ◑ | ◑ | ◑ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ◑ | ● | ◑ | ○ |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/ HCRRA / Midtown/ Nicollet | ◑ | ◑ | ● | ● | ◑ | ○ |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ● | ● | ◑ | ○ |
| **LRT 4C**[1] **-** Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ● | ○ | ● | ◑ | ○ |

[1]Estimated not modeled

[2] FTA New Starts Evaluation Measure. Note: HC, a component of VOC, not picked up separately by Mobile6 model

[3]Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers.

**Evaluation Breakpoints**

| | | | | | | |
|---|---|---|---|---|---|---|
| ● Does not support goal | 0% Reduction | 0% Reduction | >50 acres of combined potentially affected wetland, parkland and floodplain | >200 units | <3,333 | <75,000 FTA Threshold for Low ranking |
| ◑ Supports goal | 0-5% Reduction | 0-5% Reduction | 25-50 acres | 50-200 units | 3,333-10,000 | 75,000-175,000 FTA Threshold for Low-Medium/ Medium ranking |
| ○ Strongly supports goal | >5% Reduction | >5% Reduction | <25 acres | <50 units | >10,000 | >175,000 FTA Threshold for High-Med/ High ranking |

*Source: Parsons Brinckerhoff, SEH, 2006.*

## Table 15  Goal 4 Evaluation Ratings

| Alternatives | Anticipated impact on property values[2] | Community amenities within 1/2 mile of stations | Employment opportunities for low income households within 1/2 mile of stations[3] | | Intermodal Connections at Stations | | | | Integration and documentation of TOD in local comprehensive plans | Intensification of land use around stations by mode | Forecast Ridership (2030) | Consistency with regional growth plans (qualitative) | Impact of park/ride lots on development at stations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low Income Households | Employment[4] | Pedestrian | Bicycle | Other Transit | Auto | | | | | |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | ◑ | ○ | ◑ | ○ | ○ | ○ | ◑ | ◑ | ● | ◑ | ● | ○ | ◑ |
| **BRT 2**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/HCRRA | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ◑ | ○ | ○ | ◑ | ◑ | ● | ○ | ○ | ○ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/ HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ○ | ○ | ○ | ◑ |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ○ | ◑ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ◑ | ○ | ○ | ◑ | ◑ | ◑ | ○ | ◑ | ○ | ◑ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ○ | ○ | ○ | ○ | ○ | ○ | ◑ | n/a | ◑ | ○ | ○ | ○ | ◑ |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/ HCRRA / Midtown/ Nicollet | ○ | ○ | ○ | ○ | ◑ | ◑ | ◑ | n/a | ◑ | ○ | ○ | ○ | ◑ |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ○ | ○ | ○ | ○ | ◑ | ◑ | ◑ | n/a | ○ | ○ | ○ | ○ | ◑ |
| **LRT 4C**[1] **-**Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ○ | ○ | ○ | ○ | ○ | ○ | ◑ | n/a | ◑ | ○ | ◑ | ○ | ◑ |

[1]Estimated not modeled
[2]Based on national studies or national data
[3]Low Income Households from 2000 Census and defined as 60% of 7-county median family income ($59,358/$35,615); 2030 jobs from regional forecasts
[4]Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers.

**Evaluation Breakpoints**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ● Does not support goal | Research does not support positive impact at stations | No amenities w/in 1/2 mi. | <1,000 | <75,000 | Poor at majority of stations | No TOD planning in major portions of the alternative | Research does not support intensification | < 15 thousand | Not consistent | Stations unable to accommodate demand |
| ◑ Supports goal | Research supports general positive impact at stations | Amenities w/in 1/2 mi. of several stations | 1000-4,000 | 75,000 - 175,000 | Moderate at majority of stations | TOD exists and is planned in a majority of the alternative | Research limited but supports intensification for bus transit if fixed guideway | 15-20 thousand | Partially consistent | Station demand indicates shift to adjacent station required |
| ○ Strongly supports goal | Research supports definite postive impact at stations | Amenities w/in 1/2 mi. of all stations | >4000 | >175,000 | High at majority of stations | TOD exists and is planned throughout alternative | Research documents significant intensification | > 20 thousand | Fully consistent | Stations able to accommodate demand in planned area |

*Source: Parsons Brinckerhoff, SEH, 2006.*

## Table 16  Goal 5 Evaluation Ratings

| Alternatives | Existing & Planned TOD Potential at Station Locations (Qualitative) | Planned Jobs within 1/2 mile of station[2,3] (Year 2030) | Existing Other Generators within 1/2 mile of Stations | Consistency with local comprehensive plan goals regarding economic development & redevelopment at stations |
|---|---|---|---|---|
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | ● | ○ | ◑ | ○ |
| **BRT 2**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/ HCRRA | ◑ | ○ | ○ | ○ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ● | ◑ | ◑ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/ HCRRA/ Kenilworth/ Royalston | ● | ◑ | ◑ | ● |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ◑ | ○ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ◑ | ○ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ○ | ○ | ○ |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/ HCRRA/ Midtown/ Nicollet | ◑ | ○ | ○ | ● |
| **LRT 3C** - Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ○ | ○ | ○ | ○ |
| **LRT 4C**[1] **-** Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ○ | ◑ | ○ |

[1] Estimated not modeled

[2] FTA New Starts Evaluation Measure

[3] Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers.

**Evaluation Breakpoints**

| | | | | |
|---|---|---|---|---|
| ● Does not support goal | Local comprehensive plans contain transit supportive policies. TOD already present and/or multiple special area studies completed | <75K | <50 | Comprehensive plans do not support development in significant segment of alignment |
| ◑ Supports goal | Local comprehensive plans contain transit supportive policies, special area studies proposed | 75-175K | 50-90 | Comprehensive plans support development at stations in all segments of alignment |
| ○ Strongly supports goal | Limited TOD potential and/or planning | >175K | >90 | Comprehensive plans support TOD in all segments of alignment; redevelopment planning underway throughout alignment |

*Source: Parsons Brinckerhoff, SEH, 2006.*

# 11. Preliminary Recommendation

The Technical Advisory Committee (TAC) compared the benefits, costs, and impacts of a range of alternatives to address mobility needs in the Southwest Corridor. The range of transit alternatives considered included an enhanced bus, two bus rapid transit (BRT), and eight light rail transit (LRT) alternatives. From those alternatives, the TAC recommended three light rail transit (LRT) and the enhanced bus alternative be retained for detailed analysis in an environmental impact statement, the next phase of project development:

- Enhanced Bus (as the FTA required baseline alternative)
- LRT 1 A
- LRT 3A
- LRT 3C

The TAC recommendations were received by the Policy Advisory Committee (PAC) on September 27, 2006. The PAC directed that public comment be solicited on the draft technical committee recommendations during October and November, 2006.

**Background**

The evaluation measures developed by the Southwest Technical Advisory Committee (TAC) and approved by the Southwest Policy Advisory Committee (PAC) reflect the goals established for a Southwest Transitway and the Federal Transit Administration's (FTA) New Starts evaluation criteria.

The Southwest Transitway goals are divided into two tiers, Tier 1 and Tier 2. For a transitway alternative to be considered viable it must meet the Tier 1 goals: improve mobility, and provide a cost-effective, efficient travel option. Assuming a transitway alternative meets the Tier 1 goals it is then evaluated to determine how well it fulfills the Tier 2 goals: protect the environment, preserve and protect the study area's quality of life, and support economic development.

All alternatives were evaluated in terms of equivalent service frequency, length of service day, and area of coverage. Both BRT and LRT alternatives have comprehensive feeder bus components as part of their service plan.

Table 17, the Summary Evaluation Matrix shows how each alternative was rated by the TAC against evaluation measures; it follows below.

## Table 17 Summary Evaluation Matrix

| Alternatives | Tier 1 Goals: Goal 1: Improve Mobility | Goal 2: Provide a Cost-Effective, Efficient Travel Option | Results | Tier 2 Goals: Goal 3: Protect the Enviroment | Goal 4: Preserve and Protect the Quality of Life in the Study Area and Region | Goal 5: Support Economic Development | Recommendation |
|---|---|---|---|---|---|---|---|
| **Enhanced Bus** (Baseline) | **Carry forward as Baseline alternative (Required)** | | | **Carry forward as Baseline alternative (Required)** | | | **Carry forward as Baseline Alternative** |
| **BRT 1** - Eden Prairie to Minneapolis, HCRRA | ● | ● | Does not meet Tier 1 Goals; Do not carry forward | | | | |
| **BRT 2**[1] - Eden Prairie to Minneapolis, Golden Triangle/Opus/TH 169/HCRRA | ● | ● | Does not meet Tier 1 Goals; Do not carry forward | | | | |
| **LRT 1A** - Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | Meets Tier 1 Goals; Carry Forward to Tier 2 | ◑ | ◑ | ◑ | **Carry forward for further analysis** |
| **LRT 2A**[1] - Eden Prairie to Minneapolis, I-494/HCRRA /Kenilworth/Royalston | ◑ | ◑ | Meets Tier 1 Goals; Carry Forward to Tier 2 | ◑ | ◑ | ◑ | **Other alternatives better meet Tier 2 Goals. Do not carry** |
| **LRT 3A**[1] - Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | Meets Tier 1 Goals; Carry Forward to Tier 2 | ◑ | ◑ | ○ | **Carry forward for further analysis** |
| **LRT 4A** - Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ● | ◑ | Part of full alternative. Do not carry forward | | | | |
| **LRT 1C** - Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ● | Does not meet Tier 1 Goals; Do not carry forward | | | | |
| **LRT 2C** - Eden Prairie to Minneapolis, I-494/ HCRRA/ Midtown/ Nicollet | ◑ | ● | Does not meet Tier 1 Goals; Do not carry forward | | | | |
| **LRT 3C** - Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ◑ | ◑ | Meets Tier 1 Goals; Carry Forward to Tier 2 | ◑ | ◑ | ○ | **Carry forward for further analysis** |
| **LRT 4C**[1] - Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ● | ● | Part of full alternative. Do not carry forward | | | | |

[1]Estimated not modeled

**Evaluation Breakpoints**

| | Goal 3 | Goal 4 | Goal 5 |
|---|---|---|---|
| ● Does not support goal | Supports goal on fewer than 4 of 6 measures | Supports goal on fewer than 7 of 10 measures | Supports goal on fewer than 3 of 4 measures |
| ◑ Supports goal | Supports goal on 4 of 6 measures | Supports goal on 7 of 10 measures | Supports goal on 3 of 4 measures |
| ○ Strongly supports goal | Supports goal on all measures | Supports goal on all measures | Supports goal on all measures |

*Source: Parsons Brinckerhoff, SEH, 2006.*

The map on the next page (Figure 8 Preliminary Recommended Alternatives) shows the routes proposed to be retained by the TAC. The rationale for the TAC preliminary recommendations is discussed in the following pages.

**Enhanced Bus Alternative**

The Enhanced Bus alternative includes minor modifications to existing express bus service, and augments Metro Transit and Southwest Metro service with two new limited-stop bus routes. The new limited-stop routes provide bi-directional service to Eden Prairie, Minnetonka, Hopkins and St. Louis Park. Local bus service is restructured to provide access to the new routes. These routes would begin by serving selected stops, then travel non-stop on the regional highways using bus shoulder lanes and/or the I-394 HOV/HOT lane into downtown Minneapolis

The Enhanced Bus alternative represents the proposed future baseline alternative. It represents a significant increase in transit service and facilities without a major guideway investment. It is the baseline against which "build" alternatives, in this case Bus Rapid Transit (BRT) and Light Rail Transit (LRT) alternatives, are measured. A baseline alternative such as the Enhanced Bus alternative is required by the Federal Transit Administration (FTA) for transitway projects seeking Federal funding.

***TAC Recommendation:***

> ***The Enhanced Bus alternative is required by the Federal Transit Administration (FTA) and as such is recommended for retention for further evaluation.***

**BRT Alternatives**

Two BRT alternatives were developed for the Southwest Transitway. Both serve the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park and Minneapolis. Both alternatives assume special low-floor, hybrid vehicles and high-amenity stations.

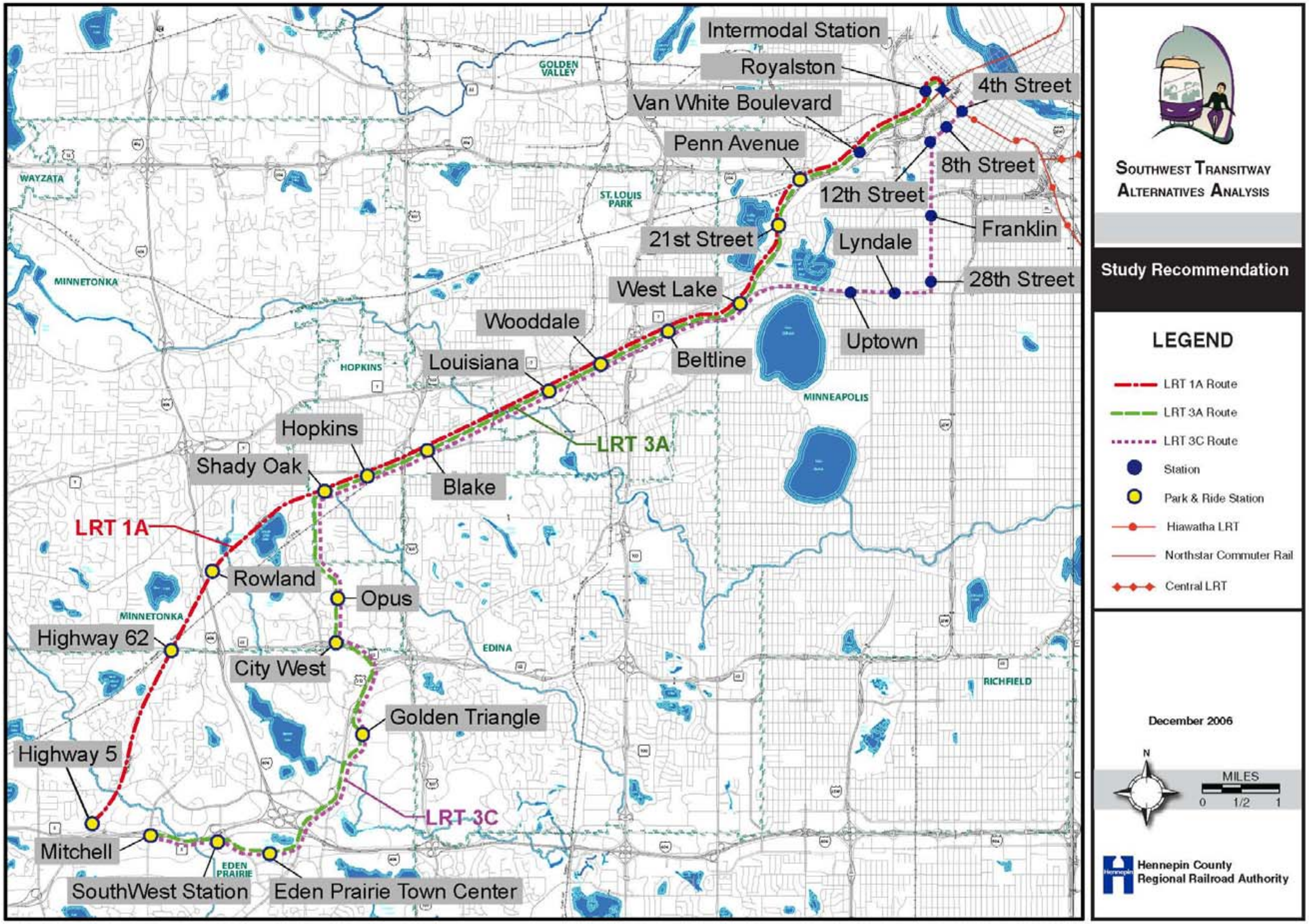
**Tier 1 Goals: Improve Mobility and Provide a Cost-Effective/Efficient Travel Option**
*Key Evaluation Measures*

<u>Ridership and New Riders:</u> BRT 1 and BRT 2 have the lowest ridership at 14,400 and 16,500, respectively, of all the build alternatives. Both BRT alternatives attract fewer new transit riders than other build alternatives: 1,300 new riders with BRT1; 2,300 new riders with BRT 2.

<u>Capital and Operating Costs:</u> BRT 1 and BRT 2 have the lowest capital and operating costs. Capital costs are estimated at $540 million for BRT 1 and $706 million for BRT 2. Operating costs are estimated at $1.8 million and $2.5 million, respectively, over the baseline cost.

<u>Travel Time Advantage:</u> Neither BRT 1 nor BRT 2 provides a travel time advantage compared to the single occupant automobile traveling during the p.m. peak.

## Figure 9  Preliminary Recommended Alternatives




*Source:  LTK, 2006.*

Transit Capacity: Neither BRT 1 nor BRT 2 can provide the peak capacity of an LRT alternative at the assumed peak hour frequency of 7.5 minutes (640 BRT passengers/peak hour vs. 2975 LRT passengers/peak hour). To accommodate the estimated peak hour demand of 2,400 passengers the BRT buses would need to operate every 2 to 3 minutes and/or operate in tandem, increasing the number and frequency of buses at intersections and on downtown Minneapolis streets.

Cost-Effectiveness Index (CEI): Based on preliminary calculations, neither BRT 1 nor BRT 2 is within a reasonable range of meeting the FTA's current CEI threshold for New Starts Preliminary Engineering, which is $29.

***TAC Recommendation:***

> ***BRT 1 and BRT 2 do not meet the Tier 1 Goals of improving mobility and providing a cost-effective and efficient travel option. They are therefore not recommended for further evaluation.***

## LRT Alternatives

LRT alternatives are defined using a combination of two designations: 1, 2, 3 or 4, and A or C. The numbers designate four possible routings west of Louisiana Avenue in St. Louis Park. The letters designate the two possible routes east of Louisiana Avenue in St. Louis Park.

### LRT A ALTERNATIVES (LRT 1A, 2A, 3A, AND 4A)

The letter "A" designates routes that use the HCRRA's Kenilworth and Cedar Lake Park Corridors in Minneapolis. Under the "A" option, four light rail transit alternatives enter Minneapolis via the HCRRA Kenilworth and Cedar Lake Park Corridors. The "A" alternatives access downtown via Glenwood, Royalston, 7$^{th}$ and 5$^{th}$ Streets, connecting to Hiawatha LRT at the proposed new Intermodal Station near the proposed new baseball stadium.

### Tier 1 Goals: Improve Mobility and Provide a Cost-Effective/Efficient Travel Option

*Key Evaluation Measures*

Ridership and New Riders: While the estimated ridership for the LRT 1A, 2A, 3A and 4A is slightly lower, by approximately 1,000 trips/day, than their "C" routing counterparts, they all are anticipated to carry a significant number of passengers. When compared to one another, LRT 3A has the highest estimated ridership at 27,000; followed by LRT 2A at 24,600; followed by LRT 1A at 23,500; followed by LRT 4A at 19,000.

In terms of attracting new riders to the transit system, all four alternatives attract a significant number of new riders to the system. When compared to one another, LRT 3A is projected to attract the highest number of new riders at 7,500; followed by LRT 2A at 5,600; followed by LRT 1A at 4,500; followed by LRT 4A at 3,100.

Capital and Operating Costs: LRT 1A, 2A, 3A and 4A have lower capital and operating costs than the comparable C alternatives. When compared to one another, LRT 3A has the highest estimated capital cost at $1.2 billion; followed by LRT 2A at $988 million; followed by LRT 1A at $864 million; followed by LRT 4A at $633 million. LRT 3A has the highest estimated operating cost at $15.9 million; followed by LRT 2A at $14.8 million; followed by LRT 1A at $11.5 million; followed by LRT 4A at $7.6 million.

Overall LRT 4A has the lowest capital and operating costs due to its shorter route, but has a relatively high per mile capital cost. LRT 1A is the least costly in terms of capital and operating costs of the full corridor "A" alternatives. LRT 3A is the most costly.

Transit Capacity: All LRT "A" alternatives are assumed to have a peak hour rider capacity of 2,976 passengers, which is sufficient to accommodate the projected peak hour demand.

Cost-Effectiveness Index (CEI): LRT 1A, 2A, 3A and 4A have lower estimated cost effectiveness ratings than the comparable "C" alternatives (lower ratings on the CEI designate better performing alternatives). When compared to one another, LRT 3A has the lowest at $26; followed by LRT 4A at $28; followed by LRT 1A at $30; followed by LRT 2A at $31. LRT 1A, 2A, 3A, and 4A have estimated CEIs that fall within 20% of the current FTA threshold for preliminary engineering.

System Integration: LRT 1A, 2A, 3A, and 4A are assumed to operate on 5th Street through downtown Minneapolis and be through-routed ("interlined") with Hiawatha trains. The ability to interline the Southwest and Hiawatha LRT lines increases the efficiency of the light rail system. Interlining eliminates the need for riders traveling to the Airport or Mall of America to transfer in downtown Minneapolis, avoids potential traffic impacts at downtown cross-streets, does not require relocating buses in downtown, and does not reduce roadway capacity in downtown for private vehicles. Interlining does not introduce new construction impacts on downtown businesses, and avoids the need for utility relocation in downtown Minneapolis.

LRT 4A does not directly serve the entire corridor. LRT 4A requires a transfer at the south end to serve the cities of Minnetonka and Eden Prairie.

Traffic impacts: Although LRT 1A, 2A, 3A, and 4A avoid potential impacts to the downtown street system, they will likely impact other major cross streets including Cedar Lake Parkway, Beltline Boulevard, Wooddale Avenue, Blake Road, 11th Avenue, Shady Oak Road, Valley View Drive, and Eden Prairie Center Drive.

The shortened route, LRT 4A, introduces special impacts within the City of Hopkins. The street network in this fully-developed community would need additional detailed analysis to identify how Hopkins could successfully function as the route terminus. Locating an overnight maintenance facility in the immediate area would introduce an additional challenge.

***TAC Recommendation:***

> ***LRT 1A, 2A, and 3A meet the Tier 1 Goals of Improving Mobility and Providing a Cost-Effective and Efficient Travel Option. Therefore, they should be carried forward through the Tier 2 evaluation.***
>
> ***LRT 4A does not meet the Tier 1 Goals because it does not adequately serve the travel demand that exists in the Southwest metro area. LRT 4A is already encompassed in the full-length A alternatives. A shortened version of the preferred alignment(s) may be identified as a future minimum***

***operating segment (MOS) if required in the future. In the event an MOS is required as the initial phase of staged implementation of the full alternative selected, detailed analysis of impacts and mitigation required to serve as an interim route terminus will be undertaken. Therefore, LRT 4A should not be retained for further evaluation.***

**Tier 2 Goals: (3) Protect the Environment, (4) Preserve Quality of Life, and (5) Support Economic Development**
*Key Evaluation Measures*

Employment/Population: When compared to their "C" counterparts, the LRT "A" alternatives do not serve as many employment centers or population concentrations. This is due to the fact that the "A" alternatives are routed through the Cedar-Isles Dean Parkway (CIDNA) and Kenwood Isles neighborhoods in Minneapolis which are lower density and have fewer employment sites than the Uptown, Lyn-Lake, and Nicollet Avenue neighborhoods served by the "C" alternatives. Of the "A" alternatives, LRT 4A serves the fewest number of employment and population concentration because it does not offer direct service to Minnetonka and Eden Prairie, and as such is not adequate to address the overall travel demand projected for the study area.

Activity Centers: The LRT "A" alternatives, which are routed through lower-density neighborhoods in Minneapolis and enter downtown behind the Target Center, serve fewer activity centers than LRT "C" alternatives. LRT 4A serves fewer activity centers than the other "A" options.

Special Generators: The LRT "A" alternatives provide direct service to the proposed Twins baseball stadium, located adjacent to the proposed Minneapolis Intermodal Station, and to the Minneapolis Farmers Market located adjacent to the Royalston Station. The LRT "C" alternatives do not provide direct access to either of these special trip generators.

Transit Service: The LRT "A" alternatives will provide transit service to the Bryn Mawr, Kenwood, and Cedar Isles Dean Parkway areas of Minneapolis that currently have low levels of transit service because of significant topographic constraints. Providing new transit service to these areas will improve their travel alternatives.

Freight Rail Relocation: Due to space constraints in the Kenilworth Corridor, the LRT "A" alternatives require that the existing freight rail service be rerouted through St. Louis Park.

Future Transit Connections: Due to their southern terminus at or near the intersection of the HCRRA property and Highway 5, all LRT "A" alternatives can be easily extended to serve Carver and Scott Counties in the future. The LRT "A" alternatives also provide the opportunity for an LRT or streetcar connection in the Midtown Corridor from West Lake Street to the Hi-Lake Station along the Hiawatha LRT line.

Transit Dependent Populations: When compared to the "C" alternatives, the LRT "A" alternatives do not serve as many transit dependent populations, defined as populations who are low-income, younger than 16 or older than 65, disabled, or who do not have an automobile. Of the “A” alternatives, LRT 4A serves the fewest number of transit dependent populations.

Economic Development: LRT 3A is considered to have the highest economic development potential of the three remaining LRT “A” alternatives. This is due to the access it will provide to areas the cities have identified for redevelopment, which include the Eden Prairie Major Center Area, Golden Triangle, and Opus. LRT 2A is considered to have the lowest economic development potential due to its location within Interstate 494 right-of-way. LRT 1A is considered to have slightly better economic development potential than LRT 2A, but both are surpassed by LRT 3A. LRT 3A is also projected to have the highest reverse commute ridership of the LRT “A” alternatives.

In evaluating the “A” alternatives the TAC not only considered the economic development potential of the alternative, but also the estimated capital cost. The TAC decided that they could not recommend moving forward with LRT 2A because, while it exhibits performance comparable to LRT 1A, it is more expensive than LRT 1A yet does not yield the potential economic development benefits of LRT 3A.

***TAC Recommendation:***

> ***LRT 1A and LRT 3A meet the Tier 2 Goals of (3) Preserving the Environment, (4) Protecting the Quality of Life, and (5) Supporting Economic Development. LRT 1A and LRT 3A should be retained for detailed evaluation during the Environmental Impact Statement (EIS) study phase.***
>
> ***LRT 2A does not meet the Tier 2 Goals and is therefore not recommended for retention. While LRT 2A does perform well in terms of ridership and attracting new riders, it does not provide adequate opportunity for economic development.***

### LRT C ALTERNATIVES (LRT 1C, 2C, 3C, AND 4C)

Routes identified by “C” use the HCRRA Midtown Corridor in Minneapolis, and a shallow tunnel under Nicollet Avenue to return to grade at Franklin Avenue. From Franklin Avenue north into downtown Minneapolis, LRT C alternatives operate on streets, using either Nicollet Avenue or Marquette and Second Streets in a one-way pair to reach Hiawatha LRT at 5$^{th}$ Street. At 5$^{th}$ Street, LRT 1C provides the opportunity to transfer to Hiawatha and the proposed Central LRT lines.

#### Tier 1 Goals: Improve Mobility and Provide a Cost-Effective/Efficient Travel Option

*Key Evaluation Measures*

Ridership and New Riders: LRT 1C, 2C, 3C and 4C have higher ridership than the comparable “A” alternatives, by approximately 1,000 trips per day. LRT 4C has the lowest ridership due to the shortened route. When compared to one another, LRT 3C has the highest estimated ridership at 28,100; followed by LRT 2C at 25,600; followed by LRT 1C at 24,500; followed by LRT 4A at 19,000.

All four “C” alternatives traverse areas of Minneapolis already well served by transit. As a result, the “C” alternatives are less successful in attracting new riders to the system than their "A" counterparts, although of all the alternatives, LRT 3C is exceeded only by LRT 3A in attracting more new riders to the system. When compared to one another, LRT 3C is projected to attract the highest number of new riders at 6,800; followed by LRT 2C at 4,900; followed by LRT 1C at 3,800; followed by LRT 4C at 2,400.

Capital and Operating Costs: LRT 1C, 2C, 3Cand 4C have higher capital and operating costs than the comparable "A" alternatives. When compared to one another, LRT 3C has the highest estimated capital cost at $1.4 billion; followed by LRT 2C at $1.2 billion; followed by LRT 1C at $1.1 billion; followed by LRT 4C at $889 million. LRT 3C has the highest estimated operating cost at $17.1 million; followed by LRT 2C at $15.5 million; followed by LRT 1C at $13.3 million; followed by LRT 4C at $8.5 million. LRT 1C is the least costly in terms of capital and operating costs of the full corridor C alternatives; LRT 3C is the most costly. Overall LRT 4C has the lowest capital and operating costs due to its shorter route, but has a relatively high per mile capital cost.

Transit Capacity: All LRT C alternatives are assumed to have a peak hour rider capacity of 2,976 passengers, sufficient to accommodate projected demand.

Cost-Effectiveness Index (CEI): When compared to one another, LRT 3C has the lowest estimated CEI at $30; followed by LRT 1C at $37; followed by LRT 2C at $38; followed by LRT 4C at $41. LRT 3C has an estimated CEI within 20% of the current FTA threshold for PE. LRT 1C, 2C and 4C have estimated CEIs that exceed the threshold by more than 20%.

System Integration: LRT 1C, 2C, 3C, and 4C cannot be through-routed ("interlined") with Hiawatha trains. All "C" alternatives require a transfer to access the Hiawatha line in downtown Minneapolis. LRT 4C requires a transfer at the south end to serve the cities of Minnetonka and Eden Prairie.

Traffic impacts: the LRT "C" alternatives enter downtown Minneapolis via new rail tracks in the existing street system. Impacts would occur to Nicollet or Marquette and Second Avenues, along with intersections at downtown cross streets between Franklin Avenue and 5th Street. Impacts may also occur at other major intersections along the alignments including Cedar Lake Parkway, Beltline Boulevard, Wooddale Avenue, Blake Road, 11th Avenue, Shady Oak Road, and for LRT 3C, along Valley View Drive and Eden Prairie Center Drive.

LRT 4C, like LRT 4A, introduces special impacts within the City of Hopkins. The street network in this fully-developed community would need additional detailed analysis to identify how Hopkins could successfully function as the route terminus. Locating an overnight maintenance facility in the immediate area would introduce an additional challenge.

***TAC Recommendation:***

> ***LRT 3C meets the Tier 1 Goals of (1) Improving Mobility and (2) Providing a Cost-Effective and Efficient Travel Option. Therefore LRT 3C is recommended to be retained for further evaluation.***

***LRT 1C, 2C, and 4C do not meet the Tier 1 Goals of (1) Improving Mobility and (2) Providing a Cost-Effective and Efficient Travel Option. Therefore LRT 1C, LRT 2C, and LRT 4C are not recommended for Tier 2 evaluation.***

**Tier 2 Goals: (3) Protect the Environment, (4) Preserve Quality of Life, and (5) Support Economic Development**
*Key Evaluation Measures*

Employment/Population: LRT 3C serves employment centers and population concentrations throughout the corridor.

Activity Centers: LRT 3C serves a higher number of activity centers than the "A" alternatives. These include Southwest Metro Transit Station, Eden Prairie Center Mall, Golden Triangle, Opus, Downtown Hopkins, Wooddale Area, Excelsior & Grand, Methodist Hospital, Calhoun Commons, Uptown, Lyn-Lake, Eat Street, and Nicollet Mall.

Special Generators: LRT 3C provides service to the Minneapolis Convention Center.

Transit Service: LRT 3C provides transit service to the Uptown, Lyn-Lake, and Nicollet areas of Minneapolis that are well-served by bus transit.

Freight Rail Swap: LRT 3C does not require freight rail relocation from Kenilworth to St. Louis Park. However, the "C" routing does require a grade separation and reconfiguration of the Canadian Pacific/Twin Cities and Western railroad tracks east of Louisiana Avenue. The reconfiguration would exchange the positions of the freight tracks and the existing trail, with LRT constructed in the location currently occupied by the existing freight tracks.

Future Transit Connections: LRT 3C uses the Midtown Corridor west of Nicollet Avenue, which may complicate plans by Minneapolis to use the Midtown Corridor for streetcar operations from West Lake Street to the Hi-Lake station along the Hiawatha LRT line.

Transit Dependent Populations: The area served by LRT 3C is higher in transit dependent populations than any of the "A" alternatives. Transit dependent populations are defined as populations who are low-income, younger than 16 or older than 65, disabled, or who do not have an automobile.

Economic Development: LRT 3C has the highest potential for economic development of all the "C" alternatives.

***TAC RECOMMENDATION:***

***LRT 3C meets the Tier 2 Goals of (3) Preserving the Environment, (4) Protecting the Quality of Life, and (5) Supporting Economic Development. Therefore, LRT 3C should be retained for further evaluation.***

## Additional TAC Recommendations

The TAC also approved two other recommendations to forward to the PAC:

- ***That the Southwest Transitway PAC request that the Metropolitan Council move the Southwest Transitway to a Tier 1 corridor when updating the Transit Plan component of the Transportation Policy Plan(TPP) in 2008.***

- ***That the Southwest Transitway PAC request that the HCRRA proceed into the Environmental Impact Statement (EIS) process for the Southwest Transitway.***

All recommendations passed unanimously with the exception of the dismissal of LRT 4A, which was not approved by St. Louis Park and Minnetonka staff. Metropolitan Council, Metro Transit, and Mn/DOT staff chose to abstain from voting on all recommendations. Twin Cities and Western (TCW) staff chose to abstain from voting on the LRT “A” recommendations due to unresolved issues regarding the proposed freight rail relocation.

# Appendix A:  Summary of Comprehensive Plans

## City of Eden Prairie

### Comprehensive Plan – Vision Goals and Policies (December 17, 2002)

**Planning, Development and Growth Goals**

- Planning, Development and Growth Goal 4:
    - Support continued development of Eden Prairie's Major Center Area, including a focus on the Marketcenter Area and the Eden Prairie Center. (Eden Prairie Town Center Station).
        - Support transit and pedestrian accessibility and connectivity as part of all redevelopment projects.
- Planning, Development and Growth Goal 6:
    - Support the development of the SouthWest Metro Transit Hub land area. (*Southwest Station*)
        - Support the efforts of SouthWest Metro Transit to develop a transit hub on its property at the southwest corner of Highway 5 and Prairie Center Drive in Eden Prairie.
        - Promote and encourage the types of mixed use development in the Eden Prairie Center and Marketcenter areas that would be conducive to and supportive of the development of a transit hub.
        - Consider, through the PUD process on a case by case basis, the granting of bonuses and incentives to allow for the higher intensity uses that will be supportive of a transit hub.
        - Encourage compact and pedestrian friendly mixed use development that offer the type of retail and convenience services that will be utilized by both transit customers and destination shoppers.
        - Consider opportunities for shared parking between transit parking lots that would predominantly be used during daytime business hours and those land uses (such at entertainment and dining) that could utilize these parking facilities during evening and weekend hours when transit is not running its peak service.

**Transportation Goals**

- Transportation Goal 2:
    - Provide and maintain a safe, convenient, effective, and energy efficient local transportation system for the movement of people, goods and services. (All stations)
        - Promote public transit in Eden Prairie that serves all residents and provides special transit services for commuters, the elderly and handicapped with regular service from neighborhood sectors to the Major Center, commuter routes and park-n-ride service facilities.
        - Continue to cooperate with the Minnesota Department of Transportation, Hennepin County, SouthWest Metro Transit, the Metropolitan Council, other regional agencies involved in transportation planning, adjacent cities and counties, and the private sector to continue to provide the most effective transportation system for the city.

- Transportation Goal 3:
    - Promote the development of a SouthWest Metro Transit Hub. (Southwest Station, Golden Triangle)
        - Support the efforts of SouthWest Metro Transit to develop a transit hub on its property at the southwest corner of Highway 5 and Prairie Center Drive in Eden Prairie.
        - Support the projected growth of the Golden Triangle Area with adequate transportation infrastructure and build upon the proximity of the area to the SouthWest Metro Transit Hub in pursuing development projects.
        - Pursue the appropriate links in the transportation system to provide access to and from the SouthWest Metro Transit Hub to other points throughout the City.

- Transportation Goal 4:
    - Reduce single occupant vehicle demand on the transportation system by providing a variety of valid transportation alternatives.
        - Promote and support the development of the Golden triangle Transportation Management Association (GTTMA).
        - Promote and support the efforts of SouthWest Metro Transit to provide quality, efficient and low-cost transit services.
        - Encourage compact and pedestrian friendly mixed-use developments that offer the type of retail and convenience services that will minimize peak hour traffic demand.
        - Support regional transit initiatives such as High Speed Busways, Light Rail Transit and Commuter Rail.

**Public Services and Facilities Goals**

- Public Services and Facilities Goal 4:
    - Seek new revenue sources and alternative funding mechanisms for transportation initiatives.
    - Promote the development of the Marketcenter Area.

## Special Area Plans

### Major Center Area (MCA) Study

- The Major Center Area study will be a strategic master plan that provides both near- and long-term recommendations. It is expected that the recommendations will include:
- Transportation and other public infrastructure improvements that maintain long-term functionality for residents, workers, shopper and visitors as they move within the Major Center Area, whether on foot, by bike, by transit or in cars.
- MCA Planning Principles (September 28, 2005)
- Increase efficiency of land uses within the MCA through:
    - Development of uses that use bus and light rail transit.
    - Mixed us development
    - Use of structured and shared parking to free up parking areas for new development.
- Transit Principle:
    - Transit-LRT

- The primary location for a walk to LRT station in the MCA should be within the Town Center, south of Lake Idlewild in the vicinity of the new north-south- main street. The secondary location for a LRT station, which would also serve as a park and ride station, should be at the site of the current day SouthWest Transit Station, integrated with bus transit service.
- The highest and most intense land uses, particularly mixed use projects, should be located within a half-mile radius of a centrally located LRT station to support the Town Center concept.
- Development located within the half-mile radius to the transit station should meet specific development standards that result in a high-amenity pedestrian environment. These standards should address build to lines, treatment of parking lots/facilities, pedestrian-scaled design features, landscaping, lighting and signage.
- Transit ridership should be supported by combining the SouthWest Transit bus station with a park and ride LRT station and thus retain a critical transportation alternative for commuters.
- LRT transit service should minimize impacts on adjacent street and pedestrian/bicycle network, such as by constructing grade-separated crossings at major intersections.
- 

Note: The MAC study is expected to be adopted by the city in the beginning of 2006.

### Golden Triangle Land Use/Multi-Modal Transportation Evaluation

- The Golden Triangle Land Use/Multi-Modal Transportation study evaluated the potential for a more mixed land use pattern in the Golden Triangle Area to satisfy the following four objectives:
- Reduce peak period traffic congestion
- Maintain or improve property tax benefits
- Increase transit choices and alternative transportation modes
- Explore opportunities for new regional commercial sites and housing sites.
  - Improved access to and from I-494 and light rail transit (LRT) are also being considered to improve future transportation options.
- The Golden Triangle Land Use/Multi-Modal Transportation study provides two alternative land use concepts based on LRT alignment options.
- LRT 3A-1 is built around a transit node at the center of the redevelopment area. This is a full transit oriented development with density most intense near the station and streets lead to the station area from all directions
- LRT 3A-3 is more of a half transit oriented development in the sense that the bulk of redevelopment opportunities are located on the west side of Shady Oak Road and new streets leading to the station are limited to the redevelopment site
- Both alternatives represent a pattern that creates a hub of activity centered on the LRT station.

Note: The document was adopted by the City Council and is used as an advisory tool and shared with developers.

## City of Minnetonka

### Comprehensive Plan (April 1999)

- Transportation Plan
- Provide an integrated multi-modal transportation system what will serve the needs of Minnetonka residents and businesses.
- Support the City's economic development plans and density goals.
- Increase the number and proportion of people who use transit or share rides, thus reducing the peak level of demand on the entire transportation system.
- Integrate alternative modes of transportation (transit, bicycle, and pedestrian) into the City's overall transportation network.
- Improve the safe and efficient movement of people and goods to and through the City of Minnetonka.
- Complement the metropolitan transportation system by providing a local system that serves non-regional trips, manages access to the regional highway system and provides a back-up system of reliever roadways to help manage traffic when major incidents occur on the regional highway system.

## City of Hopkins

### Comprehensive Plan (December 21, 1999)

**Opportunities for Hopkins**

- Access to and from Minneapolis via Light-rail Transit
    - Historically, two light rail stations were planned to serve Hopkins. At the present time, there is a great deal of regional debate on the future of light rail transit. Current options under consideration include light rail and commuter rail, which would utilize existing tacks on a shared basis. The rail link that passes through Hopkins roughly parallel to Excelsior Boulevard is still a candidate rail line. In order to preserve future options, the Comprehensive Plan update will continue to accommodate a light rail station along Excelsior Boulevard. If a light rail system is built in the future, this station would bring many people into Hopkins daily and improve access not only from Hopkins to Minneapolis but also from Minneapolis (and other locations) to Hopkins.

**Implementation Strategies**

- Transportation Strategies
    - Strategy #3 Improve the existing transit system (High Priority 2000-2005)
        - The City should work cooperatively with the Metropolitan Council Transit Operations and other agencies to improve mass transit. Transit service is a function of population and employment densities. Hopkins is a major employment center and accordingly, is being considered for future light rail transit (LRT) and/or dedicated bus way improvements.

## Special Area Plans

**East Hopkins Land Use and Market Study**

- Transit Implications
- The Southwest Transit Corridor passes through the study area and this fact contributed strongly to the Metropolitan Council's initial interest in this study. Alternately identified as corridor for Light Rail Transit, designated Busway, or Diesel Motor Unit, the rail line the slices through the study area is controlled by the Hennepin County Regional Rail Authority and remains a potential of transit-oriented development was a contributing factor that impacted plan concepts throughout this study. Accordingly, this study examines a number of potential station locations and their impacts on surrounding land use.

**West Hopkins Land Use and Market Study**

A study of the Shady Oak station area and update of the Blake Road Station area is ongoing.

## City of St. Louis Park

### Comprehensive Plan (2000-2010)

**Livable Communities**

- Mixed Use Development
  - Mixed-use development means two or more uses are contained within the same building. Residential mixed-use also means mixed-income housing, mixed types of housing on the same block, and higher density development. There is a fear that high density means congested streets. Actually, high density often results in reduced automobile traffic, because higher densities can support local retail and service as well as transit, all of which reduce dependence on the automobile.
- Transit Oriented
  - Funds for building and expanding highways are not keeping up with congestion. Effective public transportation is an alternative to the automobile which is more sustainable both in long germ infrastructure costs and energy conservation. Design for and around transit is very important to the long –term viability of any community.
  - Zoning plays an important role when considering transit. Zoning should allow as many activities as possible to be located within easy walking distance of transit stops.

**Redevelopment**

- Highway 7 Redevelopment District
  - Improve transportation features of the Highway 7 corridor
    - Allow development of a light rail transit system in the Highway 7 corridor with appropriately located stations.
- Potential Future Districts
  - West 36th Street/Wooddale Area

    - A transit way (either busway or LRT) is recommended along the Hennepin County Regional Railway authority corridor that forms the northern boundary to this area.
  - Elmwood Area
    - Transit
      - Land use planning and circulation should anticipate implementation of LRT within the rail corridor.
      - Planning should assume a center-loaded transit patron platform east of Wooddale Avenue.
      - A multi-modal transit station should be sited within the northeast quadrant of Wooddale Avenue and West 36th street.
      - The transit station should accommodate patron connections to the rail corridor, bus circulator systems and walk to traffic.
      - Parking related to transit patrons should be limited to specific parcels or structures.
      - Parking impacts to adjacent neighborhoods should be limited by strict enforcement and management procedures.
      - Transit oriented development, land use patterns and building configurations should be considered within a five-minute walk of LRT loading platforms.
- Priority will be given to projects that:
  - Enhance Transit
    - The project will enhance mobility and increase the ability for residents to safely access local amenities and services. Projects preserve or enhance the "walkability" of neighborhoods and reduce the need for automobile trips by providing interconnected walking, bicycling and public transit opportunities.

**Plan by Neighborhood #30 – Brooklawns (Louisiana station)**

- Specific Development Guidelines
  - The railroad corridor which forms the northern boundary of the neighborhood is designated as a future LRT route. Any redevelopment of land uses adjacent to this corridor shall consider this possibility. A future station may be located at Louisiana Avenue. Redevelopment shall provide pedestrian access to this location.

**Plan by Neighborhood #31 – Elmwood (Wooddale Station)**

- Specific Development Guidelines
  - A land use study is recommended for the area bounded by TH 7, TH 100 and Wooddale Avenue. This area is subject to redevelopment and uses compatible with the future transit potential of the CP Rail Bass Lake Corridor are encouraged. This may include a transit station and a mixture of residential, work place and retail/service uses. One desirable result of a land use study would be to precisely locate the most favorable site for a transit station. Land use designation changes will fallow based on the study results.
- Desired Neighborhood Improvements
  - Improved transit, including hop-a-ride and LRT.

**Plan by Neighborhood #25 Wolfe Park (Beltline Station)**

- No reference to LRT or transit improvements.

## Special Area Plans

**Elmwood Area Land Use, Transit and Transportation Study (February 5, 2003)**

Transit

- This study assumes that light rail transit (LRT) will be implemented within the Southwest Corridor, causing relocation of the freight rail in the adjacent CP Rail corridor. Should this occur, current CP Rail right of way would be available for alternative uses within the Elmwood Study Area. A center platform LRT station could be located within the Southwest Corridor immediately east of Wooddale Avenue. Parcels in the northeast quadrant of Wooddale Avenue and West 36th Street should then be used as a multi-modal transit facility interfacing circulator bus activity, a park and ride, and walk-to/bike-to traffic with LRT access.

Transportation

- Wooddale Avenue should be extended south and east, implementing a new crossing. If the Southwest Corridor is developed for LRT, it will not likely co-exist with the freight rail that currently operates on the parallel CP Rail corridor. The existing freight rail would therefore be relocated. This would make current CP Rail right of way available for redevelopment or alternative uses between Dakota Avenue on the west and the municipal boundary of St. Louis Park on the east. This includes the portion of the CP Rail corridor within the Elmwood Study Area. Assuming LRT is implemented in the Southwest Corridor, a center platform transit station could be located within the corridor as part of the LRT system, immediately east of Wooddale Avenue. Adjacent parcels to the south of the station should then be used as a multi-modal transit *facility* interfacing circulator bus activity, a park and ride, and walk-to/bike-to traffic with LRT access. This area may ultimately incorporate structured parking as a part of the transit complex, which could be considered as shared parking with multi-use properties located immediately east of the transit facility.

Transit Facilities

- Ongoing planning will determine future use of the Southwest Corridor for transit purposes. This study assumes that LRT will occur within the corridor with a center-loaded LRT platform located immediately east of Wooddale Avenue. This station would serve not only the Elmwood commercial and residential areas but also neighborhoods north of TH 7. A multi-modal transit facility should be developed in the northeast quadrant of Wooddale Avenue and West 36th Street to serve as an interface between the LRT platform and local circulator buses or walk-to patrons. As shown in Figure 13, the parcels should be developed as a multi-use facility and include retail or service elements complementary to transit patrons on the first level, fronting on West 36th Street. Bus service to and from the transit station would have curbside drop-off/pick-up areas on West 36th Street. Transit patrons could also be dropped off or picked up by passenger cars in the same location. Such a transit station could exist as a combined venture between Hennepin County, St. Louis Park, Metro Transit, other public agencies and private businesses with interest in tenancy or patron services. When LRT is operational, further analysis will need to be conducted by the County and City to accommodate transit-oriented parking that minimizes impacts to the residential neighborhood.

The parcel in the northeast quadrant of Wooddale Avenue and West 36th Street could ultimately be used as part of a district parking facility in conjunction with other adjacent parcels. Transit-oriented parking could also occur in structured parking located behind and in close proximity to mixed-use development and the Southwest Corridor. Assuming freight rail is abandoned, additional right-of-way could be reused as a part of the parking component.

## City of Minneapolis

### The Minneapolis Plan (Comprehensive Plan)

**Chapter 3. Marketplaces: Growth Centers**

- Intensive development will be encouraged and supported at selected growth centers which will be designated. All of these centers will be supported with improved amenities and transit.
- An area will be designated a growth center if it takes advantage of incentives to mix compatible land uses, such as office and residential, and maximizes transit patronage while providing adequate transportation access for the movement of goods and people.
    - Minneapolis will designate and develop selected Growth Centers which will be well served by transit and alternative transportation, have superior amenities, accommodate a range of housing needs and offer attractive employment opportunities.

**Chapter 4. Marketplaces: Neighborhoods**

- The Plan uses the terms “community corridors” and “commercial corridors” to describe streets characterized by types of mixed-use, linear development. The neighborhoods find many of their goods and services along these corridors.
    - Minneapolis will encourage reinvestment along major urban corridors as a way of promoting growth in all neighborhoods.
    - Minneapolis will coordinate land use and transportation planning on designated Community Corridors through attention to the mix and intensity of land uses, the pedestrian character and residential livability of the streets, and the type of transit service provided on these streets.
    - Minneapolis will identify and support Activity Centers by preserving the mix and intensity of land uses and enhancing the design features of each area that give it a unique and urban character.
    - Minneapolis will encourage both a density and mix of land uses in Transit Station Areas (TSAs) that both support ridership for transit as well as benefit from its users.
    - Minneapolis will require design standards for TSAs that are oriented to the pedestrian and bicyclist and that enforce traditional urban form.
    - Minneapolis will provide direct connections to transit stations for pedestrians, bicyclists, and bus riders.
    - Minneapolis recognizes that parking is a necessary part of the urban environment, but will limit the amount, location and design of parking in TSAs in order to encourage and support walking, bicycling and transit use.

**Transit Station Areas (TSAs)**

- Transit Station area (TSA) is a land use policy feature arising from regional investment in dedicated, fixed-route transit lines (e.g., LRT, commuter rail, busway). The purpose of identifying TSAs as a land use feature in the *Minneapolis Plan* is to emphasize that station areas represent unique opportunities and challenges that require special policy consideration. As such, TSAs call for tools that maximize potential community development benefits of transit while also strengthening and protecting the surrounding neighborhoods.
- The City will engage in activities that foster transit ridership. This will include redevelopment as well as regulations that prevent the introduction or expansion of uses that do not support transit (e.g., automobile repair services or low-density industrial uses).
- The City acknowledges its essential role in ensuring that critical public components of TSAs are realized. To achieve these public components, the City may need to acquire land and build or modify public infrastructure. The City further acknowledges that successful implementation will depend on partnerships with other units of government, neighborhood organizations, the not-for-profit sector, and the private sector.
    - Minneapolis will encourage both a density and mix of land uses in TSAs that both support ridership for transit as well as benefit from its users.
        - Explore and pursue opportunities to integrate development with transit stations.
        - Concentrate highest densities and mixed-use development nearest the transit station and/or along Commercial Corridors, Community Corridors and/or streets served by local bus transit.
    - Minneapolis will require design standards for TSAs that are oriented to the pedestrian and bicyclist and that enforce traditional urban form.
    - Minneapolis will provide direct connections to transit stations for pedestrians, bicyclists, and bus riders.
        - Design streets, sidewalks, and other public infrastructure to prioritize pedestrian, bus and bicycle access to transit stations.
    - Minneapolis recognizes that parking is a necessary part of the urban environment, but will limit the amount, location and design of parking in TSAs in order to encourage and support walking, bicycling and transit use.

**Chapter 9 City Form**

- Land Use Regulations and Planning Tools: Activity Centers
    - Activity Centers generally have a diversity of uses that draw traffic from citywide and regional destinations, but do not generally support automobile uses.
    - Activity Centers have a significant pedestrian and transit orientation, as service and features of these areas are already good.
    - Activity Centers have uses that are active all day long and into the evening.
    - 9.31 Minneapolis will identify and support Activity Centers by preserving the mix and intensity of land uses and enhancing the design features of each area that give it a unique and urban character.

## Special Area Plans

**Bryn Mawr Neighborhood Land Use Plan (September 23, 2005) – Penn Avenue Station**

- Future LRT station:
    - According to Mn/DOT and Hennepin County Railway Authority, the North Star Railway (a planned commuter rail) will run on the existing track on the northern border of Bryn Mawr. Dan Patch Commuter Rail and Southwest Corridor Light Rail Transport (LRT) will run through the southern segment of the neighborhood. There have been discussions about a proposed LRT station near the interchange of Penn Avenue and I-394. An LRT station and commuter rail operations could present opportunities to the neighborhood, such as offering residents an alternative means of travel around the Twin Cities. The LRT would also bring people to the neighborhood and increase commercial opportunities for the neighborhood commercial nodes.
- Goals:
    - To provide and maintain safe and efficient transportation systems for private vehicles, public transportation, bicycles, and pedestrian traffic.
- South Gateway Site:
    - The site is located at a principal gateway into the Bryn Mawr neighborhood. It is located on the south frontage road to I-394, just past the interchange of I-394 and Penn Avenue. Madeira Avenue lies to the west, Wayzata Boulevard is to the north, to the east is Penn Avenue and to the south are the Burlington Northern Santa Fe Railway lines and parks.
        - Goals: Better utilize the opportunities provided by the LRT station that may be built at that location.
        - Site strengths/opportunities: Proposed LRT/commuter rail station near the site.
        - Recommendation: Site development should consider development of the gateway area as a whole, coordinating with future off-site improvements.
            - A connector among the neighborhood, the park and future LRT station
            - Development should also enhance the vertical circulation between the LRT station, the trails, and the park.
            - Future land use in the district should be a mixed-use of moderated dwellings and office with additional small-scale retail sales and services.

**Bassett Creek Valley Master Plan (March 8, 2000) – Van White Station**

- No specific language on transit/LRT or station location.
- Master Plans have indicated the incorporation of transit

**Downtown East/North Loop Master Plan(Adopted: October 2003)**

- The primary goal of the Downtown East/North Loop Master Plan is to develop a vision and a framework for how new growth should occur in the underdeveloped districts of Downtown Minneapolis, particularly in areas surrounding proposed rail transit stations.
- Transit-Oriented Development

- In pursuit of the larger goal of building Complete Communities, instituting land use policies that inherently reduce auto dependence is paramount. The central planning ingredient for TOD is convenient access to revitalized public transit service - commuter rail, light rail transit (LRT), bus rapid transit (BRT), and city bus systems - that directly serve medium- and/or high-density nodes of mixed use development. TOD promotes the increased use of transit, particularly rail transit, because it is located at the "hub" of neighborhood uses and activities.

- Based on the existing concentration of bus lines that feed Downtown Minneapolis, the construction of the LRT line, and the prospect of new commuter rail lines, the Central Business District (CBD) will continue to be the most highly served collection of real estate in the Upper Midwest. As such, the Project Area is an ideal location to develop a series of medium and high-intensity TOD nodes that provide both new places to live Downtown and new commercial spaces that will contribute to regional and neighborhood prosperity. TOD is particularly effective at capturing the benefits rapid transit can bring to communities. Successful TOD incorporates the following key objectives:

  - *Multi-Modal:* TOD allows for multiple modes of transit to access and use the same stations thereby facilitating easy transfers between different modes.

  - *Mixed-Use Development:* Different uses and activities are clustered within a single neighborhood, within a single city block, and in some cases within a single building.

  - *Compact Development:* Facilitating a wide range of land uses within a one-quarter to one-half mile radius of transit nodes means that most everything in the neighborhood is no more than a five or ten minute walk away. Smaller lots, reduced setbacks, and greater attention to infill development opportunities make it possible to assemble different uses in a relatively small amount of geographic space.

  - *Increased Density:* Intensification of land uses makes the most of expensive land and infrastructure, while facilitating greater population growth.

  - *Traditional Neighborhood Structure:* Incorporating the concept of "town centers" into downtown neighborhoods creates a series of strong individual neighborhoods, each of which is interconnected to the CBD as a whole.

  - *Connectivity:* An interconnected street grid facilitates easy linkages between places.

  - *Civic Identity / Public Realm:* A mix of safe public spaces including parks, plazas and active, at-grade storefronts lends a "sense of place" and character to each node.

  - *Pedestrian-Friendly:* Taking measures to enhance pedestrian safety, function and aesthetic character improve neighborhood livability.

    - *Traffic Calming:* Widening sidewalks and reducing vehicular capacity on selected city streets "calms" vehicular traffic and creates a zone of activity designed to accommodate pedestrians, primarily, and to facilitate vehicular access to building sites, secondarily.

- Transportation, Transit and Parking
  - In order to create the kind of environment that will allow Complete Communities to germinate in the Project Area, the City must first seek ways to reduce automobile dependence. This challenge must be dealt with effectively at two different levels.
  - Surface lots that currently serve Downtown commuters must be re-developed for higher and better uses that are served by a mix of transportation modes. Given the value of downtown land, it is not possible to expect that each and every existing surface stall will be replaced by a stall in a new structured ramp. The commuter trips represented by at least some of those stalls must be replaced by commuters using public transit.
  - At issue is the pursuit of land use planning that promotes compact development, which in turn complements new rail transit infrastructure. In response to this challenge, land use planning efforts must be geared toward enabling residents to live in close proximity to where they work, shop, and play, thereby reducing unnecessary automobile trips.
- Policies for Transportation, Transit and Parking
  - Discontinue expansion of the City's existing Perimeter Parking Policy within the Project Area: The City's current perimeter parking policy should not be expanded any further because it discourages public transit ridership, promotes inefficient land use and is not pedestrian-friendly. In addition, the existing perimeter parking policy conflicts with the ability to discourage construction of future park and ride structures within close proximity to the LRT Corridor.
  - Eliminate or reduce required parking in specific circumstances: The City should eliminate or reduce required parking in new developments adjacent to LRT Stations within the Project Area. The City should prohibit construction of new commercial parking structures within a block of downtown LRT stations.
  - Phase-out existing surface lots within two blocks of all downtown LRT stations by instituting a five or seven year timeline for conversion to other uses.

- Development Precinct 13: Air Rights Development District over "The Cut"
  - A large swath of railway and highway lands cut through the North Loop and interrupts the fabric of Downtown Minneapolis. Within The Cut, the existing highway infrastructure is critical to the everyday function and overall economic competitiveness of Downtown. Likewise, when existing freight rail tracks along the Burlington Northern right of way are leased for commuter rail operations, it will be necessary to use land adjacent to these tracks for new rail sidings that will accommodate multiple commuter rail lines and inter-city lines (Amtrak).

- Siting of the multi-modal station: further detailed studies will need to be undertaken concerning the relationships between the components of the multi-modal station, including the rail yards, train platforms, and the exact location for the headhouse (which would include waiting areas, retail services, ticketing, and luggage handling). Moreover, these studies should address the relationship between the multi-modal rail station, the proposed LRT station, and the existing bus station on the 5th Street Ramp. In all cases, Amtrak and commuter rail platforms would be located beneath the new baseball stadium (or residential development). The interface between these new rail yards and the new street system on the deck above can be accomplished in a number of ways and therefore demands more detailed study.

# Appendix B:  FTA New Start Criteria: Land Use

The following criteria are excerpted from the *FTA Annual Report on New Starts:. Guidelines and Standards for Assessing Transit Supportive Land Use, May 2004*.

[Note: These 2004 Land Use criteria were used for the Southwest Transitway AA land use evaluations; however, it is important to note that Table B-1 information remains almost verbatim unchanged between 2004 and the FTA rating process for FFY2007 .

### Table B-1  Ratings Applied in Assessment of Land Use

| **I. EXISTING LAND USE** | | |
|---|---|---|
| ***Existing Land Use*** | | |
| Phase of Project Development | Land Use Assessment Ratings | |
| Preliminary Engineering and Final Design | HIGH | Current levels of population, employment, and other trip generators in station areas are sufficient to support a major transit investment. Most station areas are pedestrian-friendly and fully accessible. |
| | MEDIUM | Current levels of population, employment, and other trip generators in station areas marginally support a major transit investment. Some station areas are pedestrian-friendly and accessible. Significant growth must be realized. |
| | LOW | Current levels of population, employment, and other trip generators in station areas are inadequate to support a major transit investment.  Station areas are not pedestrian-friendly. |
| Ratings based on assessment of the following:<br>• Existing corridor and station area development;<br>• Existing corridor and station area development character (i.e., residential, commercial, mixed-use);<br>• Existing station area pedestrian facilities, including access for persons with disabilities; and<br>• Existing corridor and station area parking supply. | | |

### Table B-1 Ratings Applied in Assessment of Land Use, Cont'd

| **II. TRANSIT-SUPPORTIVE PLANS AND POLICIES** | | |
|---|---|---|
| ***Growth Management*** | | |
| Phase of Project Development | Land Use Assessment Ratings | |
| Preliminary Engineering and Final Design | HIGH | Adopted and enforceable growth management and land conservation policies are in place throughout the region. Existing and planned densities and market trends in the region and corridor are strongly compatible with transit. |
| | MEDIUM | Significant progress has been made toward implementing growth management and land conservation policies. Strong policies may be adopted in some jurisdictions but not others, or only moderately enforceable policies (e.g., incentive-based) may be adopted regionwide. Existing and/or planned densities and market trends are moderately compatible with transit. |
| | LOW | Limited consideration has been given to implementing growth management and land conservation policies; adopted policies may be weak and apply to only a limited area. Existing and/or planned densities and market trends are minimally or not supportive of transit. |
| Ratings based on assessment of the following:<br>• Concentration of development around established activity centers and regional transit; and<br>• Land management. | | |

| ***Transit-Supportive Corridor Policies*** | | |
|---|---|---|
| Phase of Project Development | Land Use Assessment Ratings | |
| Final Design | HIGH | Conceptual plans for the corridor and station areas have been developed. Local jurisdictions have adopted or drafted revisions to comprehensive and/or small area plans in most or all station areas. Land use patterns proposed in conceptual plans and local and institutional plan revisions are strongly supportive of a major transit investment. |
| | MEDIUM | Conceptual plans for the corridor and station areas have been developed. Local jurisdictions have initiated the process of revising comprehensive and/or small area plans. Land use patterns proposed in conceptual plans and local and institutional plan revisions are at least moderately supportive of a major transit investment. |
| | LOW | Limited progress has been made toward developing station area conceptual plans or revising local comprehensive or small area plans. Existing station area land uses identified in local comprehensive plans are marginally or not transit-supportive. |

### Table B-1. Ratings Applied in Assessment of Land Use, Cont'd

| ***Transit-Supportive Corridor Policies (continued)*** | | |
|---|---|---|
| Phase of Project Development | Land Use Assessment Ratings | |
| Preliminary Engineering | HIGH | Conceptual plans for the corridor and station areas have been developed. Discussions have been undertaken with local jurisdictions about revising comprehensive plans. Land use patterns proposed in conceptual plans for station areas (or in existing comprehensive plans and institutional master plans throughout the corridor) are strongly supportive of a major transit investment. |
| | MEDIUM | Conceptual plans for the corridor and station areas are being developed. Discussions have been undertaken with local jurisdictions about revising comprehensive plans. Land use patterns proposed in conceptual plans for station areas (or existing in local comprehensive plans and institutional master plans) are at least moderately supportive of a major transit investment. |
| | LOW | Limited progress has been made toward developing station area conceptual plans or working with local jurisdictions to revise comprehensive plans. Existing station area land uses identified in local comprehensive plans are marginally or not transit-supportive. |
| Ratings based on assessment of the following:<br>• Plans and policies to increase corridor and station area development;<br>• Plans and policies to enhance transit-friendly character of corridor and station area development;<br>• Plans to improve pedestrian facilities, including facilities for persons with disabilities; and<br>• Parking policies. | | |

| ***Supportive Zoning Regulations Near Transit Stations*** | | |
|---|---|---|
| Phase of Project Development | Land Use Assessment Ratings | |
| Final Design | HIGH | Local jurisdictions have adopted zoning changes that strongly support a major transit investment in most or all transit station areas. |
| | MEDIUM | Local jurisdictions are in the process of adopting zoning changes that moderately or strongly support a major transit investment in most or all transit station areas. Alternatively: strongly transit-supportive zoning has been adopted in some station areas but not in others. |
| | LOW | No more than initial efforts have begun to prepare station area plans and related zoning. Existing station area zoning is marginally or not transit-supportive. |

### Table B-1. Ratings Applied in Assessment of Land Use Criteria, Cont'd

| ***Supportive Zoning Regulations Near Transit Stations (continued)*** | | |
|---|---|---|
| Phase of Project Development | Land Use Assessment Ratings | |
| Preliminary Engineering | HIGH | A conceptual planning process is underway to recommend zoning changes for station areas. Conceptual plans and policies for station areas are recommending transit-supportive densities and design characteristics. Local jurisdictions have committed to examining and changing zoning regulations where necessary. Alternatively, a "high" rating can be assigned if existing zoning in most or all transit station areas is already strongly transit-supportive. |
| | MEDIUM | A conceptual planning process is underway to recommend zoning changes for station areas. Local jurisdictions are in the process of committing to examining and changing zoning regulations where necessary. Alternatively, a "medium" rating can be assigned if existing zoning in most or all transit station areas is already moderately transit-supportive. |
| | LOW | Limited consideration has been given to preparing station area plans and related zoning. Existing station area zoning is marginally or not transit-supportive. |
| Ratings based on assessment of the following:<br>• Zoning ordinances that support increased development density in transit station areas;<br>• Zoning ordinances that enhance transit-oriented character of station area development and pedestrian access; and<br>• Zoning allowances for reduced parking and traffic mitigation. | | |

| ***Tools to Implement Land Use Policies*** | | |
|---|---|---|
| Phase of Project Development | Land Use Assessment Ratings | |
| Final Design | HIGH | Transit agencies and/or regional agencies are working proactively with local jurisdictions, developers, and the public to promote transit-supportive land use planning and station area development. The transit agency has established a joint development program and identified development opportunities. Agencies have adopted effective regulatory and financial incentives to promote transit-oriented development. Public and private capital improvements are being programmed in the corridor and station areas that implement the local land use policies and which leverage the Federal investment in the proposed corridor. |
| | MEDIUM | Transit agencies and/or regional agencies have conducted some outreach to promote transit-supportive land use planning and station area development. Regulatory and financial incentives to promote transit-oriented development are being developed, or have been adopted but are only moderately effective. Capital improvements are being identified that support station area land use plans and leverage the Federal investment in the proposed major transit corridor. |
| | LOW | Limited effort has been made to reach out to jurisdictions, developers, or the public to promote transit-supportive land use planning; to identify regulatory and financial incentives to promote development; or to identify capital improvements. |

## Table B-1. Ratings Applied in Assessment of Land Use, Cont'd

| Phase of Project Development | Land Use Assessment Ratings | |
|---|---|---|
| Preliminary Engineering | HIGH | Transit agencies and/or regional agencies are working proactively with local jurisdictions, developers, and the public to promote transit-supportive land use planning and station area development. Local agencies are making recommendations for effective regulatory and financial incentives to promote transit-oriented development. Capital improvement programs are being developed that support station area land use plans and leverage the Federal investment in the proposed major transit corridor. |
| | MEDIUM | Transit agencies and/or regional agencies have conducted some outreach to promote transit-supportive land use planning and station area development. Agencies are investigating regulatory and financial incentives to promote transit-oriented development. Capital improvements are being identified that support station area land use plans and leverage the Federal investment in the proposed major transit corridor. |
| | LOW | Limited effort has been made to reach out to jurisdictions, developers, or the public to promote transit-supportive land use planning; to identify regulatory and financial incentives to promote development; or to identify capital improvements. |
| Ratings based on assessment of the following:<br>• Outreach to government agencies and the community in support of land use planning;<br>• Regulatory and financial incentives to promote transit-supportive development; and<br>• Efforts to engage the development community in station area planning and transit-supportive development. | | |

| III. PERFORMANCE AND IMPACTS OF LAND USE POLICIES | | |
|---|---|---|
| ***Performance of Land Use Policies*** | | |
| Phase of Project Development | Land Use Assessment Ratings | |
| Final Design | HIGH | A significant number of development proposals are being received for transit-supportive housing and employment in station areas. Significant amounts of transit-supportive development have occurred in other existing transit corridors and station areas in the region. |
| | MEDIUM | Some development proposals are being received for transit-supportive housing and employment in station areas. Moderate amounts of transit-supportive development have occurred in other existing transit corridors and station areas in the region. |
| | LOW | A limited number of proposals for transit-supportive housing and employment development in the corridor are being received. Other existing transit corridors and station areas in the region lack significant examples of transit-supportive housing and employment development. |

## Table B-1. Ratings Applied in Assessment of Land Use Criterion, Cont'd

| | | |
|---|---|---|
| Preliminary Engineering | HIGH | Transit-supportive housing and employment development is occurring in the corridor. Significant amounts of transit-supportive development have occurred in other existing transit corridors and station areas in the region. |
| | MEDIUM | Station locations have not been established with finality, and therefore, development would not be expected. Moderate amounts of transit-supportive housing and employment development have occurred in other existing transit corridors and station areas in the region. |
| | LOW | Other existing transit corridors and station areas in the region lack significant examples of transit-supportive housing and employment development. |
| Ratings based on assessment of the following:<br>• Demonstrated cases of development affected by transit-oriented policies; and<br>• Station area development proposals and status. | | |
| ***Potential Impact of Transit Project on Regional Land Use*** | | |
| Phase of Project Development | Land Use Assessment Ratings | |
| Preliminary Engineering and Final Design | HIGH | A significant amount of land in station areas is available for new development or redevelopment at transit-supportive densities. Local plans, policies, and development programs, as well as real estate market conditions, strongly support such development. |
| | MEDIUM | A moderate amount of land in station areas is available for new development or redevelopment at transit-supportive densities. Local plans, policies, and development programs, as well as real estate market conditions, moderately support such development. |
| | LOW | Only a modest amount of land in station areas is available for new development or redevelopment. Local plans, policies, and development programs, as well as real estate market conditions, provide marginal support for new development in station areas. |
| Ratings based on assessment of the following:<br>• Adaptability of station area land for development; and<br>• Corridor economic environment. | | |

*Source: LSA Design, 2006*

Table B-2 presents the quantitative measures and thresholds FTA utilizes for *Existing Land Use*, *Corridor Policies,* and *Zoning Near Transit Stations* factors. This table is intended as a rough guide for assigning ratings for land use factors in which quantitative data are given some consideration. These thresholds reflect only the quantitative aspects of ratings, and are complemented by a range of qualitative measures described in Table 5. All quantitative measures may not be available for every project.

## Table B-2. Quantitative Element Rating Guide [1]

| | Existing Land Use | | | |
|---|---|---|---|---|
| | Station Area Development | | Parking Supply | |
| Rating | Employment served by system[2] | Ave. Population Density (persons/sq. mi.) | CBD typical cost/day[3] | CBD spaces per employee[4] |
| High (5) | > 250,000 | > 15,000 | > $16 | < 0.2 |
| Medium-High (4) | 175,000—250,000 | 10,000—15,000 | $ 12—16 | 0.2—0.3 |
| Medium (3) | 125,000—175,000 | 6,667—10,000 | $ 8—12 | 0.3—0.4 |
| Low-Medium (2) | 75,000—125,000 | 3,333—6,667 | $ 4—8 | 0.4—0.5 |
| Low (1) | < 75,000 | < 3,333 | < $ 4 | > 0.5 |

| | Corridor Policies and Station Area Zoning | | | | |
|---|---|---|---|---|---|
| | Station Area Development | | | Parking Supply | |
| Rating | CBD comm.. FAR[5] | Other comm.. FAR[6] | Residential DU/acre | CBD spaces per 1,000 sq.ft. | Other spaces per 1,000 sq.ft. |
| High (5) | > 10.0 | > 2.5 | > 25 | < 1 | < 1.5 |
| Medium-High (4) | 8.0—10.0 | 1.75—2.5 | 15—25 | 1—1.75 | 1.5—2.25 |
| Medium (3) | 6.0—8.0 | 1.0—1.75 | 10—15 | 1.75—2.5 | 2.25—3.0 |
| Low-Medium (2) | 4.0—6.0 | 0.5—1.0 | 5—10 | 2.5—3.25 | 3.0—3.75 |
| Low (1) | < 4.0 | < 0.5 | < 5 | > 3.25 | > 3.25 |

*Source: LSA Design, 2006*

1 This table is intended as a rough guide for assigning land use ratings for factors in which quantitative data are given primary consideration. The ranges shown were developed based on an analysis of land use characteristics and assigned ratings for New Starts projects rated for Fiscal Years 1999 through 2002. Measures of parking supply are the most commonly reported measures, but may not be available for every project.

2 Entire line with a no-transfer ride from the New Starts project stations (including the CBD), even if the New Starts project is an extension not located in CBD.

3 CBD core (not fringe parking).

4 Average across CBD.

5 CBD core area.

6 Elsewhere in corridor (typical for commercial districts).

# Appendix C: Annotated References

The following is excerpted from Jeffery Smith and Thomas Gihring*. "Financing Transit Systems Through Value Capture, An Annotated Bibliography", Victoria Transport Policy Institute, 2006*

The annotations below summarize many of the issues regarding the benefits, impacts and opportunities of transit on their communities.

**20) Litman, Todd, *Rail Transit In America: Comprehensive Evaluation of Benefits*, Victoria Transport Policy Institute (www.vtpi.org), 2004. Also see, *Evaluating Public Transit Benefits and Costs*, by the same author and publisher, which provides additional information on methods for evaluating benefits**.
This study evaluates rail transit benefits based on a comprehensive analysis of transportation system performance in major U.S. cities. It finds that cities with large, well-established rail systems have significantly higher per capita transit ridership, lower average per capita vehicle ownership and annual mileage, less traffic congestion, lower traffic death rates, lower consumer expenditures on transportation, and higher transit service cost recovery than otherwise comparable cities with less or no rail transit service. It finds that monetized benefits exceed rail transit costs several times over. This indicates that rail transit systems provide economic, social and environmental benefits, and these benefits tend to increase as a system expands and matures. This report discusses best practices for evaluating transit benefits. It examines criticisms of rail transit investments, finding that many are based on inaccurate analysis.

**29) Al-Mosaind, Musaad A., Kenneth J. Duecker, and James G. Strathman, "Light Rail Transit Stations And Property Values: A Hedonic Price Approach," *Discussion paper 92-04, Presented at Transportation Research Board 72nd Annual Meeting*, Center for Urban Studies, School of Urban and Public Affairs, Portland State University, December 1992.**Proximity to LRT stations may improve the accessibility of residents to the CBD and the rest of the urban area, and may also result in transportation cost savings. These effects show up in higher property values. However, in the absence of attention to design qualities, LRT stations may impose negative externalities, depreciating nearby home values. Which of these two effects predominates? In metropolitan Portland, Oregon, two distance models to LRT stations were compared. The first showed a positive capitalization in sale prices for homes within 500 m (1600 ft or 1/4 mi) walking distance. This effect was equally felt for all homes within that distance zone. The second model found a statistically weak negative price gradient for homes within the 500-m zone. This implies a positive influence of proximity, where homes are priced about 10% higher. Zoning for higher density around stations also raised site values.

**30) Anas, A., and Regina Armstrong, *Land Values and Transit Access: Modeling the Relationship in the New York Metropolitan Area: An Implementation Handbook*. Report No. FTA-NY-06-0152-93, U.S. Federal Transit Administration, Office of Technical Assistance and Safety, Springfield VA. (National Technical Information Service) September 1993.**
This article presents findings of a multi-year study of the relationship between land values and transit access in the New York area, as precursor to capturing this value for public transit. Initiated as an element of the Third Regional Plan for the New York/New

Jersey/Connecticut Region, the results serve as a research prototype for transit systems throughout the US. Two economic models are presented – NYREG and NYSTA – which predict shifts in land values within the region and at a parcel scale in relation to transit stations. "The total benefits of reducing wait times on transit equal $3.7 billion ($1.57/trip). Taxing the producer surplus increases would raise $100 million/yr, enough to finance a doubling of the number of trains (an unknown cost)."

**31) Armstrong, Robert J., "Impacts of Commuter Rail Service as Reflected in Single- Family Residential Property Values",** ***Transportation Research Record, 1466 (1994): 88-97.*** Single-family residential properties in metropolitan Boston, Mass, are examined. Results indicate that there is an increase in single-family residential property values of approximately 6.7% by virtue of being located within a community having a commuter rail station. At the regional level there appears to be a significant impact on single-family residential property values resulting from the accessibility provided by commuter rail service.

**32) Barker, William G., "Bus Service and Real Estate Values",** ***68th Annual Meeting of the Institute of Transportation Engineers, Toronto, Ontario, 1998.*** **(Available from ITE, 1099 14th Street, NW, Washington DC 20005-3438 U.S.A.).**
Real estate developers and lending institutions are not willing to base investments on the location of easily changed bus routes. However, the availability of local bus service does increase the value of at least some urban real estate.

**33) Baum-Snow, Nathaniel and Matthew E. Kahn, "The Effects of Public Transit Projects to Expand Urban Rail Transit,"** ***Journal of Public Economics*****, Vol. 77, 2001, pp. 241-63.**
Study of land values in Boston, Atlanta, Chicago, Portland and Washington DC found that a decrease from three to one kilometer distance from transit stations increases rents by $19 per month, and housing values by $4,972.

**34) Benjamin, John D., and G. Stacy Sirmin, "Mass Transportation, Apartment Rent and Property Values,"** ***The Journal of Real Estate Research, Vol. 12, No. 1 (1996).***
This study examines the effects of transit access, measured in ground distance to the nearest station, on residential rent levels. From over 250 observations of 81 apartment complexes, the authors find that rents decrease by 2.4% to 2.6% for each one-tenth mile in distance from a Metro station in Washington, DC.

**35) Bernick, M., R. Cervero, and V. Menotti,** ***Comparison of Rents at Transit-Based Housing Projects in Northern California*****, Working Paper 624, University of California at Berkeley, Institute of Urban and Regional Development, 1994.**
"Rents at the BART housing projects are higher than those of nearby projects."

**36) Bollinger, C., K. Ihlanfeldt, and D. Bowes, "Spatial Variation in Office Rents Within the Atlanta Region",** ***1996 TRED Conference, Lincoln Land Institute, Cambridge, Mass*****., Georgia State University, Policy Research Center, July 1998.**
This is a hedonic rent study of office buildings in the Atlanta area from 1990 to 1996. Part of the rent differences among office buildings is due to differences in wage rates, transportation rates, and proximity to concentrations of office workers. The convenience of face-to-face meetings facilitated by office agglomerations is also reflected in office rents, providing evidence that agglomeration tendencies continue to be important in

explaining office concentrations, despite the ability of information technology designed to reduce the need for some such contacts.

**37) Borhart, Robert J., *Corridor Reservation: Implications for Recouping a Portion of the 'Unearned Increment' Arising from Construction of Transportation Facilities,* Final Report, Virginia Transportation Research Council, Charlottesville, Va., Series title: VTRC; 94-R15, 1994.**
Increases in land rents show up in higher property taxes, not only in property selling prices. The author quotes President Franklin D. Roosevelt supporting value capture.

**38) Bowes, David R. and Keith R. Ihlanfeldt, "Identifying the Impacts of Rail Transit Stations on Property Values," *Journal of Urban Economics*, Vol. 50, 2001, pp. 1-25.**
Found that properties between one and three miles of a rail transit station in Atlanta, Georgia have a higher value than otherwise comparable properties located more than three miles away, but properties within a quarter mile of a station are worth 19% less than homes beyond three miles.

**39) Cambridge Systematics, *Economic Impact Analysis of Transit Investments: Guidebook for Practitioners*, TRB Report 35, Transit Cooperative Research Program, Transportation Research Board (www.trb.org), 1998**.
This comprehensive guidebook describes various technical methods for measuring the economic impacts of transit investments, including changes in adjacent property values. It also includes a summary of research findings on the increases in property values found around BART stations in the San Francisco Bay area. Results are summarized in the table below. Tables 9.6 – 9.10 list 15 studies dating from 1970 to 1996 that calculate the premium effect of transit investments, measured in unit area of property.

**40) Cervero, Robert, "Rail Transit and Joint Development: Land Market Impacts in Washington, D.C. and Atlanta," *Journal of the American Planning Association, Vol. 60, No. 1 (1994): 83-94.***
In addition to public-private cost sharing and the lease revenues derived from commercial space in rail stations, joint development projects generate more fare revenues as they stimulate more transit trips. This study examines how transit investments affect office market indicators. Evidence shows that J-D projects create measurable land value increases and other associated benefits. Among five dependent variables studied, office rent levels are most closely correlated with transit factors – especially ridership. Other benefits associated with transit centers are low vacancy rates, higher absorption rates, and larger office building size. In conclusion, urban rail transit will significantly benefit land use and site rents only if a region's economy is growing and supportive programs such as permissive zoning are in place.
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**41) Cervero, R., "Transit-Based Housing in the San Francisco Bay Area: Market Profiles and Rent Premiums," *Transportation Quarterly Vol.* 50, No.3 (1996): 33-49.**
Cervero's study evaluated apartment rents (most studies evaluate housing prices). Around the three BART stations studied, most residents lived in multi-unit complexes of 20-60 units, were young adults, professionals earning incomes comfortably higher than around some other stations, living alone or as couples, but without children (DINKs), most of whom owned just one car, not one car apiece. The housing near two of the

stations those residents lived in did lease at building rents that were 10%-15% higher; around the third (Richmond) no rent premium was found. Cervero did not explain if any characteristic of that neighborhood was different: more industrial or surrounded by lower-income residents or what. He concluded that, "In theory, the existence of a rent premium for multi-unit projects suggests value capture mechanisms (e.g., forming benefit assessment districts) could be used to help finance rail systems."

**42) Cervero, Robert, "Benefits of Proximity to Rail on Housing Markets: Experiences in Santa Clara County,"** ***Journal of Public Transportation, Vol. 5, No. 1 (2002).***
Hedonic price models show that nearness to light rail and commuter rail stops substantially add value to residential parcels. Large apartments within ¼ mile of LRT stations command land value premiums as high as 45 percent. Such market profits provide a potential source of local revenue from value capture programs.

**43) Cervero, Robert, and Michael Duncan, "Transit's Value Added: Effects of Light Commercial Rail Services on Commercial Land Values,"** ***Presented at TRB Annual Meeting, 2002.*** **(Available at www.apta.com/info/briefings/cervero_duncan.pdf)**
This study models the value effects of proximity to light rail and commuter rail stations, as well as freeway intersections, in Santa Clara County, California. Substantial capitalization benefits to commercial-retail and office properties were found, on the order of 23% for a typical commercial parcel near an LRT stop, and more than 120% for commercial land in a business district within a quarter mile of a commuter rail station.

**44) Cervero, Robert, Christopher Ferrell, and Steven Murphy, "Transit-Oriented Development and Joint Development in the United States: A Literature Review,"** ***Research Results Digest, No. 52, Transit Cooperative Research Program, (October 2002).***
This is a comprehensive review of literature on transit oriented development. Topics include: Definition of TOD, agency roles, impacts and benefits on land markets, supportive policies and regulations, the use of value capture financing, and station area design supportive of TOD. The authors suggest that transit boards might share in the land-value benefits derived from proximity to transit by participating in joint development as well as value capture.

**45) Chen, Hong, Anthony Rufolo, and Kenneth Dueker, "Measuring the Impact of Light Rail Systems on Single Family Home Values: An Hedonic Approach With GIS Application",** ***Transportation Research Record 1617, TRB, National Research Council, Washington, DC, (1998).***
Proximity to transit stations account for a 10.5% home price differential. This confirms the findings of Al-Mosaind et. al. (see Ref. 25). They conclude that the positive effects outweigh the negatives. *Financing Transit Systems Through Value Capture* 19.

**46) Damm, David, Steven Lerman, Eva Lerner-Lam, and Jeffrey Young, "Response of Urban Real Estate Values in Anticipation of the Washington Metro,"** ***Journal of Transport Economics and Policy,*** **(September 1980): 315-335.**
The authors draw conclusions from reviews of earlier studies of value capture financing, showing that in response to new transit lines, land values are enhanced in centers of concentrated activity and in predominantly undeveloped areas. Their Metro case study demonstrates that the values of retail properties are highly sensitive to

proximity to transit stations. This suggests that retail areas are better suited for value capture policies.

**47) Diaz, Roderick B., "Impacts of rail transit on property values,"** ***Commuter Rail/Rapid Transit Conference, Toronto, Ont.*****, American Public Transit Association, 1999.**
The author summarizes recent North American studies examining the impact of 12 rail projects, including both heavy rail and light rail. Several variables contributing to positive and negative changes in property values are identified. In Miami, home values near stations increased by up to 5 percent (Gatzlaff, 1993). In Toronto, nearby home value increases averaged $2,237 (Bajic, 1983). In general, proximity to rail increases accessibility, which is the primary factor in rising property values.
www.apta.com/info/online/diaz.pdf (From "Rail transit and property values" in *Information Center Briefing*, Number 1 - March 2001, at www.apta.com/info/briefings/briefings_index.htm).

**48) Dunphy, Robert T., *The Cost of Being Close*, ULI Working Paper 660, Urban Land Institute, October 1998.**
In Southern California, real estate consultant Larry Netherton compared examples of comparable housing for sale at different distances from a central business area. Buyers would have to travel another 15 to 30 minutes to trim $10 to $15 per square foot off the price of a house. In Orange County, two similar upper-end housing projects were compared, one near major employment, retail, and cultural centers, and the other 20 miles away from employment centers. The closer-in units sold for an average of $599,400, the distant units sold for $320,000 – a difference of about $280,000, or $14,000 per mile, or $11,200 per minute of extra commute time. In more distant Riverside County, the closer-in project was priced at $214,900, while a same-sized, similar house 20 miles farther out sold for $141,900. The differential here was $73,000 total, or $3,600 per mile, or $2,400 per minute of extra commute time.

**49) Fejarang, R. A., "Impact on Property Values: A Study of the Los Angeles Metro Rail,"** ***Transportation Research Board 73rd Annual Meeting, January 1994.*** In a city such as Los Angeles, value impacts can be caused by regional as well as local behavior. Did the announcement of Metro Rail impact property values? The announcement involved a consortium of federal, state, and local funding propositions that began in 1983 and legislated in 1988. The period studied was from 1980 to 1990 during which plans became actualized. That is, investments were secured and rail transit was under design and construction, but not yet available for riders or for rider-dependent shopping. Isolating exogenous variables was accomplished at both macro and micro levels. Using a pre-test - post-test control group, property values following the period of actualization were found to be significantly different from prior values. Property values near rail lines were found to be significantly different from property values located a distance. (From Transport Research Laboratory) *Financing Transit Systems Through Value Capture* 20.

**50) Thomas A. Garrett, *Light Rail Transit in America: Policy Issues and Prospects for Economic Development*, Federal Reserve Bank of St. Louis (www.stlouisfed.org), 2004.** Hedonic pricing model applied to residential property values in St. Louis found that average home values increase $140 for every 10 feet closer they are to a MetroLink rail transit station, beginning at 1,460 feet. A home located 100 feet from the station has a price premium of $19,029 compared with the same house located 1,460 feet away. This represents a 32% increase in property values. Their analysis also indicated that beyond 1,460 feet, property values increased with distance from MetroLink stations, but this probably location-related reflects other factors not included in their model, such as traffic volumes on nearby streets, rather than proximity to station. Their analysis did not investigate property value impacts on commercial properties, which probably also increase with proximity to stations.

**51) Gatzlaff, Dean H., and Mark Smith, "The Impact of the Miami Metrorail on the Value of Residences Near Station Locations",** ***Land Economics, Vol. 69 No. 1 (February, 1993).*** Miami Metrorail began in the mid-1980s, in a city that is largely new and sprawling. The 20 miles of rail line run thru downtown, half to the poorer north, half to the richer south. Neither are considered prime areas for redevelopment. Ridership is relatively low (some stations are in blighted areas). The researchers looked at only houses that had sold before and after Metrorail was completed. The researchers found that the line perceptibly increased nearby site values in the richer neighborhoods, not in the poor areas where new capital still had not ventured.

**52) Goodwin, Ronald E., and Carol A. Lewis,** ***Land Value Assessment Near Bus Transit Facilities: A Case Study of Selected Transit Centers in Houston, Texas,*** **Southwest Region University Transportation Center, Houston, Texas, 1997.** Site values in the Houston region were falling due to shrinking incomes and diminished incomes. However, values fell less near bus stops than they did in more distant locations.

**53) Gruen, Aaron,** ***The Effect Of CTA and METRA Stations on Residential Property Values: Transit Stations Influence Residential Property Values*****, Report to the Regional Transportation Authority, June 1997.** By improving accessibility, lessening congestion, and reducing household transportation costs, transit service adds value to residential locations. Observing 96 Chicago-area Chicago Transit Authority (CTA) and METRA stations, Gruen used hedonic modeling supplemented by a literature review and interviews with realtors and other experts on local market conditions. More important than the presence of a transit station is the perception of neighborhood desirability. Still, the proximity of transit does positively affect property values. The price of a single-family house located 1,000 feet from a station is 20% higher than a comparable house located a mile away. Realtors in both the affluent suburban West Hinsdale station area and the gentrifying Logan Square area on Chicago's northwest side point out that prices have been increasing and that these locations increasingly appeal to younger, higher-income professionals, many of whom commute via CTA or METRA to downtown Chicago. Apartment properties located closer to train stations tend to realize higher rents and occupancy levels than comparable apartments less conveniently located. (www.ggassoc.com from "Rail Transit And Property Values," *Information Center Briefing*, No. 1, March 2001, at www.apta.com/info/briefings/briefingsindex.htm). *Financing Transit Systems Through Value Capture* 21

**54) Hess, Daniel Baldwin and Tangerine Maria Almeida,** ***Impact of Proximity to Light Rail Rapid Transit on Station-Area Property Values in Buffalo*****, Paper 062198, Transportation Research Board 85th Annual Meeting (www.trb.org), 2006.** This study assesses the impact of proximity to light rail transit on residential property values near stations in Buffalo, New York, where light rail has been in service for 20 years, but population is declining and ridership is decreasing. The researchers construct hedonic models of assessed value for residential properties within ½ mile of 14 Metro Rail stations, including independent variables that describe property characteristics, neighborhood characteristics, and locational amenities. The model suggests that every foot closer to a light rail station increases property values by $2.31 (using geographical straight line distance) and $0.99 (using network distance). Consequently, a home located within one-quarter mile radius of a light rail station can earn a premium between $1,300 to $3,000, or 4 to 11 percent of the median assessed home value. Model results suggest that three independent variables—the number of bathrooms, size of the parcel, and location on the East side or West side of Buffalo—are more influential than rail proximity in predicting property values. Individual regression models for each of the light rail system's 14 stations suggest that effects are not felt evenly throughout the system. Proximity effects are positive in high-income station areas and negative in low-income station areas. An analysis of the actual walking distance to stations (along the street network) versus the perceived proximity (measured by straight-line distance) to stations reveals that the results are statistically more significant in the network distance than the straight line distance model, but the effects are greater in the straight line distance model, which suggests that apparent proximity to rail stations is an added locational advantage compared to physical walking distance to the station.

**55) Huang, W., *The Effects of Transportation Infrastructure on Nearby Property Values: A Review of the Literature*, Working Paper 620, Institute of Urban and Regional Development, Berkeley, Calif., 1994.** The effect of the presence of transportation infrastructure on distant lot values is small, but there are many distant lots, therefore the hedonic method may underestimate incremental site rents. Furthermore, it may be a mistake to regard as exogenous the values attributed to other amenities that developers add in response to accessibility-induced value.

**56) Kay, J. H., and G. Haikalis, "All Aboard", *Planning, Vol. 66, No. 10, (October 2000): 14-19.*** In Dallas, DART has shown what a modern city driven by the private sector can accomplish with rail transit. Property values around transit stations have jumped by approximately 25% since DART began operation in 1996. However, Dallas's extensive land area complicates transit's contribution to the regional transportation system. In a sidebar, Haikalis describes New Jersey's new Hudson-Bergen line. Available from: APA, 122 South Michigan Avenue, Suite 1600, Chicago, IL 60603-6107, TRIS Database: "Taxing Property Values for Transit".

**57) Knaap, Gerrit, Lewis Hopkins, and Arun Pant, *Does Transportation Planning Matter? Explorations into the Effects of Planned Transportation Infrastructure on Real Estate Sales, Land Values, Building Permits, and Development Sequence*, Lincoln Institute of Land Policy, Research Paper, 1996.** This study observed property values in the Westside LRT corridor in Washington County, suburban Portland, Oregon. The study compared values prior to construction with values at the beginning of LRT operations. Values of parcels located within ½-mile of the line were found to decrease with distance from the stations, but rise with distance from the rail line between stations. Thus, the opposite affects of accessibility and nuisance were deduced.

**58) Landis, John, Robert Cervero, Subhrajit Guhathukurta, David Loutzenheiser, and Ming Zhang, Rail Transit Investments, *Real Estate Values, and Land Use Change: A Comparative Analysis of Five California Rail Transit Systems*,**

**Monograph 48, Institute of Urban and Regional Studies, University of California at Berkeley, July 1995.** This study measured ground distance to BART stations in Alameda and Contra Costa Counties, California. The authors found that 1990 single family home prices declined by $1 to $2 per meter distance from a BART station. They did not find a significant impact on home values based on proximity to CalTrain commuter rail stations, although houses within 300 meters of the CalTrain right-of-way sold at a $51,000 discount. No increase in value around commercial / industrial stops was found, but the authors note that commercial property observations encounter significant data measurement problems.

**59) Lewis-Workman, Steven, and Daniel Brod, "Measuring the Neighborhood Benefits of Rail Transit Accessibility,"** ***Transportation Research Record 1576*****,** ***(1997): 147-153.*** **(Transportation Research Board www.trb.org)** The authors found that within a one-mile radius from the Pleasant Hill rail station in the Bay Area, average home prices decline by about $1,578 for every 100 feet distance from the station. In the area within a one-mile radius from the Forest Hills, 67th Avenue, and Rego Park rail stations, average home prices decline about $2,300 for every 100 feet distance from the station.

**60) Nelson, Arthur C., "Effects Of Elevated Heavy-Rail Transit Stations On House Prices With Respect To Neighborhood Income,"** ***Transportation Research Record 1359 (1992): 127-132.*** In Atlanta's low value neighborhoods, a transit stop raises value. The reverse is also found, whereby in high value communities, installing a transit stop lowers site value – by nearly the same amount.

**61) Nelson, Arthur C., "Transit Stations And Commercial Property Values: A Case Study With Policy And Land-Use Implications,"** ***Journal of Public Transportation,*** **Vol. 2, No. 3. (1999).** Nelson develops a theory of commercial property value with respect to both transit station proximity and the role of policies that encourage commercial development around transit stations without discouraging such development elsewhere. He applies this theory to sale of commercial property in Atlanta's "Midtown", located 1 km (.6 mi) north of the downtown edge. Midtown is served by three heavy rail transit stations operated by the Metropolitan Atlanta Transit Authority (MARTA). To encourage transit-oriented development near MARTA stations, the city waives parking requirements and floor area ratio restrictions. Commercial property values are affected positively by both access to rail stations and policies that encourage more intensive development around those stations. Citywide analysis, measuring access as ground distance to a MARTA station, finds that price per square meter falls by $75 for each meter away from transit stations. Prices rise by $443 for location within special public interest districts (SPIDs). At the time of his study, Atlanta was the most sprawled metro region in the nation, and that the size of the SPIDs was identical to comfortable walking distance from stations, about a 1/4 mile radius. Theoretical and policy implications are explored.

**62) Parsons Brinkerhoff,** ***The Effects of Rail Transit on Property Values: A Summary of Studies*****, Research carried out for Project 21439S, Task 7. NEORail II, Cleveland, Ohio, February 27, 2001.** This paper summarizes the results of several previous studies in tabular form. The authors note that varying methodologies make it difficult to compare results. Nevertheless, it is clear that in most cases access to transit systems is valued by property owners. Rail's influence on residential values is demonstrated more clearly than on commercial uses; however, influence on commercial values appears to vary by: (i) how much accessibility is improved, (ii) the relative attractiveness of locations near stations, and (iii) the strength of the regional real estate market.

**63) Pickett, M.W., and K.E. Perrett, *The effect of the Tyne and Wear Metro on Residential Property Values,* Supplementary Report 825, Transport and Road Research Laboratory, Crowthorne, Berkshire, U.K., 1984.** Three different methods of analysis are performed on the data collected. Results show an average increase of £360 (1.7%) in the value of properties near Metro stations during the fourmonth period surrounding the date on which each section of line opened. In reference to related studies, Dvett et. al. found a small but significant positive effect on the value of single-family dwellings at three of the six BART station areas studied. Lerman et. al. found that distance from Washington Metro stations influences property values, the value rising as the opening date nears, and falling if the opening is delayed. The Regional Commission in Atlanta found an associated increase in industrial property values.

**64) Price Waterhouse Coopers, *Review of Property Value Impacts at Rapid Transit Stations and Lines*, Technical Memorandum 6, Richmond/Airport – Vancouver Rapid Transit Project, April 3, 2001.** The authors review transit impact studies from selected cities across North America. The reviewers find a positive relationship between property values and station location, but also a possible negative impact on single-family homes along the line due to nuisance impacts. Four research reports are summarized: (1) Transit Case Studies for the City of Hillsboro, Oregon, (2) Transit Benefits 2000 Working Papers, (3) Light Rail Transit Impacts in Portland, Oregon, and (4) Impact of the Vancouver, BC Skytrain on Surrounding Real Estate Value.

**65) Richert, Thomas M., *Economic Impacts of Automated People Mover Development in Commercial Centers*, Advanced Transit Association, 1999.** After one year of operation of the APM, retail sales in downtown vs. the greater metro region grew in Denver by 8%, in St. Louis by 4%, and in Miami by 1% (where patronage of downtown commercial space had been lagging historically). Higher retail sales translate into higher site values. *Financing Transit Systems Through Value Capture* 24.

**66) Rice Center for Urban Mobility Research, *Assessment of Changes in Property Values in Transit Areas*, Urban Mass Transit Administration, Houston, Texas, 1987.** This is a summary of earlier findings from Toronto, Baltimore, Denver, San Diego, and San Francisco. Some transit centers showed a 100% to 300% increase in commercial site values. In Atlanta, 61% of the businesses within 500 feet of a transit stop reported increased sales.

**67) Rodríguez, Daniel A., Felipe Targa, "The Value Of Accessibility To Bogotá's Bus Rapid Transit System," *Transport Reviews*, Vol. 24, No.  , 2004, pp. 587 – 610.** By estimating spatial hedonic price functions, this paper determines the extent to which access to BRT stations in Bogotá, Colombia currently are capitalized into land values. Results suggest that for every 5 minutes of additional walking time to a BRT station, the rental price of a property decreases between 6.8% and 9.3%, after controlling for structural characteristics, neighborhood attributes, and proximity to the BRT corridor. Evaluated at the average walking time to a BRT station, this effect translates into an elasticity of between -0.16 and -0.22. Although these estimates cannot be attributable directly to the presence of the BRT system because we use a cross-sectional design, they suggest that the land market in Bogotá values access to BRT station locations.

**68) Ryan, S., "Property Values and Transportation Facilities: Finding the Transportation-Land Use Connection,"** ***Journal of Planning Literature, Vol. 13, Issue 4 (May 1999): 412-427.*** Ryan reviews empirical studies of the relationship between the presence of transportation facilities – highways, heavy rail, and light rail transit systems – and property values. Inconsistencies in findings from this literature over the past several decades are explained. For example, results vary based on whether researchers measure accessibility in terms of travel time or travel distance. Measuring distance yields mixed results in property value effects. Measuring time yields the expected inverse relationship between access to transportation facilities and property values. The delineation of study areas also influences the direction of effects. This study offers a new interpretation of the transportation facility-property value literature, improving, the ability to measure relationships and to anticipate land-market responses to transportation facilities.

**69) Sedway Group, *Regional Impact Study*, Report commissioned by Bay Area Rapid Transit District (BART), July 1999.** This is a review of studies of the benefits associated with BART service, measured in positive residential and office property impacts. Reported single family home values fell by $3,200 to $3,700 for each mile distance from a BART station in Alameda and Contra Costa counties. Apartments near BART stations were found to rent for 15% to 26% more than apartments distant from BART stations. The average unit land price for office properties also decreased as distance from a BART station increased, from $74 per square foot within ¼ mile of a station to $30 per square foot at locations exceeding ½ mile. Sedway Group, San Francisco, CA at www.sedway.com (From "Rail transit and property values," Information Center Briefing, No. 1 March 2001, at www.apta.com/info/briefings/briefings_index.htm). *Financing Transit Systems Through Value Capture* 25.

**70) Voith, Richard, "Changing Capitalization of CBD-Oriented Transportation Systems: Evidence from Philadelphia, 1970-1988," Federal Reserve Bank of Philadelphia, Working Paper No. 31-19 (1991 November); *Journal of Urban Economics*, Vol. 33 (1993): 361-376.** Voith estimates house value premiums associated with CBD-oriented train service provided by the Southeastern Pennsylvania Transportation Authority (SEPTA). Unlike most previous studies, he documents changes over an extended period, for each year in his 19-year sample. His data include over 59,000 home sales. In 1980 the average sales price was nearly $120,000.
Prices declined from 1974 through 1982, bottomed out during 1983 and 1984, and rose steeply from 1985 through 1988. Using hedonic house value regressions, he finds strong evidence that accessibility to the CBD is capitalized into suburban house values. The premium began in 1970 at well over $12,000, declined until 1976, bottoming out at a bit over $5,000, then from 1978 to 1984 averaged nearly $9,000, and at the end of his sample, 1988, reached $20,000 plus. The value of such accessibility fluctuates with the economic health of the city (which is impacted by the City's tax on wages). Between 1981-1988 while employment in the suburbs grew rapidly, so did the premium associated with train service (to the CBD) increase dramatically, indicating that the central city economy still contributes significantly to the overall wealth of

communities. Hence, suburban communities may not be able to isolate themselves from central decline.

**71) Weinberger, Rachel R., *Commercial Rents and Transportation Improvements: Case of Santa Clara County's Light Rail,* WP00RW2, Lincoln Institute of Land Policy, 2001.** In Santa Clara County, California, property owners sued the County claiming losses in value from the nearby light rail. To determine the actual effect of the light rail facility on property values, Weinberger examined commercial property rents comparing accessibility to transit and to highway as determinants of rent, and analyzed the effects over time. Controlling for other factors, properties within a half-mile of light rail stations were found to command almost 15% more rent. Highway access, being ubiquitous, offers no particular locational advantage. As the transit system matured, nearby properties accrued greater benefits. But, in times of high demand, so did all other locations command higher rents.

**72) Weinstein, Bernard L., and Terry L. Clower, *The Initial Economic Impacts of the DART LRT System*, Center for Economic Development and Research, University of North Texas, July 1999.** Values of properties adjoining Dallas's DART light rail stations grew 25% more than similar properties not served by the rail system. Proximity to stations appears to be an economic advantage for most classes of real estate, especially Class A and C office buildings, and commercial strip retail outlets. Average occupancy rates for Class A buildings near rail stations increased from 80% in 1994 to 88.5% in 1998, while rents increased from an average $15.60/sf to $23/sf. Commercial strip retailers near the stations experienced a 49.5% gain in occupancy and a 64.8% improvement in rental rates. (www.dart.org/economic.htm; from "Rail transit and property values" in *Information Center Briefing*, No. 1, March 2001, at www.apta.com/info/briefings/briefings_index.htm).

# Appendix D:  Environmental Screening

## Table D-1  Base Corridor Alternatives, Evaluation of Goal 1, Measures 7 & 8

| | Goal 1 - Improve Mobility | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Measure #7 - Transit Dependent Populations within 1/2-mile of Stations | | | | | | Measure #8 - Jobs and Population within 1/2-mile of Stations | | | | | |
| Alternative | Low Income Households (1) | Households in Poverty (2) | Elderly (65+) | Youth (<18) | Zero-Car Households | Disabled | Population (3) 2000 | Population (3) 2030 | Households 2000 | Households 2030 | Employment (4) 2000 | Employment (4) 2030 |
| BRT 1 | 2,120 | 2,739 | 5,413 | 6,793 | 4,101 | 6,263 | 41,177 | 51,867 | 22,239 | 28,194 | 144,869 | 189,501 |
| BRT 2 | 2,163 | 2,775 | 5,459 | 6,856 | 4,132 | 6,282 | 41,998 | 51,957 | 22,985 | 28,726 | 162,207 | 210,322 |
| LRT 1A | 1,783 | 1,619 | 4,226 | 6,526 | 2,213 | 4,959 | 33,264 | 41,739 | 16,225 | 20,273 | 78,312 | 91,229 |
| LRT 1C | 4,451 | 5,690 | 6,493 | 10,364 | 9,184 | 11,049 | 68,099 | 82,004 | 36,259 | 45,132 | 161,232 | 210,382 |
| LRT 2A | 1,851 | 1,651 | 4,308 | 6,713 | 2,245 | 5,015 | 34,959 | 43,546 | 17,088 | 21,322 | 82,659 | 98,447 |
| LRT 2C | 4,518 | 5,722 | 6,575 | 10,551 | 9,217 | 11,105 | 69,794 | 83,811 | 37,122 | 46,182 | 165,579 | 217,601 |
| LRT 3A | 1,831 | 1,652 | 4,279 | 6,544 | 2,246 | 4,953 | 34,803 | 42,612 | 17,445 | 21,386 | 95,273 | 114,190 |
| LRT 3C | 4,499 | 5,723 | 6,546 | 10,382 | 9,217 | 11,043 | 69,637 | 82,877 | 37,479 | 46,246 | 178,193 | 233,343 |
| LRT 4A | 1,617 | 1,555 | 3,857 | 5,387 | 2,170 | 4,461 | 29,872 | 37,356 | 14,844 | 18,410 | 71,818 | 83,623 |
| LRT 4C | 4,284 | 5,626 | 6,124 | 9,225 | 9,141 | 10,551 | 64,707 | 77,621 | 34,878 | 43,269 | 154,738 | 202,777 |

(1) Low Income Households - Based on 60% of the Median Family Income in 7 County Area ($59,358) [$35,615]
Assumes the household earnings between $25,000 and $34,999 are equally distributed.
Source: Metropolitan Council and the U.S. Census Bureau  (MetroGIS DataFinder Catalog Website)
Dataset: Profile of Selected Economic Characteristics for Census Tracts: 2000

(2) - New Measurement Method: Household Poverty Threshold of $12,326
Source: Metropolitan Council and the U.S. Census Bureau  (MetroGIS DataFinder Catalog Website)
Dataset: Profile of Selected Economic Characteristics for Census Tracts: 2000

(3) Population 2000, 2030 - Based on latest official TAZ forecasting spreadsheet
Source: Metropolitan Council and the U.S. Census Bureau  (MetroGIS DataFinder Catalog Website)
Dataset: Transportation Analysis Zones: 1990 – 2000 linked to forecasting spreadsheet
Dataset: Forecasting spreadsheet received from Metropolitan Council (9/13/2005)

(4) Employment 2000, 2030 - Based on latest official TAZ forecasting spreadsheet
Source: Metropolitan Council and the U.S. Census Bureau  (MetroGIS DataFinder Catalog Website)
Dataset: Transportation Analysis Zones: 1990 – 2000 linked to forecasting spreadsheet
Dataset: Forecasting spreadsheet received from Metropolitan Council (9/13/2005)

*Source:  SEH,  2006*

## Table D-2 Base Corridor Alternatives, Evaluation of Goal 3, Measures 3 & 4

| Alternative | Goal 3 - Protect the Environment | | | | | | |
|---|---|---|---|---|---|---|---|
| | Measure #3 - Potentially Affected Natural Environment | | | | | | Measure #4 - Affected by Noise and Vibration |
| | 100-foot Buffer | | | 50-foot Buffer | | | Number of Dwelling Units Within 100 feet |
| | Waterbodies/ Wetlands (acres) | Parklands (acres) | Floodplain (acres) | Waterbodies/ Wetlands (acres) | Parklands (acres) | Floodplain (acres) | |
| **BRT 1** | 15 | 7 | 19 | 8 | 5 | 13 | 152 |
| **BRT 2** | 27 | 8 | 27 | 18 | 5 | 18 | 119 |
| **LRT 1A** | 6 | 7 | 17 | 1 | 5 | 11 | 162 |
| **LRT 1C** | 7 | 5 | 17 | 1 | - | 11 | 253 |
| **LRT 2A** | 24 | 7 | 22 | 14 | 5 | 15 | 146 |
| **LRT 2C** | 25 | 5 | 22 | 14 | - | 15 | 237 |
| **LRT 3A** | 39 | 7 | 26 | 26 | 5 | 17 | 161 |
| **LRT 3C** | 40 | 5 | 26 | 26 | - | 17 | 252 |
| **LRT 4A** | 1 | 7 | 13 | 0 | 5 | 9 | 130 |
| **LRT 4C** | 2 | 5 | 13 | 0 | - | 9 | 221 |

*Source: SEH, 2005*

## Table D-3 Base Corridor Alternatives, Evaluation of Goal 4, Measures 2 & 3

| Alternative | Goal 4 - Preserve and Protect the Quality of Life | | | | |
|---|---|---|---|---|---|
| | Measure #2 - Access to Community Amenities | | | Measure #3 - Access to Employment | |
| | Parks | Trails[1] | Libraries | Employment[2] 2000** | Employment[2] 2030** |
| **BRT 1** | 46 | High | 2 | 144,869 | 189,501 |
| **BRT 2** | 45 | Medium | 3 | 162,207 | 210,322 |
| **LRT 1A** | 43 | High | 2 | 78,312 | 91,229 |
| **LRT 1C** | 44 | High | 3 | 161,232 | 210,382 |
| **LRT 2A** | 45 | Medium | 2 | 82,659 | 98,447 |
| **LRT 2C** | 46 | Medium | 3 | 165,579 | 217,601 |
| **LRT 3A** | 42 | Medium | 2 | 95,273 | 114,190 |
| **LRT 3C** | 43 | Medium | 3 | 178,193 | 233,343 |
| **LRT 4A** | 38 | Medium | 2 | 71,818 | 83,623 |
| **LRT 4C** | 39 | Medium | 3 | 154,738 | 202,777 |

[1] Level of access to existing or proposed trails.

[2] Source: Metropolitan Council and the U.S. Census Bureau (MetroGIS DataFinder Catalog Website)
Dataset: Transportation Analysis Zones: 1990 – 2000 linked to forecasting spreadsheet
Dataset: Forecasting spreadsheet received from Metropolitan Council (9/13/2005)
** (Area of TAZ within 1/2-mile Station buffer / Area of TAZ) x TAZ Total

*Source: SEH, 2005*

## Table D-4 Base Corridor Alternatives, Evaluation of Goal 5, Measures 2 & 3

| | Goal 5 - Support Economic Development | | | | | | |
|---|---|---|---|---|---|---|---|
| | Measure #2 - Existing and Planned Jobs within 1/2-mile of Stations | | Measure #3 - Existing and Planned Other Generators within 1/2-mile of Stations | | | | |
| Alternative | Employment 2000** | Employment 2030** | Schools | Medical Facilities | Entertainment Venues | Government Centers | Major Shopping Centers |
| BRT 1 | 144,869 | 189,501 | 31 | 2 | 16 | 14 | 20 |
| BRT 2 | 162,207 | 210,322 | 30 | 2 | 16 | 15 | 29 |
| LRT 1A | 78,312 | 91,229 | 21 | 1 | 13 | 11 | 14 |
| LRT 1C | 161,232 | 210,382 | 36 | 3 | 18 | 14 | 19 |
| LRT 2A | 82,659 | 98,447 | 20 | 1 | 12 | 15 | 19 |
| LRT 2C | 165,579 | 217,601 | 35 | 3 | 17 | 18 | 24 |
| LRT 3A | 95,273 | 114,190 | 19 | 1 | 12 | 15 | 18 |
| LRT 3C | 178,193 | 233,343 | 34 | 3 | 17 | 18 | 23 |
| LRT 4A | 71,818 | 83,623 | 18 | 1 | 11 | 10 | 13 |
| LRT 4C | 154,738 | 202,777 | 33 | 3 | 16 | 13 | 18 |

** (Area of TAZ within 1/2-mile Station buffer / Area of TAZ) x TAZ Total

Source: Metropolitan Council and the U.S. Census Bureau (MetroGIS DataFinder Catalog Website)

Dataset: Transportation Analysis Zones: 1990 – 2000 linked to forecasting spreadsheet

Dataset: Forecasting spreadsheet received from Metropolitan Council (9/13/2005)

*Source: SEH, 2005*

## Table D-5 Corridor Segments, Evaluation of Goal 3, Measures 3 & 4

| | Goal 3 - Protect the Environment | | | | | | |
|---|---|---|---|---|---|---|---|
| | Measure #3 - Potentially Affected Natural Environment | | | | | | Measure #4 - Affected by Noise and Vibration |
| | 100-foot Buffer | | | 50-foot Buffer | | | Number of Dwelling Units Within 100 feet |
| Alternative | Waterbodies/ Wetlands (acres) | Parklands (acres) | Floodplain (acres) | Waterbodies/ Wetlands (acres) | Parklands (acres) | Floodplain (acres) | |
| **West of Shady Oak Station** | | | | | | | |
| BRT 1 | 14.1 | 0.0 | 5.4 | 8.1 | 0.0 | 3.2 | 49 |
| BRT 2 | 26.5 | 0.4 | 14.1 | 17.7 | 0.1 | 8.3 | 24 |
| LRT 1 | 5.8 | 0.0 | 3.9 | 0.8 | 0.0 | 1.4 | 32 |
| LRT 1 - Alternate A | 4.6 | 0.7 | 8.9 | 1.3 | 0.2 | 4.8 | 37 |
| LRT 2 | 23.1 | 0.0 | 9.0 | 14.0 | 0.0 | 5.5 | 16 |
| LRT 3 | 38.5 | 0.0 | 12.5 | 25.3 | 0.0 | 7.7 | 31 |
| **East of Shady Oak Station** | | | | | | | |
| BRT 1 | 0.7 | 7.3 | 13.2 | 0.3 | 5.1 | 9.8 | 103 |
| BRT 2 | 0.7 | 7.3 | 12.5 | 0.3 | 5.1 | 9.4 | 95 |
| Alt. A (Royalston) | 0.7 | 7.3 | 13.2 | 0.2 | 5.1 | 9.4 | 130 |
| Alt. A1 (Hennepin) | 0.7 | 7.3 | 13.2 | 1.3 | 5.1 | 9.8 | 117 |
| Alt. C | 1.6 | 4.9 | 13.2 | 0.5 | 0.0 | 9.4 | 221 |

*Source: SEH, 2005*

## Table D-6 Corridor Segments, Evaluation of Goal 4, Measures 2 & 3

| | Goal 4 - Preserve and Protect the Quality of Life | | | | |
|---|---|---|---|---|---|
| | Amenities | | | Employment | |
| Alternative | Parks | Trails[1] | Libraries | Employment[2] 2000** | Employment[2] 2030** |
| **West of Shady Oak Station** | | | | | |
| **BRT 1** | 7 | High | 0 | 8,898 | 12,596 |
| **BRT 2** | 6 | Low | 1 | 26,236 | 33,417 |
| **LRT 1** | 5 | High | 0 | 6,495 | 7,606 |
| **LRT 1 - Alternate A** | 5 | Medium | 0 | 7,089 | 8,429 |
| **LRT 2** | 7 | Medium | 0 | 10,841 | 14,824 |
| **LRT 3** | 4 | Low | 0 | 23,455 | 30,567 |
| **East of Shady Oak Station** | | | | | |
| **BRT 1** | 39 | High | 2 | 135,971 | 176,905 |
| **BRT 2** | 39 | High | 2 | 135,971 | 176,905 |
| **Alt. A (Royalston)** | 38 | High | 2 | 71,818 | 83,623 |
| **Alt. A1 (Hennepin)** | 39 | High | 2 | 135,971 | 176,905 |
| **Alt. C** | 39 | High | 3 | 154,738 | 202,777 |

[1] Existing or proposed trails that intersect with the proposed transit corridor.

[2] Source: Metropolitan Council and the U.S. Census Bureau (MetroGIS DataFinder Catalog Website)
Dataset: Transportation Analysis Zones: 1990 – 2000 linked to forecasting spreadsheet
Dataset: Forecasting spreadsheet received from Metropolitan Council (9/13/2005)
** (Area of TAZ within 1/2-mile Station buffer / Area of TAZ) x TAZ Total

*Source: SEH, 2005*

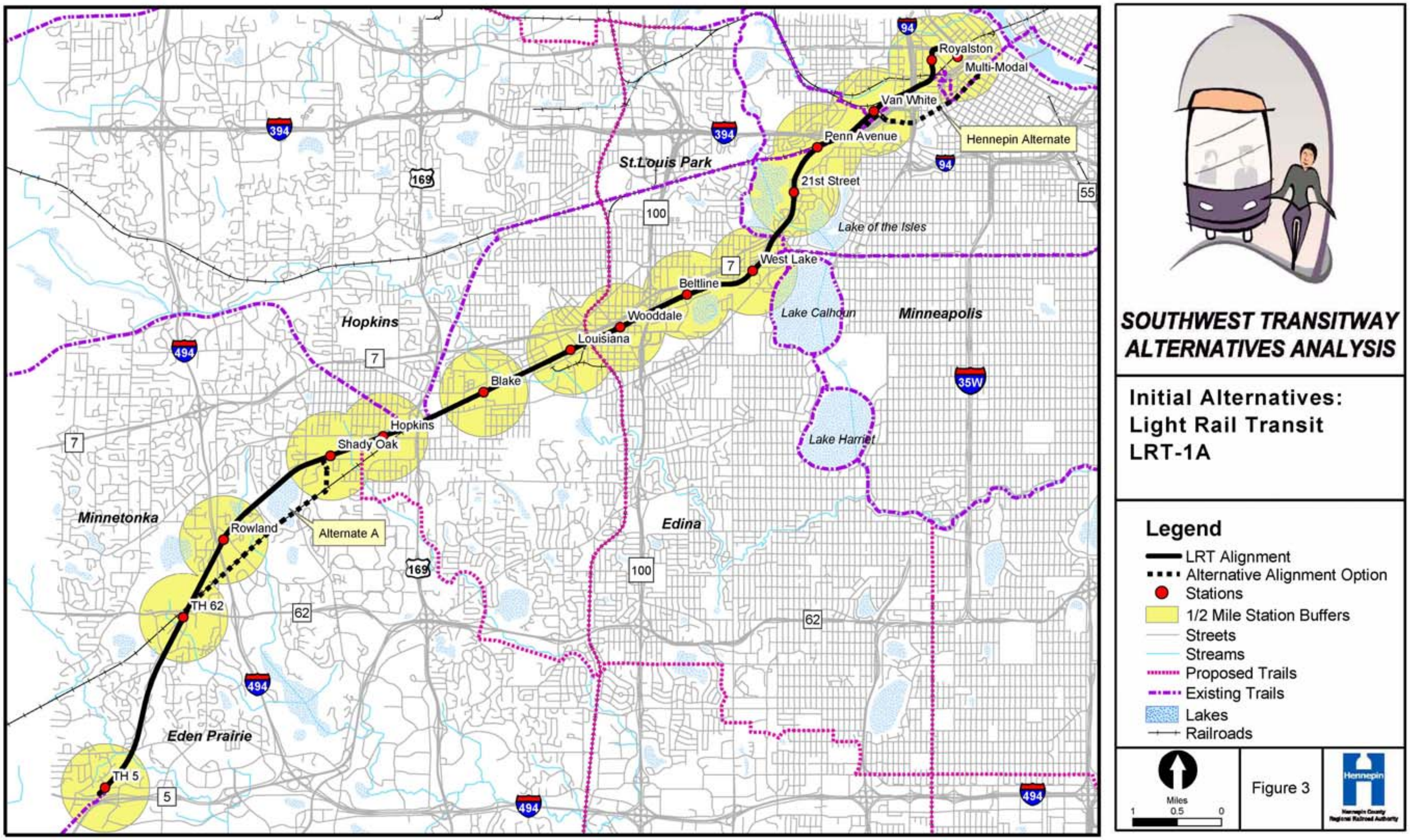
## Table D-7 Corridor Segments, Evaluation of Goal 5, Measures 2 & 3

| | Goal 5 - Support Economic Development | | | | | | |
|---|---|---|---|---|---|---|---|
| | Measure #2 - Existing and Planned Jobs within 1/2-mile of Stations | | Measure #3 - Existing and Planned Other Generators within 1/2-mile of Stations | | | | |
| Alternative | Employment 2000** | Employment 2030** | Schools | Medical Facilities | Entertainment Venues | Government Centers | Major Shopping Centers |
| **West of Shady Oak Station** | | | | | | | |
| **BRT 1** | 8,898 | 12,596 | 4 | 0 | 2 | 1 | 5 |
| **BRT 2** | 26,236 | 33,417 | 3 | 0 | 2 | 2 | 14 |
| **LRT 1** | 6,495 | 7,606 | 3 | 0 | 2 | 1 | 1 |
| **LRT 1 - Alternate A** | 7,089 | 8,429 | 3 | 0 | 2 | 1 | 1 |
| **LRT 2** | 10,841 | 14,824 | 2 | 0 | 1 | 5 | 6 |
| **LRT 3** | 23,455 | 30,567 | 1 | 0 | 1 | 5 | 5 |
| **East of Shady Oak Station** | | | | | | | |
| **BRT 1** | 135,971 | 176,905 | 27 | 2 | 14 | 13 | 15 |
| **BRT 2** | 135,971 | 176,905 | 27 | 2 | 14 | 13 | 15 |
| **Alt. A (Royalston)** | 71,818 | 83,623 | 18 | 1 | 11 | 10 | 13 |
| **Alt. A1 (Hennepin)** | 135,971 | 176,905 | 27 | 2 | 14 | 13 | 15 |
| **Alt. C** | 154,738 | 202,777 | 33 | 3 | 16 | 13 | 18 |

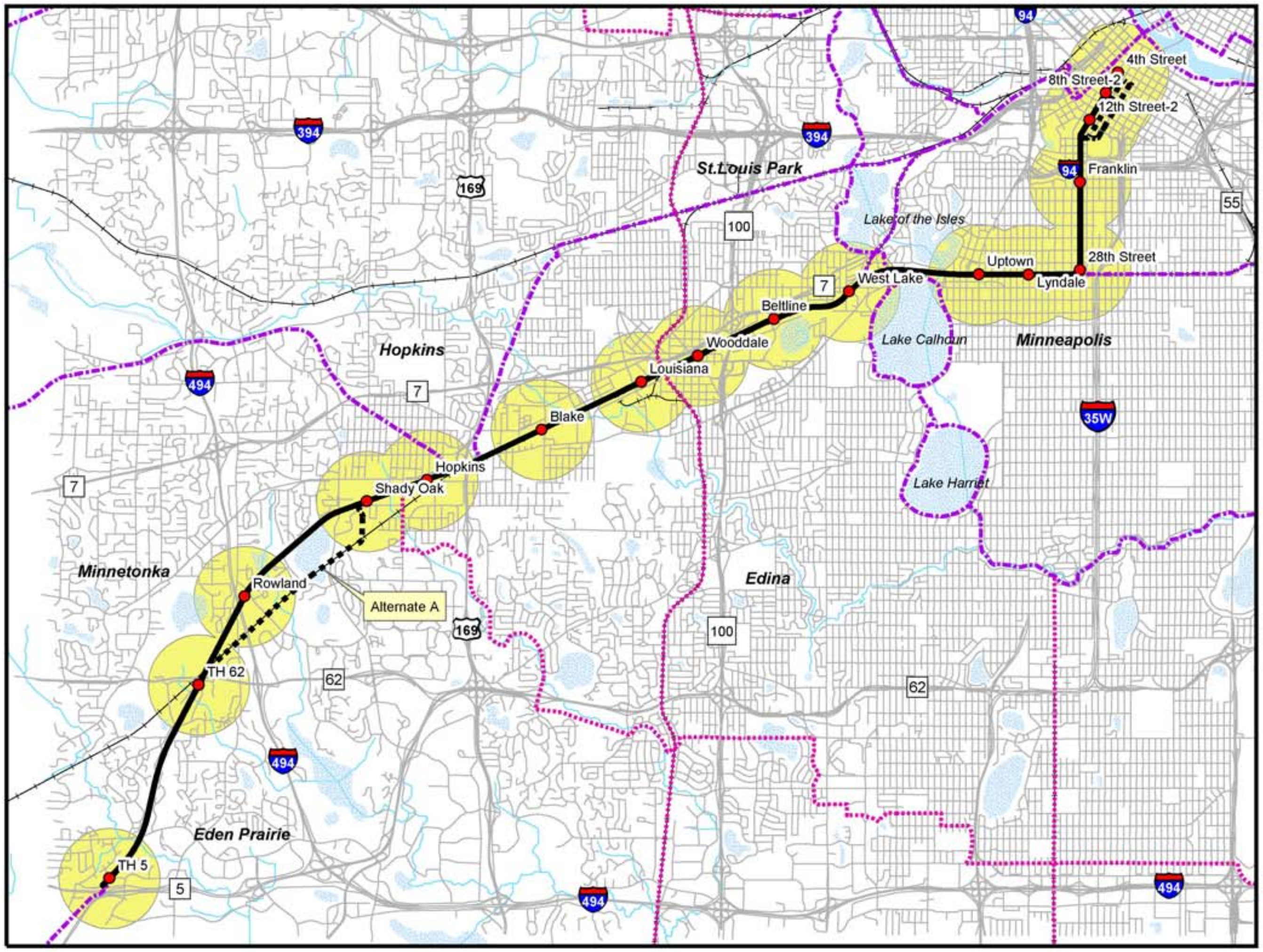
** (Area of TAZ within 1/2-mile Station buffer / Area of TAZ) x TAZ Total
Source: Metropolitan Council and the U.S. Census Bureau (MetroGIS DataFinder Catalog Website)
Dataset: Transportation Analysis Zones: 1990 – 2000 linked to forecasting spreadsheet
Dataset: Forecasting spreadsheet received from Metropolitan Council (9/13/2005)

*Source: SEH, 2005*

# Appendix E:  Environmental Resources Maps



Royalston
Multi-Modal
Van White
Penn Avenue
Hennepin Alternate
21st Street
Lake of the Isles
West Lake
Beltline
Wooddale
Louisiana
Blake
Hopkins
Shady Oak
Rowland
Alternate A
TH 62
TH 5
St.Louis Park
Hopkins
Minneapolis
Lake Calhoun
Lake Harriet
Minnetonka
Edina
Eden Prairie
SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS
Initial Alternatives:
Light Rail Transit
LRT-1A
Legend
LRT Alignment
Alternative Alignment Option
Stations
1/2 Mile Station Buffers
Streets
Streams
Proposed Trails
Existing Trails
Lakes
Railroads
Miles
1 0.5 0
Figure 3
Hennepin




**SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS**

**Initial Alternatives: Light Rail Transit LRT-1C**

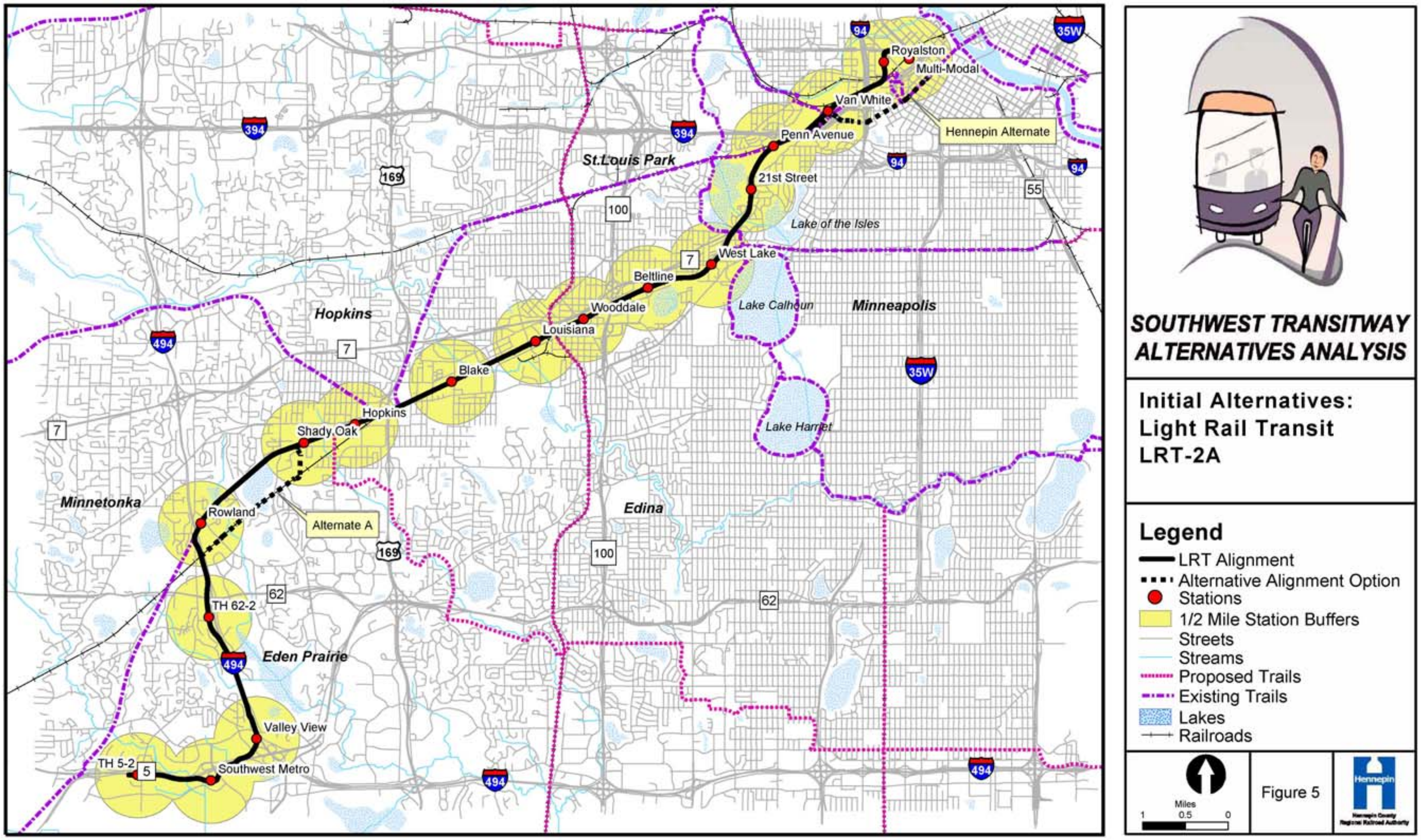
**Legend**

- LRT Alignment
- Alternative Alignment Option
- Stations
- 1/2 Mile Station Buffers
- Streets
- Streams
- Proposed Trails
- Existing Trails
- Lakes
- Railroads

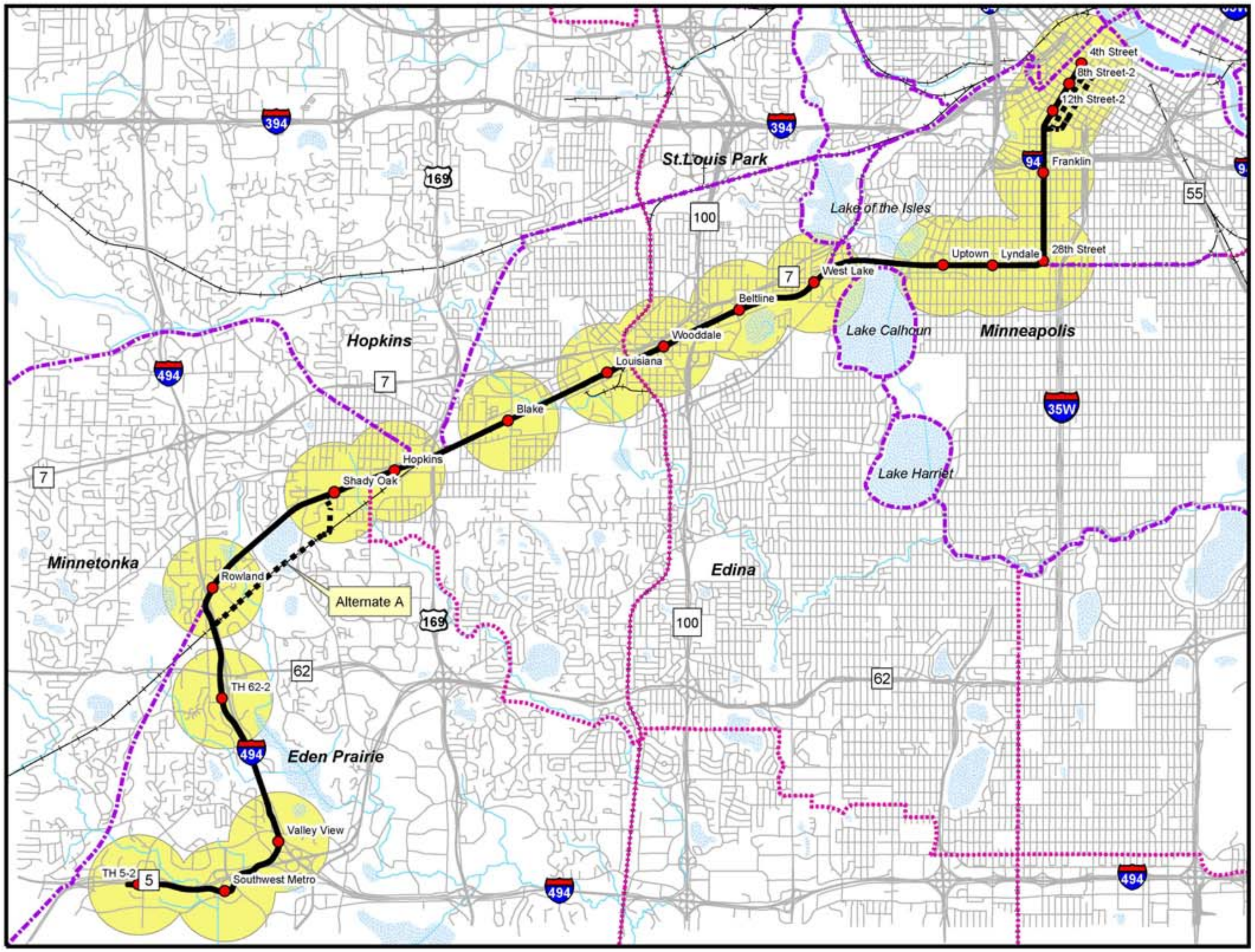
Miles 1 0.5 0

Figure 4

Hennepin County Regional Railroad Authority



Royalston
Multi-Modal
Van White
Hennepin Alternate
Penn Avenue
21st Street
St.Louis Park
Lake of the Isles
West Lake
Beltline
Wooddale
Louisiana
Lake Calhoun
Minneapolis
Hopkins
Blake
Shady Oak
Minnetonka
Rowland
Alternate A
Edina
Lake Harriet
TH 62-2
Eden Prairie
Valley View
TH 5-2
Southwest Metro
SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS
Initial Alternatives:
Light Rail Transit
LRT-2A
Legend
LRT Alignment
Alternative Alignment Option
Stations
1/2 Mile Station Buffers
Streets
Streams
Proposed Trails
Existing Trails
Lakes
Railroads
Miles
1 0.5 0
Figure 5
Hennepin




**SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS**

**Initial Alternatives: Light Rail Transit LRT-2C**

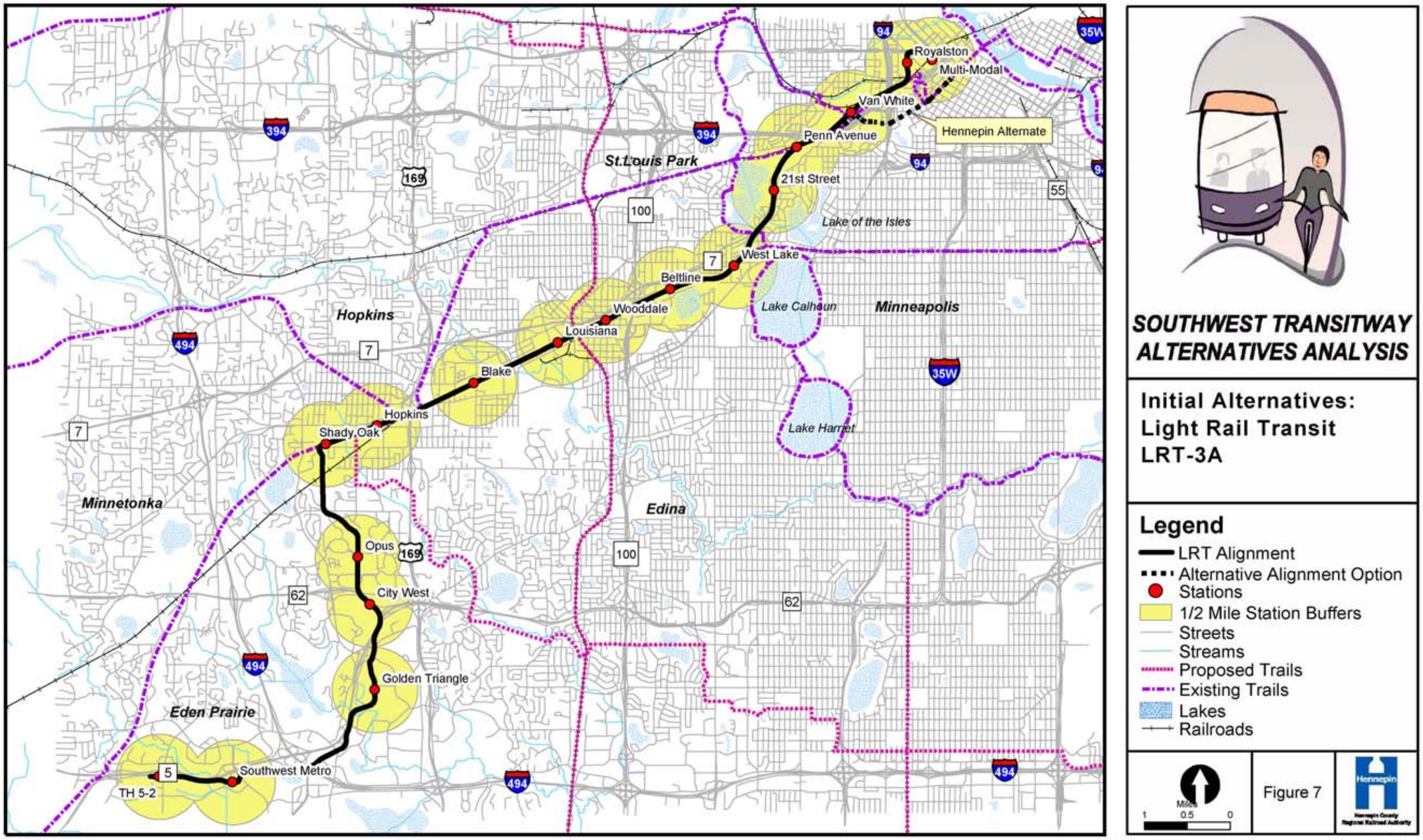
## Legend

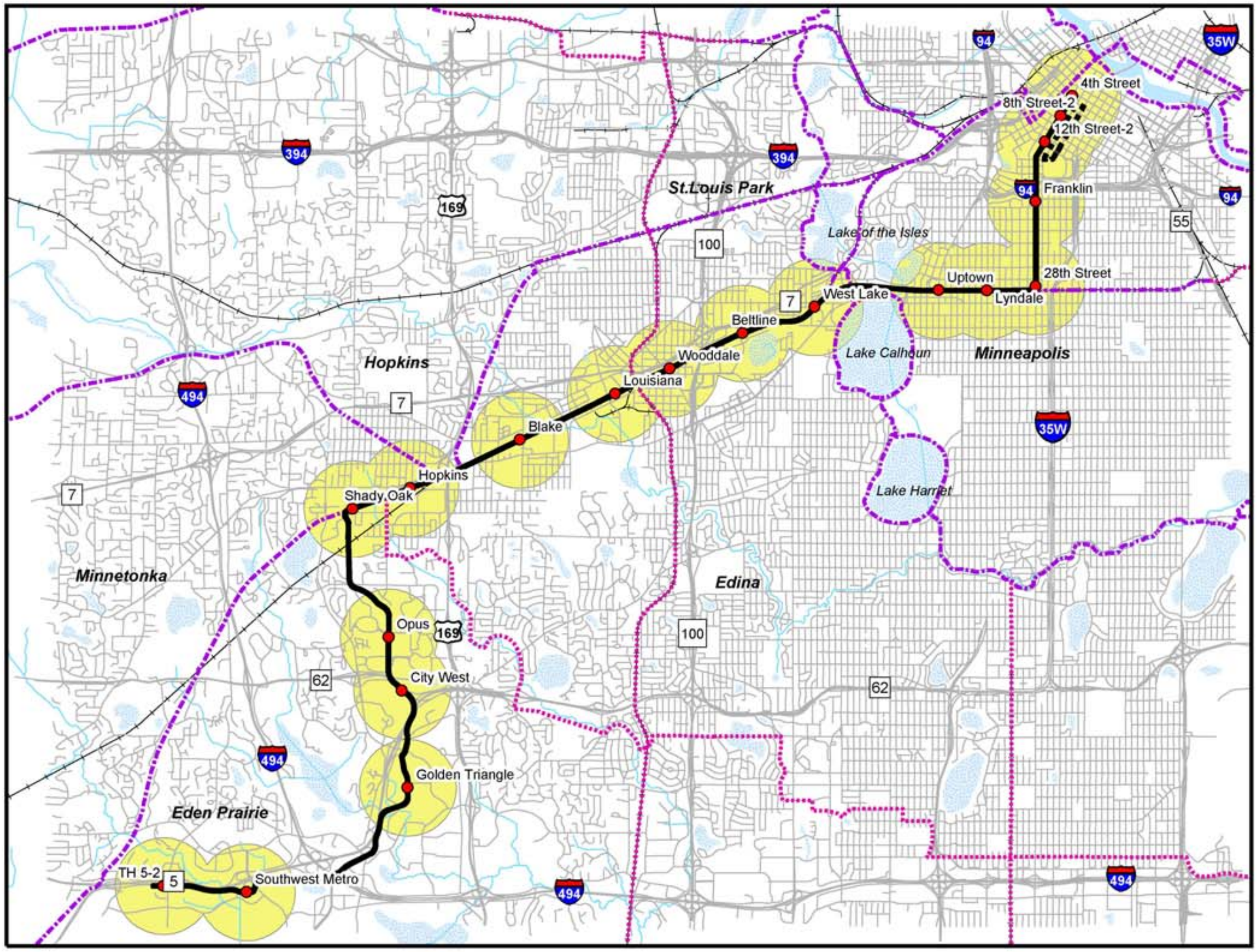
- LRT Alignment
- Alternative Alignment Option
- Stations
- 1/2 Mile Station Buffers
- Streets
- Streams
- Proposed Trails
- Existing Trails
- Lakes
- Railroads

Miles 1 0.5 0

Figure 6

Hennepin
Hennepin County Regional Railroad Authority


Royalston
Multi-Modal
Van White
Penn Avenue
Hennepin Alternate
21st Street
Lake of the Isles
St.Louis Park
West Lake
Beltline
Wooddale
Louisiana
Lake Calhoun
Minneapolis
Hopkins
Blake
Hopkins
Shady Oak
Lake Harriet
Minnetonka
Edina
Opus
City West
Golden Triangle
Eden Prairie
Southwest Metro
TH 5-2
394
169
100
94
35W
55
7
494
62
5
SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS
Initial Alternatives:
Light Rail Transit
LRT-3A
Legend
LRT Alignment
Alternative Alignment Option
Stations
1/2 Mile Station Buffers
Streets
Streams
Proposed Trails
Existing Trails
Lakes
Railroads
Miles
1
0.5
0
Figure 7
Hennepin




## SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS

**Initial Alternatives: Light Rail Transit LRT-3C**

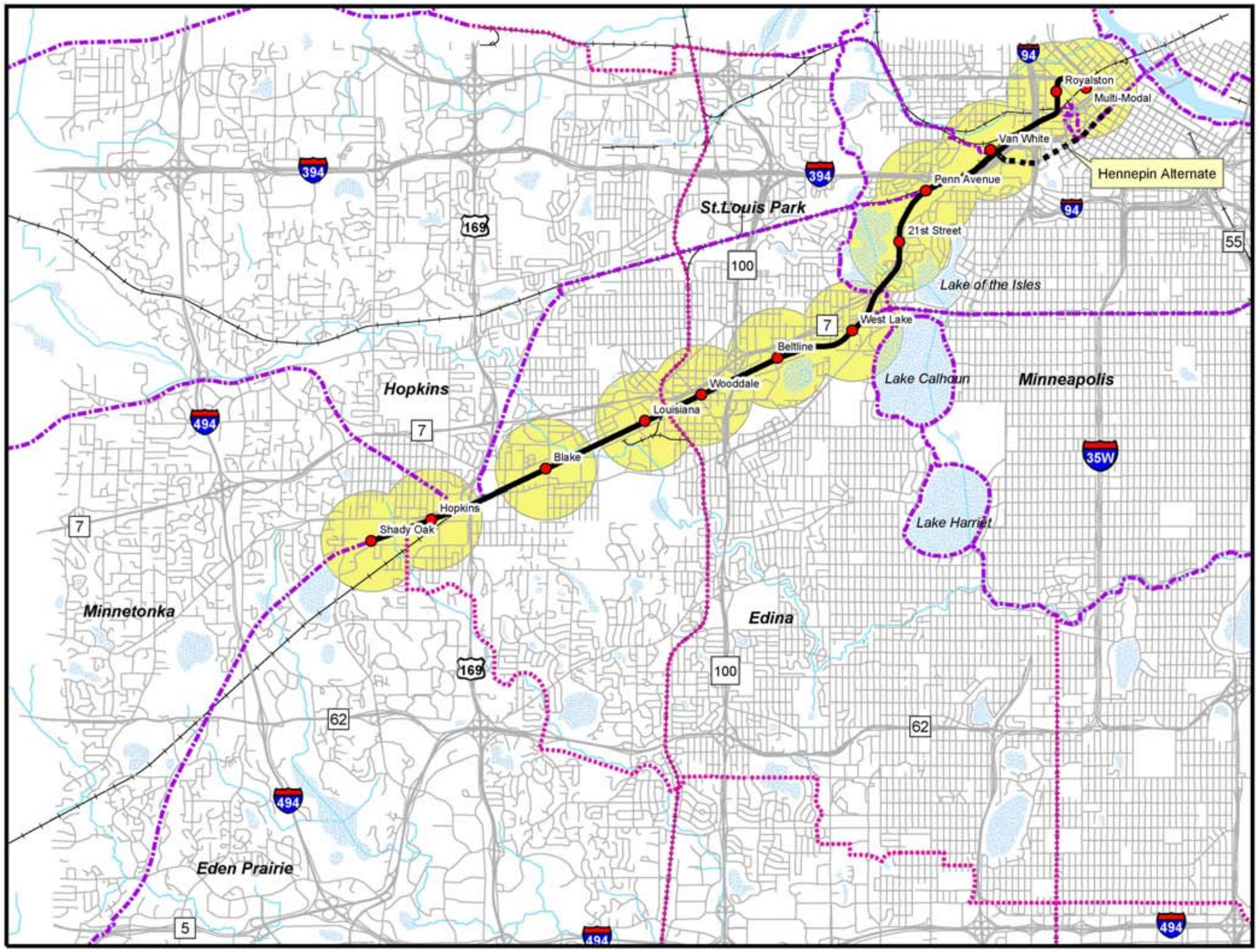
**Legend**

- LRT Alignment
- Alternative Alignment Option
- Stations
- 1/2 Mile Station Buffers
- Streets
- Streams
- Proposed Trails
- Existing Trails
- Lakes
- Railroads

Miles 1 0.5 0

Figure 8

Hennepin County Regional Railroad Authority




**SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS**

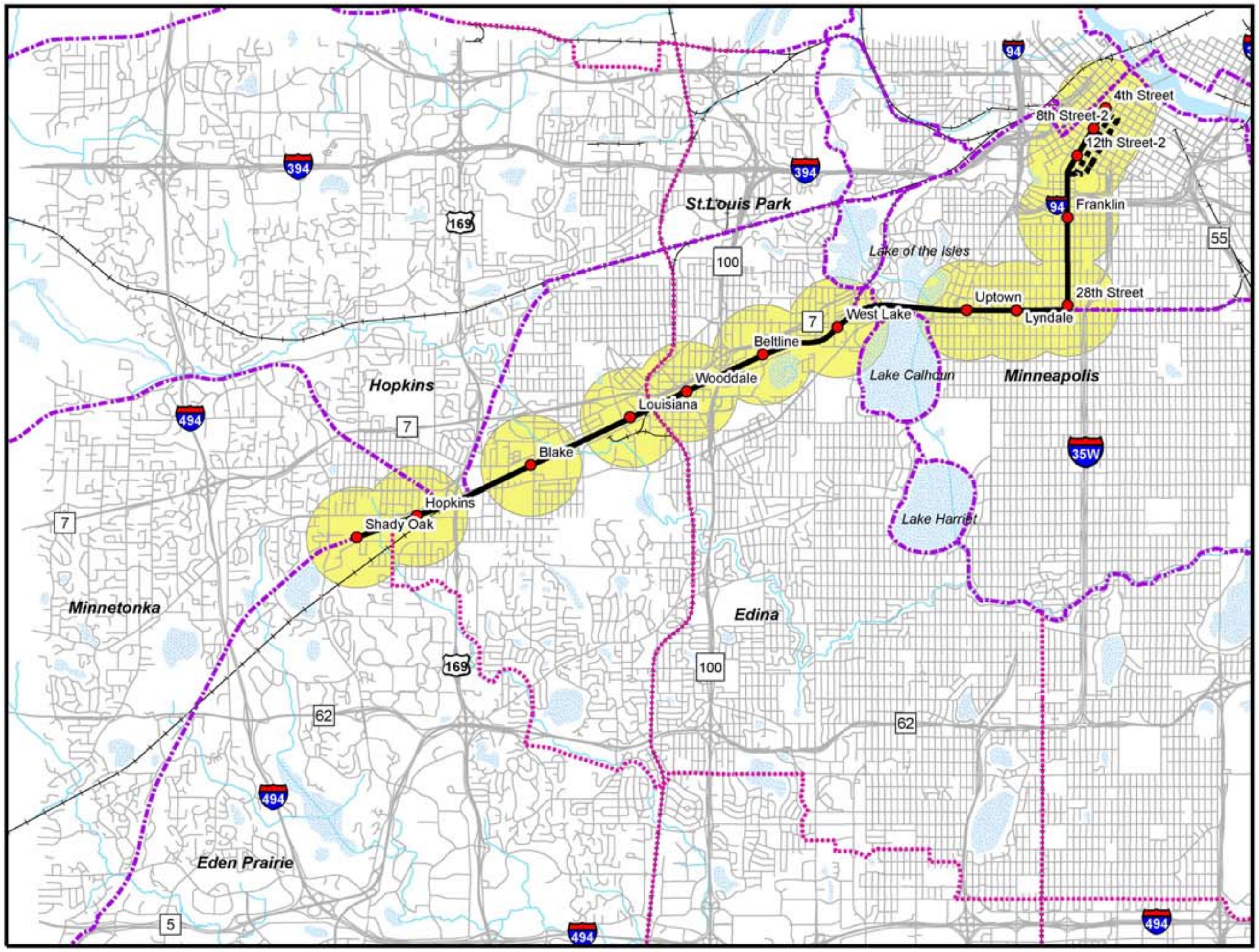
**Initial Alternatives: Light Rail Transit LRT-4A**

**Legend**

- LRT Alignment
- Alternative Alignment Option
- Stations
- 1/2 Mile Station Buffers
- Streets
- Streams
- Proposed Trails
- Existing Trails
- Lakes
- Railroads

Miles 1 0.5 0

Figure 9




**SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS**

**Initial Alternatives: Light Rail Transit LRT-4C**

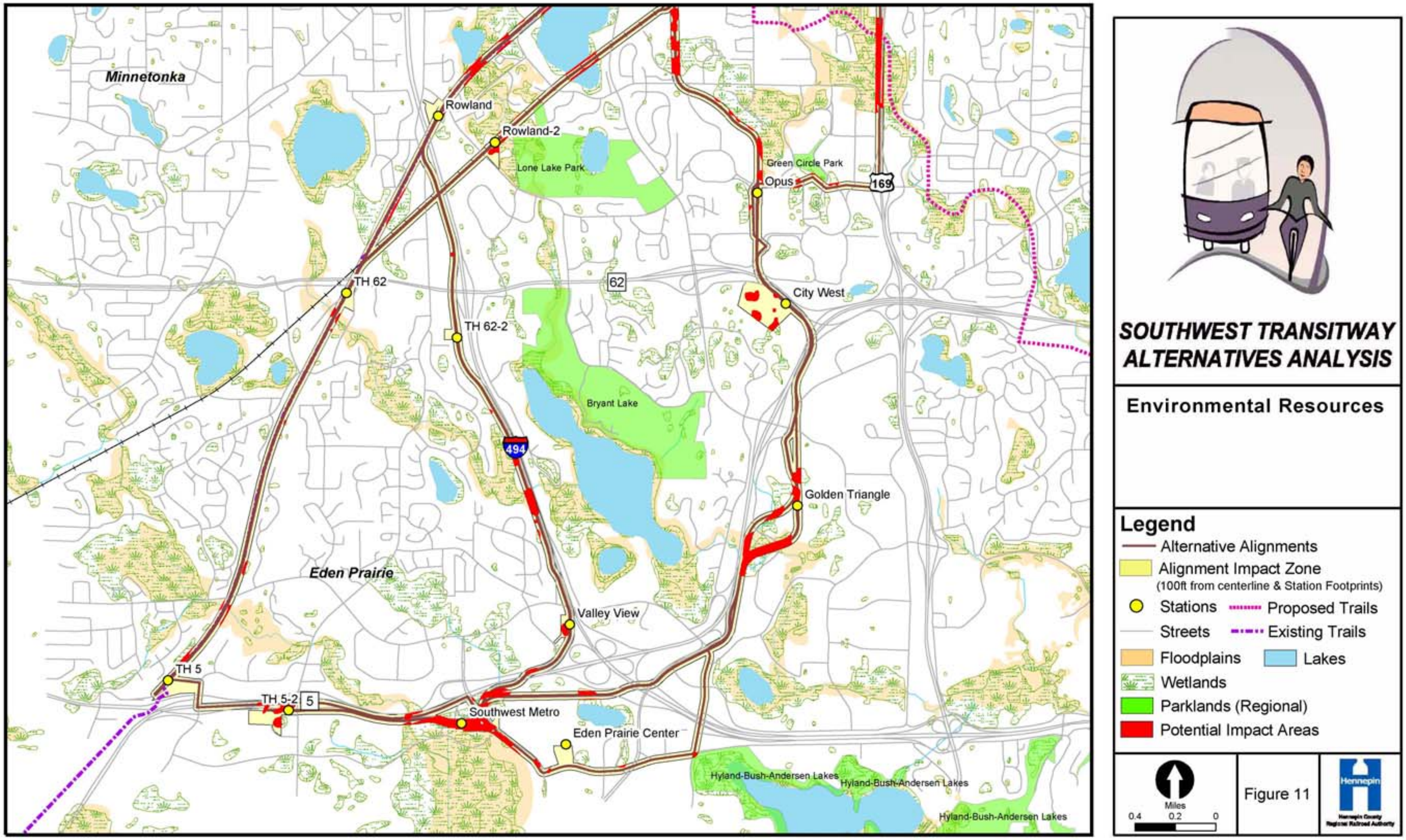
**Legend**

- LRT Alignment
- Alternative Alignment Option
- Stations
- 1/2 Mile Station Buffers
- Streets
- Streams
- Proposed Trails
- Existing Trails
- Lakes
- Railroads

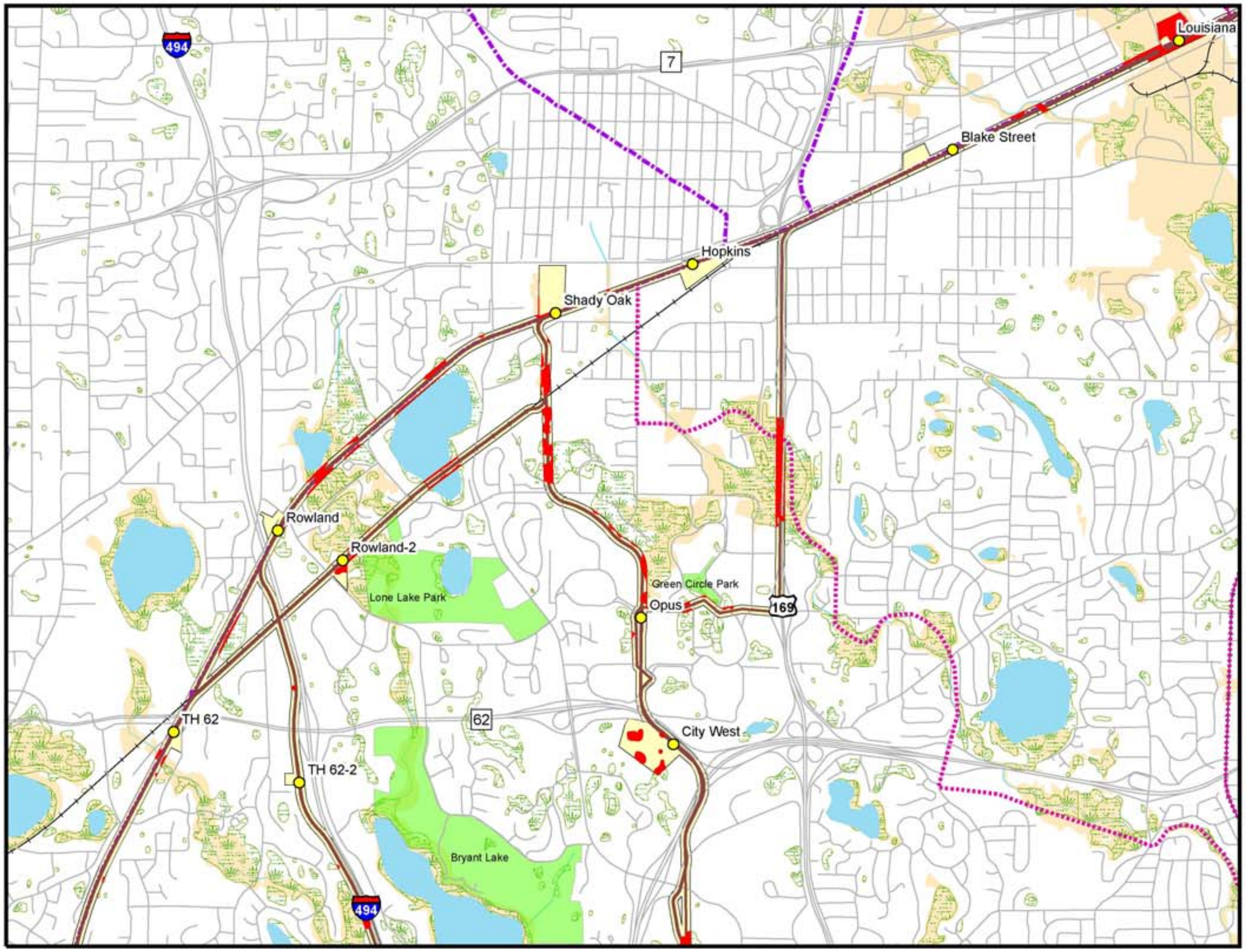
Miles
1 0.5 0

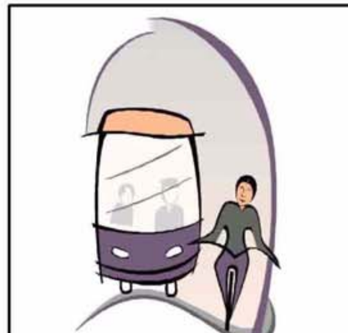
Figure 10

Hennepin County Regional Railroad Authority



Minnetonka
Eden Prairie
Rowland
Rowland-2
Lone Lake Park
Green Circle Park
Opus
169
TH 62
62
City West
TH 62-2
Bryant Lake
494
Golden Triangle
Valley View
TH 5
TH 5-2
5
Southwest Metro
Eden Prairie Center
Hyland-Bush-Andersen Lakes
Hyland-Bush-Andersen Lakes
Hyland-Bush-Andersen Lakes
SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS
Environmental Resources
Legend
Alternative Alignments
Alignment Impact Zone
(100ft from centerline & Station Footprints)
Stations
Proposed Trails
Streets
Existing Trails
Floodplains
Lakes
Wetlands
Parklands (Regional)
Potential Impact Areas
Miles
0.4
0.2
0
Figure 11
Hennepin



SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS

Environmental Resources

**Legend**

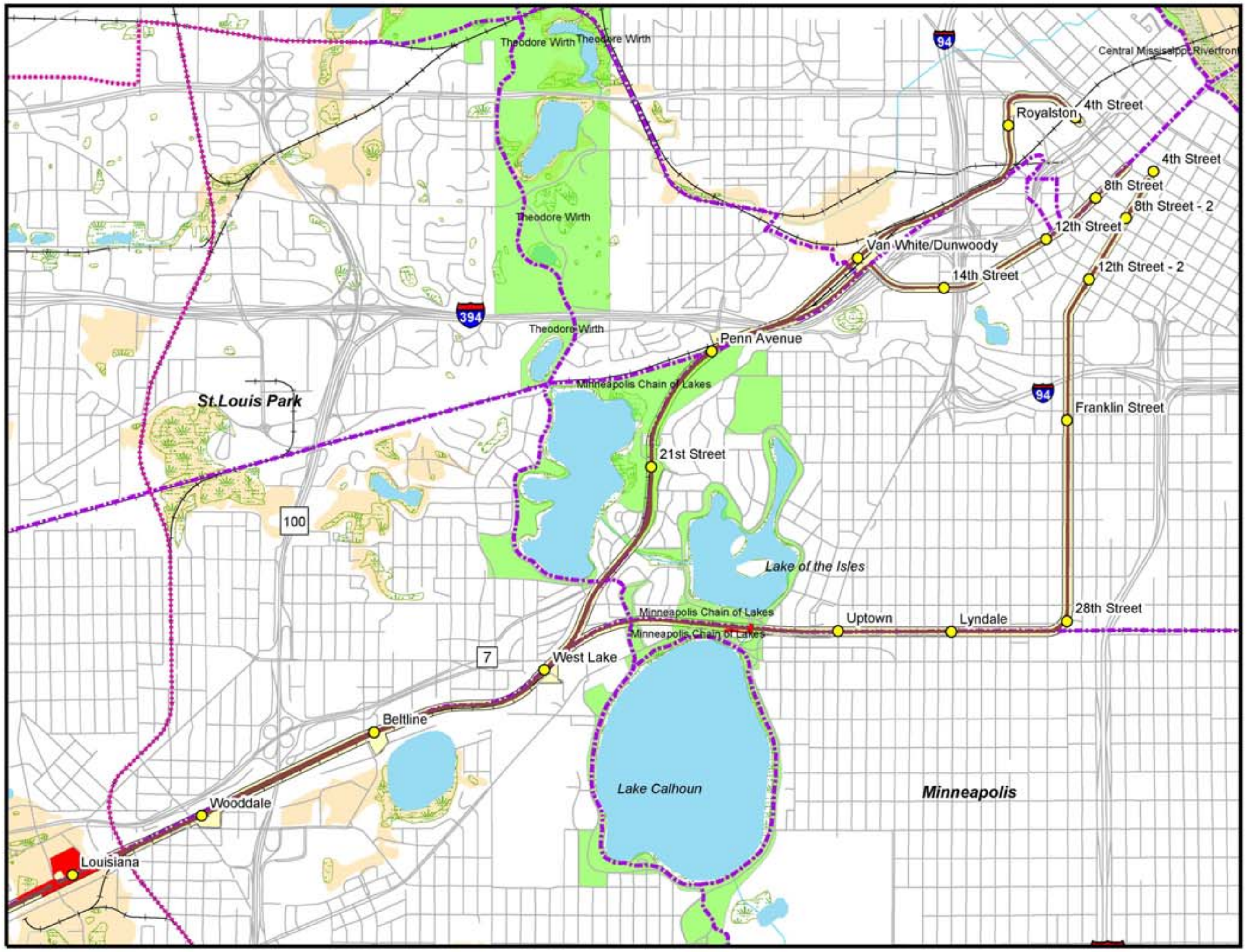
- Alternative Alignments
- Alignment Impact Zone (100ft from centerline & Station Footprints)
- Stations
- Proposed Trails
- Streets
- Existing Trails
- Floodplains
- Lakes
- Wetlands
- Parklands (Regional)
- Potential Impact Areas

Miles
0.4 0.2 0

Figure 12

Hennepin

Hennepin County Regional Railroad Authority




## SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS

### Environmental Resources

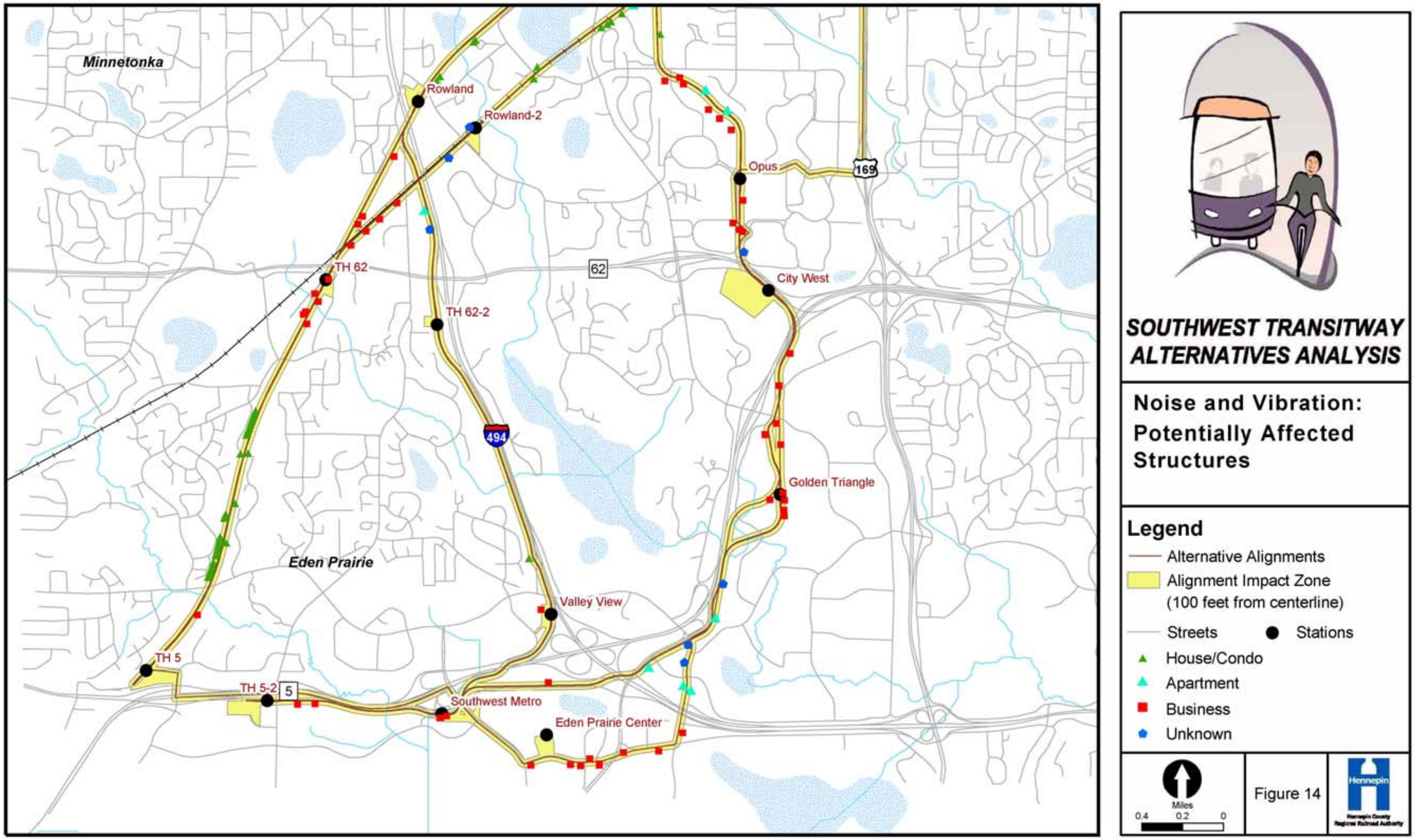
**Legend**

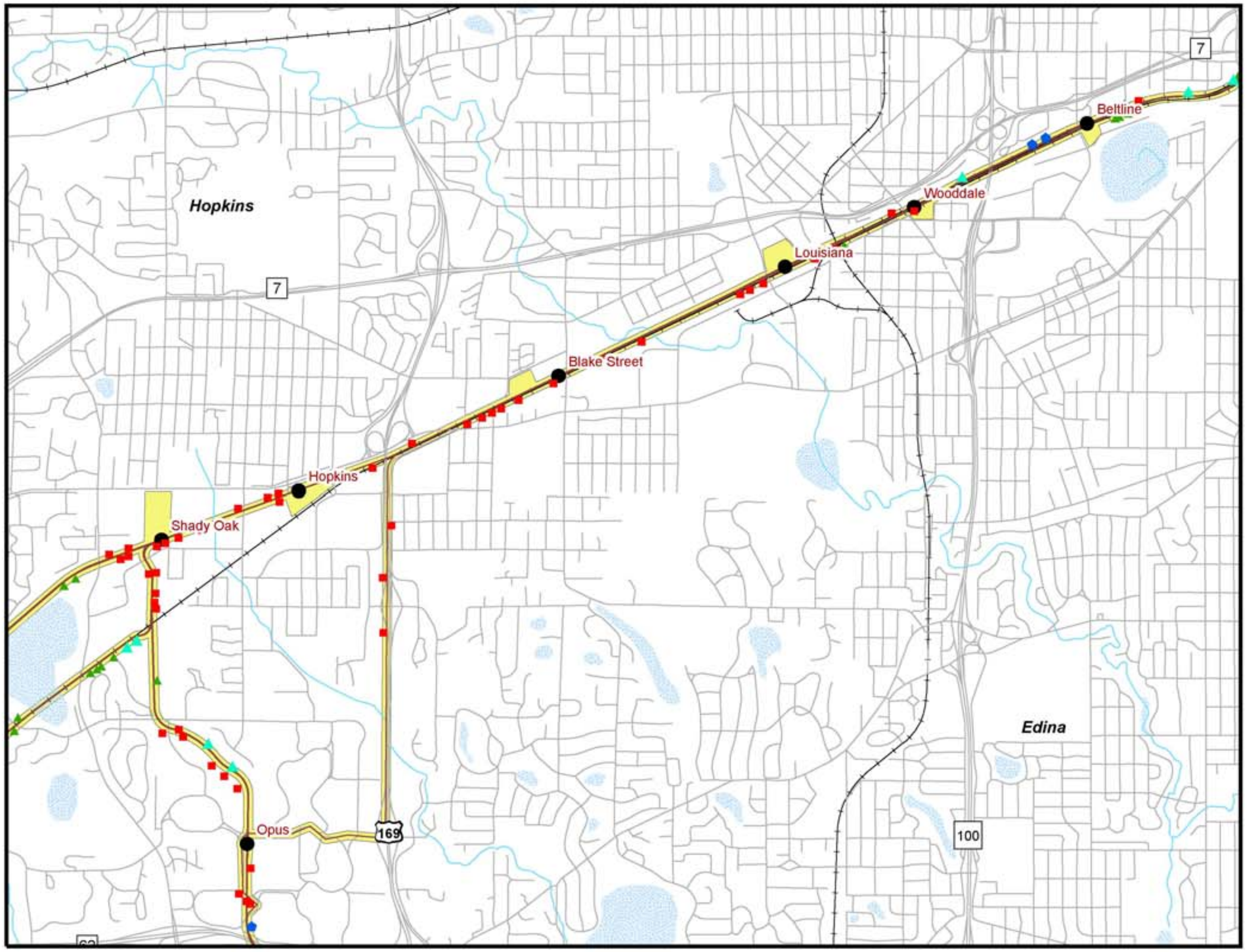
- Alternative Alignments
- Alignment Impact Zone (100ft from centerline & Station Footprints)
- Stations
- Proposed Trails
- Streets
- Existing Trails
- Floodplains
- Lakes
- Wetlands
- Parklands (Regional)
- Potential Impact Areas

Miles
0.4 0.2 0

Figure 13

Hennepin
Hennepin County Regional Railroad Authority


Minnetonka
Rowland
Rowland-2
Opus
169
TH 62
62
City West
TH 62-2
494
Golden Triangle
Eden Prairie
Valley View
TH 5
TH 5-2
5
Southwest Metro
Eden Prairie Center
SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS
Noise and Vibration: Potentially Affected Structures
Legend
Alternative Alignments
Alignment Impact Zone (100 feet from centerline)
Streets
Stations
House/Condo
Apartment
Business
Unknown
Miles
0.4 0.2 0
Figure 14
Hennepin




**SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS**

**Noise and Vibration: Potentially Affected Structures**

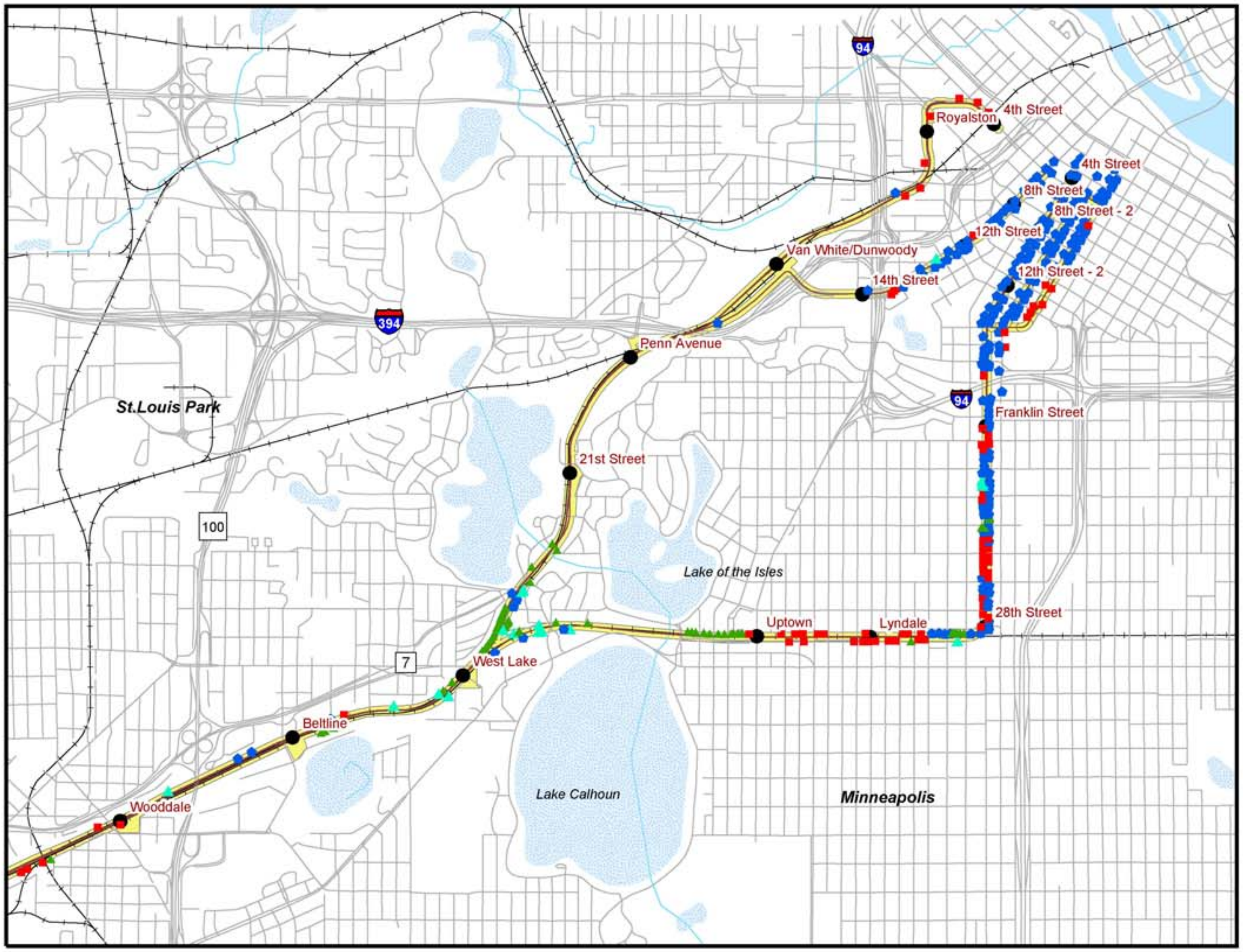
**Legend**

- Alternative Alignments
- Alignment Impact Zone (100 feet from centerline)
- Streets
- Stations
- House/Condo
- Apartment
- Business
- Unknown

Miles
0.4 0.2 0

Figure 15

Hennepin
Hennepin County Regional Railroad Authority




**SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS**

**Noise and Vibration: Potentially Affected Structures**

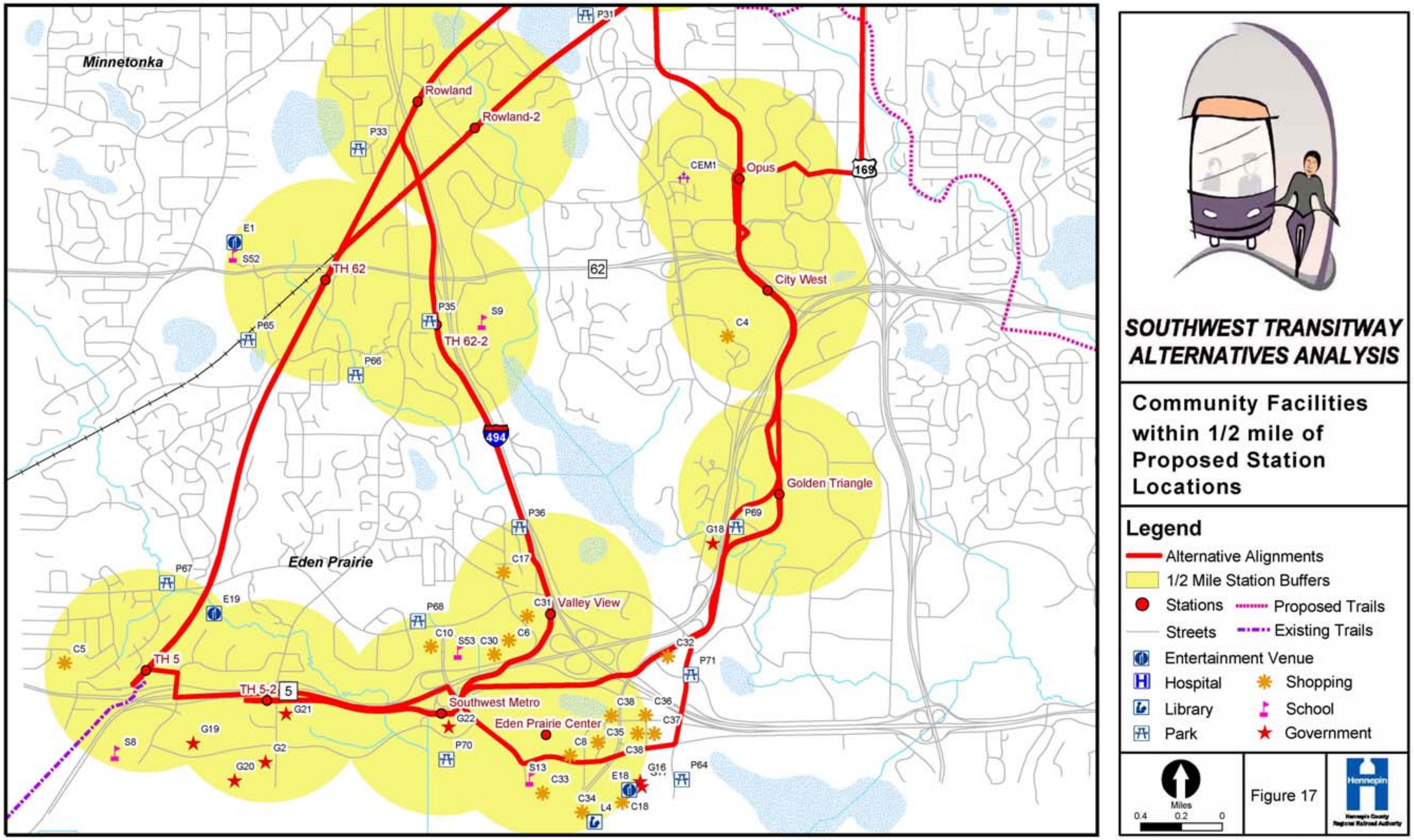
**Legend**

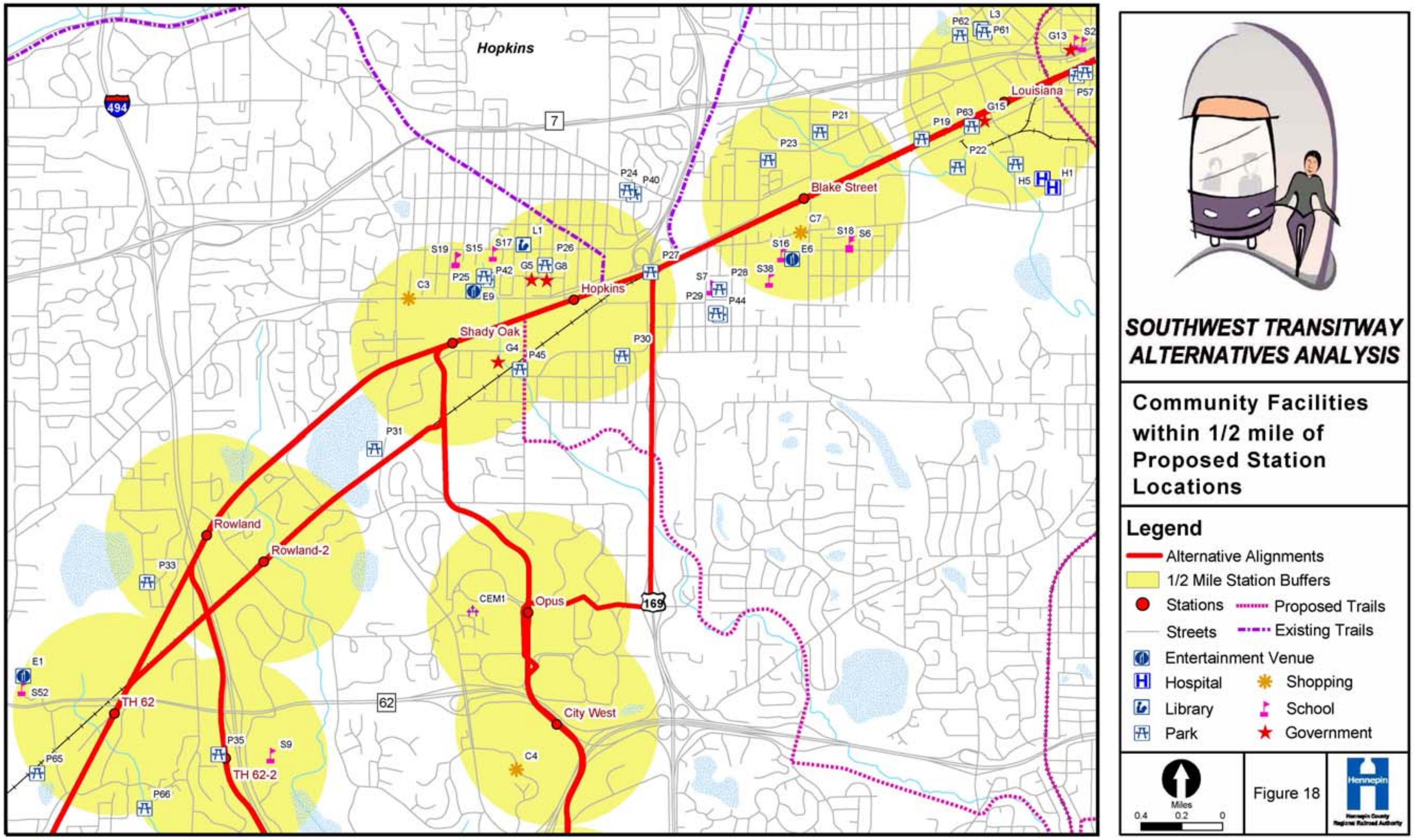
- Alternative Alignments
- Alignment Impact Zone (100 feet from centerline)
- Streets
- Stations
- House/Condo
- Apartment
- Business
- Unknown

Miles 0.4 0.2 0

Figure 16

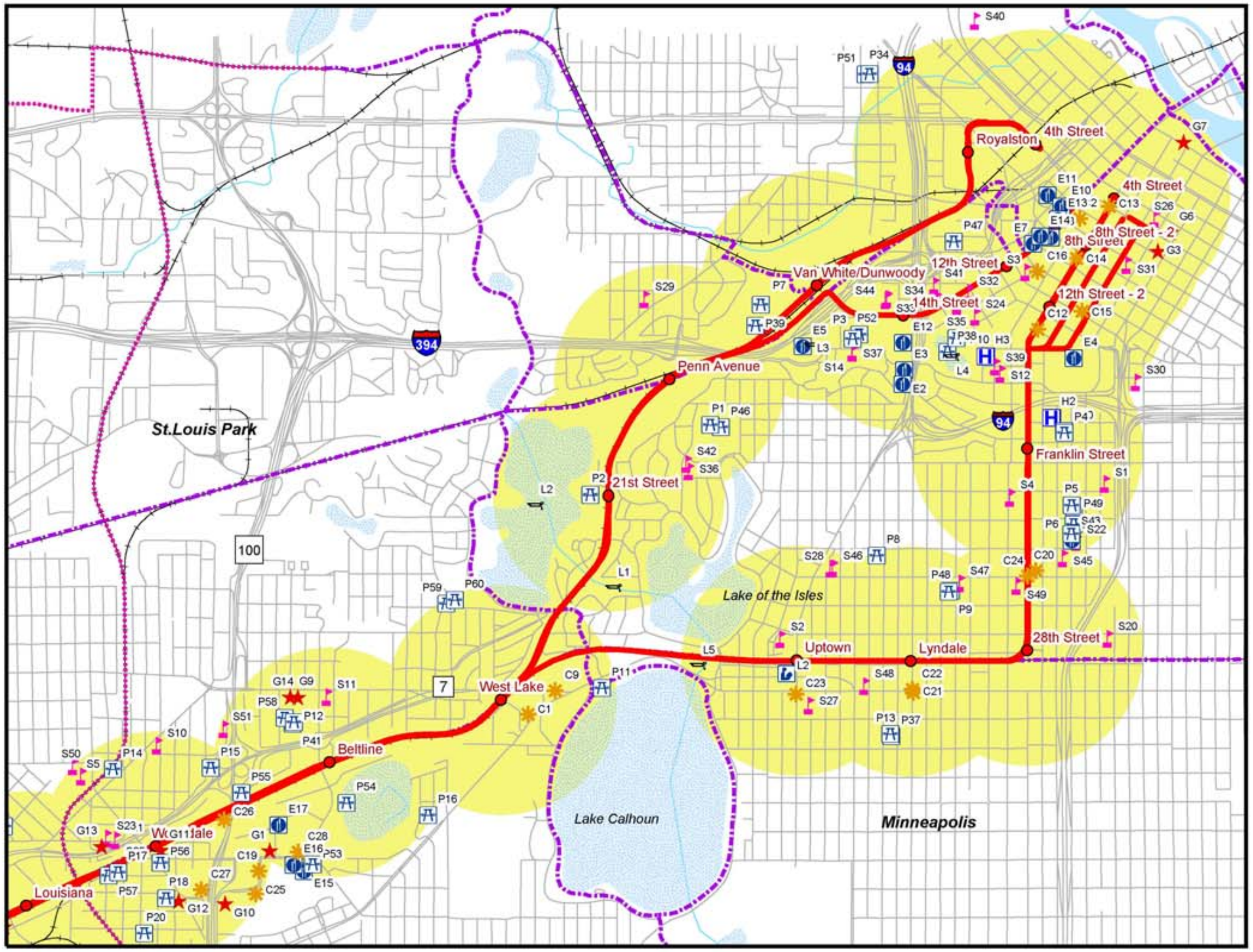
Hennepin County Regional Railroad Authority


SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS
Community Facilities within 1/2 mile of Proposed Station Locations
Legend
Alternative Alignments
1/2 Mile Station Buffers
Stations
Proposed Trails
Streets
Existing Trails
Entertainment Venue
Hospital
Shopping
Library
School
Park
Government
Miles
0.4
0.2
0
Figure 17
Hennepin
Minnetonka
Eden Prairie
Rowland
Rowland-2
TH 62
TH 62-2
Opus
City West
Golden Triangle
Valley View
TH 5
TH 5-2
Southwest Metro
Eden Prairie Center
62
494
169
5
P31
P33
CEM1
E1
S52
P35
S9
P65
P66
C4
P36
P69
G18
C17
P67
E19
P68
C31
C10
S53
C30
C6
C5
C32
P71
G21
G22
C38
C36
C37
S8
G19
G2
P70
C8
C35
G20
S13
C33
E18
G16
P64
C34
L4
C18



Hopkins
Shady Oak
Hopkins
Blake Street
Louisiana
Rowland
Rowland-2
Opus
City West
TH 62
TH 62-2
SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS
Community Facilities within 1/2 mile of Proposed Station Locations
Legend
Alternative Alignments
1/2 Mile Station Buffers
Stations
Proposed Trails
Streets
Existing Trails
Entertainment Venue
Hospital
Shopping
Library
School
Park
Government
Miles
0.4 0.2 0


Figure 18




**SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS**

**Community Facilities within 1/2 mile of Proposed Station Locations**

**Legend**

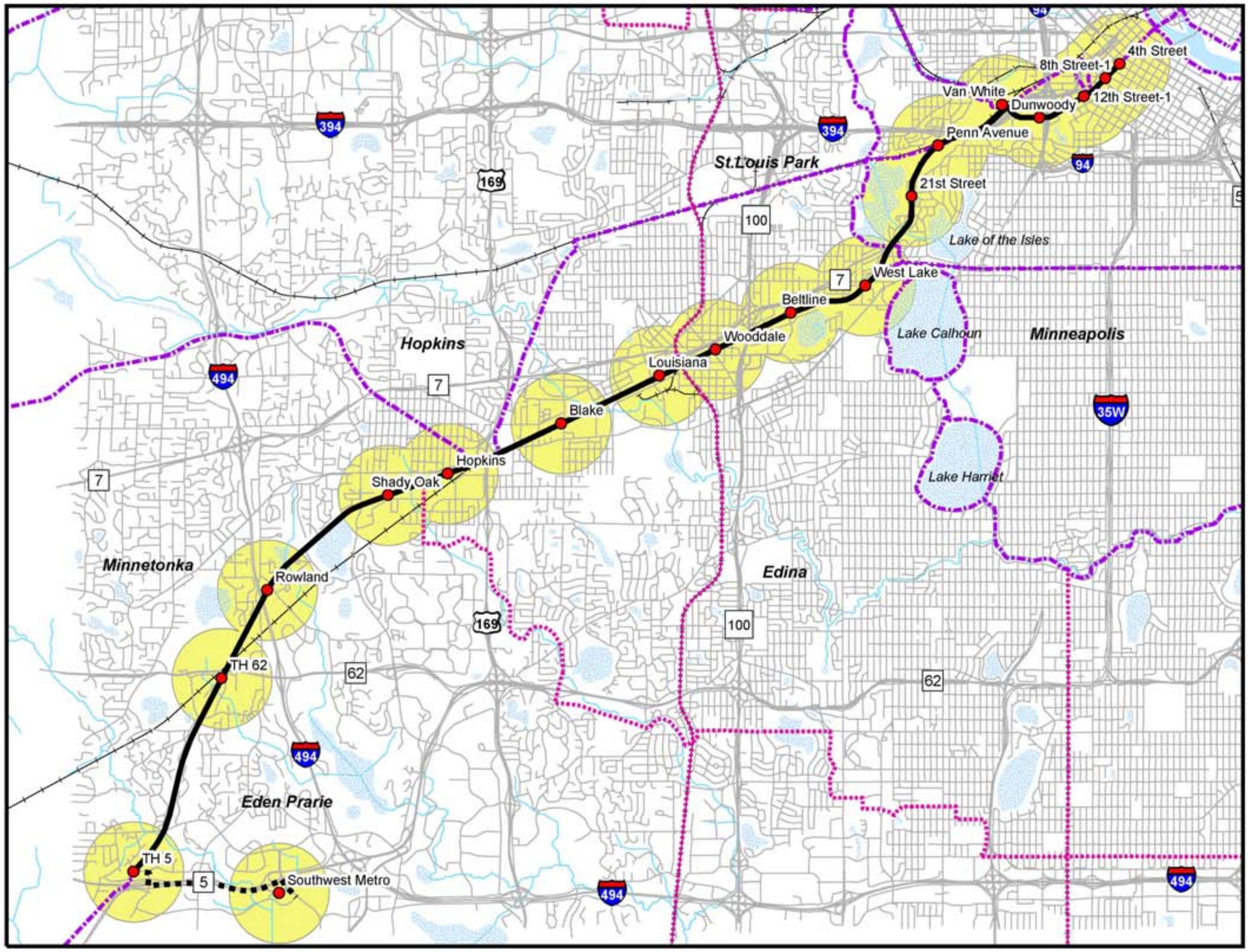
- Alternative Alignments
- 1/2 Mile Station Buffers
- Stations
- Proposed Trails
- Streets
- Existing Trails
- Entertainment Venue
- Hospital
- Shopping
- Library
- School
- Park
- Government

Miles 0.4 0.2 0

Figure 19

Hennepin County Regional Railroad Authority

| Community Facilities | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Label | Name | Label | Name | Label | Name | Label | Name | Label | Name |
| | **Shopping Centers** | | **Parks** | | **Parks** | | **Schools** | | **Government Centers** |
| C1 | Calhoun Commons | P1 | Kenwood Park | P53 | Wolfe Park | S1 | Saint Stephens School | G1 | Saint Louis Park Post Office |
| C2 | City Center Shopping Center | P2 | Mpls Chain Of Lakes Regional Park | P54 | Bass Lake Preserve and Trail | S2 | West High School | G2 | Eden Prairie City Hall |
| C3 | Suburban Square Shopping Center | P3 | The Parade | P55 | Bee Hive Park | S3 | Interdistrict Downtown School | G3 | Hennepin County Government Center |
| C4 | Shady Oak Center | P4 | Stevens Square | P56 | Elmwood Plaza Park | S4 | Humboldt Institute | G4 | Hopkins Police Heliport |
| C5 | Prairie Court Center | P5 | Washburn Fair Oaks | P57 | Historic Depot at Jorvig Park | S5 | Saint Louis Park High School | G5 | Hopkins City Hall |
| C6 | Menard Plaza - Eden Prairie | P6 | Morrison Park | P58 | Skippy Ball Field | S6 | Saint John School | G6 | Minneapolis City Hall & Courthouse |
| C7 | Hopkins Commerce Center | P7 | Bryn Mawr Meadows | P59 | Menzed Park | S7 | Hopkins School | G7 | Minneapolis Post Office |
| C8 | Eden Place Center | P8 | Mueller Park | P60 | Cedar Meadows Park | S8 | Central Middle | G8 | Hopkins Post Office |
| C9 | Calhoun Village | P9 | Whittier Park | P61 | Freedom Park | S9 | International School | G9 | Saint Louis Park City Hall |
| C10 | Prairie View Shopping Center | P10 | Loring Park | P62 | Oak Village Park | S10 | Holy Family School | G10 | Dept. of Motor Vechiles Center / AAA |
| C11 | Calhoun Square | P11 | Mpls Chain Of Lakes Regional Park | P63 | South Oak Park | S11 | Park Hill School | G11 | Muncipal Parking Lot |
| C12 | Midwest Plaza | P12 | Carpenter Park | P64 | ALP Park | S12 | Emerson School | G12 | Fire Station #1 |
| C13 | Gaviidae Common 2 | P13 | Bryant Square Park | P65 | Birch Lake Park | S13 | Northwest Technical Institute | G13 | Central Community Center |
| C14 | Gaviidae Common I | P14 | Lake Street Park | P66 | Forest Hill Park | S14 | Northrop College | G14 | St. Louis Park Police Dept. |
| C15 | Crystal Court (Ids) | P15 | Webster Park | P67 | Edenvale Park | S15 | Katherine Curren Elem. | G15 | St. Louis Park Municipal Service Center |
| C16 | City Center | P16 | Bass Lake Park | P68 | Willow Park | S16 | Blake School | G16 | Eden Prairie Center |
| C17 | Factory Outlet Mall | P17 | Jorvig Park | P69 | Eden Prairie Dog Park | S17 | Main St School Of Performing Arts | G17 | Eden Prairie Office of Housing/HR |
| C18 | Eden Prairie Shopping Center | P18 | Center Park | P70 | Purgatory Creek Park | S18 | Saint John's School | G18 | MnDOT Maintenance |
| C19 | Target | P19 | Edgebrook Park | P71 | Lake Smetana Park | S19 | Curren School | G19 | Eden Prairie Street Maintenance |
| C20 | Clinton Park Shopping | P20 | Justad Park | | **Entertainment Venues** | S20 | Clinton School (Historical) | G20 | Eden Prairie Fire Station |
| C21 | Shopping | P21 | Cottageville Park | E1 | Childrens Theater Company | S21 | Park Spanish Immersion Elem. | G21 | Eden Prairie Water Plant |
| C22 | Lyn-Lake Activity Center | P22 | Creekside Park | E2 | Walker Art Center | S22 | Minneapolis School Of Art | G22 | SW Station |
| C23 | Uptown Activity Center | P23 | Oakes Park | E3 | Guthrie Theater | S23 | Central Junior High School | | **Cemeteries** |
| C24 | 26th-Nicollet Activity Center | P24 | Burnes Park | E4 | Minneapolis Convention Center | S24 | Metropolitan State Junior College | CEM1 | Saint Margaret Cemetery |
| C25 | Byerly's | P25 | Central Park | E5 | Parade Ice Garden | S25 | Northside Community Elem. | | **Hospitals** |
| C26 | Hoigaards | P26 | Downtown Park | E6 | Blake Sch Ice Arena | S26 | Mill City Montessori | H1 | Methodist Hospital |
| C27 | Burlington Coat Factory | P27 | The Overpass Aggressive Skate Park | E7 | Orpheum Theater | S27 | Calhoun School | H2 | Abbott Hospital |
| C28 | Wolfe Professional Center | P28 | Harley Hopkins Park | E8 | State Theater | S28 | Jefferson Junior High School | H3 | Eitel Hospital |
| C29 | Town Place Center | P29 | Alden Park | E9 | Hopkins Pavillion | S29 | Bryn Mawr School | H5 | Methodist Hospital |
| C30 | Metro Ford | P30 | Buffer Park | E10 | Block E Entertainment Complex | S30 | Madison School | | |
| C31 | Suburban Chevy | P31 | Shady Oak Beach Park | E11 | Target Center | S31 | Downtown Open | | |
| C32 | Crossroads Retail | P32 | Shady Oak Beach Park | E1 | Glen Lake Golf & Practice Center | S32 | Minneapolis Technical College | | |
| C33 | Commonwealth Retail | P33 | Glen Moor Park | E12 | Minneapolis Sculpture Garden | S33 | Dunwoody Institute | | |
| C34 | Tower Square | P34 | Sumner Park | E13 | Pantages Theater | S34 | Chiron Middle | | |
| C35 | Eden Glen | P35 | Holasek Hills Park | E14 | Hennepin Stages | S35 | Minneapolis Community College | | |
| C36 | Town Place Center | P36 | Topview Park | E15 | Veteran Memorial Amplitheatre | S36 | Kenwood School | | |
| C37 | Cub Foods | P37 | Bryant Square | E16 | St. Louis Park Recreation Center | S37 | Blake School - Northrop Campus | | |
| C38 | Best Buy | P38 | Loring Park | E17 | Pavek Broadcasting Museum | S38 | Blake School | | |
| C38 | Idlewild Commercial | P39 | Bryn Mawr Meadows | E18 | AMC Theaters | S39 | Emerson Elem. | | |
| | **Libraries** | P40 | Burnes Park | E19 | Bent Creek Golf Club | S40 | Blaine School | | |
| L1 | Hopkins Library | P41 | Carpenter Park | | | S41 | Basilica School | | |
| L2 | Walker Library | P42 | Central Park | | | S42 | Kenwood Elem. | | |
| L3 | Hennepin County Library | P43 | Morrison Park | | | S43 | Minneapolis Institute Of Arts | | |
| L4 | Hennepin County Library | P44 | Alden Park | | | S44 | Dunwoody Institute | | |
| L1 | Kenilworth Lagoon | P45 | Hagan Field | | | S45 | Minneapolis College Of Art And Desi | | |
| L2 | Cedar Lake | P45 | Hagan Field | | | S46 | Jefferson Elem. | | |
| L3 | Spring Lake | P46 | Kenwood Park | | | S47 | Whittier Park Elem. | | |
| L4 | Loring Lake | P47 | Wilson Park | | | S48 | Wellstone International H.S. | | |
| L5 | Chain Of Lakes Lagoon | P48 | Whittier Park | | | S49 | Whittier School | | |
| | | P49 | Washburn Fair Oaks | | | S50 | Saint Louis Park H.S. | | |
| | | P50 | Stevens Square | | | S51 | Groves Academy | | |
| | | P51 | Sumner Field | | | S52 | Hennepin County Home School | | |
| | | P52 | The Parade | | | S53 | Prairie UW | | |




**SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS**

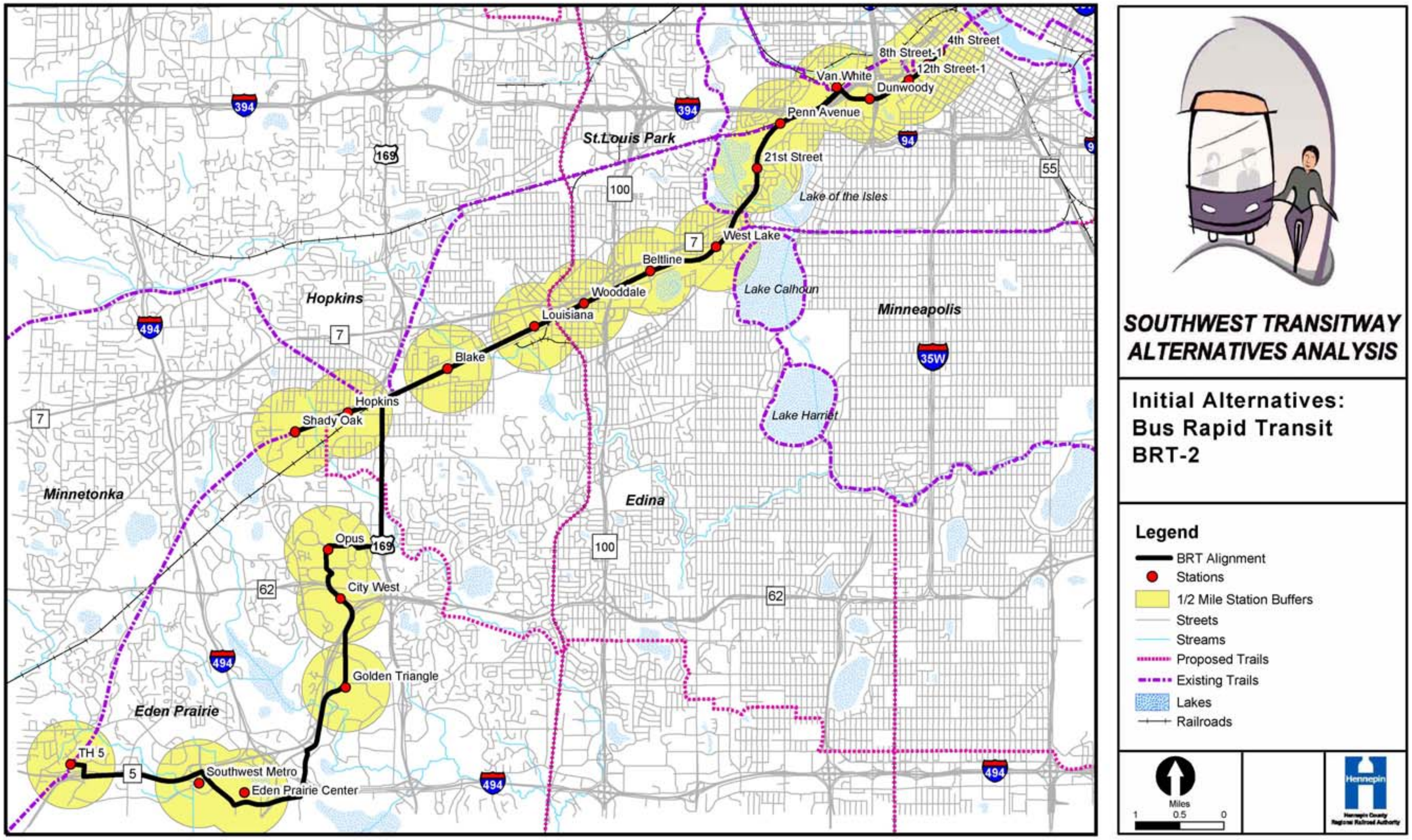
**Initial Alternatives: Bus Rapid Transit BRT-1**

**Legend**

- BRT Alignment
- Stations
- 1/2 Mile Station Buffers
- Streets
- Streams
- Proposed Trails
- Existing Trails
- Lakes
- Railroads

Miles
1 0.5 0

Hennepin
Hennepin County Regional Railroad Authority


SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS
Initial Alternatives:
Bus Rapid Transit
BRT-2
Legend
BRT Alignment
Stations
1/2 Mile Station Buffers
Streets
Streams
Proposed Trails
Existing Trails
Lakes
Railroads
Miles
1
0.5
0
Hennepin
4th Street
8th Street-1
12th Street-1
Van White
Dunwoody
Penn Avenue
21st Street
West Lake
Beltline
Wooddale
Louisiana
Blake
Hopkins
Shady Oak
Opus
City West
Golden Triangle
Southwest Metro
Eden Prairie Center
TH 5
St.Louis Park
Hopkins
Minneapolis
Minnetonka
Edina
Eden Prairie
Lake of the Isles
Lake Calhoun
Lake Harriet
394
494
35W
94
169
100
55
62
7
5

# Appendix F: Southwest Policy Advisory Committee and HCRRA Resolutions

## Southwest Policy Advisory Committee Resolutions

| | |
|---|---|
| **Resolution No. 2006-2** | **Supporting the Preliminary Recommendations of the Southwest Transitway Alternatives Analysis Study** |
| **Resolution No. 2006-3** | **Recommending that the HCRRA Request the Metropolitan Council to Raise the Implementation Priority for the Southwest Transitway** |
| **Resolution No. 2006-4** | **Supporting Efforts to Raise the Priority of the Southwest Transitway and to Construct the project in a Timely Manner** |

## Hennepin County Regional Rail Authority Final Resolution

**SOUTHWEST POLICY ADVISORY COMMITTEE**
**RESOLUTION NO. 2006-2**
**A RESOLUTION SUPPORTING THE PRELIMINARY RECOMMENDATIONS OF THE SOUTHWEST TRANSITWAY ALTERNATIVES ANALYSIS STUDY**

**WHEREAS**, transportation infrastructure forms the backbone of the region's economy as well as its quality of life, and has a direct impact on economic development; and

**WHEREAS**, a well designed and functional transportation system with multiple mode choices is essential to maintaining long-term mobility throughout the metropolitan region; and

**WHEREAS,** the Metropolitan Council's long-range transportation plan identifies a future fixed transitway corridor in the southwest portion of the metropolitan area through the cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie; and

**WHEREAS,** the southwest portion of the metropolitan area has experienced unprecedented population and employment growth over the last 20 years resulting in increasing congestion; and,

**WHEREAS,** a Light Rail Transit (LRT) line servicing the cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie will improve mobility and will help maintain a competitive business environment and high quality of life for the entire Metro Area; and

**WHEREAS,** the Southwest Transitway Alternatives Analysis Study, funded by the Hennepin County Regional Railroad Authority, is near completion, comparing the costs, benefits, and impacts of a range of transit alternatives to serve the southwest area; and

**WHEREAS,** the Southwest Technical Advisory Committee has provided the preliminary recommendation that LRT Alternatives 1A, 3A, and 3C be retained for further consideration; and

**WHEREAS**, the LRT "3" Alternatives are projected to have higher daily ridership, more new transit riders, and better cost-effectiveness indexes than the LRT "1" Alternative; and,

**WHEREAS**, the LRT "3" Alternatives that serve the Opus Business Park, the Golden Triangle and Eden Prairie Center, better serve the employment and commercial centers of the Southwest Area than the LRT "1" Alternative; and,

**WHEREAS**, the LRT "3" Alternatives provide better opportunities for development, redevelopment and economic development and better support the cities long-range planning initiatives than the LRT "1" Alternatives; and,

**WHEREAS,** the Southwest Policy Advisory Committee has received a strong preference for the LRT "3" Alternatives over the LRT "1" Alternatives through the public comment process.

**NOW, THEREFORE, BE IT RESOLVED** that the Southwest Policy Advisory Committee concurs with the preliminary recommendations of the Southwest Technical Advisory Committee to bring LRT Alternatives 1A, 3A, and 3C into a Draft Environmental Impact Statement (DEIS) process with the understanding that Alternative LRT 1A be retained for further study as an option only to be considered in the event that LRT 3A and LRT 3C are proved to be infeasible.

**ADOPTED** by the Southwest Policy Advisory Committee this 13th day of December, 2006.

**SOUTHWEST POLICY ADVISORY COMMITTEE**
**RESOLUTION NO. 2006-3**
**A RESOLUTION RECOMMENDING THAT THE HCRRA REQUEST THE METROPOLITAN COUNCIL TO RAISE THE IMPLEMENTATION PRIORITY FOR THE SOUTHWEST TRANSITWAY**

**NOW, THEREFORE BE IT RESOLVED,** that the Southwest Policy Advisory Committee recommends that the Hennepin County Regional Railroad Authority request that the Metropolitan Council raise the priority for implementation of a Southwest Transitway; and,

**ADOPTED** by the Southwest Policy Advisory Committee this 13th day of December, 2006.

**SOUTHWEST POLICY ADVISORY COMMITTEE**
**RESOLUTION NO. 2006-4**
**A RESOLUTION SUPPORTING EFFORTS TO RAISE THE PRIORITY OF THE SOUTHWEST TRANSITWAY AND TO CONSTRUCT THE PROJECT IN A TIMELY MANNER**

**NOW THEREFORE, BE IT RESOLVED,** that the Southwest Policy Advisory Committee strongly supports all efforts by the Hennepin County Regional Railroad Authority, the Metropolitan Council, the Minnesota Department of Transportation, and the Federal Transit Administration to fund and construct in a timely manner, an LRT line through the southwest metro area, that it be considered a priority project for the region, and after the Central Corridor, become the next planned expansion of the Comprehensive Transit System for the metropolitan region.

**ADOPTED** by the Southwest Policy Advisory Committee this 13th day of December, 2006.

# Southwest Transitway Alternatives Analysis

# Technical Memorandum No. 3
# Definition of Alternatives

**Prepared for**
**Hennepin County Regional Railroad Authority**

**Prepared by:**

**PB Americas, Inc. (PB)**

**January 2007**

## Table of Contents



## List of Tables

## List of Figures



## Appendix Figures

# 1. Introduction

This technical memorandum documents the methodology, assumptions, and results of the definition of alternatives task prepared for the Southwest Transitway Alternatives Analysis (Southwest Transitway AA).

# 2. Background and Assumptions

The Hennepin County Regional Railroad Authority (HCRRA) in partnership with the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, Minneapolis and Edina; the Metropolitan Council, the Minnesota Department of Transportation, Metro Transit, and SouthWest Metro Transit; the Twin West, Minneapolis Regional, and Eden Prairie Chambers of Commerce; and, the Three Rivers Parks Park District and Midtown Community Works Partnership are conducting the Southwest Transitway Alternatives Analysis (Southwest Transitway AA). The purpose of the Southwest Transitway AA is to identify and compare the benefits, costs and impacts of a range of transit options, and to determine a preferred course of action.

The HCRRA was established in 1980 as a political subdivision and local government unit of Minnesota to conduct rail transit planning and to acquire abandoned freight rail corridors in order to preserve them for future transportation uses. The HCRRA consists of the seven members of the Hennepin County Board of Commissioners. Currently, the HCRRA maintains over 57 miles of former freight rail corridors, which accommodate 37 miles of bicycle and pedestrian trails.

This technical memorandum discusses the process used to define the initial alternatives and to refine them into alternatives for evaluation. The alternatives were developed in coordination with the Southwest Transitway Technical Advisory Committee (TAC) and the Southwest Transitway Policy Advisory Committee (PAC).

The process for defining and refining the potential Southwest Transitway alternatives included:

- Reviewing previous studies of the Southwest Transitway.
- Establishing a set of Southwest Transitway Goals and Objectives that address the Purpose and Need Statement contained in Technical Memorandum No. 1.
- Performing a transit technology screening to identify which transit technologies address the study areas travel needs as documented in the Purpose and Need Statement.
- Identifying general alignments (i.e. station locations and routings).
- Combining the selected transit technologies and alignments into an initial set of transitway alternatives for agency and public review and comment.
- Modifying the initial transitway alternatives into refined alternatives for evaluation based on comments and technical analyses.

This technical memorandum documents the work of Task 5 in the consultant scope of services (Development of Alternatives). The principal objective of Task 5 was to define the alternatives for evaluation (as well as public and agency comment) during the Southwest Transitway AA.

# 3. Methodology

## A. Review of Previous Transitway Studies

The consultant team began the process of developing the initial alternatives by reviewing previous Southwest Transitway studies. The consultant team reviewed the following documents:

- *The Feasibility of LRT in the Twin Cities Metro Area*, Metropolitan Council, 1981
- *Comprehensive LRT System Plan for Hennepin County*, HCRRA, 1988
- Hennepin County Stage 1 LRT System Scoping Decision Document, HCRRA, 1988
- *Draft Environmental Impact Statement (DEIS) Hennepin County LRT System*, HCRRA, 1989
- *Preliminary Design Plans: Stage 1 System in Minneapolis*, HCRRA, 1990
- *Preliminary Design of the Southwest LRT Corridor in the Cities of St. Louis Park and Hopkins,* HCRRA, 1990
- *LRT Regional Coordination Plan*, Regional Transit Board, 1990
- *St. Louis Park Rail Task Force Report*, St. Louis Park, 1999
- *Twin Cities Exclusive Busway Study*, Mn/DOT, 2000
- *29$^{th}$ Street and Southwest Busway Feasibility Study*, Hennepin County and Metro Transit, 2000
- *Southwest Rail Transit Study*, HCRRA, 2003
- *Addendum to the Southwest Rail Transit Study: Modified LRT 3A Analysis*, HCRRA, 2004
- *Transportation Policy Plan*, Metropolitan Council, 2004
- *Transit 2030 Plan*, Metropolitan Council, 2004

## B. Develop Southwest Transitway Goals and Objectives

On February 11, 2005, the Southwest Transitway Technical Advisory Committee (TAC) developed goals and objectives and forwarded them for consideration by the Southwest Transitway Policy Advisory Committee (PAC). On March 2, 2005, the Southwest Transitway PAC unanimously approved the goals and objectives forwarded by the Southwest Transitway TAC.

Southwest Transitway AA Goals:

1. Improve Mobility
2. Provide a Cost-Effective, Efficient Travel Option
3. Protect the Environment
4. Preserve and Protect the Quality of Life in the Study Area and the Region
5. Support Economic Development

In addition, the Southwest Transitway PAC decided to prioritize the goals into two tiers. Tier one goals are those that must be achieved in order for a project to move forward.

Tier two goals are those that should be achieved once it is determined a viable project exists. The tier one goals are to Improve Mobility and Provide a Cost-Effective, Efficient Travel Option. The tier two goals are to Protect the Environment, Preserve and Protect the Quality of Life in the Study Area and the Region, and Support Economic Development.

These goals and related objectives are based upon the identified transportation needs in the study area as described in *Technical Memorandum No. 1 Purpose and Need Statement*. They were used to develop the initial alternatives to address transportation needs, and form the basis of the evaluation measures.

The adopted Southwest Transitway goals and objectives are consistent with the Federal Transit Administration's (FTA) Section 5309 New Starts Program.

## Tier One Goals

Tier 1 goals are defined as those goals that must be achieved or a project does not exist.

### *GOAL 1: Improve mobility*

*Objectives:*

- Provide a travel option competitive with other modes in terms of journey time
- Provide a reliable travel option that improves mobility throughout the day
- Provide a travel option that serves population and employment concentrations
- Provide a travel option that adds capacity and access to the regional and local transportation system
- Provide a travel option that serves people who depend on transit
- Provide a travel option that enhances pedestrian and bicycle activity and access to community nodes

### *GOAL 2: Provide a cost-effective, efficient travel option*

*Objectives:*

- Provide a travel option with acceptable capital and operating costs
- Provide a travel option that efficiently and effectively moves people
- Provide a travel option that integrates efficiently with other modes and avoids substantial negative impacts to the existing roadway system
- Provide a travel option that supports regional system efficiency

## Tier Two Goals

Tier 2 goals are defined as goals to be satisfied assuming a proposed project results from the application of the Tier 1 goals.

### *GOAL 3: Protect the environment*

*Objectives:*

- Provide a travel option beneficial to the region's air quality
- Provide a travel option that avoids or minimizes alterations to environmentally sensitive areas

- Provide a travel option that supports efficient, compact land use that facilitates accessibility
- Provide a travel option that avoids major environmental impacts on adjacent properties, such as noise and vibration

***GOAL 4: Preserve and protect the quality of life in the study area and the region***

*Objectives:*

- Provide a travel option that contributes to the economic health of the study area and region through improving mobility and access
- Provide a travel option that is sensitively designed with respect to existing neighborhoods and property values
- Provide a travel option that protects and enhances access to public service and recreational facilities
- Provide a travel option that supports sound planning and design of transit stations and park-and-ride lots
- Provide a travel option that enhances the image and use of transit services in the region

***GOAL 5: Support economic development***

*Objectives:*

- Provide a travel option that supports economic development and redevelopment with improved access to transit stations
- Provide a travel option that supports local sustainable development/redevelopment goals
- Provide a transportation system element that facilitates more efficient land development patterns and saves infrastructure costs
- Provide a travel option that accommodates future regional growth in locations consistent with local plans and the potential for increased transit ridership

These goals and objectives were also applied later in the AA process to assist in the refinement of the study alternatives.

# 4. Transit Technology Screening

This section documents the process used to determine which transit technologies address the transportation needs identified in the Purpose and Need Statement contained in Technical Memorandum No. 1. First the range of possible transit technologies was identified and then a set of qualitative evaluation measures was applied to determine which technologies to retain for inclusion in the Southwest Transitway AA..

## *A. Transit Technologies*

The transit technology review considered the following:

- Conventional Diesel Bus (including use of HOV and shoulder bus lanes)
- Bus Rapid Transit (BRT)

- Streetcar (modern)
- Light Rail Transit (LRT)
- Heavy Rail Transit (rapid transit or subway)
- Commuter Rail (bi-level and diesel multiple unit)
- Automated Guideway Transit (AGT)/Monorail
- Personal Rapid Transit (PRT)

### Conventional Diesel Bus

The diesel transit bus is the most commonly used transit vehicle in the world. Buses offer the flexibility of operation in mixed traffic on city streets and highways.

### Bus Rapid Transit (BRT)

Bus Rapid Transit (BRT) works to combine the flexibility of buses with the frequency and travel time advantages of rail transit. BRT typically offers high capacity, high frequency bus operation in an exclusive bus-only roadway with on-line, high amenity stations.

### Streetcar (Modern)

Streetcars were the precursor to the modern day light rail vehicles. Today, streetcars come in several forms from a modern vehicle to replica and refurbished vehicles. Streetcar technology is similar to light rail technology in terms of track gauge, overhead electrification, and operations. In contrast to modern light rail systems, streetcar systems typically serve intra-city trips and are more likely to share street rights-of-way with other vehicles or use semi-exclusive rights-of-way. Streetcar vehicles are typically smaller, lighter and have fewer seats than light rail vehicles. This design makes them efficient at serving short trips (stops several blocks apart) within relatively densely populated areas.

### Light Rail Transit (LRT)

Light Rail Transit (LRT) is a medium to high capacity passenger rail service that can be used both for short and line-haul trips. LRT technology has evolved from the streetcar system to a more modern system that can carry more passengers further and faster. LRT vehicles typically operate in exclusive or semi-exclusive rights-of-way and are powered from an overhead electrification system. Stations are typically 1/2 to 2 miles apart.

### Heavy Rail Transit (subway)

Heavy rail, commonly referred to as a rapid transit or subway, is a high-capacity, high-speed transit service that operates on exclusive tracks with an electrified third rail and no grade crossings. Heavy rail systems typically serve high density areas with significant congestion problems with stations from ½ to 3 miles apart.

### Commuter Rail (bi-level and diesel multiple unit)

Commuter rail service is defined as passenger rail service operating on existing freight rail tracks. Service is typically between outer suburban, exurban areas and the city center. Trains typically operate every half hour inbound in the morning and outbound in the evening. Commuter rail stations are typically spaced three to five miles apart. Commuter rail service is primarily oriented toward commuter service to outer suburban regions, and as a result it typically serves longer trips than most light and heavy rail transit lines. Commuter rail trains are normally made up of a locomotive and several passenger coaches or self propelled diesel-electric passenger coaches.

### Automated Guideway Transit (AGT)/Monorail

Monorail/AGT are electric transit systems in which the vehicles are suspended from or straddle a guideway. Most of these systems are driverless, and utilize an electrified power rail. They are separated from all traffic on exclusive rights-of-way. Monorail/AGT is typically used for circulation/distribution at airports or downtowns.

### Personal Rapid Transit (PRT)

Personal rapid transit (PRT) is a transit system that provides point-to-point, demand responsive service to individuals or small groups. Electrically powered vehicles carrying as few as 3 to 5 passengers, or more depending on design, travel on guideways separated from traffic. PRT is designed to serve as a circulator/distributor system providing service within business parks, airports, and campus environments. It could also be used to provide service to/from line-haul transit systems such as LRT, BRT, commuter rail, and heavy rail to other activity centers.

## *B. Transit Technology Screening Criteria*

The following screening criteria were used to determine which technologies to retain:

- **Compatible with the study area's transit travel demand**
  The technology is easily able to accommodate the line-haul transit travel demand of the study area.
- **Proven Technology**
  The technology is fully implemented with a history that can be researched and studied.
- **Compatible with existing infrastructure**
  The technology is compatible with existing and planned infrastructure and will not require major retrofit of existing infrastructure.
- **Identified in the region's long-range transportation plan, the TPP, and other studies**
  The technology is identified as an option in the Metropolitan Council's long-range transportation plan, the Transportation Policy Plan (TPP). The TPP includes the region's long-range plan for transit and transitways, the Transit 2030 Plan. In addition, the following studies have been completed documenting the feasibility of transit technologies for the Southwest Transitway, the *Hennepin County LRT System Draft Environmental Impact Statement (DEIS), 1989*; the *29th Street and Southwest Busway Feasibility Study, 2000*; *Mn/DOT's Exclusive Busway Study, 2000*; and the *Southwest Rail Transit Study, 2003.*

## C. Summary of Transit Technology Screening

The results of this analysis suggested that the Southwest Transitway TAC should retain conventional diesel bus, bus rapid transit (BRT), and light rail transit (LRT) for inclusion in the Southwest Transitway AA.

The Southwest Transitway TAC concurred and forwarded their recommendation to the Southwest Transitway PAC. On July 27, 2005, the Southwest Transitway PAC voted unanimously to accept the Southwest Transitway TAC's recommendation to retain conventional bus, BRT and LRT.

Table 1 summarizes the results of the Transit Technology Screening.

Conventional diesel buses were retained based upon the following:

- **Travel Demand –** Because of its flexibility**,** conventional buses service a variety of trip types. Express and limited stop services provide line-haul transit service to the study area. For shorter trips, local services offers more frequent stops and closer access to a greater number of destinations.

- **Proven Technology –** The conventional diesel bus in the most commonly used transit vehicle in the world. All major metropolitan transit systems include conventional bus options. In the Twin Cities, conventional buses constitute the predominant technology used in the existing transit system. Vehicles can range in size, interior quality levels, and operating characteristics.

- **Compatible with Existing Infrastructure –** Conventional diesel buses are compatible with the region's current transportation infrastructure. In the existing regional transportation system, bus-only shoulder lanes, bus-only ramps, and High-Occupancy Vehicle (HOV) lanes provide conventional buses with a series of advantages over other modes of travel.

- **Identified in the Long-Range Transportation Plan –** The Metropolitan Council's Transit 2030 Plan identifies conventional bus operations as remaining the backbone of the regional transit system.

Bus rapid transit (BRT) was retained based upon the following:

- **Travel Demand –** Demand exists within the southwestern portion of the metro area for high-frequency line-haul bus transit service. BRT operating at a high frequency primarily within exclusive rights-of-way can provide transit service to accommodate the travel demand needs within the area.

- **Proven Technology –** Bus rapid transit is a proven technology that has been implemented in numerous urban areas, including Pittsburgh, Boston Los Angeles, and Ottawa.

- **Compatible with Existing and Planned Infrastructure –** A BRT system utilizing rubber-tired buses on a paved guideway is consistent with existing regional infrastructure.

- **Regional Transportation Plan –**The Metropolitan Council's Transit 2030 Plan identified BRT as a potential transit technology to serve the travel demand in the Twin Cities. BRT was also determined to be a feasible transitway alternative in both the *29th Street and Southwest Busway Feasibility Study, 2000* and *Mn/DOT's Exclusive Busway Study, 2000.*

Light rail transit (LRT) was retained based upon the following:

- **Travel Demand –** Demand exists within the southwestern portion of the metro area for high-frequency line-haul rail transit service. An LRT line operating at frequencies similar to the Hiawatha LRT line is expected to accommodate this projected travel demand.
- **Proven Technology –** LRT is a proven technology that has been implemented in the Twin Cities and numerous cities across the country, including Denver, Portland, Salt Lake City and St Louis.
- **Compatible with Existing and Planned Infrastructure –** The infrastructure required for a new southwest LRT system would be the same as, and compatible with the existing Hiawatha LRT line's infrastructure.
- **Regional Transportation Plan –** The Metropolitan Council's Transit 2030 Plan identifies LRT as a potential transit technology to serve the travel demand in the Twin Cities. LRT was also determined to be a feasible transit technology in the Southwest Rail Transit Study, 2003.

Appendix B provides a larger discussion of the evaluation of each transit technology.

**Table 1 Transit Technology Screening**

| Modes | Compatibility with Travel Demand | Proven Technology | Compatibility with Existing Infrastructure | Identified in the Regional Transportation Plan | Recommendation |
|---|---|---|---|---|---|
| Conventional Bus | ○ | ○ | ○ | ○ | Retain |
| BRT | ○ | ○ | ○ | ○ | Retain |
| Light Rail Transit (LRT) | ○ | ○ | ○ | ○ | Retain |
| Streetcar (Modern)* | ◐ | ○ | ◐ | ● | Not Retain |
| Heavy Rail Transit | ● | ○ | ● | ● | Not Retain |
| Commuter Rail | ● | ○ | ○ | ○ | Not Retain |
| Monorail/AGT (Automated Guideway Transit) | ● | ○ | ● | ● | Not Retain |
| Personal Rapid Transit (PRT) | ● | ● | ● | ● | Not Retain |

**LEGEND**

| | |
|---|---|
| **Compatibility with Travel Demand:** | Ability of service type to accommodate expected travel demand |
| **Proven Technology:** | Fully implemented and able to be evaluated |
| **Compatibility with Existing Infrastructure:** | Does not require massive retrofit of existing infrastructure |
| **Identified in the Regional Transportation Plan:** | Identified in the Metropolitan Council's Transportation Policy Plan (TPP) |

○ Fully Meets Criteria
◐ Partially Meets Criteria
● Does Not Meet Criteria

*May be appropriate for intercity/local circulator service connecting to/from the corridor

10Aug05

*Source: Parsons Brinckerhoff, 2006*

## D. Guidelines for Defining Alternatives

This section documents the process used to define the initial alternatives, which combined transit technologies with conceptual alignments (composed of potential station locations and general routes.)

### A. Station Locations

The guidelines for locating transit stations included service to activity centers, accessibility by bus, auto, bicycle and walking, integration with the community and surrounding environment, and spacing appropriate for transit operations.

***Activity Centers***
Stations were located to serve concentrations of residential population, employment and destination/activity centers (e.g., shopping centers, medical centers, recreation areas).

***Access to the Station***
Stations were located in areas easy accessible via foot, bicycle, bus or automobile. Consideration was given to existing and planned roadways, bus routes, pedestrian and bicycle connections and availability of land for park-and-ride.

***Integration with the Community and the Environment***
Stations were located to be compatible with the community and the natural environment. Considerations included compatibility with existing/proposed land use as identified in local comprehensive plans, the area's potential for transit oriented development or redevelopment, and avoiding negative environmental and community impacts, for example increased traffic on neighborhood streets.

***Appropriate Spacing for Transit Operations***
Stations should be spaced approximately ½ to one mile apart, except in downtowns, where stations every few blocks are appropriate.

### B. Routes

Following the identification of station locations, the second step in defining alternatives was to determine the best route for connecting the stations. The guidelines for selecting routes between stations included minimizing travel time, costs and adverse environmental and community impacts.

***Travel Time***
The routes were selected to minimize travel time between stations because shorter overall travel times improve the attractiveness of the transit service and increase transit ridership.

***Capital Costs***
The routes were selected to minimize capital costs associated with right-of-way, structures, utilities, roadway construction and signal systems.

***Operating Costs***

The routes were selected to minimize operating and maintenance costs, which are a function of travel time and routing characteristics (e.g., curves, steep grades, paved trackwork, structures and integrated roadway/transit signal systems).

***Environmental and Community Impacts***

The routes were selected to minimize adverse impacts to the existing environment and community including sensitive or protected natural resources, adjacent land uses, vehicular and pedestrian traffic and public safety.

### C. Transit Operating Plan

The next step in developing the alternatives was to define the transit operating plan. It is proposed the study area would be adequately served by high-frequency (7.5 minute peak headway in 2030) line-haul transit service. Feeder bus operating plans for each alternative were coordinated with the two transit operators in the study area, Metro Transit and SouthWest Metro Transit. The transit operating plan for each alternative is included in Appendix D.

## 5. Definition of Initial Alternatives

The following section describes the initial alternatives recommended for evaluation in the Southwest AA Study. These alternatives include an Enhanced Bus option required by FTA, Bus Rapid Transit (BRT) options, and Light Rail Transit (LRT) options. These initial transitway alternatives were presented to the public at a series of non-National Environmental Policy Act (NEPA) scoping meetings in May 2005. These alternatives were then modified based upon input received at the scoping meetings, meetings with staff from the five partner cities, meeting with other partner agencies (Mn/DOT, Metro Transit, SouthWest Metro Transit), and on other input received from the general public.

The definition of each alternative includes a description of the area served, the routing, the station location, major infrastructure requirements, and the transit operating plan. A more detailed definition of each alternative is included in Appendix D.

Table 2 at the conclusion of this section identifies the stations served by each alternative.

### 1. *No Build Alternative (2030)*

The No Build Alternative represents existing and committed infrastructure, facilities and services expected to be in place and operating for the forecast year, 2030. Future projects included in a financially constrained regional plan are considered elements of a no build alternative, unless they might have a major impact on decisions for the corridor alternatives in the Southwest Transitway AA, in which case they are removed from the ridership model of highways or transit guideways. The *Twin Cities 2030 Transportation Policy Plan* was developed under a constrained funding scenario. The No Build alternative is incorporated in the 2030 Twin Cities regional travel demand forecasting model, used to forecast ridership for the Southwest Transitway AA. The following description is provided as background information on the level of transportation investment already programmed by the region.

The Twin City metropolitan area surrounding Minneapolis and St. Paul is planning for rapid population growth, growing congestion and limited prospects for new major freeways by 2030. The region’s *Transportation Policy Plan* identifies the 2030 system as multi-modal, geographically balanced, cost-effective and supportive of the Regional Development Framework. Roadway infrastructure and service improvements are focused on maintaining and managing the existing system, removing or relieving bottlenecks, and adding capacity. The *Transit 2030 Plan*, a major component of the overall *Transportation Policy Plan*, is designed and scaled to strongly support the region's economic vitality by promoting mobility, access to opportunities, and more efficient use of land and public infrastructure.

For the highway network, each major corridor improvement undergoes intense planning through the Minnesota Department of Transportation (Mn/DOT), host county and cities in an FHWA planning process comparable in scope and schedule to the FTA process. Highway improvements include planning for roadway-based transit. Through a partnership called Team Transit, Mn/DOT, the Metropolitan Council, transit agencies, cities and counties coordinate to provide a system of advantages for transit vehicles to help improve the efficiency of the region's freeways by implementing bus-only shoulders, bus-only ramps, and High Occupancy Vehicle (HOV) lanes. Team Transit has also constructed a network of park-and-ride lots throughout the study area, positioned to offer efficient access to the regional highway system.

In the vicinity of the Southwest Transitway study area, major improvements programmed for implementation under the constrained funding scenario include the following:

- Lane Additions: Additional highway lanes on I-494, TH 100, and I-35W
- HOV lanes: Fully implemented on I-35W through Richfield and Minneapolis, with on-line stations for BRT service, identifying the improved I-35W as a transitway
- Construction of new highway TH 212 from I-494 in Hennepin County into Carver County
- Bus shoulder lane expansions on TH 62, I-494, TH 100, TH 169, TH 212, and TH 5, facilitating the planned Express Commuter Bus System on I-494, TH 5 and TH 169
- Southwest Transitway
- Park-and-Ride lots: County Road 60/Minnetonka Boulevard, TH 212/TH 101, TH 212/CSAH 41
- TH 212 SouthWest Metro Transit bus service to TH 101, Chanhassen and CSAH 41, Chaska

Within the Southwest study area, existing and planned transit service centers on a dense local bus route structure. As the Twin Cities metropolitan area does not have dedicated funding for transit, transit operators in the region modify routes regularly to better target service to the markets served and to match available funding. The entire Southwest Transitway study area is within the regional Transit Taxing District.

The 2030 No Build alternative assumes the future transit service network will closely resemble the dense route structure and extensive facilities of the existing system, with additions noted above and reflected in the regional travel model maintained by the Metropolitan Council. The 2030 No Build transit system is graphically represented in the Figure D-1 in Appendix D. Major additions to the regional transit system outside the Southwest Transitway study area planned to be in place by 2030 include Northstar commuter rail service between Minneapolis and Big Lake, Central Corridor LRT service between downtown Minneapolis, the University of Minnesota, and downtown St. Paul, Bottineau Boulevard BRT service between Rogers and downtown Minneapolis, Cedar Avenue BRT service between Dakota County and the Mall of America in Bloomington, the Red Rock commuter rail service between Hastings and St. Paul, and the Rush Line transitway between Pine County and St. Paul.

## Existing Transit Service

Metro Transit operates twenty-three routes within the study area: seven local, two limited stop, and thirteen express routes. SouthWest Metro Transit operates a total of twenty-three routes: eleven local and twelve express routes. Team Transit has constructed a network of park-and-ride lots throughout the study area, positioned to offer efficient access to the regional highway system. The existing transit system is described in *Technical Memorandum No.1 Purpose and Need Statement* for the Southwest Transitway.

## 2. Enhanced Bus Alternative

The Federal Transit Administration (FTA) requires the development of a baseline bus option for inclusion in an alternatives analysis study. The FTA web site defines baseline bus as:

> *… the best than can be done for mobility without constructing a new transit guideway. An acceptable baseline alternative emphasizes transportation system upgrades such as intersection improvement, minor road widening, traffic engineering actions, bus route restructuring, shortened bus headways, expanded use of articulated buses, reserved bus lanes, contra-flow lanes for buses and High Occupancy Vehicle (HOVs) on freeways, special bus ramps on freeways, expanded park/ride facilities, express and limited-stop service, signalization improvement, and timed-transfer operations.*[1]

In an Alternatives Analysis (AA), the Enhanced Bus alternative, not the No Build alternative, is used as the basis for comparison to the "build" alternatives, which are defined as BRT and LRT for this study. This is required to demonstrate that the higher level of investment in a "build" alternative is justified (or not.)

### Description

The Enhanced Bus alternative includes two new limited-stop bus routes providing bi-directional service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and downtown Minneapolis; minor modifications to the existing express service; increased service frequencies on the existing transit system; and, restructured local service to provide access to stops along the new limited-stop routes.

The transit operating plan for the Enhanced Bus alternative is generally carried through as elements of the BRT and LRT alternatives to ensure that ridership forecast differences result from characteristics of the alternative other than the level of transit service provided.

Figure 1 illustrates the Enhanced Bus alternative. The transit operating plan for the Enhanced Bus alternative is described in Appendix D.

#### *Limited-Stop Route "A" – Eden Prairie, Hopkins, St. Louis Park to Downtown Minneapolis*

This route begins at a park-and-ride lot at Mitchell Road and Technology Drive. The route enters TH 5 to SouthWest Metro Transit Station on Technology Drive, and then reenters TH 5 to Flying Cloud Drive to the bus-only shoulder lanes on TH 212. From the bus-only shoulder lanes of TH 212, the route enters the bus-only shoulder lanes on TH 169 to Excelsior Boulevard in Hopkins. The route continues in mixed traffic along Excelsior Boulevard then northbound in mixed traffic on Blake Road to TH 7. The route continues in mixed traffic along TH 7 to access the bus-only shoulder lanes on TH 100. From the TH 100 bus-only shoulder lanes the route enters the I-394 High Occupancy Vehicle (HOV) lanes to downtown Minneapolis. The route departs the I-394 HOV lane at 12th Street to access the 2nd and Marquette Avenue one-way pair to its downtown terminus at the Gateway Transit Center (3rd and Washington Avenues).

<u>Stops</u>
Limited Stop Route A provides service to the following 14 stops: Mitchell Road park-and-ride at TH 5, SouthWest Station, Flying Cloud Drive, TH 212/Shady Oak Road, TH 169/Bren Road, TH 169/

[1] http://www.fta.gov

Excelsior Boulevard, Excelsior Boulevard/ Blake Road, Blake Road/TH 7, TH 7/Texas Avenue, TH 7/Louisiana Avenue, TH 7/Wooddale Avenue, 11th Avenue/Marquette and2nd Avenues, 8th Avenue/Marquette and 2nd Avenues, and 5th/Marquette and 2nd Avenues.

### *Limited-Stop Route "B" – Minnetonka, Hopkins, St. Louis Park to Downtown Minneapolis*

This route begins at the intersection of Shady Oak Road and Excelsior Boulevard. The route then travels in mixed traffic along Excelsior Boulevard to Blake Road. From Blake Road the route travels north to TH 7, then westbound on TH 7 to access new bus-only shoulder lanes on TH 100. From the TH 100 bus-only shoulder lanes the route enters the I-394 High Occupancy Vehicle (HOV) lanes to downtown Minneapolis. The route departs the I-394 HOV lane at 12th Street to access the 2nd and Marquette Avenue one-way pair to its downtown terminus at the Gateway Transit Center (3rd and Washington Avenues).

*Stops*

Limited Stop Route B provides service to the following 11 stops: Shady Oak Road/Excelsior Boulevard, 8th Avenue (downtown Hopkins)/Excelsior Boulevard, TH 169/Excelsior Boulevard, Blake Road/Excelsior Boulevard, Blake Road/ TH 7, TH 7/Texas Avenue, TH 7/Louisiana Avenue, TH 7/Wooddale Avenue, 11th/Marquette and 2nd Avenues, 8th/Marquette and 2nd Avenues, and 5th/Marquette and 2nd Avenues.

## Minor Infrastructure Improvements

The following minor infrastructure improvements in the study area are included in the region's long range transportation plan, the TPP:

- Bus shoulder lane expansions on TH 62, I-494, TH 100, TH 169, TH 212, and TH 5,
- Park-and-ride lots: County Road 60/Minnetonka Boulevard, TH 212/TH 101, TH 212/CSAH 41

The following minor infrastructure improvements are not included in the region's long-range transportation plan, the TPP, and are therefore proposed as capital costs required to implement the Enhanced Bus alternative:

- New park-and-ride lots at Mitchell Road/TH 5, TH 212/Shady Oak Road, 8th Avenue (downtown Hopkins), and TH 7/Texas Avenue.

A queue-bypass ramp connecting TH 100 and I-394 is recommended to improve this area so it can be traversed with a minimum of delay. However, this improvement would have to be coordinated with Mn/DOT before its implementation could be assumed.

## Service Plan

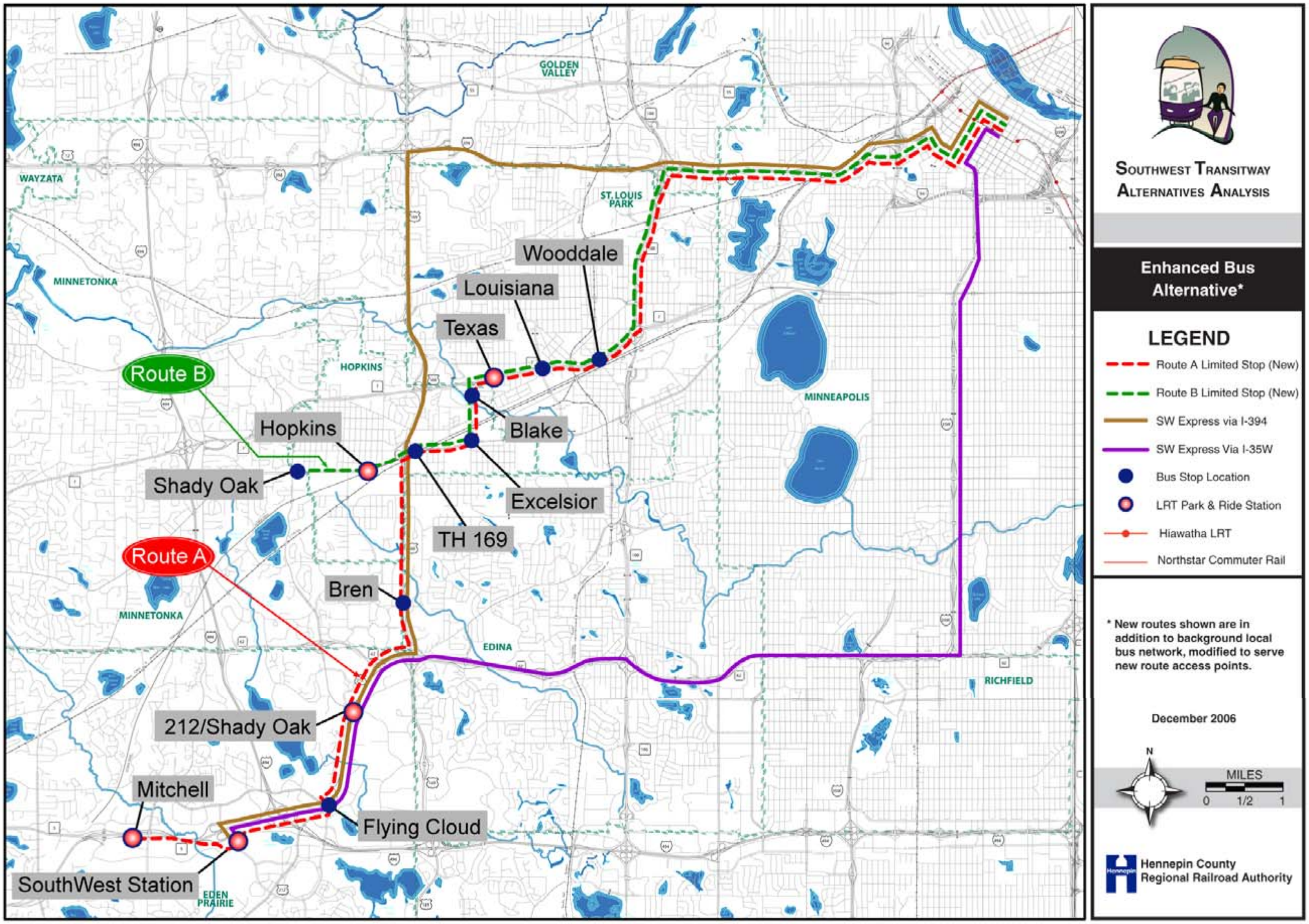
The weekday service frequencies are listed below. When combined for the overlapping segment from Hopkins to downtown Minneapolis, the resulting frequencies are 10 minutes in the early morning, 7.5 minutes during the morning peak, 10 minutes for the mid-day, 7.5 minutes during afternoon peak, and 15 minutes during the evening.

**Table 2 Enhanced Bus Service Plan – Frequency (Minutes between Buses) and Hours**

| | **Weekdays** | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) |
|---|---|---|---|---|---|
| **Weekdays** | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
| Route "A" | 20 | 15 | 20 | 15 | 30 |
| Route "B" | 20 | 15 | 20 | 15 | 30 |
| Combined | 10 | 7.5 | 10 | 7.5 | 15 |
| **Weekends** | 20-60 minutes | 20-60 minutes | 20-60 minutes | 20-60 minutes | 20-60 minutes |
| **Weekdays** | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |

*Source: Parsons Brinckerhoff, 2006.*

## Figure 1: Initial Enhanced Bus Alternative




*Source: Parsons Brinckerhoff, 2006.*

## C. Build Alternatives

The two build alternatives, defined as those requiring major infrastructure improvements are Bus Rapid Transit (BRT) and Light Rail Transit (LRT).

**Table 3 Characteristics of BRT and LRT**

| Characteristic | BRT | LRT |
|---|---|---|
| Service Type | High frequency (7.5 minute peak), bi-directional, line-haul, limited-stop, seven days per week. | High frequency (7.5 minute peak), bi-directional, line-haul, limited-stop, seven days per week. |
| Service Hours | Weekday: 4:00 AM to2:00 AM<br>Weekend/Holiday: 4:00 AM to 2:00 AM | Weekday: 4:00 AM to 2:00 AM<br>Weekend/Holiday: 4:00 AM to 2:00 AM |
| Station Spacing | Downtown: ¼ to ½ mile<br>First ring: ½ to 1 mile<br>Second ring: 1 to 2 miles | Downtown: ¼ to ½ mile<br>First ring: ½ to 1 mile<br>Second ring: 1 to 2 miles |
| Fare Collection | Proof of Payment | Proof of Payment |
| Stations | High amenity, on-line with park & ride where appropriate. | High amenity, on-line with park & ride where appropriate. |
| Dedicated Guideway | Two-lane bus only roadway (approximately 28 feet in width) | Two exclusive tracks (approximately 30 feet wide path) |
| Vehicles | Low-floor, diesel hybrid vehicles | Light rail vehicles (assumes use of Bombardier Hiawatha LRT vehicle, or similar) |
| Intelligent Transportation System (ITS) | Signal priority and preemption where feasible | Signal priority and preemption where feasible. |

*Source: Parsons Brinckerhoff, 2006.*

### Bus Rapid Transit (BRT) Alternatives

Effective BRT transit service is frequent, direct, easy to understand, comfortable, reliable, operationally efficient, and above all – rapid. Of the alternative transit modes recommended for evaluation for the Southwest Transitway, bus rapid transit encompasses perhaps the widest variety of potential features. A range of options exists within each component of a bus rapid transit system, allowing the BRT concept to be tailored to the needs and resources of the community for which it is proposed.

Two BRT alternatives, labeled BRT 1 and BRT 2, are defined to serve the travel needs of the study area. In developing these BRT alternatives the consultant team reviewed the *29th Street and Southwest Busway Feasibility Study, 2000* and *Mn/DOT's Exclusive Busway Study, 2000*. The two primary routes under the Enhanced Bus alternative, Limited Stop Routes A and B, operate as the principal BRT routes under the BRT alternatives. The two routes provide overlapping service from Shady Oak Road to Minneapolis, combining to offer 7.5 minute headways from Shady Oak into downtown Minneapolis.

### *BRT 1*

The BRT 1 alternative is proposed to operate from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

*Routing*

The route begins near the intersection of TH 5 and the HCRRA's Southwest Corridor. From that point the route enters a new exclusive (bus-only) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive (bus-only) guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive (bus-only) guideway in the HCRRA's Cedar Lakes Corridor. When it reaches the new Van White Boulevard, the route exits the exclusive guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis. The route ends at the intersection of 5th Street and Hennepin Avenue, adjacent to the existing Hiawatha LRT line, then loops around using 3rd and 4th Streets.

*Stations*

BRT 1 provides service to the following 15 stations: TH 5, TH 62, Rowland Road, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, 12th Street, 8th Street, and 5th Street.

**Table 4 BRT 1 Service Plan – Frequency (Minutes between Buses) and Hours**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | | | | | |
| Route A | 20 | 15 | 20 | 15 | 30 |
| Route B | 20 | 15 | 20 | 15 | 30 |
| Combined | 10 | 7.5 | 10 | 7.5 (to 7:30 pm) | 15 |
| | | | | | |
| Weekend | | | | | |
| Route A | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Route B | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Combined | 15-30 | 15-30 | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Relocation*

To construct and operate an exclusive bus-only guideway in the HCRRA's Kenilworth Corridor the existing freight rail service must be relocated.

In 1999, St. Louis Park in partnership with Hennepin County and Mn/DOT convened the Southwest Railroad Advisory Task Force to study freight rail issues affecting St. Louis Park. After the task force concluded their work, the St. Louis Park City Council adopted a position that "freight rail from the west headed for St. Paul should continue to travel through the Kenilworth corridor in Minneapolis unless and until such time as a viable form of mass transit displaces it….If at a future date, it is determined that the Kenilworth Corridor is the most feasible route for mass transit and that freight rail and a mass transit system cannot coexist in that corridor, freight rail traffic will be re-routed through St. Louis Park. This is to be accomplished by constructing a northerly connection on the Golden Auto Site and a connection on the iron triangle property." (Citation Page 1, May 23, 2001)

Under alternative BRT 1 it would be necessary to remove the existing freight railroad track from the HCRRA Kenilworth Corridor. Consistent with the conclusion of the St. Louis Park Rail Task Force position statement, since mass transit is proposed, the freight rail traffic in Kenilworth is proposed to be relocated to the Canadian Pacific Railway's (CP) north-south line (the MNS Subdivision) located west of TH 100, then east on the Burlington Northern SantaFe Railway's (BNSF) Wayzata Subdivision. This requires construction of a new connection on the Golden Auto Site in the northwest corner between the CP Bass Lake Subdivision and the MNS Subdivision, and restoration of the Iron Triangle, a former connection in the southeast corner between the BNSF Wayzata Subdivision and the CP MNS Subdivision.

### *BRT 2*

The BRT 2 alternative is proposed to operate from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. As with BRT 1, the two routes provide overlapping service from Shady Oak Road to Minneapolis, combining to offer 7.5 minute headways from Shady Oak into downtown Minneapolis.

The route begins near the intersection of TH 5 and Mitchell Road in Eden Prairie. From that point the route uses the existing bus-only shoulders along TH 5 to the Prairie Center Drive interchange, where it enters new reserved bus-only lanes along Prairie Center Drive. It follows Prairie Center Drive south, then turns east into new reserved bus-only lanes along Singletree Lane. When the route reaches the intersection of Singletree Lane and Flying Cloud Drive, it turns north and continues in new bus-only shoulders along Flying Cloud Drive. At Valley View Road the route enters an exclusive (bus-only) guideway along the east side of the TH 212 right-of-way, then swings east and north along new right-of-way through the Golden Triangle area.

After crossing Shady Oak Road, the exclusive bus-only guideway crosses over TH 212 into the City West area, then crosses over TH 62 into the Opus area of Minnetonka. At Bren Road the route leaves the bus-only guideway and follows new reserved bus-only lanes along Bren Road to the TH 169 interchange. At TH 169 the route follows the existing bus-only shoulders north to Excelsior Boulevard, where it then enters an exclusive (bus-only) guideway located in the HCRRA's Southwest Corridor.

For this alternative, the exclusive guideway in the HCRRA's Southwest Corridor begins near Shady Oak Road. It continues east, passing under TH 169, where it is joined by the route branch coming north from Bren Road. The combined route continues in the exclusive guideway to West Lake Street in Minneapolis.

Just north of West Lake Street the route enters an exclusive (bus-only) guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive (bus-only) guideway in the HCRRA's Cedar Lakes Park Corridor. When it reaches the new Van White Boulevard, the route exits the exclusive guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis. The route ends at the intersection of 5th Street and Hennepin Avenue, adjacent to the existing Hiawatha LRT line, then loops around using 3$^{rd}$ and 4$^{th}$ Streets.

*Potential Route Variations*

This alternative includes a route variation in Eden Prairie. After serving the SouthWest Metro Transit station, the route continues east on bus-only shoulders along TH 5. Once it passes under I-494 and

Valley View Road, the route enters an exclusive (bus-only) guideway that carries it into the Golden Triangle area. The variation does not include an Eden Prairie Center station.

*Stations*

BRT 2 provides service to the following 18 stations: Mitchell Road, SouthWest, Eden Prairie Center, Golden Triangle, City West, Opus, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, 12th Street, 8th Street, and 5th Street.

**Table 5 BRT 2 Service Plan – Frequency (Minutes between Buses) and Hours**

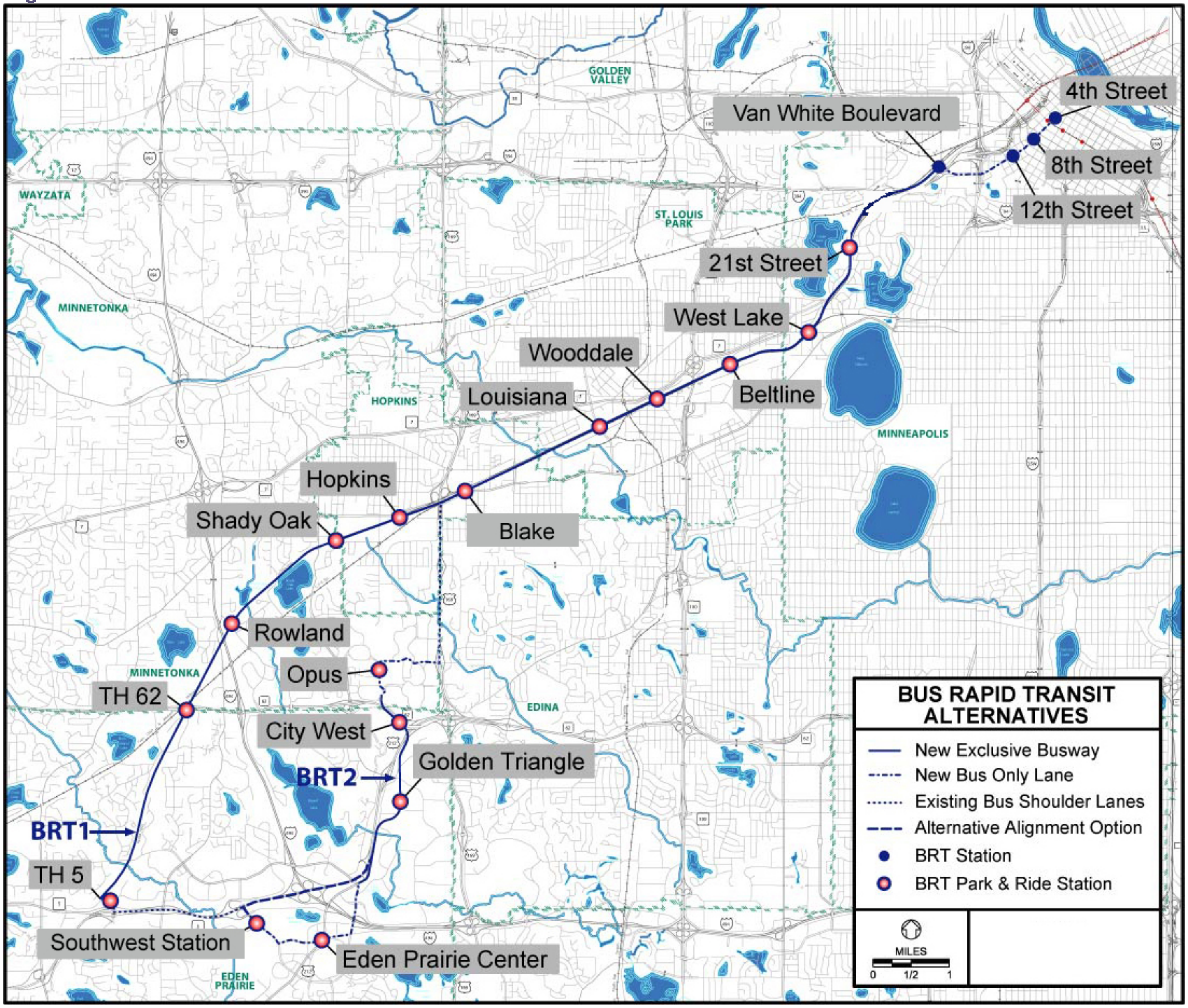
| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | | | | | |
| Route "A" | 20 | 15 | 20 | 15 | 30 |
| Route "B" | 20 | 15 | 20 | 15 | 30 |
| Combined (routes A & B) | 10 | 7.5 | 10 | 7.5 (to 7:30 pm) | 15 |
| | | | | | |
| Weekend | | | | | |
| Route "A" | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Route "B" | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Combined (routes A & B) | 15-30 | 15-30 | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Relocation*

As described under BRT 1, to construct and operate an exclusive bus-only guideway in the HCRRA's Kenilworth Corridor the existing freight rail service must be relocated. Consistent with the conclusion of the St. Louis Park Rail Task Force position statement, since mass transit is proposed, the freight rail traffic in Kenilworth is proposed to be relocated to the CP north-south line (the MNS Subdivision) located west of TH 100, then east on the BNSF Wayzata Subdivision. This requires construction of a new connection on the Golden Auto Site in the northwest corner between the CP Bass Lake Subdivision and the MNS Subdivision, and restoration of the Iron Triangle, a former connection in the southeast corner between the BNSF Wayzata Subdivision and the CP MNS Subdivision.

**Figure 2: Initial BRT Alternatives**




*Source: Parsons Brinckerhoff, 2006.*

## Light Rail Transit (LRT) Alternatives

Light rail transit service is characterized by service that is frequent, direct, easy to understand, comfortable, reliable, operationally efficient, and rapid.

Eight initial LRT alternatives were defined to serve the travel needs of the study area. In developing the initial LRT alternatives, the consultants reviewed the HCRRA's *Southwest Rail Transit Study, 2003* was reviewed.

The eight LRT alternatives are described using a combination of a numeric (1, 2, 3, or 4) and alphabetic (A or C) designation. The numbers designate the four possible routings west of Louisiana Avenue in St. Louis Park. The letters designate the two possible routes east of Louisiana Avenue in St. Louis Park.

Alternatives numbered "1" designate routes that use the HCRRA's Southwest Corridor through Eden Prairie, Minnetonka, Hopkins, to Louisiana Avenue in St. Louis Park. Alternatives numbered "2" designate routes that use TH 5 and I-494 rights-of-way through Eden Prairie and Minnetonka and HCRRA's Southwest Corridor through Hopkins to Louisiana Avenue in St. Louis Park. Alternatives numbered "3" use a combination of new exclusive rights-of-way through Eden Prairie, Minnetonka and part of Hopkins, then they use the HCRRA's Southwest Corridor through Hopkins to Louisiana Avenue in St. Louis Park. Alternatives numbered "4" designate shortened routes using the HCRRA's Southwest Corridor from Shady Oak Road in Minnetonka to Louisiana Avenue in St. Louis Park. These alternatives do not provide direct LRT service to areas of Minnetonka west of Shady Oak Road and Eden Prairie. LRT alternatives 1 through 4 mirror those resulting from the HCRRA's *Southwest Rail Transit Study, 2003*.

Alternatives with the letter "A" designate routes that use the HCRRA's Southwest Corridor through St. Louis Park, and the HCRRA's Kenilworth and Cedar Lake Park Corridors in Minneapolis. Alternatives with the letter "C" designate routes that use the HCRRA's Southwest Corridor in St. Louis Park, the HCRRA's Midtown Corridor in Minneapolis, and a shallow tunnel under Nicollet Avenue between 29$^{th}$ and Franklin Avenue in Minneapolis. In general, the A and C routings are similar to those contained in the HCRRA's *Draft Environmental Impact Statement (DEIS) Hennepin County LRT System, 1988.*

The LRT alternatives are summarized in the following paragraphs and illustrated in the figures which follow. A more extensive route and station description and individual maps of each alternative are included in Appendix D.

### *LRT 1A*

The LRT 1A alternative is proposed to operate from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

<u>*Routing*</u>

The route begins near the intersection of TH 5 and the HCRRA's Southwest Corridor. From that point the route enters a new exclusive light rail transit (LRT) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive (LRT) guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive (LRT) guideway in the HCRRA's Cedar Lakes Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lakes Corridor to street level, where it enters Royalston Avenue. In Royalston Avenue the route operates on exclusive (LRT) guideway in the median of Royalston Avenue to 7$^{th}$ Street. At 7$^{th}$ Street the route enters a shallow tunnel under 7$^{th}$

Street to 5th Street. At 5th Street the route continues through downtown Minneapolis on the Hiawatha LRT tracks.

*Potential Route Variations*
Two route variations are included in the LRT 1A alternative, one in Eden Prairie and the other in downtown Minneapolis.

Under the LRT 1A alternative as described above, the LRT route must cross the TC&W Railroad tracks near TH 62. The TH 62 overpass and the existing grades in that area make the crossing difficult. To avoid this potentially difficult and costly crossing, a short route variation that uses the TC&W and Canadian Pacific right-of-way may be evaluated in future engineering studies. Under this variation the route turns into the railroad right-of-way after passing below TH 62, and run next to the railroad tracks to a location near the Minnetonka-Hopkins city limits. At that point the route crosses beneath the freight tracks and turns north, following new right-of-way until it reaches the HCRRA's Southwest Corridor. The route then enters the HCRRA's Southwest Corridor and proceeds towards Minneapolis.

The second route variation uses Dunwoody Boulevard and Hennepin Avenue rather than Royalston Avenue to access downtown Minneapolis. Under this variation the route leaves the HCRRA's Cedar Lakes Corridor at the new Van White Boulevard and enters Dunwoody Boulevard and Hennepin Avenue to 5th Street in downtown Minneapolis. While this route variation can interline with the Hiawatha LRT line eastbound it cannot interline with the Hiawatha LRT line westbound to access the Warehouse and proposed Intermodal stations.

*Stations*
LRT 1A provides service to the following 13 stations: TH 5, TH 62, Rowland Road, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, and Royalston.

Because this route operates on the Hiawatha LRT tracks through downtown Minneapolis it also provides direct service to the proposed Intermodal, as well as existing Warehouse, Nicollet, Government Plaza and Metrodome LRT stations.

The Hennepin Avenue variation of this alternative does not include service to the proposed Royalston, the proposed Intermodal, and the Warehouse stations. However, it does provide service to new stations at 12th Street and 8th Street as well as to the existing LRT stations at Nicollet, Government Plaza, and the Metrodome in downtown Minneapolis.

**Table 6 LRT 1A Service Plan – Frequency (Minutes Between Trains) and Hours**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Relocation*
As described under the BRT alternatives, to construct and operate an exclusive transit-only guideway in the HCRRA's Kenilworth Corridor the existing freight rail service must be relocated. Consistent with the conclusion of the St. Louis Park Rail Task Force position statement summarized previously, since mass transit is proposed under LRT 1A, the freight rail traffic in Kenilworth is proposed to be relocated to the CP's north-south line (the MNS Subdivision) located west of TH 100, then east on the BNSF's Wayzata Subdivision.

## *LRT 2A*

The LRT 2A alternative is proposed to operate from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

*Routing*
The route begins near the intersection of TH 5 and Mitchell Road in Eden Prairie. From that point the route enters an exclusive (LRT) guideway along the south side of TH 5, crossing under Prairie Center Drive. As it approaches the I-494/TH 5 interchange, the route climbs and crosses over TH 5, descending along the west side of the I-494 exit ramp to TH 5. It continues north along the west side of I-494 right-of-way to the HCRRA's Southwest Corridor, where it turns east and crosses under the freeway.

After entering the HCRRA's Southwest Corridor, the route continues in an exclusive (LRT) guideway to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive (LRT) guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive (LRT) guideway in the HCRRA's Cedar Lakes Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lakes Corridor to street level where it enters Royalston Avenue. In Royalston Avenue the route operates on exclusive (LRT) guideway in the median of Royalston Avenue to $7^{th}$ Street. At $7^{th}$ Street the route enters a shallow tunnel under $7^{th}$ Street to $5^{th}$ Street. At $5^{th}$ Street the route continues through downtown Minneapolis on the Hiawatha LRT tracks.

*Potential Route Variation*
This alternative includes the potential Hennepin Avenue route variation described under LRT 1A.

*Stations*
LRT 2A provides service to the following 15 stations: Mitchell Road, SouthWest, Valley View, TH 62, Rowland Road, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, $21^{st}$ Street, Van White Boulevard, and Royalston.
Because this route can operate on the Hiawatha LRT tracks through downtown Minneapolis it also provides direct service to the proposed Intermodal, as well as existing Warehouse, Nicollet, Government Center and Metrodome LRT stations.

**Table 7 LRT 2A Service Plan – Frequency (Minutes Between Trains) and Hours**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Relocation*

As described previously, to construct and operate an exclusive transit-only guideway in the HCRRA's Kenilworth Corridor the existing freight rail service must be relocated. Consistent with the conclusion of the St. Louis Park Rail Task Force position statement summarized previously, since mass transit is proposed under LRT 2A, the freight rail traffic in Kenilworth is proposed to be relocated to the CP's north-south line (the MNS Subdivision) located west of TH 100, then east on the BNSF's Wayzata Subdivision.

### LRT 3A

The LRT 3A alternative is proposed to operate from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

*Routing*

The route begins near the intersection of TH 5 and Mitchell Road in Eden Prairie. From that point the route enters an exclusive (LRT) guideway along the south side of TH 5, crossing under Prairie Center Drive. It turns south along the east side of Prairie Center Drive, then turns east into new right-of-way located behind the existing properties on the north side of Singletree Lane. The route continues along the south side of Leona Road to Flying Cloud Drive, where it turns north. It runs along the east side of Flying Cloud Drive, over I-494 and into the east side of the TH 212 right-of-way.

The route then swings east and north along new right-of-way through the Golden Triangle area. After crossing Shady Oak Road, the route crosses over TH 212 into the City West area, then it crosses over TH 62 into the Opus area of Minnetonka. The route follows new right-of-way through Opus, crossing under Smetana Road and continuing north along the Minnetonka-Hopkins city limits. After reaching the HCRRA's Southwest Corridor, the route turns east and enters an exclusive (LRT) guideway to West Lake Street in Minneapolis.

Just north of West Lake Street the route enters an exclusive (LRT) guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive (LRT) guideway in the HCRRA's Cedar Lakes Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lakes Corridor to street level where it enters Royalston Avenue. In Royalston Avenue the route operates on exclusive (LRT) guideway in the median of Royalston Avenue to 7$^{th}$ Street. At 7$^{th}$ Street the route enters a shallow tunnel under 7$^{th}$ Street to 5$^{th}$ Street. At 5$^{th}$ Street the route continues through downtown Minneapolis on the Hiawatha LRT tracks.

*Potential Route Variation*

This alternative includes a route variation in Eden Prairie. After serving the SouthWest station, the route would cross under Prairie Center Drive and continue along the north side of Technology Drive. It then turns northeast, crossing over I-494 and intersecting Flying Cloud Drive. The route follows along the east side of Flying Cloud Drive and into the east side of the TH 212 right-of-way. The variation does not include an Eden Prairie Center station.

This alternative also includes the potential Hennepin Avenue route variation described under LRT 1A.

*Stations*
LRT 3A provides service to the following 16 stations: Mitchell Road, SouthWest, Eden Prairie Center, Golden Triangle, City West, Opus, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, and Royalston.
Because this route can operate on the Hiawatha LRT tracks through downtown Minneapolis it also provides direct service to the proposed Intermodal, as well as existing Warehouse, Nicollet, Government Center and Metrodome LRT stations.

**Table 8 LRT 3A Service Plan – Frequency (Minutes Between Trains) and Hours**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Relocation*
As described previously, to construct and operate an exclusive transit-only guideway in the HCRRA's Kenilworth Corridor the existing freight rail service must be relocated. Consistent with the conclusion of the St. Louis Park Rail Task Force position statement summarized previously, since mass transit is proposed under LRT 3A, the freight rail traffic in Kenilworth is proposed to be relocated to the CP's north-south line (the MNS Subdivision) located west of TH 100, then east on the BNSF's Wayzata Subdivision.

### *LRT 4A*
The LRT 4A alternative is proposed to operate from Shady Oak Road in Minnetonka to downtown Minneapolis, providing service to Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

*Routing*
The route begins near the intersection of Shady Oak Road and the HCRRA's Southwest Corridor. From Shady Oak Road the route enters a new exclusive light rail transit (LRT) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive (LRT) guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive (LRT) guideway in the HCRRA's Cedar Lakes Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lakes Corridor to street level where it enters Royalston Avenue. In Royalston Avenue the route operates on

exclusive (LRT) guideway in the median of Royalston Avenue to 7th Street. At 7th Street the route enters a shallow tunnel under 7th Street to 5th Street. At 5th Street the route continues through downtown Minneapolis on the Hiawatha LRT tracks.

*Potential Route Variation*
This alternative includes the potential Hennepin Avenue route variation described under LRT 1A.

*Stations*
LRT 4A provides service to the following 10 stations: Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, and Royalston. Because this route can operate on the Hiawatha LRT tracks through downtown Minneapolis it also provides direct service to the proposed Intermodal, as well as existing Warehouse, Nicollet, Government Center and Metrodome LRT stations.

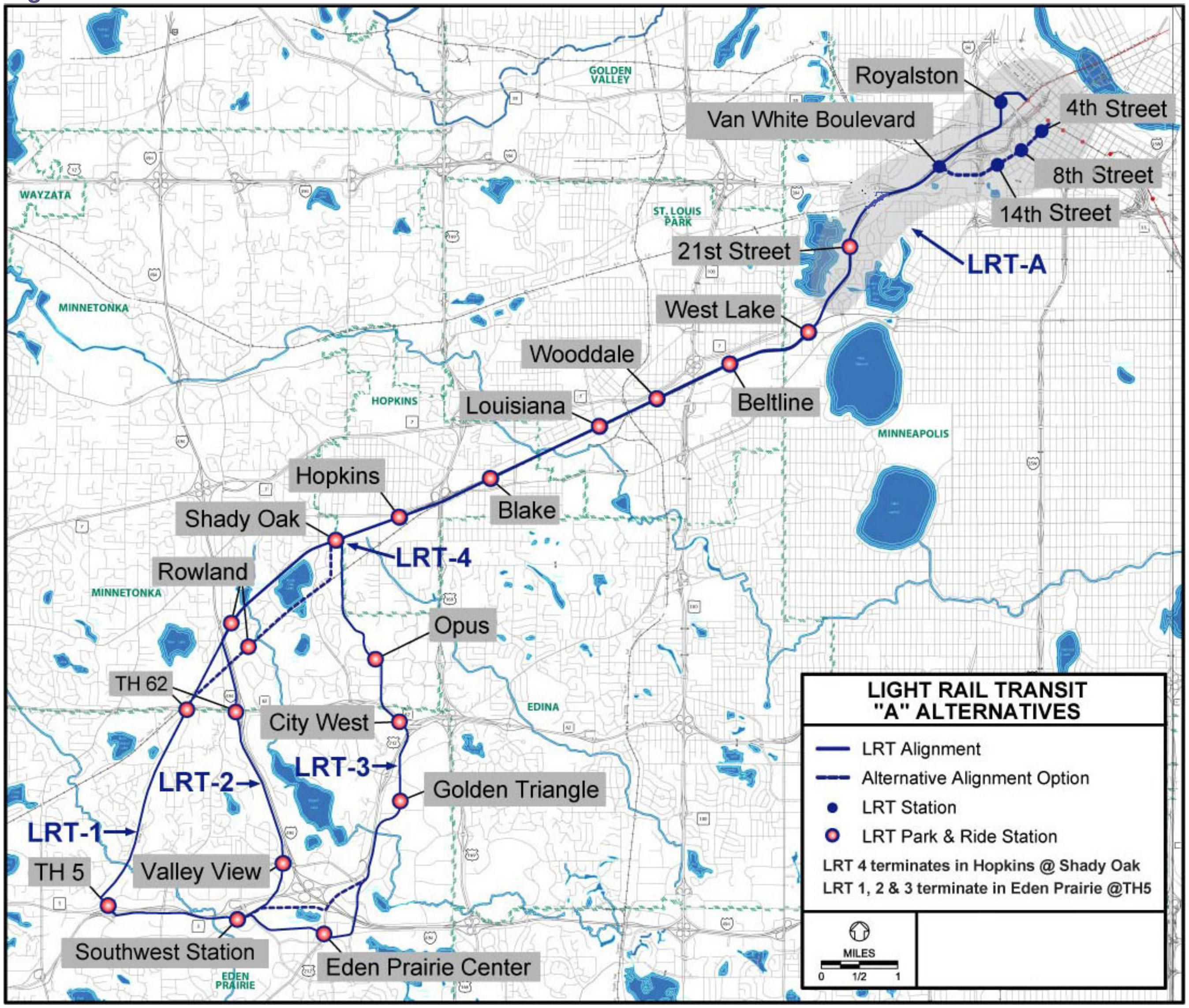
**Table 9 LRT 4A Service Plan – Frequency (Minutes Between Trains) and Hours**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Relocation*
As described previously, to construct and operate an exclusive transit-only guideway in the HCRRA's Kenilworth Corridor the existing freight rail service is proposed to be relocated. Consistent with the conclusion of the St. Louis Park Rail Task Force position statement summarized previously, since mass transit is proposed under LRT 4A, the freight rail traffic in Kenilworth is proposed to be relocated to the CP's north-south line (the MNS Subdivision) located west of TH 100, then east on the BNSF's Wayzata Subdivision.

**Figure 3: Initial LRT A Alternatives**




*Source: Parsons Brinckerhoff, 2006.*

### *LRT 1C*

The LRT 1C alternative is proposed to operate from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

*Routing*

The route begins near the intersection of TH 5 and the HCRRA's Southwest Corridor. From that point the route enters a new exclusive light rail transit (LRT) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis. Just east of West Lake Street the route enters a new exclusive (LRT) guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive (LRT) guideway in a cut and cover tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2nd and Marquette Avenues to 4th Street.

*Potential Route Variation*

This alternative includes the potential shared railroad right-of-way route variation described under LRT 1A.

*Stations*

LRT 1C provides service to the following 17 stations: TH 5, TH 62, Rowland Road, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, Uptown, Lyndale Avenue, 28th Street, Franklin Avenue, 12th Street, 8th Street (Nicollet routing), 7th Street (2nd/Marquette routing), and 4th Street.

**Table 10 LRT 1C Service Plan – Frequency (Minutes Between Trains) and Hours**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Right-of-Way Exchange*

Under alternative LRT 1C in order to serve the proposed stations at Wooddale Avenue, Beltline Boulevard, and West Lake Street the rights-of-way owned by the HCRRA and the CP Railway are proposed to be exchanged and a grade separated crossing of the LRT and freight rail tracks is proposed to be constructed between Louisiana Avenue and Wooddale Avenue. This exchange allows freight rail operations to be located to the north of the LRT service. Under this alternative, freight rail service is proposed to continue to operate in the HCRRA's Kenilworth Corridor in Minneapolis.

### *LRT 2C*

The LRT 2C alternative is proposed to operate from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

*Routing*

The route begins near the intersection of TH 5 and Mitchell Road in Eden Prairie. From that point the route follows along the south side of TH 5, crossing under Prairie Center Drive. As it approaches the I-494/TH 5 interchange, the route climbs and crosses over TH 5, descending along the west side of the I-494 exit ramp to TH 5. It continues north along the west side of I-494 to the HCRRA's Southwest Corridor, where it turns east and crosses under the freeway.

After entering the HCRRA's Southwest Corridor, the route continues in an exclusive (LRT) guideway to West Lake Street in Minneapolis. Just east of West Lake Street the route enters a new exclusive (LRT) guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive (LRT) guideway in a shallow tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2nd and Marquette Avenues.

*Stations*

This alternative includes service to the following 19 stations: Mitchell Road, SouthWest, Valley View, TH 62, Rowland Road, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, Uptown, Lyndale Avenue, 28th Street, Franklin Avenue, 12th Street, 8th Street (Nicollet routing) or 7th Street (2nd/Marquette routing), and 4th Street.

**Table 11 LRT 2C Service Plan – Frequency (Minutes Between Trains) and Hours**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Right-of-Way Exchange*

Under alternative LRT 2C in order to serve the proposed stations at Wooddale Avenue, Beltline Boulevard, and West Lake Street the rights-of-way owned by the HCRRA and the CP Railway are proposed to be exchanged and a grade separated crossing of the LRT and freight rail tracks is proposed to be constructed between Louisiana Avenue and Wooddale Avenue. This exchange allows freight rail operations to be located to the north of the LRT service. Under this alternative freight rail service is proposed to continue to operate in the HCRRA's Kenilworth Corridor in Minneapolis.

## *LRT 3C*

The LRT 3C alternative is proposed to operate from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

*Routing*

The route begins near the intersection of TH 5 and Mitchell Road in Eden Prairie. From that point the route follows along the south side of TH 5, crossing under Prairie Center Drive. It turns south along the east side of Prairie Center Drive, then turns east into new right-of-way located behind the existing properties on the north side of Singletree Lane. The route continues along the south side of Leona Road to Flying Cloud Drive, where it turns north. It runs along the east side of Flying Cloud Drive, over I-494 and into the east side of the TH 212 right-of-way. The route then swings east and north along new right-of-way through the Golden Triangle area.

After crossing Shady Oak Road, the route crosses over TH 212 into the City West area, then crosses over TH 62 into the Opus area of Minnetonka. The route follows new right-of-way through Opus, crossing under Smetana Road and continuing north along the Minnetonka-Hopkins city limits. After reaching the HCRRA's Southwest Corridor, the route turns east and follows an exclusive (LRT) guideway to West Lake Street in Minneapolis.

Just east of West Lake Street the route enters a new exclusive (LRT) guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive (LRT) guideway in a shallow tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route either operates two-way on Nicollet Mall or as a one-way paired loop on 2$^{nd}$ and Marquette Avenues.

*Potential Route Variation*

This alternative includes the potential Eden Prairie route variation described under LRT 3A.

*Stations*

LRT 3C provides service to the following 20 stations: Mitchell Road, SouthWest, Eden Prairie Center, Golden Triangle, City West, Opus, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, Uptown, Lyndale Avenue, 28$^{th}$ Street, Franklin Avenue, 12$^{th}$ Street, 8$^{th}$ Street and 4$^{th}$ Street.

.

**Table 12  LRT 3C Service Plan – Frequency (Minutes Between Trains) and Hours**

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Right-of-Way Exchange*

Under alternative LRT 3C in order to serve the proposed stations at Wooddale Avenue, Beltline Boulevard, and West Lake Street the rights-of-way owned by the HCRRA and the CP Railway are proposed to be exchanged and a grade separated crossing of the LRT and freight rail tracks is proposed to be constructed between Louisiana Avenue and Wooddale Avenue.  This exchange allows freight rail operations to be located to the north of the LRT service.  Under this alternative freight rail service is proposed to continue to operate in the HCRRA's Kenilworth Corridor in Minneapolis.

### *LRT 4C*

The LRT 4C alternative is proposed to operate from Shady Oak Road in Minnetonka to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

Routing

The route begins near the intersection of Shady Oak Road and the HCRRA's Southwest Corridor. From Shady Oak Road the route enters a new exclusive light rail transit (LRT) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis.  Just east of West Lake Street the route enters a new exclusive (LRT) guideway in the HCRRA's Midtown Corridor to Nicollet Avenue.  At Nicollet Avenue the route turns northward entering a new exclusive (LRT) guideway in a shallow tunnel under Nicollet Avenue to Franklin Avenue.  At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street.  At Grant the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2nd and Marquette Avenues.

*Stations*

LRT 4C provides service to the following 14 stations:  Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, Uptown, Lyndale Avenue, 28th Street, Franklin Avenue, 12th Street, 8th Street(Nicollet routing) or 7th Street (2nd/Marquette routing), and 4th Street.

.

**Table 13  LRT 4C Service Plan – Frequency (Minutes Between Trains) and Hours**

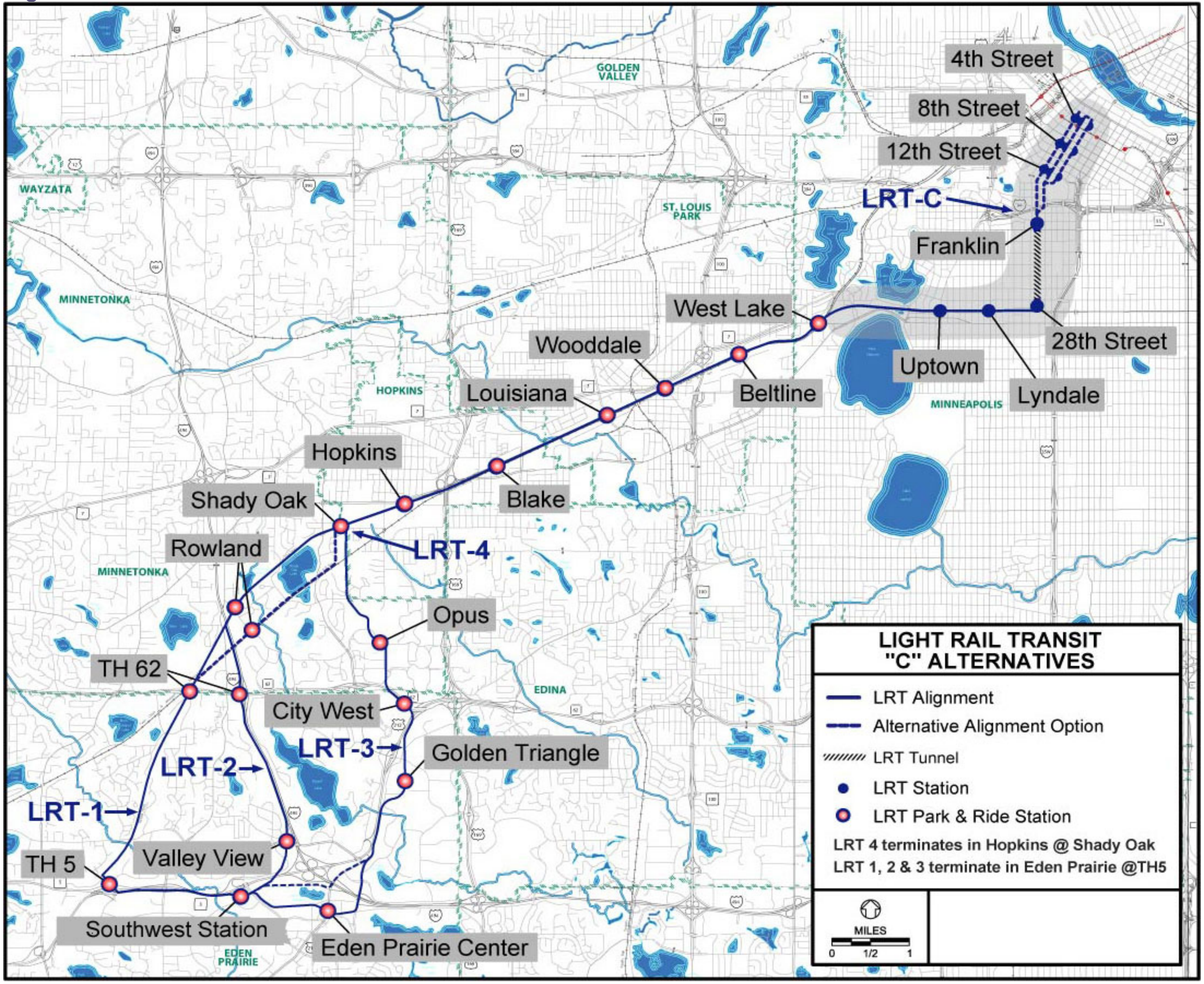
| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Source: Parsons Brinckerhoff, 2006.*

*Freight Rail Right-of-Way Exchange*

Under alternative LRT 4C in order to serve the proposed stations at Wooddale Avenue, Beltline Boulevard, and West Lake Street the rights-of-way owned by the HCRRA and the CP Railway are proposed to be exchanged and a grade separated crossing of the LRT and freight rail tracks is proposed to constructed between Louisiana Avenue and Wooddale Avenue.  This exchange allows freight rail operations to be located to the north of the LRT service.  Under this alternative freight rail service is proposed to continue to operate in the HCRRA's Kenilworth Corridor in Minneapolis.

**Figure 4: Initial LRT C Alternatives**




*Source: Parsons Brinckerhoff, 2006.*

## Table 14  Stations Served by Initial Southwest Transitway Alternatives

| Station (Enhanced Bus Stop) | Enhanced Bus Alternative | BRT Alternatives | | LRT Alternatives | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 1A | 2A | 3A | 4A | 1C | 2C | 3C | 4C |
| TH 5 / HCRRA | | x | x | x | | | | x | | | |
| Mitchell Rd. | x | | | | x | x | | | x | x | |
| TH 62 / HCRRA | | x | | x | | | | x | | | |
| SouthWest Station | x | | x | | x | x | | | x | x | |
| Valley View | | | | | x | | | | x | | |
| TH 62/Baker Rd | | | | | x | | | | x | | |
| Eden Prairie Center | | | x | | | x | | | | x | |
| Flying Cloud Dr. / TH 212 | x | | | | | | | | | | |
| Golden Triangle | | | x | | | x | | | | x | |
| City West | | | x | | | x | | | | x | |
| Rowland Rd. / HCRRA | | x | | x | x | | | x | x | | |
| Shady Oak Rd. / TH 212 | x | | | | | | | | | | |
| Opus / Bren | x | | x | | | x | | | | x | |
| Shady Oak Rd. / HCRRA | | x | X | x | x | x | x | x | x | x | x |
| Hopkins 8th Ave. / HCRRA | | x | | x | x | x | x | x | x | x | x |
| Hopkins / 8th Ave. | | | | | | | | | | | |
| TH 169 / Excelsior | x | | | | | | | | | | |
| Excelsior / Blake | x | | | | | | | | | | |
| Blake Rd. / TH 7 | x | | | | | | | | | | |
| Texas / TH 7 | x | | | | | | | | | | |
| Blake Rd./HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Louisiana Ave. / HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Louisiana Ave / TH 7 | x | | | | | | | | | | |
| Wooddale Ave. / HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Wooddale Av / TH 7 | x | | | | | | | | | | |
| Beltline Blvd. / HCRRA | | x | x | x | x | x | x | x | x | x | x |
| West Lake St. / HCRRA | | x | x | x | x | x | x | x | x | x | x |
| 21st St. / HCRRA | | x | x | x | x | x | x | | | | |
| Van White Blvd. / HCRRA | | x | x | x | x | x | x | | | | |
| Royalston Ave. | | | | x | x | x | x | | | | |
| Intermodal Station | | | | x | x | x | x | | | | |
| Hennepin Avenue Option [1] | | | | x | x | x | x | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hiawatha LRT downtown [2] Minneapolis Stations | | | | x | x | x | x | | | | |
| Enhanced Bus Stops Downtown Minneapolis | x | | | | | | | | | | |
| 14$^{th}$ / Hennepin | | x | x | x | x | x | x | | | | |
| 10$^{th}$ / Hennepin | | x | x | x | x | x | x | | | | |
| Uptown Station | | | | | | | | x | x | x | x |
| Lyndale / Midtown | | | | | | | | x | x | x | x |
| 28$^{th}$ / Nicollet | | | | | | | | x | x | x | x |
| Franklin / Nicollet | | | | | | | | x | x | x | x |
| 12$^{th\,/}$ Nicollet or 2$^{nd}$ / Marquette | | | | | | | | x | x | x | x |
| 8$^{th}$ / Nicollet or 2$^{nd}$ / Marquette | | | | | | | | x | x | x | x |
| 4$^{th}$ / 5$^{th}$ Street | | x | x | x | x | x | x | x | x | x | x |

*Source: Parsons Brinckerhoff, 2006*

Notes: 1. Hennepin Avenue Option replaces the Royalston Avenue and proposed Intermodal Stations with 14$^{th}$ and 10$^{th}$ Street stations. LRT riders with this option can only access the Warehouse Hiawatha LRT station via transfer but can directly access all other Hiawatha LRT stations.
2. Downtown Minneapolis Hiawatha LRT stations -- direct access to stations from Warehouse District to Metrodome; as well as all other Hiawatha LRT stations via transfer.

# 6. Refined Alternatives

The initial set of alternatives described earlier in this technical memorandum was presented at three community open houses, several community meetings, and individual meetings with the five affected cities to solicit comments. Subsequently, the alternatives were refined based upon comments received at these meetings into the set of alternatives for evaluation. See Appendix C for a list of the meetings.

Refinements to the initial alternatives are listed below, followed by a map of each refined alternative. A full description of each refined alternative is provided in Appendix D.

## *A. Enhanced Bus*

- In response to changed routing from SouthWest Metro, the previous Uptown service is rerouted to I-35W.

## *B. Bus Rapid Transit (BRT)*

### BRT 1

- In response to comments from members of the Bryn Mawr neighborhood, a station is added at Penn Avenue to serve their neighborhood.

- To provide better bus feeder connections the station originally identified at TH 169 is moved to Blake Road.

### BRT 2

- In response to comments from members of the Bryn Mawr neighborhood, a station is added at Penn Avenue to serve their neighborhood.

- To avoid an additional freeway crossing, the terminal station is moved from TH 5 to Mitchell Road.

- For operating efficiency, westbound vehicles are proposed to use Technology Drive rather than TH 5 between the SouthWest Metro Transit Station and Mitchell Road.

- The BRT guideway is proposed to cross I-494 at Flying Cloud Drive rather than at Prairie Center Drive.

- To provide better integration with Eden Prairie's plan for the Major Center Area, the Eden Prairie Center Station is moved west about 1/3 mile and renamed the Eden Prairie Town Center station.

## *C. Light Rail Transit (LRT)*

### LRT A Segment

- In response to comments from members of the Bryn Mawr neighborhood, a station is added at Penn Avenue for LRT 1A, LRT 2A, LRT 3A, and LRT 4A alternatives.

### LRT A Segment (Hennepin Avenue option)

- To provide better access to the bus network, the stations along Hennepin Avenue are moved from 14th and 10th Streets to 12th and 8th Streets.

### LRT C Segment

- Because of transit operating issues, the LRT C alternatives are proposed to operate on a loop via 4th Street rather than interline with the Hiawatha LRT line on 5th Street.

- Because of parking ramp access issues and to facilitate better pedestrian flow, the stations on 2nd/Marquette are proposed to be located at 7th Street rather than 8th Street.

### LRT 1 Segment

- Because of freight railroad grade constraints, the potential route deviation that shares the TCW-CP right-of-way is proposed to turn north following the Minnetonka-Hopkins jurisdiction boundary rather than ¼ mile west. This change affects the LRT 1A and LRT 1C alternatives.

### LRT 2 Segment

- To avoid an additional freeway crossing, the terminal station is moved from TH 5 to Mitchell Road.

- Because of existing terrain and access issues, the Valley View Station is moved south about 1/4 mile.

- The TH 62 Station is proposed to be about 1/4 mile south of the original location, adjacent to the athletic club's south parking lot.

### LRT 3 Segment

- To avoid an additional freeway crossing, the terminal station is moved from TH 5 to Mitchell Road.

- The routing is proposed to cross I-494 at Flying Cloud Drive rather than Prairie Center Drive.

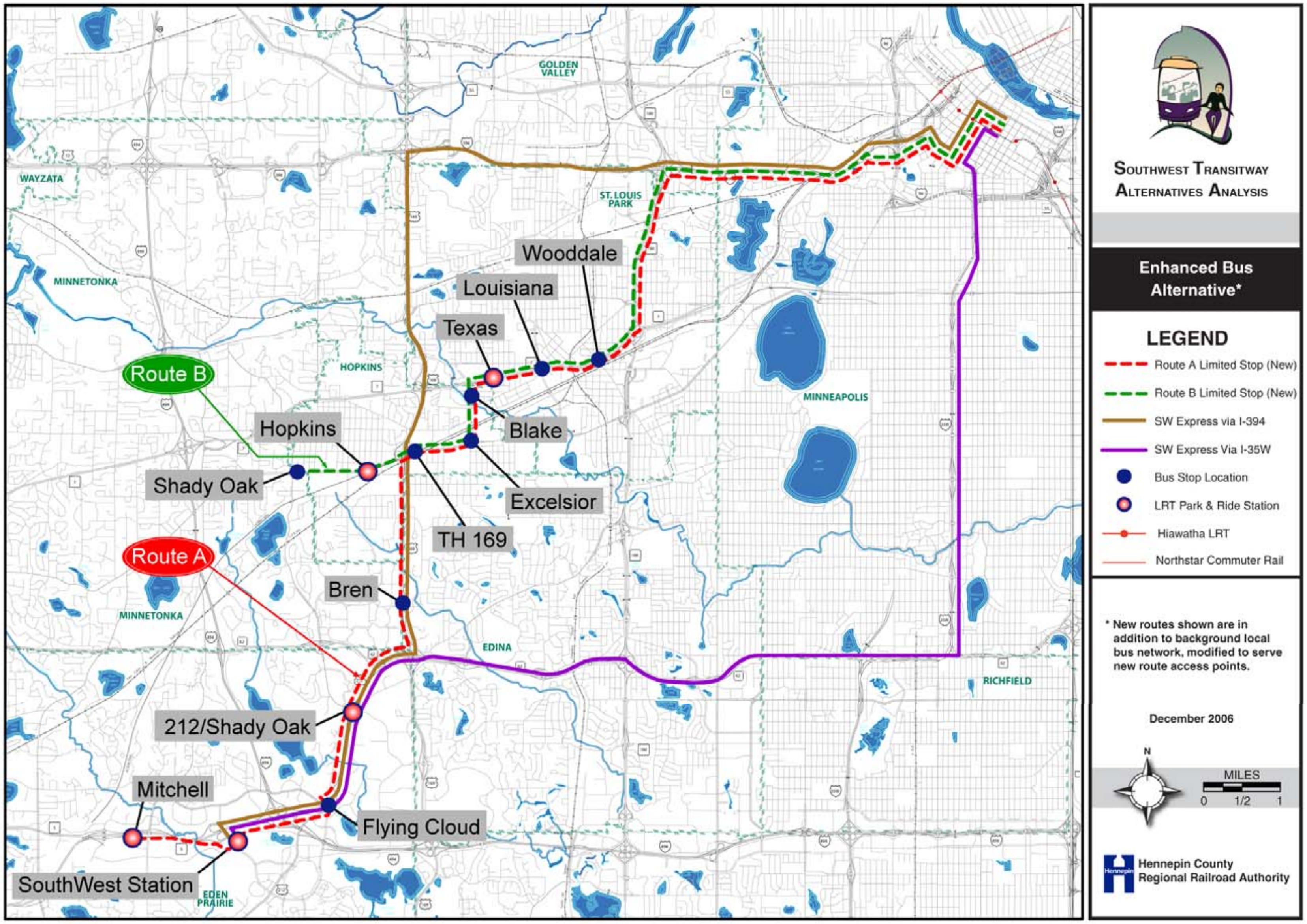
- To provide better integration with Eden Prairie's plan for the Major Center Area, the Eden Prairie Center Station is moved west about 1/3 mile and renamed Eden Prairie Town Center Station.

- Because of existing terrain, the routing through the north end of Opus is changed.

## *D. Refined Alternatives for Evaluation*

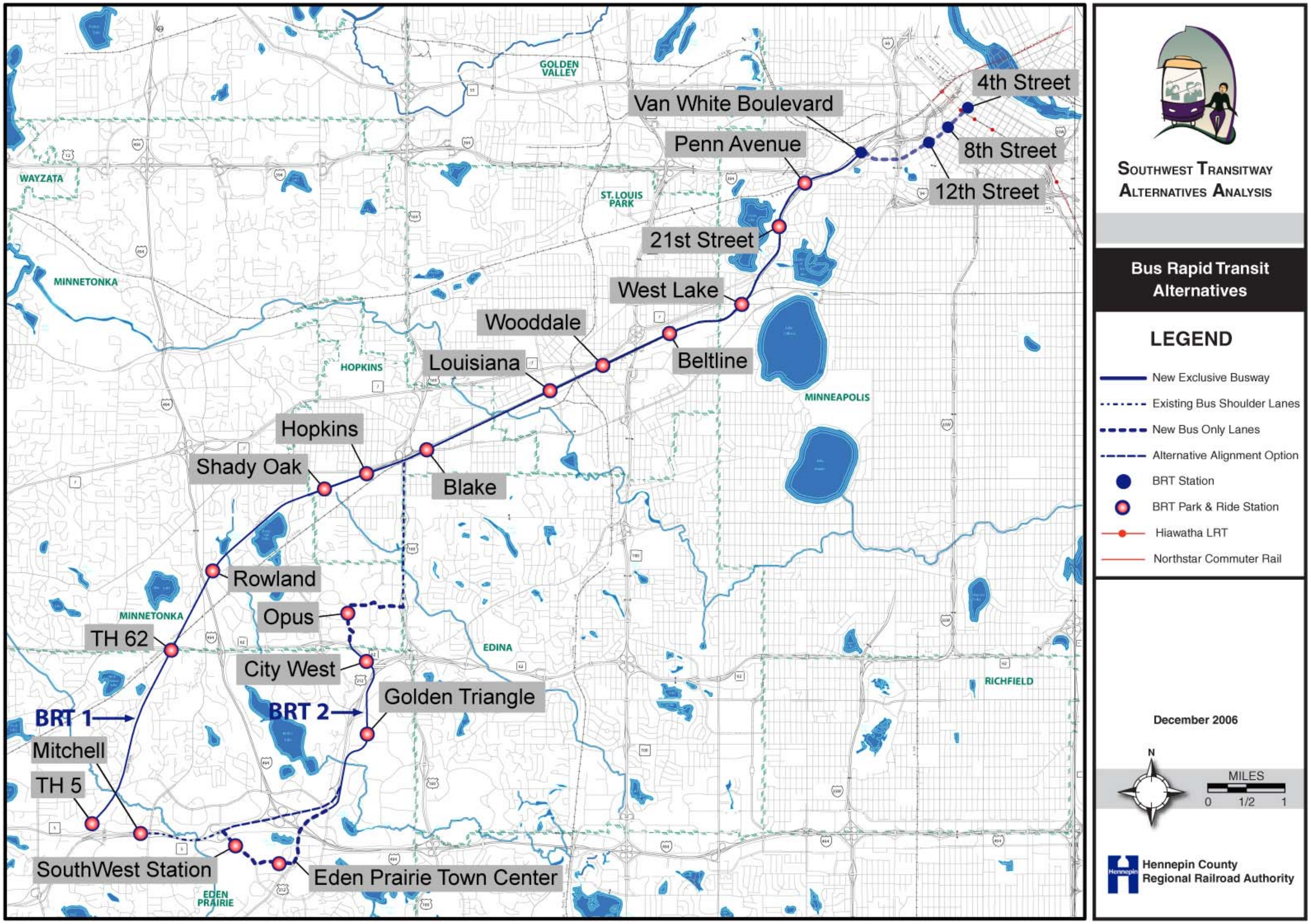
Figures 5 through 7 illustrate the Enhanced Bus, BRT and LRT A and C alternatives refined for evaluation in the Southwest Transitway Alternatives Analysis. Appendix D describes the alignment, stations, infrastructure requirements, service plan, and connecting transit service for each refined alternative. Following the figures 5 through 7, Table 15 identifies the stations included in the refined alternatives.

**Figure 5: Refined Enhanced Bus Alternative**



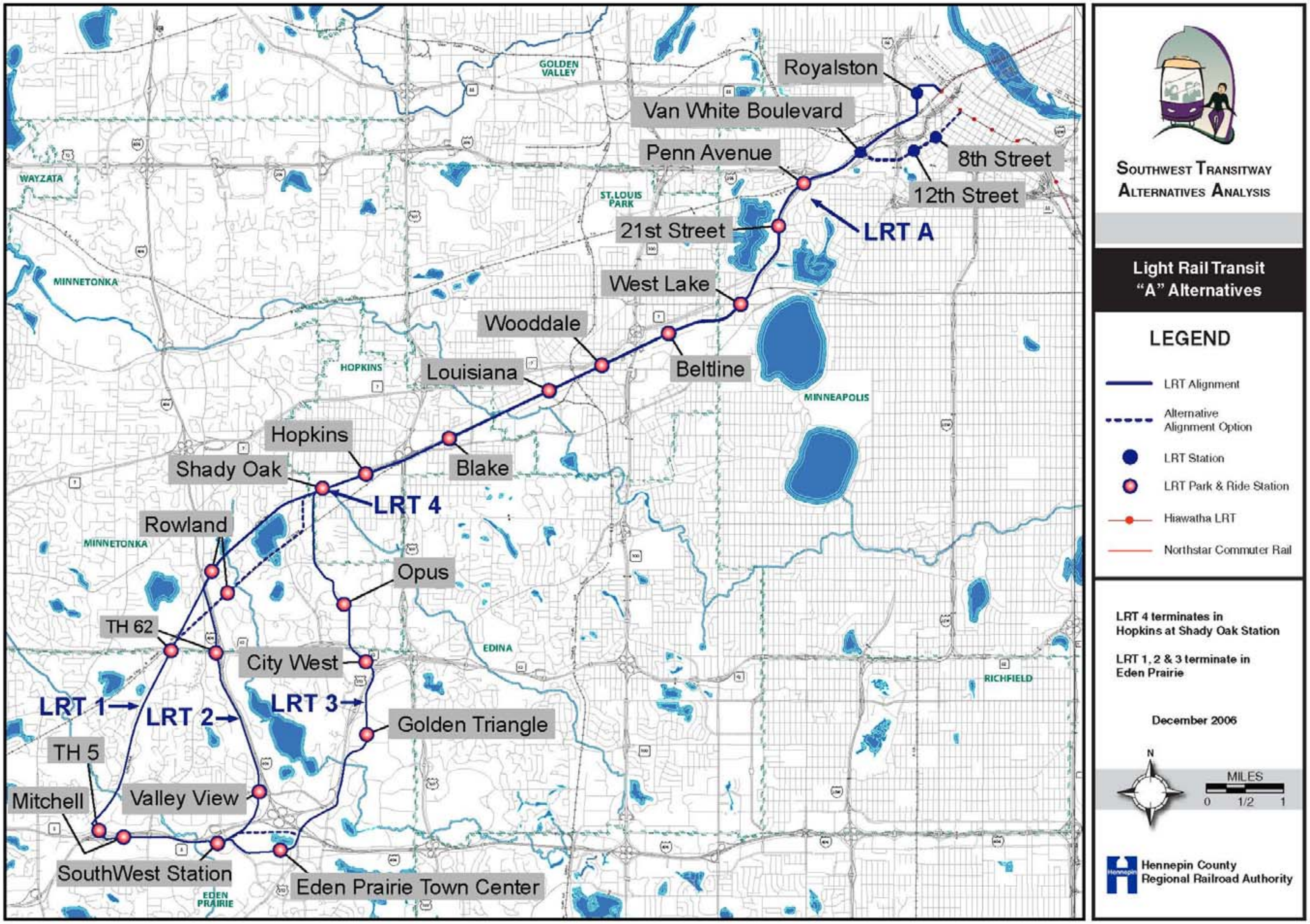

*Source: Parsons Brinckerhoff, 2007.*

**Figure 6: Refined Bus Rapid Transit Alternatives**



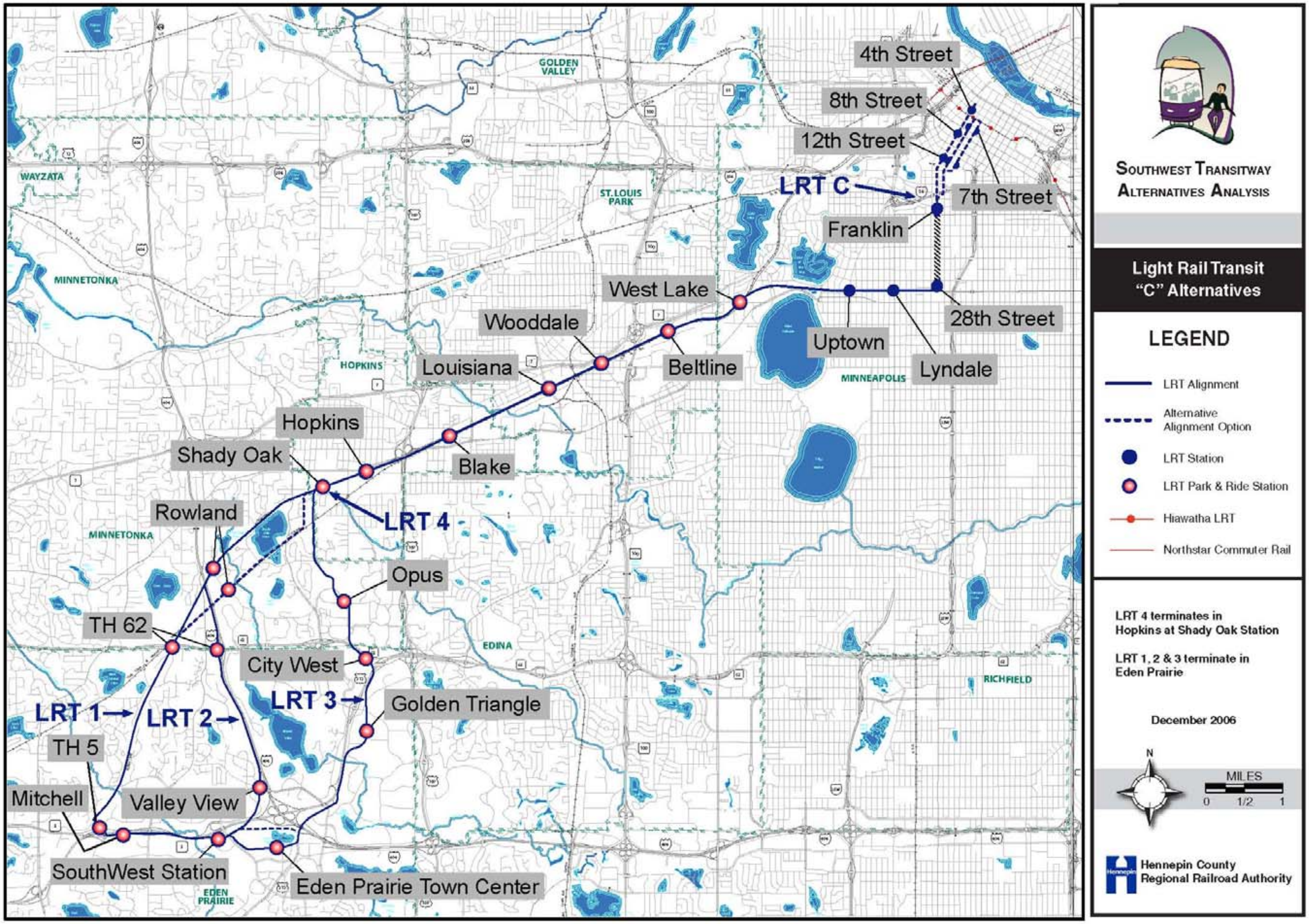

*Source: Parsons Brinckerhoff, 2007.*

**Figure 7: Refined Light Rail "A" Alternatives**




*Source: Parsons Brinckerhoff, 2007.*

**Figure 8: Refined Light Rail "C" Alternatives**




*Source: Parsons Brinckerhoff, 2007.*

## Table 15 Stations Served by Refined Southwest Transitway Alternatives

| Station (Enhanced Bus Stop) | Enhanced Bus Alternative | BRT Alternatives | | LRT Alternatives | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 1A | 2A | 3A | 4A | 1C | 2C | 3C | 4C |
| TH 5 / HCRRA | | x | x | x | | | | x | | | |
| Mitchell Rd. | x | | | | x | x | | | x | x | |
| TH 62 / HCRRA | | x | | x | | | | x | | | |
| SouthWest Station | x | | x | | x | x | | | x | x | |
| Valley View | | | | | x | | | | x | | |
| TH 62/Baker Rd | | | | | x | | | | x | | |
| Eden Prairie Town Center | | | x | | | x | | | | x | |
| Flying Cloud Dr. / TH 212 | x | | | | | | | | | | |
| Golden Triangle | | | x | | | x | | | | x | |
| City West | | | x | | | x | | | | x | |
| Rowland Rd. / HCRRA | | x | | x | x | | | x | x | | |
| Shady Oak Rd. / TH 212 | x | | | | | | | | | | |
| Opus / Bren | x | | x | | | x | | | | x | |
| Shady Oak Rd. / HCRRA | | x | X | x | x | x | x | x | x | x | x |
| Hopkins $8^{th}$ Ave. / HCRRA | | x | | x | x | x | x | x | x | x | x |
| Hopkins / $8^{th}$ Ave. | | | | | | | | | | | |
| TH 169 / Excelsior | x | | | | | | | | | | |
| Excelsior / Blake | x | | | | | | | | | | |
| Blake Rd. / TH 7 | x | | | | | | | | | | |
| Texas / TH 7 | x | | | | | | | | | | |
| Blake Rd./HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Louisiana Ave. / HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Louisiana Ave / TH 7 | x | | | | | | | | | | |
| Wooddale Ave. / HCRRA | | x | x | x | x | x | x | x | x | x | x |
| Wooddale Av / TH 7 | x | | | | | | | | | | |
| Beltline Blvd. / HCRRA | | x | x | x | x | x | x | x | x | x | x |
| West Lake St. / HCRRA | | x | x | x | x | x | x | x | x | x | x |
| $21^{st}$ St. / HCRRA | | x | x | x | x | x | x | | | | |
| Penn Ave. / HCRRA | | x | x | x | x | x | x | | | | |
| Van White Blvd. / HCRRA | | x | x | x | x | x | x | | | | |
| Royalston Ave. | | | | x | x | x | x | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Intermodal Station | | | | x | x | x | x | | | | |
| Hennepin Avenue Option [1] | | | | x | x | x | x | | | | |
| Hiawatha LRT downtown [2] Minneapolis Stations | | | | x | x | x | x | | | | |
| Enhanced Bus Stops Downtown Minneapolis | x | | | | | | | | | | |
| $12^{th}$ / Hennepin | | x | x | x | x | x | x | | | | |
| $8^{th}$ / Hennepin | | x | x | x | x | x | x | | | | |
| Uptown Station | | | | | | | | x | x | x | x |
| Lyndale / Midtown | | | | | | | | x | x | x | x |
| $28^{th}$ / Nicollet | | | | | | | | x | x | x | x |
| Franklin / Nicollet | | | | | | | | x | x | x | x |
| $12^{th}$ / Nicollet or $2^{nd}$ / Marquette | | | | | | | | x | x | x | x |
| $8^{th}$ / Nicollet or $7^{th}$ on $2^{nd}$ / Marquette | | | | | | | | x | x | x | x |
| $4^{th}$ / $5^{th}$ Street | | x | x | x | x | x | x | x | x | x | x |

*Source: Parsons Brinckerhoff, 2006*

Notes: 1. Hennepin Avenue Option replaces the Royalston Avenue and proposed Intermodal Stations with $12^{th}$ and $8^{th}$ Street stations. LRT riders with this option can only access Warehouse Hiawatha LRT station via transfer but can directly access all other Hiawatha LRT stations.

2. Downtown Minneapolis Hiawatha LRT stations -- direct access to stations from Warehouse District to Metrodome; as well as all other Hiawatha LRT stations via transfer.

## Appendix A: Transit Technology Screening

The following transit technologies were considered for inclusion in the Southwest AA Study:

- Conventional Diesel Bus (including use of HOV lanes)
- Bus Rapid Transit
- Streetcar
- Light Rail Transit (LRT)
- Heavy Rail Transit (subway)
- Commuter Rail (bi-level and diesel multiple unit)
- Automated Guideway Transit (AGT)/Monorail
- Personal Rapid Transit (PRT)

The screening criteria included the following:

- **Compatible with the study area's transit travel demand**
  The technology is easily able to accommodate the line-haul transit travel demand of the corridor. Other technologies may be appropriate for shorter-distance feeder or circulator service to stations, and could be considered by others for connecting service to the principal corridor technology.
- **Proven Technology**
  The technology is fully implemented with a history that can be research and studied.
- **Compatible with existing infrastructure**
  The technology is compatible with existing and planned infrastructure and will not require massive retrofit of existing infrastructure.
- **Identified in the region's long-range transportation plan, the TPP, and/or other studies**
  The Metropolitan Council, acting as the region's Metropolitan Planning Organization (MPO), prepares the region's long-range plan for transit and transitways.
  In addition, a number of other studies have been completed documenting the feasibility of bus rapid transit, light rail transit, and commuter rail. These studies include the *Hennepin County LRT System Draft Environmental Impact Statement (DEIS), 1989*; the *29th Street and Southwest Busway Feasibility Study, 2000*; *Mn/DOT's Exclusive Busway Study, 2000*; and *Mn/DOT's Commuter Rail System Plan, 1997*.

As a result of this analysis the transit technologies retained for inclusion in the Southwest Alternatives Analysis (AA) study include the conventional diesel bus (including use of HOV and shoulder bus lanes), bus rapid transit (BRT), and light rail transit (LRT). The technologies retained for inclusion in the Southwest AA provide for on-vehicle bicycle transport.

Methods of access to the primary technology of the corridor currently include pedestrian, bicycle, local circulator bus, and automobile drop-off and park-and-ride facilities. Other technologies may be considered in the future. Current and potential future methods and technologies for feeder service developed by others are not evaluated in this discussion.

## Figure A-1: Transit Technology Review

| Modes | Compatibility with Travel Demand | Proven Technology | Compatibility with Existing Infrastructure | Identified in the Regional Transportation Plan | Recommendation |
|---|---|---|---|---|---|
| Conventional Bus | ○ | ○ | ○ | ○ | Retain |
| BRT | ○ | ○ | ○ | ○ | Retain |
| Light Rail Transit (LRT) | ○ | ○ | ○ | ○ | Retain |
| Streetcar (Modern)* | ◐ | ○ | ◐ | ● | Not Retain |
| Heavy Rail Transit | ● | ○ | ● | ● | Not Retain |
| Commuter Rail | ● | ○ | ○ | ○ | Not Retain |
| Monorail/AGT (Automated Guideway Transit) | ● | ○ | ● | ● | Not Retain |
| Personal Rapid Transit (PRT) | ● | ● | ● | ● | Not Retain |

LEGEND

**Compatibility with Travel Demand:** Ability of service type to accommodate expected travel demand
**Proven Technology:** Fully implemented and able to be evaluated
**Compatibility with Existing Infrastructure:** Does not require massive retrofit of existing infrastructure
**Identified in the Regional Transportation Plan:** Identified in the Metropolitan Council's Transportation Policy Plan (TPP)

*May be appropriate for intercity/local circulator service connecting to/from the corridor

○ Fully Meets Criteria
◐ Partially Meets Criteria
● Does Not Meet Criteria

10Aug05

## Conventional Bus

### *Description*

The 40-foot diesel transit bus is the most commonly used transit vehicle in the world. Buses offer the flexibility of operation in mixed traffic on city streets and highways.  A standard 40-foot bus has a seated capacity of 44.

Conventional Bus in Twin Cities

Throughout the region, conventional buses provide express, limited-stop, and local circulator service.  Currently, the Twin Cities is the 11th largest transit system in the country. According to the Metropolitan Council's Transit 2030 plan, conventional buses are and will remain the backbone of the region's transit system.

### *Transit Advantages*

Through a partnership called Team Transit, Mn/DOT, Metropolitan Council, transit agencies, cities and counties, have cooperated to provide a system of advantages for transit vehicles to help improve the efficiency of the region's freeways by implementing bus-only shoulders, bus-only ramps, and High Occupancy Vehicle (HOV) lanes.

### *Bus-Only Shoulders and Ramps*

Bus-only shoulders and ramps are a quick, inexpensive way to allow buses to bypass congestion on the freeway system by using the shoulders.  Buses are restricted to use of the bus only shoulder lanes only during congested freeway times and the buses are only allowed to travel 15 miles faster than the flow of the general purpose lanes or a maximum of 35 miles per hour.

***High Occupancy Vehicle (HOV) lanes***
Two HOV lanes exist in the Twin Cities region. One is a reversible HOV lane located in the center of I-394. The other is located in the I-35W corridor from Lakeville to Minneapolis. Buses and car pools with at least two occupants are allowed to utilize the HOV lanes.

***Compatibility with Travel Demand***
While conventional buses operating express and limited stop service provide line-haul transit service to the study area, their ability to continue to provide a competitive travel option may be jeopardized as roadway congestion continues to increase.

Conventional bus service is also appropriate for connecting or feeder service to corridor access points/stations. This technology currently provides connecting service to the Hiawatha LRT stations through Bloomington and Minneapolis.

***Compatibility with Existing/Planned Infrastructure***
A conventional bus operating on city streets and highways is compatible with the region's existing and planned transportation infrastructure.

***Existing Systems***
All major metropolitan areas in North American have a transit system including conventional bus operations.

***Identified in the Transportation Plan (Transit 2030)***
The Metropolitan Council, the region's Metropolitan Planning Organization (MPO), identifies conventional bus operations as remaining the backbone of the regional transit system.

## Bus Rapid Transit

***Description***
Bus Rapid Transit (BRT) attempts to combine the flexibility of buses with the frequency and travel time advantages of rail transit. BRT typically offers high capacity, high-frequency bus operation along an exclusive bus-only roadway with on-line, high amenity stations. A typical bus rapid transit guideway is a two-lane bus only roadway a minimum of 28 feet in width.


Proposed BRT Service in Eugene, Oregon

According to the Federal Transit Administration (FTA), "BRT combines the quality of rail transit and the flexibility of buses. A BRT system combines *intelligent transportation systems* technology, priority for transit, cleaner and quieter vehicles, rapid and convenient fare collection, and integration with land use policy."[2]

BRT systems typically offer high frequency, limited-stop bus operations in primarily exclusive right-of-way with on-line stations. The use of exclusive right-of-way, limited-

[2] http://www.fta.dot.gov/7639_7662_ENG_HTML.htm

stop operations, and on-line stations provides passengers with quick and reliable service. The on-line stations are similar to rail stations providing passengers with seating, shelter form the elements, bike racks, schedules and maps, park/ride lots, and ticket machines.

***Compatibility with Travel Demand***
Due to the high service frequency and travel time competitiveness it is likely that a bus rapid transit system can accommodate the projected travel demand.

***Compatibility with Existing/Planned Infrastructure***
A BRT system is assumed to require construction of some bus only roadway which is consistent with the existing and planned infrastructure in the region. In addition, a BRT is likely to also utilize bus-only roadways, bus-only shoulder lanes, ramp meter bypasses, and other transit advantages. The region currently provides these types of facilities to improve transit travel time reliability and encourage transit usage.

***Existing Systems***
Bus Rapid Transit (BRT) is a relatively new concept, but does operate in a number of North American cities including Los Angeles, Pittsburgh, Eugene, and Boston.

***Identified in the Regional Transportation Plan (Transit 2030)***
The Metropolitan Council, the region's Metropolitan Planning Organization (MPO), does identify Bus Rapid Transit as a potential transitway technology in the region's long-range transit plan, Transit 2030.

In addition, the Minnesota Department of Transportation (Mn/DOT) *Twin Cities Exclusive Busway Study, 2000*, determined that an exclusive busway from Eden Prairie to downtown Minneapolis was a feasible transitway alternative. Hennepin County and Metro Transit also conducted a busway feasibility study for the Southwest (defined as Hopkins to downtown Minneapolis) in 1999 and determined that busway or BRT was a feasible alternative for a Southwest Transitway.

## Light Rail Transit

***Description***
Light rail transit (LRT) is a medium to high capacity passenger rail service that can be used both for short and line-haul trips. LRT technology has evolved from the streetcar system to a more modern system that can carry more passengers further and faster. LRT vehicles typically operated in exclusive or semi-exclusive rights-of-way and are powered from an overhead electrification system.


The Twin Cities Hiawatha LRT line

LRT can operate in single-track or double-track configuration employing a single car or multiple car training. LRT stations are typically spaced about one to two miles apart in suburban areas and one-half mile in the downtown area.

In June 2004, the Twin Cities began operation on the region's first light rail transit (LRT) line, the Hiawatha line. The Hiawatha LRT line connects downtown Minneapolis with the Minneapolis St. Paul International Airport (MSP) and the Mall of America.

***Compatibility with Travel Demand***
A light rail transit (LRT) system operating at frequencies similar to the Hiawatha LRT line is expected to accommodate the projected travel demand.

***Compatibility with Existing/Planned Infrastructure***
While a light rail transit (LRT) system serving the southwest metro area will require new infrastructure, that infrastructure is compatible with the infrastructure constructed for the Hiawatha LRT line.

***Existing Systems***
Light rail transit systems operate in numerous North American cities including Denver, Portland, Salt Lake City, and Los Angeles.

***Identified in the Regional Transportation Plan (Transit 2030)***
The Metropolitan Council, the region's Metropolitan Planning Organization (MPO), does identify Light Rail Transit (LRT) as a potential transitway technology in the region's long-range transit plan, Transit 2030.

Light Rail Transit (LRT) has been studied as a feasible technology for a Southwest Transitway since the mid-1980s. A Southwest LRT line was first included in the *Hennepin County Stage 1 LRT Plan, 1988.*

In 2003 the *Southwest Rail Transit Study* was completed which identified four potential light rail transit (LRT) routes as feasible and appropriate for further evaluation.

## Streetcar

***Description***
Streetcars were the precursor to the modern day light rail vehicles. Today, streetcars come in several different forms from a modern vehicle as shown on the right to replica and refurbished vehicles. Streetcar technology is similar to light rail technology in terms of track gauge and operations. In contrast to modern light rail systems, streetcars systems typically serve intra-city trips and are more likely to share street rights-of-way with other vehicles. Streetcar vehicles are typically smaller, lighter, and have fewer seats than light rail vehicles. This design makes them efficient at serving short trips within relatively densely populated areas.

Streetcar in Portland, Oregon

Streetcars typically operate in mixed traffic on surface streets serving short distance intra-city trips with stops as frequently as every few blocks. They are well suited to local transit needs in developed urban major activity centers, and are often used as shuttle service to attractions, shopping, downtown circulation, parking areas and airports.

***Compatibility with Travel Demand***
Streetcars typically serve a circulator/distributor function for short distance intra-city trips. They do not typically serve longer distance trips from low density suburban areas to the intercity core.

Streetcar technology is under consideration for implementation adjacent to the existing bicycle/pedestrian trails in the Midtown Corridor.  This technology may be appropriate for connecting or feeder service to the line-haul service being evaluated for the Southwest Corridor.

***Compatibility with Existing/Planned Infrastructure***
Streetcars use the same track gauge and similar overhead electrification systems as light rail transit vehicles.  In Portland, light rail vehicles and streetcars share the same tracks.

***Existing Systems***
Streetcar systems currently exist in numerous North American cities including Portland, New Orleans, San Francisco, and Memphis.

***Identified in the Regional Transportation Plan (Transit 2030)***
The Metropolitan Council, the region's Metropolitan Planning Organization (MPO), does not identify streetcars as a potential transitway technology in the region's long-range transit plan, Transit 2030.


Subways offer high-capacity service

## Heavy Rail Transit (Subway)

***Description***
Heavy rail, commonly referred to as a subway, is a high-capacity, high-speed transit service that operates on exclusive tracks with an electrified third rail and no grade crossings.  Heavy rail systems typically service high density areas with significant congestion problems such as Chicago, New York, Boston, and London.

***Compatibility with Travel Demand***
The anticipated travel demand in the southwest metro area does not warrant the high frequency and intense infrastructure demands of heavy rail transit.

**Compatibility with Existing/Planned Infrastructure**
Heavy rail requires construction on a new unique guideway that cannot be shared with bus, light rail or commuter rail vehicles.

**Existing Systems**
Heavy rail systems exist throughout the U.S. and the rest of the world.  Existing heavy rail systems include the El in Chicago, the T in Boston, the Metro in Washington D.C., the Subway in New York, MARTA in Atlanta, and the Tube in London.

**Identified in the Regional Transportation Plan (Transit 2030)**
The Metropolitan Council, the region's Metropolitan Planning Organization (MPO), does not identify heavy rail transit (subway) as a potential transitway technology in the region's long-range transit plan, Transit 2030.

## Commuter Rail

### *Description*

New Jersey Commuter Rail

Commuter rail service in this region is defined as passenger rail service operating on existing freight rail tracks.  Service is typically between outer suburban, exurban areas and the city center.  Trains typically operate every half hour in bound in the morning and outbound in the evening. Commuter rail stations are typically spaced three to five miles apart.

Commuter rail is primarily oriented toward commuter service to outer suburban regions, and as a result it typically serves longer trip than most light and heavy rail transit lines.  Commuter rail trains are normally made up of a locomotive and several passenger coaches.  Commuter rail uses either single or bi-level passenger cars.  Commuter rail vehicles have an on-board operator, who adjusts vehicle speed in response to traffic conditions and railway signaling requirements. Commuter rail vehicles have the ability to share track with freight trains and other intercity passenger services such as Amtrak.

### *Compatibility with Travel Demand*

Due to the low service frequency (approximately every 30 minutes) and hours (peak only) it is unlikely that commuter rail service could accommodate the projected travel demand for the southwest metro area.

### *Compatibility with Existing/Planned Infrastructure*

While implementation of commuter rail service typically requires station construction, track improvements, and track leasing fees, the required infrastructure is compatible with the infrastructure required for the proposed Northstar commuter rail line.

### *Existing Systems*

Commuter rail systems exist in numerous North American cities including Dallas, Virginia, Chicago, Washington D.C., and San Francisco.

### *Identified in the Regional Transportation Plan (Transit 2030)*

While commuter rail is identified in the regional transportation plan as a potential transitway technology, a commuter rail route serving the southwest metro area is not identified.

During the 1997 Minnesota Legislative session, the Legislature instructed the Minnesota Department of Transportation (Mn/DOT) to conduct a feasibility study to determine if the Twin Cities metropolitan area could support commuter rail service. Out of 19 rail corridors studied, 6 proved to be feasible of supporting commuter rail services. Those 6 lines were divided into two tiers. Tier one included the Northstar Corridor from St. Cloud to Minneapolis, the Red Rock Corridor from Hastings to Minneapolis, and the Dan Patch Corridor from Lakeville to Minneapolis. Tier two includes the Bethel Corridor, the Rush Line Corridor and the Norwood-Young America Corridor.  The Southwest Corridor was not identified as a commuter rail corridor.

A diesel multiple unit (DMU) option was evaluated for the Southwest Corridor during the *Southwest Rail Transit Study, 2003*. The diesel multiple unit (DMU) technology was included in the Southwest Rail Transit Study to determine if it is a lower cost alternative that could more easily be implemented than light rail transit (LRT). Based upon the analysis conducted for this study, the Southwest TAC determined and the Southwest PAC concurred that the Aero DMU technology would not result in significantly lower cost alternative and would not necessarily be easier to implement than LRT.

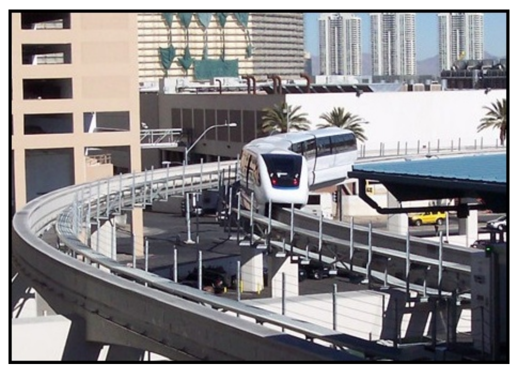
While the DMU capital costs were estimated to be approximately 10 percent less than LRT these cost savings are quickly eroded due to the higher operating and maintenance costs for the DMU technology. The higher operating and maintenance costs are due to higher costs, $1 to $2 million/year, for general operations and maintenance as well as the annual lease payment, estimated to range from $1 million to $7.5 million per year, to the private freight rail companies. In order to implement a DMU system an additional track must be constructed and a lease agreement must be negotiated with the Canadian Pacific, Twin City & Western, and Burlington Northern & Santa Fe freight rail companies.

Other issues with the DMU technology included the lack of a seamless connection to downtown Minneapolis, the University of Minnesota, the MSP Airport, the Mall of America, and downtown St. Paul; the fact that the Aero DMU is a prototype and not currently in operation; and the potential noise, vibration, and emissions impact of the DMU vehicle.

### Monorail/Automated Guideway Transit (AGT)

***Description***

Monorail/Automated Guideway Transit (AGT) is an electric rail system in which the vehicles are suspended from or straddles a guideway. Most of these systems are driverless, utilize heavy rail technology (i.e., an electrified rail), and are separated from other traffic. AGT/Monorails are typically used for circulation/distribution at airports including Atlanta's Hartsfield-Jackson Int'l Airport; at theme parks including Walt Disney World; and along the Las Vegas strip as shown in the photo.



Monorail system in Las Vegas

***Compatibility with Travel Demand***

Monorail/AGT is a transit service intended to circulate/distribute passengers within a relatively small geographic area. It is also intended to provide connections to larger line-haul transit systems. As such, Monorail/AGT is not compatible with the anticipated travel demand from the southwest area.

***Compatibility with Existing/Planned Infrastructure***

A Monorail/AGT system requires construction of a new separated guideway that is unique and cannot be used by buses, light rail or commuter rail vehicles.

***Existing Systems***

Monorail/AGT systems currently exist in Las Vegas, Seattle, Disneyworld and many airports.

***Identified in the Regional Transportation Plan (Transit 2030)***
The Metropolitan Council, the region's Metropolitan Planning Organization (MPO), does not identify Monorail/Automated Guideway Transit (AGT) as a potential transitway technology in the region's long-range transit plan, Transit 2030.

PRT provides point-to-point service

## Personal Rapid Transit (PRT)

***Description***
Personal Rapid Transit is a transit system that provides point-to-point, demand-responsive service to individuals or small groups. Electrically powered vehicles carrying 3 to 5 passengers travel on 16 foot high guideways separated from traffic.

PRT is designed to serve as a circulator/distributor transit system providing service within business parks/airports/campus environments and making connections to line-haul transit systems such as LRT, BRT, Commuter Rail, Heavy Rail, and conventional bus.

***Compatibility with Travel Demand***
PRT is a transit service intended to circulate/distribute passengers within a relatively small geographic area. It is also intended to provide connections to larger line-haul transit systems. As such, PRT is not compatible with the anticipated travel demand from the southwest area.

PRT may be appropriate as a feeder to a line-haul system, connecting to areas using this type of an internal circulation/distribution system.

***Compatibility with Existing/Planned Infrastructure***
A PRT system requires the construction of an elevated guideway to separate the service from other traffic. The PRT elevated guideway is unique and could not be used by other transit vehicles such as buses or light rail vehicles. The system also requires elevated stations with Americans with Disabilities (ADA) compliant elevators at each station. PRT stations are designed to be approximately ¼ mile apart.

***Existing Systems***
No large scale PRT system exists today.

***Identified in the Regional Transportation Plan (Transit 2030)***
The Metropolitan Council, the region's Metropolitan Planning Organization (MPO), does not identify Personal Rapid Transit as a potential transitway technology in the region's long-range transit plan, Transit 2030.

## Introduction

This report provides an inventory of previous studies on the proposed Southwest Transitway Corridor. Hennepin County Department of Housing, Community Works and Transit has an archive of these studies and related work at their building on 417 N. 5th St. in Minneapolis.

## Southwest Transitway Corridor Reports

**The Feasibility of LRT in the Twin Cities Metropolitan Area, Metropolitan Council (1981)**

During the 1980 Legislative Session, the Minnesota Legislature directed the Metropolitan Council to conduct a feasibility study of the use of light rail transit in the Metropolitan Area and appropriated a sum of $150,000 for that purpose. The feasibility study included the following corridors: West, Southwest, University, Northeast, Northwest, and Hiawatha. The report concluded that the three corridors with the most promise were the University, Southwest, and Hiawatha corridors.

**Comprehensive LRT System Plan for Hennepin County, HCRRA (June 1988)**

The Hennepin County Regional Railroad Authority (HCRRA) was directed by the Minnesota Legislature in 1987 to develop a comprehensive plan prior to implementation of a light rail transit system. The HCRRA received an additional requirement that three specific corridors (a southern, northern and southwest) be studied for ridership potential, cost of development and derived public benefit. The final product included a 20-Year Plan, which identified the candidate corridors, and the Stage I Plan, to be implemented in the following eight years.

HCRRA's Comprehensive LRT System Plan for Hennepin County identified the corridor characteristics to be analyzed:

- Railroad and other rights-of-way for LRT track location
- LRT passenger station locations
- Estimated ridership by corridor, residents and visitors
- Cost of building an LRT system
- Cost of operating and maintaining an LRT system
- Benefits of LRT system
- Provisions of feeder bus services
- Park-and-ride lots at LRT stations
- LRT/surface street traffic operations
- Development potential in LRT station areas

The plan also listed downtown Minneapolis LRT issues, such as at-grade vs. subway location, station locations, Nicollet Mall vs. not on the mall and impacts on surface street operations.

Both plans identified the Southwest Corridor, with proposed operation from Hopkins to downtown Minneapolis. A number of alignments were analyzed for the Southwest Corridor:

- 1 – Kenilworth
- 2 – Hennepin Ave.
- 3 – LaSalle and 1st Ave.
- 4 – Nicollet Avenue
- 5 – I-35W
- 6 – Portland/Park Avenues

The Comprehensive Plan concluded that the 29.1 miles of the Stage I System would meet one or more significant travel needs, would be within the financial capacity of the HCRRA and was buildable within a six-to eight-year time frame.

**Hennepin County Stage I LRT System Scoping Decision Document, HCRRA (November 8, 1988)**

The system studied in preparation for the EIS is based on the adopted *Comprehensive LRT System Plan for Hennepin County – Stage I*.

Two LRT alternatives were selected for detailed analysis in the EIS:

Alternative 1: Build an LRT system generally based on the adopted Comprehensive LRT System Plan for Hennepin County – Stage I. In addition, they had three options for the Central Area Alignment:

Option A – a tunnel between the Metrodome and 29th Street and Nicollet Avenue
Option B – an east/west tunnel in downtown, and routing the Southwest Corridor through Kenilworth.
Option C – an at-grade option

Alternative 2: No-build.

Issues the EIS would not address:

- Other transit modes – Other modes had previously been studied and it was determined that LRT was appropriate in the corridors identified in the Hennepin County LRT System Plan.
- Consistency with existing local comprehensive and other adopted plans – LRT was not a component of any comprehensive plans of any cities within the Stage I LRT system, therefore could not be examined.

**Draft Environmental Impact Statement (DEIS), Hennepin County Light Rail Transit System, HCRRA (November 1989)**

The Draft Environmental Impact Statement for the Hennepin County Regional Railroad Authority's proposed 33.9 – 35.55-mile Hennepin County Light Rail Transit System covered four corridors radiating from downtown Minneapolis: University Corridor, Hiawatha Corridor, Southwest Corridor and the Northwest Corridor. All the corridors in the proposed Hennepin County LRT system were identified in the adopted *Comprehensive LRT System Plan for Hennepin County* (June 1988) as part of the Stage I System Plan.

The Southwest Corridor would operate between 5th Avenue in Hopkins and downtown Minneapolis. The alignment options consisted of:

- Tunnel Option – following the Midtown Corridor, where it would enter the tunnel at Portland Avenue, cross under I-35W at 26th Street and continue under ground under 3rd Avenue to Marquette Avenue and to downtown.
- Option A: Nicollet At-Grade – The Southwest Corridor (coming from the West) and the Hiawatha Corridor (coming from the East) would converge in the Midtown Corridor at Nicollet Avenue and travel north at-grade.
- Option B: HCRRA Alignment through Kenwood – The Southwest would travel on the HCRRA's right-of-way in the Kenilworth Corridor.

***Alternatives Considered:***

- Build LRT – Build system based on the adopted Comprehensive LRT System Plan for Hennepin County. The routes built may be composed of a combination of system links as identified in the alignment options.
- No Build – Regular transit service would continue.

***Overriding Principles:***

- LRT must be competitive with cars.
- LRT service must efficiently serve trips between corridors.

**LRT Preliminary Design Plans: Stage I System in Minneapolis, HCRRA, (May 1990)**

This document contains the alignment and station plans for the Southwest Corridor and other corridors from the *Comprehensive System Plan for Hennepin County* (June 1988). The plans are for the stretch of the Southwest Corridor from the St. Louis Park/Minneapolis border to the Nicollet Avenue Station. What is referred to as the "Central Corridor" is the underground connection to downtown, via Portland, 3rd, Marquette and Nicollet Avenues.

**Preliminary Design of the Stage I LRT System in Minneapolis, HCRRA, (June 1990)**

This technical memorandum presents the Preliminary Design Plan for LRT in five proposed major areas for the Stage I System. It includes completion of design activities to approximately a ten percent level for the LRT plans, including the Southwest Corridor. The Southwest Corridor was assumed to begin at 5th Avenue in Hopkins and terminate at 4th Street (Library)/Nicollet Avenue in Minneapolis. The segment from 5th Avenue to I-35W was assumed to operate at-grade in the Soo Line right-of-way. From that point the route was assumed to join with the Hiawatha LRT line in a tunnel beginning at the intersection of Portland Avenue and the Midtown Corridor and ending at First Avenue North and First Street South.

Stations were proposed to include: Excelsior Boulevard, Tyler Avenue, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, Abbott Avenue, Hennepin Avenue, Lyndale Avenue, Nicollet Avenue, Portland Avenue, Franklin Avenue, Convention Center, 7th Street and the Library Station.

**Preliminary Design of the Southwest LRT Corridor in the Cities of St. Louis Park and Hopkins, HCRRA (November 1990)**

This report is the technical memorandum for the Preliminary Design Plan for the proposed Southwest Corridor in St. Louis Park and Hopkins. These plans present the

4.4-mile long alignment on the existing Soo Line right-of-way from the Minneapolis/St. Louis Park border to 5th Avenue in Hopkins.

The report addresses adequacy of bridges and structures along the route, proposed station locations and facilities, their site descriptions, a preliminary feeder bus plan, street system interface and railroad coordination.

**Light Rail Transit Regional Coordination Plan, Regional Transit Board, (December 1990)**
This plan provided guidelines for the design, construction and operation of LRT in the Twin Cities, and was a companion document to the *LRT Development and Financial Plan,* published by the Regional Transit Board[3] in February 1990. The proposed 10-year plan identified 83 miles of LRT, including the Southwest Corridor (defined as Hopkins to downtown Minneapolis), implementation of which would cost a total of $1.6 billion (1991 dollars).

**HCRRA Baseline Cost Estimate, HCRRA (1991)**
This document outlines the estimated baseline costs for the Hennepin County Stage I Light Rail Transit System, which includes the Southwest Corridor.

**St. Louis Park Railroad Study, St. Louis Park, (January 1999)**
St. Louis Park's primary objective was to reduce the impacts of train movement through the city. The tasks conducted by the consultants included reviewing the future of railroad transportation in the St. Louis Park area. The report provides a factual account of railroad infrastructure and operations in 1999. In addition, it includes future projections of railroad companies currently operating in the town, as well as light rail and commuter rail considerations. It documents those who were affected by railroad operations, the NL/Golden Auto Site Redevelopment and an identification of alternatives, with cost estimates for mitigation.

After completion of the report, the St. Louis Park City Council issued a position statement that included their acceptance of the rerouting of freight trains at such a time as they are displaced in the Kenilworth Corridor by mass transit.

**Transit 2020 Master Plan, Metropolitan Council (February 2000)**
In February of 2000, the Metropolitan Council published the Transit 2020 Master Plan, the region's long-range plan for improving transit. This plan states the overall goal is to double transit ridership in the region by 2020 through doubling the capacity of the bus system, which will remain the backbone of the transit system, and the development of a network of dedicated transit corridors.

The Southwest Corridor from Eden Prairie to downtown Minneapolis was identified in Transit 2020 as an exclusive busway for implementation prior to 2010. The Metropolitan Council estimated that an exclusive busway in the Southwest Corridor would serve approximately 19,500 passengers/day and would cost approximately $ 120 to 150 million (2000 dollars) to construct.

[3] The Regional Transit Board was formerly a separate entity, charged with mid-range transportation planning. In 1995 the board was disbanded and responsibilities were transferred to the Metropolitan Council.

## Twin Cities Exclusive Busway Study, MN/DOT (August 2000)

In 2000, the Commissioner of Transportation directed staff to conduct a study to determine the cost of constructing and operating an exclusive busway system by the Year 2020. Mn/DOT estimated the construction costs for the Southwest Corridor, defined as Eden Prairie to downtown Minneapolis, would serve approximately 19,500 passengers in year 2020 and would cost approximately $124 million (2000 dollars) and $6 million/year to operate the system.

This study recommended three exclusive busway corridors for implementation by 2010. Those corridors included the Southwest Corridor, St. Paul Northeast Corridor and the Minneapolis Northwest Corridor.

## 29th Street and Southwest Busway Feasibility Study, Hennepin County & Metro Transit (February 2000)

Hennepin County and Metro Transit commissioned the busway feasibility study in May 1999 to determine if the construction and operation of a limited-stop, rapid transit busway within the Southwest and Midtown (29th Street) Corridors was feasible and to determine if it would be a practical first step towards light rail transit. Feasibility for this analysis was defined in terms of ridership forecasts and cost assumptions.

SRF Consulting, Inc. was hired to conduct this analysis. The analysis assumed that busway infrastructure would be compatible with LRT use after conversion and that bicycle/pedestrian trails in use in the corridor would remain. Sufficient space exists for both. The consultants found that exclusive limited-stop busways in both corridors were "technically" feasible based on ridership forecasts and cost estimates. Based on capital costs, constructing a busway will not preclude conversion to LRT in the future.

## 29th Street and Southwest Vintage Rail Trolley Study, HCRRA & Metropolitan Council (October 2000)

Hennepin County Regional Railroad Authority (HCRRA) and the Metropolitan Council initiated the Addendum in April 2000 at the request of the Midtown Greenway Coalition. The purpose of the study was to determine the feasibility (defined in terms of ridership forecasts and costs) of constructing and operating a vintage trolley and to determine whether vintage trolley is a practical step toward future LRT. The consultants found that based solely on ridership forecasts and cost estimates, a vintage trolley in the 29th Street/Midtown Corridor (defined as West Lake Street to Hiawatha Avenue) and Southwest Corridor (defined as Hopkins to downtown Minneapolis) was technically feasible and would not preclude future conversion to LRT.

## (TPP), Metropolitan Council (January 2001)

A is a federal requirement and must be updated every three years. The aim of the Metropolitan Council's was to[4]:

- **Sharpen the region's economic competitiveness** by ensuring the convenient, affordable movement of people and the timely efficient movement of goods.
- **Enhance community and neighborhood livability** with connected streets, sidewalks and bikeways and convenient development that incorporate offices, homes and retail in ways that are conducive to transit services.
- **Expand mobility options** besides the car to connect jobs, services and housing.
- **Improve environmental quality** of the region's air and water.

[4] Metropolitan Council. *Transportation Policy Plan.* January 24, 2001, p. i.

- **Promote savings** through cost-effective use of regional and local infrastructure.

With congestion mounting, Metropolitan Council cited Smart Growth as an important strategy in mitigating the problems associated with explosive growth and keeping the region livable and mobile. The Twin Cities region needed a variety of transportation options and the bus system needed to be greatly expanded and organized. A network of dedicated corridors would have supported smart growth. The report maintained that the bus would remain the future of transit services, with capacity being doubled by 2025.

Adequate and stable funding remained a critical issue, because without an adequate funding source, the region would not be able to meet its mobility needs and achieve its Smart Growth goals. In comparison with nine peer cities, the Twin Cities metropolitan area ranked second to last in per capita transit spending for transit.

According to the *Transit 2020 Plan*, the Metropolitan Council planned for two dedicated busways by 2010 and three more by 2025. Corridors included: Riverview, Midtown Greenway/Southwest, Minneapolis Northwest, St. Paul Northeast and Minneapolis Northeast. In addition to the Hiawatha line, the region would have two new LRT lines by 2025, with another under construction. By 2025, there would be three new commuter rail lines with a fourth under construction. Potential corridors included Northstar, Red Rock, Dan Patch and Central, with connections to the Northstar and Red Rock lines.

**Transit 2025 Map, Metropolitan Council (September 2002)**
The Metropolitan Council's Transit 2025 map was revised to define the Southwest Corridor as "technology unspecified" rather than Busway.

**Southwest Rail Transit Study, HCRRA, (October 2003)**
The Hennepin County Regional Railroad Authority (HCRRA), in partnership with Eden Prairie, Minnetonka, Hopkins, St. Louis Park and Minneapolis conducted the *Southwest Rail Transit Study*. The purpose of the study was to determine if rail transit was a feasible component to the overall transportation solution for the southwestern metro area.

The HCRRA hired URS, Corporation to conduct the Southwest Rail Transit Study. URS worked with the Southwest Technical Advisory Committee (TAC) to evaluate various routes for both light rail transit (LRT) and diesel multiple unit (DMU) rail transit technologies. The routes were evaluated based upon ridership forecasts, capital and operating cost estimates, potential environmental impacts, and potential social/community impacts.

The Southwest Policy Advisory Committee (SWPAC) recommended the following four light rail transit alternatives:

- **1A:** from TH 312 in Eden Prairie to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor.
- **2A:** from the SouthWest Station in Eden Prairie to downtown Minneapolis via I-494, the HCRRA property, and the Kenilworth Corridor.
- **3A:** from the SouthWest station in Eden Prairie to downtown Minneapolis via the Eden Prairie Center Mall, the Golden Triangle, Opus, downtown Hopkins, the HCRRA property, and the Kenilworth Corridor.

**4A:** from downtown Hopkins to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor.

In addition, the next study phase will address a rail transit connection along the Midtown Corridor, environmental impacts and mitigation measures, public involvement, and retention of the trails.

The SWPAC recommended that an LRT alignment at-grade on Lyndale Avenue, and LRT alignment in the TH 100 right-of-way, and the Diesel Multiple Unit (DMU) not be retained for further study.

The SWPAC's rationale for not retaining the Lyndale Avenue LRT option included:

- Traffic impacts through the elimination of two traffic lanes for median running LRT.
- Bryant and Aldrich bridges over the Midtown Corridor would need to be removed for LRT to accomplish grade change.
- 300 on-street parking spaces would be consolidated into new parking structure.
- Access restrictions to Lyndale Ave. businesses in the vicinity of Franklin Avenue.
- Elevated LRT structure would be required from south of Franklin Avenue to north of the Basilica, which would have to go over the Harriet Irene Huxley Pedestrian Bridge linking the Sculpture Garden with Loring Park.
- Would cost $100 million more than Kenilworth option.

The SWPAC's rationale for not retaining the Diesel Multiple Unit option included:

- Higher capital and operating/maintenance costs than LRT.
- Might take longer to implement than LRT.
- Lack of seamless connection to downtown Minneapolis, the U of M, the airport, the Mall of America or downtown St. Paul.
- Slower travel times than LRT.
- DMU not designed to stop every ½ mile to a mile.
- At the time of study, DMU still in demonstration phase and not in operation anywhere in the country.

**Southwest Rail Transit Study: Addendum, Modified LRT 3A Alignment Alternatives**
**HCRRA, (April 2004)**

The Modified LRT 3A Alignment Alternatives Report is an addendum to the *Southwest Rail Transit Study* (October 2003). The Southwest Policy Advisory Committee (SWPAC) recommended and the HCRRA concurred that an additional analysis be conducted to reroute alternative LRT 3A to more directly serve major employment centers in Minnetonka and Eden Prairie.

The HCRRA hired IBI to conduct this analysis. IBI working with the Southwest Technical Advisory Committee (TAC) developed three potential routes: LRT 3A-1, LRT 3A-2 and LRT 3A-3.

The results of the analysis for LRT 3A-1, LRT 3A-2, and LRT 3A-3 were inconclusive. The Southwest TAC recommended that more in-depth analysis to develop a routing that combines the travel time advantage of the original LRT 3A alternative with the access and economic development potential of the modified LRT 3A alternatives while minimizing impacts to areas the route traverses be developed as part of the proposed Southwest Alternatives Analysis (AA) Study.

## Appendix C: Agency/Stakeholder Meetings to Refine Initial Alternatives

### Public Open Houses (Non-NEPA Scoping)

| | |
|---|---|
| May 10, 2005 | SouthWest Metro Transit Station |
| May 11, 2005 | Hopkins Depot Coffee House |
| May 12, 2005 | Kenwood Recreation Center |

### Partner Cities

| | |
|---|---|
| August 17, 2005 | St. Louis Park Staff |
| August 18, 2005 | Hopkins |
| September 15, 2005 | Edina Transportation Committee |
| September 22, 2005 | Minnetonka |
| September 27, 2005 | Eden Prairie |
| November 1, 2005 | Minneapolis |

### Partner Agencies

| | |
|---|---|
| | Mn/DOT |
| August 17, 2005 | Metro Transit Staff |
| February 23, 2006 | SouthWest Metro Transit |

### Neighborhood Groups

| | |
|---|---|
| May 18, 2005 | Bryn Mawr Neighborhood Association |
| June 6, 2005 | Kenwood Isles Neighborhood Association |
| June 13, 2005 | Whittier Neighborhood Association |
| October 11, 2006 | West Calhoun Neighborhood Association |
| November 22, 2006 | Citizens for Loring Park |

### Other Interested Parties

| | |
|---|---|
| May 9, 2005 | Midtown Greenway Land Use/Transportation Committee |
| June 8, 2005 | I-494 Corridor Commission |
| January 22, 2006 | League of Women Voters – West Tonka |
| February 1, 2006 | Riley Purgatory Creek |
| September 12, 2006 | Cedar Lakes Park Association |
| November 12, 2006 | League of Women Voters - Minnetonka |

### Business Groups

| | |
|---|---|
| Aug 16, 2005 | Hopkins Business Council |
| September 1, 2005 | Hopkins Rotary Club |
| September 2, 2005 | St. Louis Park Sunrise Rotary |

## Appendix D: Definition of Refined Alternatives

The following section describes the refined alternatives evaluated in the Southwest Transitway Alternatives Analysis. These alternatives incorporate the modifications resulting from public and community input and the comments of the study partner cities and partner agencies (MnDOT, Metro Transit, SouthWest Metro Transit). Each description identifies the major infrastructure improvements required and connecting transit service assumed.

The development of the feeder bus network for the BRT and LRT alternatives took into account the coverage and frequencies of the existing bus network in the corridor and improvements recommended in the enhanced bus network. In addition, the corridor was examined to identify where connections might be improved or strengthened to support the build alternatives. The alternatives incorporate changes to the bus network recommended by Metro Transit and SouthWest Metro. Route alignments were lengthened or truncated to better connect to transit stations, and route frequencies were increased or, in a few cases, reduced to levels appropriate to their new, additional function as feeders to a light rail or bus rapid transit network. Several new routes are proposed, or discontinued routes reinstated, to improve or strengthen connections to the transit stations and provide additional service to the network.

In a limited number of cases under the BRT and LRT alternatives, bus routes currently operating into downtown Minneapolis were truncated at a station, which requires passengers to transfer from the feeder bus to the rail or BRT service to complete their trips downtown. However, bus routes which offer faster service to downtown Minneapolis than that offered through transferring at BRT or LRT stations continue to operate through to downtown Minneapolis on their highway alignments, to provide maximum benefit to all transit users. Where these conditions occur, the buses may not connect at a station. In addition, at a number of stations where feeder bus service was not seen as beneficial or necessary and where coverage is provided by buses feeding adjacent stations, no feeder bus service was provided.

Each alternative is illustrated on a map following the text description.

### *No Build Alternative*

The No Build Alternative represents existing and committed infrastructure, facilities and services expected to be in place and operating for the forecast year, 2030. Future projects included in a financially constrained regional plan are considered elements of a no build alternative. The Twin Cities *2030* was developed under a constrained funding scenario. The No Build alternative is incorporated in the 2030 Twin Cities regional travel demand forecasting model, used to forecast ridership for the Southwest Transitway AA. The following description is provided as background information on the level of transportation investment already programmed by the region.

The Twin City metropolitan area surrounding Minneapolis and St. Paul is planning for rapid population growth, growing congestion and limited prospects for major freeways by 2030. The region’s 2030 Transportation Plan identifies the 2030 system as multi-modal, geographically balanced, cost-effective and supportive of the Regional Development Framework. Roadway infrastructure and service improvements are focused on maintaining and managing the existing system, removing or relieving bottlenecks, and adding capacity. The Transit System Plan, a major component of the overall Transportation Plan, is designed and scaled to strongly support the region's economic vitality by promoting mobility, access to opportunities, and more efficient use of land and public infrastructure.

For the highway network, each major corridor improvement undergoes intense planning through the Minnesota Department of Transportation (MnDOT), host county and cities in and FHWA planning process comparable in scope and schedule to the FTA process. Highway improvements include planning for roadway-based transit. Through a partnership called Team Transit, Mn/DOT, Metropolitan Council, transit agencies, cities and counties continuously cooperate to provide a system of advantages for transit vehicles to help improve the efficiency of the region's roadway system. These advantages include authorized use of shoulders for bus operations during congested periods, ramp meter bypasses, bus-only freeway ramps, and High Occupancy Vehicle (HOV) lanes. Currently, there are 223 miles of shoulder bus operations, 88 ramp meter bypasses, 4 bus-only freeway ramps, and HOV lanes on I-394 and I-35W. Team Transit has also constructed a network of park-and-ride lots throughout the study area, positioned to offer efficient access to the regional highway system.

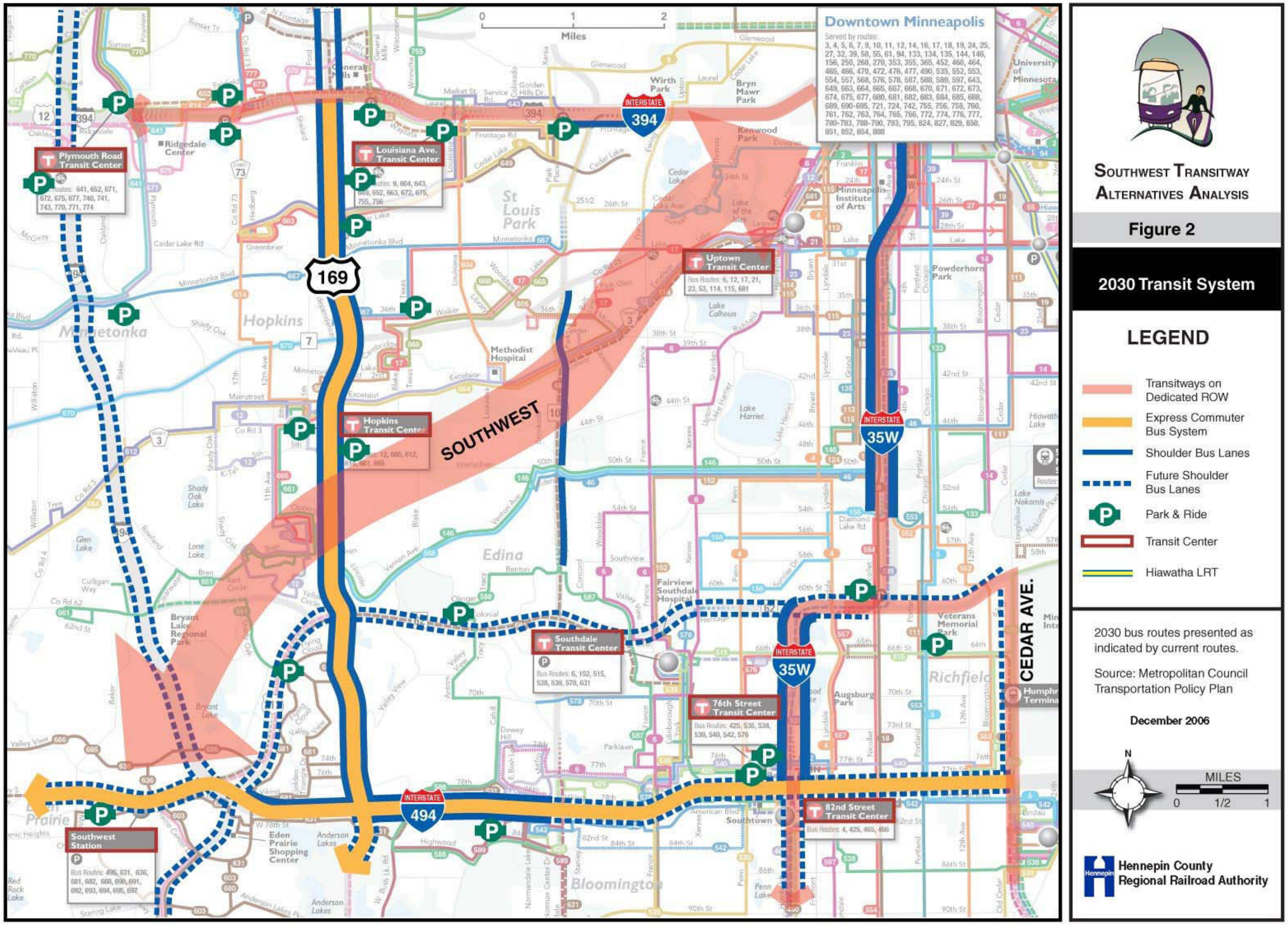
In the vicinity of the Southwest Transitway study area, major improvements programmed for implementation under the constrained funding scenario include the following:

- Lane Additions: Additional highway lanes on I-494, TH 100, and I-35W
- HOV lanes: Fully implemented on I-35W through Richfield and Minneapolis, with on-line stations for BRT service
- Construction of new TH 212 from I-494 in Hennepin County into Carver County
- Bus Shoulder lanes expansions on TH 62, I-494, TH 100, TH 169, TH 212, and TH 5, facilitating the planned Express Commuter Bus System on I-494, TH 5 and TH 169
- Southwest Transitway
- Park-and-ride lots: County Road 60/Minnetonka Boulevard, TH 212/TH 101, TH 212/CSAH 41
- TH 212 SouthWest Metro Transit bus service to TH 101, Chanhassen and CSAH 41, Chaska

Within the Southwest study area, existing and planned transit service centers on a dense local bus route structure. Metro Transit operates twenty-two routes within the study area: seven local, two limited stop, and thirteen express routes. SouthWest Metro Transit operates a total of twenty-three routes: eleven local and twelve express routes. In addition, the Metropolitan Council contracts for services on several routes serving the area, such as Routes 604 and 615. As the Twin Cities metropolitan area does not have dedicated funding for transit, transit operators in the region modify routes regularly to better target transit service to the markets served and to match available funding. The entire Southwest Transitway study area is within the regional Transit Taxing District.

The 2030 No Build Alternative assumes the future service network will closely resemble the dense route structure and extensive facilities of the existing system, with additions noted above and reflected in the regional travel model maintained by the Metropolitan Council. The 2030 No Build transit system is graphically represented in the figure which follows. Major additions to the regional transit system outside the Southwest Transitway study area planned to be in place by 2030 include Northstar commuter rail service between Minneapolis and Big Lake, Central Corridor LRT service between downtown Minneapolis, the University of Minnesota, and downtown St. Paul, Bottineau Boulevard BRT service between Rogers and downtown Minneapolis, Cedar Avenue BRT service between Dakota County and the Mall of America in Bloomington, the Red Rock commuter rail service between Hastings and St. Paul, and the Rush Line transitway between Pine County and St. Paul.

## Figure D-1 2030 No Build Alternative



## *Enhanced Bus Alternative*

The Enhanced Bus alternative includes minor modifications to the existing express service, and augments Metro Transit and SouthWest Metro Transit service with two limited-stop bus routes providing bi-directional service to Eden Prairie, Minnetonka, Hopkins and St. Louis Park.  Local service is restructured to provide access to the new limited stop service.  These routes begin by serving selected stops, then travel non-stop on the regional highways using bus shoulder lanes and HOV lanes into downtown Minneapolis.  This allows the limited stop services to offer more attractive travel times, and increases options for commuters in the corridor.

In addition to the new routes, the enhanced bus alternative includes increases in service frequency for many Metro Transit and SouthWest Metro bus routes to improve the overall level of transit service in the corridor.  These changes form the basis for the bus service enhancements recommended in all the alternatives, and in most cases are carried through as elements of all of the “build” alternatives.  There are also several new routes, mostly shuttle or circulator routes that operate as neighborhood circulators and feeders to the longer distance routes in the enhanced bus alternative, and function as feeder-distributor routes for the rail or bus alternatives under the BRT and LRT alternatives.

Station stop facilities under the Enhanced Bus Alternative are assumed to be consistent with current Metro Transit bus pulloffs and shelters.  For stops with park-and-ride lots, access is assumed from the cross-street.

The approximate line length between the SouthWest Station and the edge of downtown Minneapolis is 16 miles. The fastest portions of the route are expected to be along TH 169, I-394 and I-35W, and in the express segment along TH 212. The slowest portions are in the Minneapolis and Hopkins central business districts, and on the arterials between TH 212 and SouthWest Station.

### *Existing Express Bus Routes*

***SouthWest Station Express Route 690 via I-394***

Starting from SouthWest Station in Eden Prairie, this route uses TH 5, TH 212, and TH 169, using shoulder lanes on TH 169 where available, to access the I-394 HOV lane. Buses exit I-394 at 12$^{th}$ Street to enter downtown Minneapolis, where buses would make multiple downtown stops at locations to be determined at a later stage of project development

***SouthWest Station Express Route 681 via I-35W***

Starting from SouthWest Station in Eden Prairie, this route uses TH 5, TH 212, and TH 62, using shoulder lanes where available, to access the I-35W HOV lane.  Buses exit I-35W at 11$^{th}$ Street to enter downtown Minneapolis, where buses would make multiple downtown stops at locations to be determined at a later stage of project development.

SouthWest Metro Transit is considering future changes to its express routes, including eliminating the off-highway portions of Route 681 and its routing through Uptown Station. Routes 681 and 690 will continue to operate as high-frequency express routes between SouthWest Station and downtown Minneapolis, although exact routings may change.

### *New Limited Stop Routes*

*Limited-Stop Route "A" – Eden Prairie, Hopkins, St. Louis Park to downtown Minneapolis*

This route begins at the park-and-ride lot at Mitchell Road and Technology Drive. The route enters TH 5 to SouthWest Station on Technology Drive to Singletree Lane to Prairie Center Drive to Flying Cloud Drive to the bus-only shoulder lanes on TH 212. From the bus-only shoulder lanes of TH 212 the route enters the bus-only shoulder lanes on TH 169 to Excelsior Boulevard in Hopkins. The route continues in mixed traffic along Excelsior Boulevard then northbound in mixed traffic on Blake Road to TH 7. The route continues in mixed traffic along TH 7 to TH 100. From TH 100 the route enters the I-394 High Occupancy Vehicle (HOV) lanes to downtown Minneapolis, where buses would make multiple stops at locations to be determined at a later stage of project development.

Limited-Stop Route "A" would stop at the following locations:
- Mitchell Road (park-and-ride lot), Eden Prairie
- SouthWest Station (park-and-ride lot), Eden Prairie
- Flying Cloud Drive, Eden Prairie
- TH 212 at Shady Oak Road (park-and-ride lot), Eden Prairie
- TH 169 at Bren Road, Minnetonka
- TH 169 at Excelsior Boulevard, Hopkins
- Excelsior Boulevard at Blake Road, Hopkins
- Blake Road just south of TH 7, Hopkins
- TH 7 at Texas Avenue (park-and-ride lot),
- Louisiana Avenue, St. Louis Park
- Wooddale Avenue, St. Louis Park

*Limited-Stop Route "B" – Minnetonka, Hopkins, St. Louis Park to downtown Minneapolis*

This route begins at the intersection of Shady Oak Road and Excelsior Boulevard. The route then travels in mixed traffic along Excelsior Boulevard to Blake Road. From Blake Road the route travels north to TH 7, then westbound on TH 7 to TH 100. From TH 100 the route enters the I-394 High Occupancy Vehicle (HOV) lanes to downtown Minneapolis, where buses make multiple stops at locations to be determined at a later stage of project development.

Limited-Stop Route "B" would stop at the following locations:
- Shady Oak Road and Excelsior Boulevard, Minnetonka
- Excelsior Boulevard at 8$^{th}$ Avenue/downtown Hopkins (park-and-ride lot)
- Excelsior Boulevard at TH 169, Hopkins
- Excelsior Boulevard at Blake Road, Hopkins
- Blake Road at TH 7, Hopkins
- TH 7 at Texas Avenue, St. Louis Park (park-and-ride lot)
- TH 7 at Louisiana Avenue, St. Louis Park
- TH 7 at Wooddale Avenue, St. Louis Park

The approximate line length between the Hopkins Transit Center and the edge of downtown Minneapolis is 9.5 miles.

### *Minor Infrastructure Improvements*

The following minor infrastructure improvements are not included in the region's long-range transportation plan, the TPP, and are therefore assumed as capital costs required to implement the Enhanced Bus alternative:

- A queue-bypass ramp connecting TH 100 and I-394 to ensure that this area can be traversed with a minimum of delay.
- New or expanded park-and-ride lots at Mitchell Road/TH 5, TH 212/Shady Oak Road, 8th Avenue (downtown Hopkins), and TH 7/Texas Avenue.

### *Service Plan*

The weekday service frequencies are listed below. When combined for the overlapping segment from Hopkins to downtown Minneapolis, the resulting frequencies are 10 minutes in the early morning, 7.5 minutes during the morning peak, 10 minutes for the mid-day, 7.5 minutes during afternoon peak, and 15 minutes during the evening.

**Table 1 Enhanced Bus Service Plan**

| **Weekdays** | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Route "A" | 20 | 15 | 20 | 15 | 30 |
| Route "B" | 20 | 15 | 20 | 15 | 30 |
| Combined | 10 | 7.5 | 10 | 7.5 | 15 |
| **Weekends** | 20-60 minutes | 20-60 minutes | 20-60 minutes | 20-60 minutes | 20-60 minutes |

Source: Parsons Brinckerhoff, 2006

*Enhanced Bus Connecting Transit Service*

The following identifies routes that intersect with Limited Stop Routes A and B at the stops specified between Eden Prairie and downtown Minneapolis, and indicates changes to those routes recommended under the Enhanced Bus alternative.

**Mitchell Road/TH 5:** Route 631 connects to this park-and-ride lot.

Route 631 is a circulator that connects Eden Prairie and surrounding communities to Eden Prairie Town Center and SouthWest Stations. (Note: the City of Eden Prairie requested in September 2006 that "Town" be added to this station name.) Service on route 631 increases from an hourly service to a frequency of 15 minutes during peak periods, and operates hourly in the evenings until 10:00 PM.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A connect with Limited Stop Route A at this transit park-and-ride station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which currently operates only in the clockwise direction, operates in both directions under the Enhanced Bus operating plan, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also changes to bi-directional serves with an hourly headway in the evenings until 10:00 PM.

Changes to Route 631 are described above under Mitchell Road/TH 5.

Route 636 is a circulator servicing Eden Prairie. Route 636 remains unchanged during peak periods, and midday service is eliminated.

Route 680 is not changed under this alternative.

Route 681 combines with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis. The off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Routes 690, 690A and 690B are combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. Connecting with the Limited Stop Route A at the SouthWest Station allows these bus routes to take advantage of the bus only ramp that connects eastbound TH 5 with the station. In addition to 681 and 690, SouthWest Metro Transit Express Routes 685, 685A, 691, 694, 698, and 699A operate between SouthWest Station and Downtown Minneapolis.

**Flying Cloud Drive**: Route 685 connects with Limited Stop Route A at this stop. Route 685 is not changed under this alternative.

**TH 212/Shady Oak**: Route 681 connects with Limited Stop Route A at this stop. Route 681 is described above under SouthWest Station.

**Bren**: Route 568 connects with Limited Stop Route A at this stop. This route is not changed under this alternative.

**Shady Oak**: Route 664 connects with Limited Stop Route B at this stop. Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. Under the Enhanced Bus alternative, the route alternative operates on its former alignment and schedule.

**Hopkins**: Routes 12,615, 661, 664 and 665 connect with Limited Stop Route B at this park-and-ride lot station.

Service frequencies on route 12 are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

Peak service frequency on route 615 increase from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 661 is a recently discontinued Metro Transit route that is reinstated in the Enhanced Bus alternative with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 664 are described under Shady Oak.

Service frequency on Route 665 is increased from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**TH 169**: Limited Stop Routes A and B connect to Route 12, Changes to these Route 12 are described above under Hopkins.

**Excelsior at Blake**: Limited Stop Routes A and B connect to Routes 12, 17 and 668 at this stop.

Changes to these Route 12 are described above under Hopkins.

Route 17 Lake Street branch is extended to Blake and Excelsior to serve this stop. Service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Route 668 is extended to connect to Excelsior and Blake and the Library-Lane loop is eliminated.

**Blake at TH 7**: Limited Stop Routes A and B connect to Routes 17.

Route 17 Lake Street branch serves the stop. Changes to Route 17 are described under Excelsior at Blake.

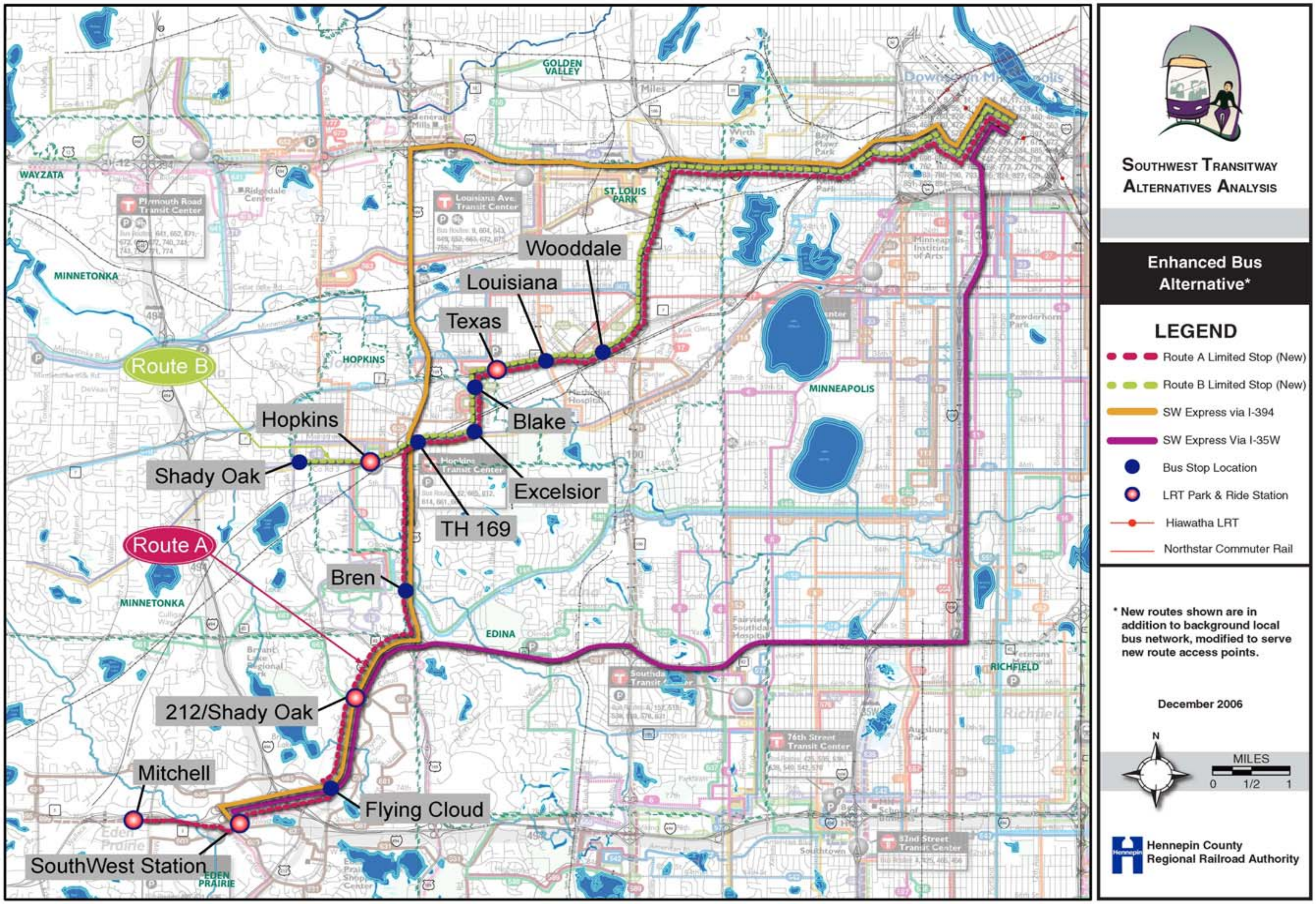
**Texas**: Limited Stop Routes A and B would connect to Route 668 at this stop.

Route 668 connects to the stop at Blake and TH 7 and the Library-Lane loop is eliminated. Changes to Route 668 are described under Excelsior at Blake.

**Louisiana**: Limited Stop Routes A and B connect with route 604 at this stop. Route 604 is increased in service frequency under this alternative, from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale**: Route 615 connects to Limited Stop Routes A and B at this location. Changes to Route 615 are described under Hopkins.

## Figure D-2 Enhanced Bus Alternative




*Source: Parsons Brinckerhoff, 2006.*

## *Bus Rapid Transit Alternatives*

Two BRT alternatives are described below. The two primary routes under the Enhanced Bus alternative, Limited Stop Routes “A” and “B”, operate as the principal BRT routes under the BRT alternatives. In addition, a number of SouthWest Metro and Metro Transit routes use the BRT alignment for portions of their routes.

### BRT 1: HCRRA Right-of-Way, TH 5 to Downtown Minneapolis

BRT 1 operates from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. BRT 1 uses a new two-lane roadway located in existing HCRRA right-of-way to bus-only lanes in downtown Minneapolis.

BRT 1 begins at SouthWest Station, proceeding west via TH 5 on bus shoulder lanes, exiting at Mitchell Road to follow local streets to the intersection of TH 5 and the HCRRA’s Southwest Corridor. From that point the route enters a new exclusive bus-only guideway in the HCRRA’s Southwest Corridor to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive bus-only guideway in the HCRRA’s Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA’s Cedar Lake Park Corridor. When it reaches the new Van White Boulevard, the route exits the exclusive bus-only guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis. The route ends at the intersection of 5th Street and Hennepin Avenue, adjacent to the existing Hiawatha LRT line.

*Stations*

BRT 1 station locations are listed below. All stations west of Van White Boulevard in Minneapolis are assumed to include park-and-ride facilities. A center platform configuration is proposed unless otherwise noted.

- SouthWest Station, Eden Prairie - The proposed station expands the current SouthWest Metro Transit Station parking facility in the northwest corner of Technology Drive and Prairie Center Drive. Access to and from the site would be via Technology Drive.
- TH 5, Eden Prairie – The proposed site is located in the northeast corner of TH 5 and the HCRRA Southwest Corridor LRT Trail right-of-way. Access to and from the site would be via re-routed Venture Lane.
- TH 62, Eden Prairie/Minnetonka – The proposed site is located south of TH 62, in the southeast corner of West 62$^{nd}$ Street and the HCRRA Southeast Corridor property, between Industrial Drive on the west and Carlson Drive on the east. Access to and from the site would be via Carlson Drive and West 62$^{nd}$ Street.
- Rowland Road, Minnetonka – The proposed site is located in the southeast corner of Rowland and Baker Roads, just east of I-494 and west of the HCRRA Southwest Corridor property. Access would be via Rowland and Baker Roads. An alternative site, required as part of the potential route variation, is located in the northeast corner of Rowland Road and the HCRRA Southwest Corridor property and is accessed via Rowland Road.
- Shady Oak Road, Minnetonka – The proposed site is located west of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17$^{th}$ Avenue.

- 8th Avenue, Hopkins – The proposed site is located between 8th and 5th Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a reconstructed intersection at 8th Avenue.
- Blake Road, Hopkins - The proposed site is located northwest of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2nd Avenue NE.
- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36th Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.
- West Lake Street, Minneapolis - The proposed site is located between the HCRRA Southwest Corridor property and Whole Foods grocery store, on the southeast side of the HCRRA Southwest Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.
- 21st Street, Minneapolis - The proposed site is located in the southwest corner of West 21st Street and the HCRRA Southwest Corridor property. Access to the site would be via West 21st Street and Upton Avenue South.
- Penn Avenue, Minneapolis – The proposed site is located north of the HCRRA Southwest Corridor property, south of Penn Avenue and south of I-394. Access to the station area would be via Penn Avenue. Pedestrian access to the station platforms would be via a bridge over the BNSF freight railroad adjacent to the HCRRA Southwest Corridor property.
- Van White Boulevard, Minneapolis - The proposed site is located north of the HCRRA Southwest Corridor property, adjacent to the planned Van White Boulevard. This station is assumed to be constructed in coordination with planned mixed-use development in that location. Access to the station area would be via Van White Boulevard.
- Hennepin Avenue at 12th, 8th and 4th Streets, downtown Minneapolis –These stations are proposed to be located on Hennepin Avenue, in the blocks between 11th and 12th Streets, 7th and 8th Streets, and 4th and 5th Streets.

*Infrastructure Improvements Required*

BRT 1 requires the construction of a new two-lane bus-only roadway (busway) approximately 28 feet wide, and on-line stations within the guideway, in HCRRA right-of-way through the Southwest, Kenilworth and Cedar Lake Corridors, beginning at TH 5 in Eden Prairie. A grade separation is required at the TC&W Railroad crossing near TH 62 in Minnetonka, and at Excelsior Boulevard in Hopkins. BRT 1 also is assumed to require addition of a reserved bus-only lane in each direction along Dunwoody Boulevard in Minneapolis.

### *Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Route “A” | 20 | 15 | 20 | 15 | 30 |
| Route “B” | 20 | 15 | 20 | 15 | 30 |
| Combined | 10 | 7.5 | 10 | 7.5 | 15 |
| Weekend | | | | (to 7:30 pm) | |
| Route “A” | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Route “B” | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Combined | 15-30 | 15-30 | 10 | 10 | 15-30 |

*Freight Rail Relocation*
Under alternative BRT 1 it would be necessary to remove the existing freight railroad track from the HCRRA Kenilworth Corridor. In 1999, St. Louis Park in partnership with Hennepin County and Mn/DOT convened the Southwest Railroad Advisory Task Force to study freight rail issues affecting St. Louis Park. After the task force concluded their work, the St. Louis Park City Council adopted a position that “freight rail from the west headed for St. Paul should continue to travel through the Kenilworth corridor in Minneapolis unless and until such time as a viable form of mass transit displaces it….If at a future date, it is determined that the Kenilworth Corridor is the most feasible route for mass transit and that freight rail and a mass transit system cannot coexist in that corridor, freight rail traffic will be re-routed through St. Louis Park. This is to be accomplished by constructing a northerly connection on the Golden Auto Site and a connection on the iron triangle property.” (citation Page 1, May 23, 2001)

Consistent with the conclusion of the St. Louis Park Rail Task Force position statement, since mass transit is assumed the freight rail traffic in Kenilworth would be relocated to the Canadian Pacific's north-south line (the MNS Subdivision) located west of TH 100, then east on the BNSF's Wayzata Subdivision. This requires construction of a new connection on the Golden Auto Site in the northwest corner between the CP Bass Lake Subdivision and the MNS Subdivision, and restoration of the Iron Triangle, a former connection in the southeast corner between the BNSF Wayzata Subdivision and the MNS Subdivision.

*BRT 1 Connecting Transit Service*
**TH 5 Station**: Routes 631, 636 681, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and surrounding communities to Eden Prairie Town Center and SouthWest Stations. (Note: the City of Eden Prairie requested in September 2006 that “Town” be added to this station name.) Service on route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service will be eliminated.

SouthWest Metro Transit Express Routes 681, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A operate from the existing SouthWest Station via TH 5 shoulder lanes to enter the BRT right-of-way at TH 5 station.

**TH 62 Station**: Routes 661, 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) in the BRT 1 alternative and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 681 Circulator is a proposed new route serving Eden Prairie and Golden Triangle, replacing part of the alignment of existing route 681, which will not operate from SouthWest Station on TH 212. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Rowland Station**: No routes serve this station.

**Shady Oak Station**: Route 12 serves this station. Changes to route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615,661, 664 and 665 serve this station.

Changes to Route 12 are described below under West Lake Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is be 60 minutes. The route operates to midnight.

Changes to Route 661 are described above under TH 62 Station.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. Peak period service operates on the BRT alignment between Hopkins Station and downtown Minneapolis. Off-peak service operates between Hopkins Station and the terminal on CR 101. Off-peak riders with destinations east of Hopkins Station transfer to other services at the Hopkins Station. The route operates on the BRT alignment between Hopkins Station and downtown Minneapolis.

Route 665 is rerouted from its current highway alignment and enters the BRT alignment at Hopkins Station for its connection to downtown Minneapolis. Service frequency be increases from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, 664, 665, 668 and 670 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Routes 615, 664 and 665 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated. The route operates on the BRT right-of-way between West Lake Station and downtown Minneapolis.

Route 670 is rerouted to operate on the BRT alignment between Blake Station and downtown Minneapolis. The route, which now operates as a peak period, peak direction route on a one hour peak period headway, operates bi-directionally at half hour headways in the BRT 1 alternative and is given midday and evening (to midnight) service at a one hour headway.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station. Changes to this route are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of route 17, route 604 and route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

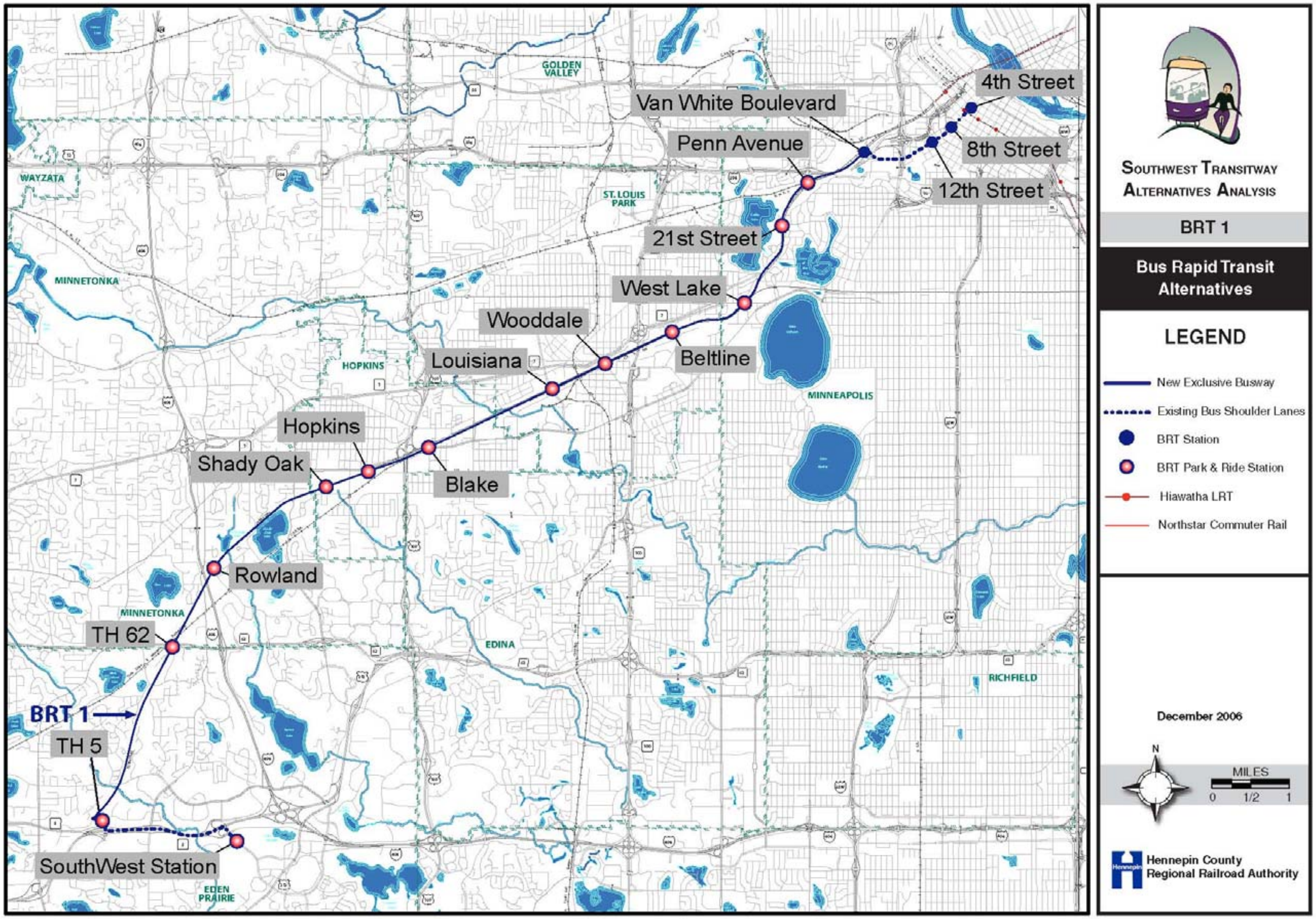
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station**: Route 25 connects to this station. Changes to Route 25 are described above under West Lake Station.

**Figure D-3 BRT 1 Alternative**




*Source: Parsons Brinckerhoff, 2006*

**BRT 2: Eden Prairie Center/Golden Triangle/Opus/Hopkins, HCRRA Right-of-Way to Downtown Minneapolis**

BRT 2 operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The alignment begins near the intersection of TH 5 and Mitchell Road in Eden Prairie. From that point the route uses the existing bus-only shoulders along TH 5 to the Prairie Center Drive interchange, where it enters new reserved bus-only lanes along Prairie Center Drive. It follows Prairie Center Drive south, then turns east into new reserved bus-only lanes along Singletree Lane. When the route reaches the intersection of Singletree Lane and Flying Cloud Drive, it turns north and continues in bus-only shoulders along Flying Cloud Drive. At Valley View Road the route enters an exclusive bus-only guideway along the east side of the TH 212 right-of-way, then swings east and north along new right-of-way through the Golden Triangle area.

After crossing Shady Oak Road, the exclusive guideway crosses over TH 212 into the City West area, then crosses over TH 62 into the Opus area of Minnetonka. At Bren Road the route leaves the bus-only guideway and follows new reserved bus-only lanes along Bren Road to the TH 169 interchange. At TH 169 the route follows the existing bus-only shoulders north to Excelsior Boulevard, where it then enters an exclusive bus-only guideway located in the HCRRA's Southwest Corridor.

For this alternative, the exclusive bus-only guideway along the HCRRA's Southwest Corridor begins near Shady Oak Road. It continues east, passing under TH 169, where it is joined by the route branch coming north from Bren Road. The combined route continues in the exclusive bus-only guideway to West Lake Street in Minneapolis.

Just north of West Lake Street the route enters an exclusive bus-only guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lake Park Corridor. When it reaches the new Van White Boulevard, the route exits the exclusive bus-only guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis. The route ends at the intersection of 5th Street and Hennepin Avenue, adjacent to the existing Hiawatha LRT line.

*Potential Route Variations*

This alternative includes a route variation in Eden Prairie. After serving the SouthWest station, the route would continue east in bus-only shoulders along TH 5. Once it has passed under I-494 and Valley View Road, the route enters an exclusive bus-only guideway that carries it into the Golden Triangle area. The variation does not include an Eden Prairie Center station.

The recommended BRT 2 alignment also includes an extension of the exclusive busway west of TH 169 to Shady Oak Road. This branch is intended to provide service to downtown Hopkins and to intercept park-and-ride traffic at the Minnetonka/Hopkins border.

*Stations*

BRT 2 stations locations are listed below. All stations west of Van White Boulevard in Minneapolis are assumed to include park-and-ride facilities. A center platform configuration is proposed unless otherwise noted.

- Mitchell Road/TH 5, Eden Prairie – The proposed site is located west of Mitchell Road, south of TH 5, north of Lone Oak Road. Access would be via Mitchell and Loan Oak Roads.
- SouthWest Station, Eden Prairie - The proposed station expands the current SouthWest Metro Transit Station parking facility in the northwest corner of Technology Drive and Prairie Center Drive. Access to the site would be via Technology Drive.
- Eden Prairie Town Center, Eden Prairie – The proposed site is located north of Singletree Lane, west of a new extended Main Street. Access to and from the site would be via Singletree Lane and the new Main Street extension.
- Golden Triangle, Eden Prairie - The proposed site is located west of TH 212 at the east edge of the former Best Buy Site. Access would be via an extended West 70th Street.
- City West, Eden Prairie - The proposed site is located on the southwest side of TH 62, adjacent to or constructed in conjunction with the planned City West development at this location. Access would be via Shady Oak Road,West 62nd Street, and new development roads.
- OPUS, Minnetonka – The proposed site is located in the southeast corner of the Bren Road East and Bren Road West one-way-pair divergence. Access would be from the two Bren Roads.
- Shady Oak Road, Minnetonka – The proposed site is located east of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17th Avenue.
- 8thAvenue, Hopkins – The proposed site is located between 8th and 5th Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a reconstructed intersection at 8th Avenue.
- Blake Road, Hopkins - The proposed site is located northeast of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2nd Avenue NE.
- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36th Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.
- West Lake Street, Minneapolis - The proposed site is located between the HCRRA Southwest Corridor property and Whole Foods grocery store, on the southeast side of the HCRRA Southwest Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.
- 21st Street, Minneapolis - The proposed site is located in the southwest corner of West 21st Street and the HCRRA Southwest Corridor property. Access to the site would be via West 21st Street and Upton Avenue South.
- Penn Avenue, Minneapolis – The proposed site is located north of the HCRRA Southwest Corridor property, south of Penn Avenue and south of I-394. Access to the station area would be via Penn Avenue. Pedestrian access to the station

platforms would be via a bridge over the BNSF freight railroad adjacent to the HCRRA Southwest Corridor property.

- Van White Boulevard, Minneapolis - The proposed site is located north of the HCRRA Southwest Corridor property, adjacent to the planned Van White Boulevard. This station is assumed to be constructed in coordination with planned mixed-use development in that location. Auto access to the station area would be via Van White Boulevard.
- Hennepin Avenue at 12th, 8th and 4th Streets, downtown Minneapolis – These stations are proposed to be located on Hennepin Avenue, in the blocks between 11th and 12th Streets, 7th and 8th Streets, and 4th and 5th Streets.

*Infrastructure Improvements Required*

BRT 2 requires the Kenilworth Corridor freight rail relocation described previously. BRT 2 requires the construction of a new two-lane busway approximately 28 feet wide, and on-line stations within the guideway, in HCRRA right-of-way through the Southwest, Kenilworth and Cedar Lake Corridors, beginning at Shady Oak Road in Minnetonka. A grade separation is required at Excelsior Boulevard in Hopkins. The addition of new reserved bus-only lanes is assumed along Prairie Center Drive from TH 5 to Singletree Lane, and along Singletree Lane from Prairie Center Drive to Flying Cloud Drive in Eden Prairie. A new right-of-way with exclusive two-lane busway is required beginning at Valley View Road, crossing over Flying Cloud Drive into the Golden Triangle, over TH 212 to City West, and over TH 62 to Opus, with on-line stations in this segment. New reserved bus-only lanes are required on Bren Road to the connection with TH 169. BRT 2 also is assumed to require addition of a reserved bus-only lane in each direction along Dunwoody Boulevard in Minneapolis.

*Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Route “A” | 20 | 15 | 20 | 15 | 30 |
| Route “B” | 20 | 15 | 20 | 15 | 30 |
| Combined | 10 | 7.5 | 10 | 7.5 | 15 |
| Weekend | | | | (to 7:30 pm) | |
| Route “A” | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Route “B” | 30-60 | 30-60 | 20 | 20 | 30-60 |
| Combined | 15-30 | 15-30 | 10 | 10 | 15-30 |

*BRT 2 Connecting Transit Service*

**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Stations. Service on route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service would operate hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service is eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Route 680 is not changed under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which currently operates only in the clockwise direction, operates in both directions in the BRT 2 alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also operates bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to Routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via the BRT alignment, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing Route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, Routes 690, 690A and 690B are combined with Route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis via the BRT alignment. In addition to 681 and 690, SouthWest Metro Transit Express Routes 685, 685A, 691, 694, 698, and 699A operate on the BRT alignment between SouthWest Station and Downtown Minneapolis.

**Eden Prairie Town Center Station**: Routes 636 and 681 Circulator serve this station. Route 636 is described above under TH5 Station. Route 681 is described above under SouthWest Station.

**Golden Triangle Station**: Routes 631 and 681 Circulator serve this station. Route 631 is described above under TH 5 Station. Route 681 is described above under SouthWest Station.

**City West Station**: No bus routes serve this station.

**Opus Station**: Routes 12 and 661 serve this station. Changes to Route 12 are described below under West Lake Station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Shady Oak Station**: Route 12 serves this station. Changes to route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station. Changes to route 12 are described below under West Lake Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand) in the BRT 2 alternative. Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Changes to route 661 are described above under TH 62 Station.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. Peak period service operates on the BRT alignment between Hopkins Station and downtown Minneapolis. Off-peak service operates between Hopkins Station and the terminal on CR 101. Off-peak riders with destinations east of Hopkins Station transfer to other services at the Hopkins Station. The route operates on the BRT alignment between Hopkins Station and downtown Minneapolis.

Route 665 is rerouted from its current highway alignment and enters the BRT alignment at Hopkins Station for its connection to downtown Minneapolis. Service frequency is increased from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, 664, 665, 668 and 670 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to routes 615, 664 and 665 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated. The route would operate on the BRT guideway between West Lake station and downtown Minneapolis.

Route 670 is rerouted to operate on the BRT guideway between Blake Station and downtown Minneapolis. The route, which now operates as a peak period, peak direction route on a one hour peak period headway, operates bi-directionally at half hour headways and operates midday and evening (to midnight) service at a one hour headway.

**Louisiana Avenue Station**: Route 604 serves this station. Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of Route 17 and Route 615 serve this station. Changes to this route are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

Changes to route 615 are described above under Blake station.

**Beltline Station**: The 36th Street branch of route 17, route 604 and route 615 serves this station. Changes to route 17 are described above under Blake Station.

Changes to route 604 are described above under Louisiana Avenue Station.

Changes to route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies increase slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

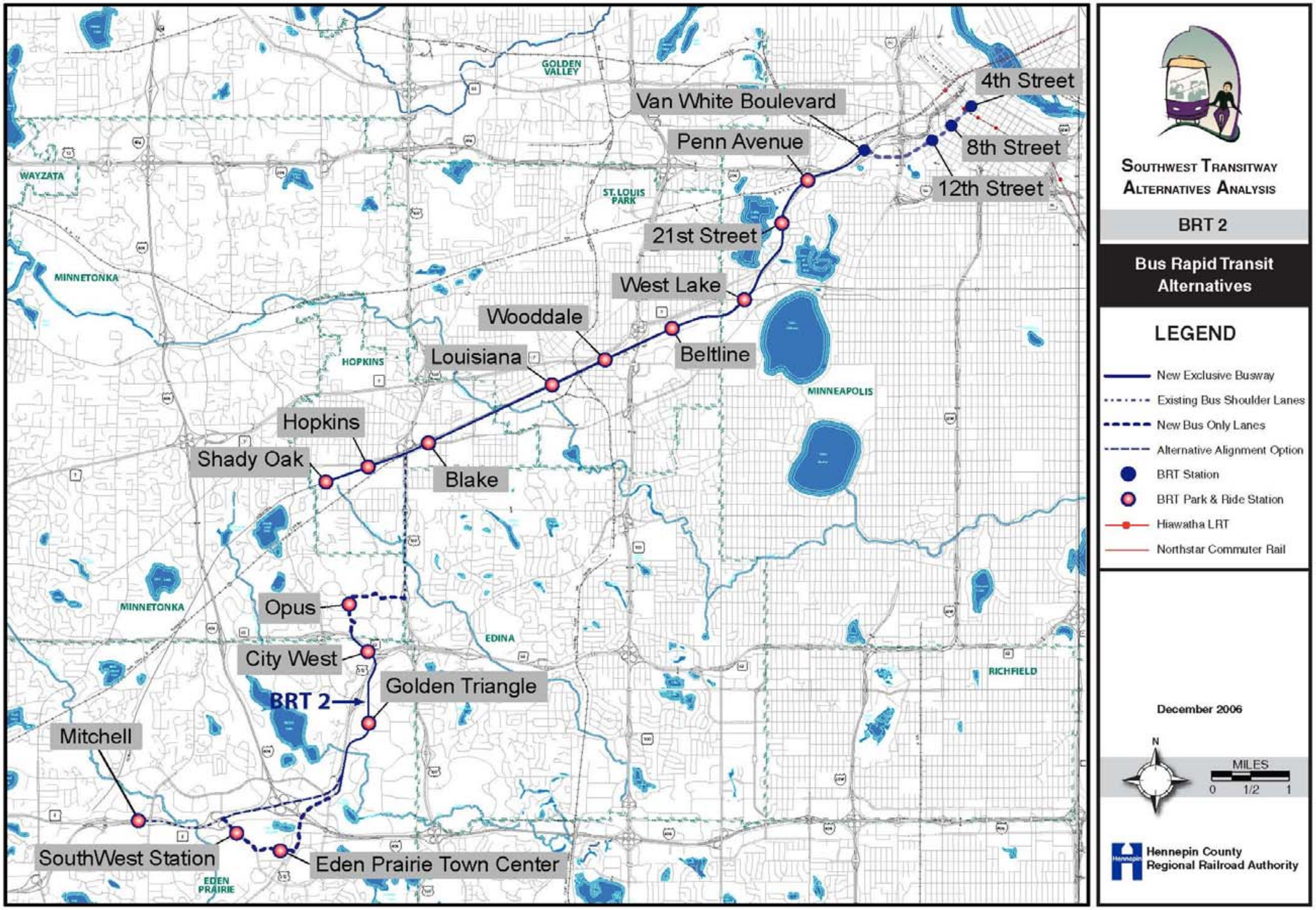
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station**: Route 25 connects to this station. Changes to route 25 are described above under West Lake Station.

## Figure D-4  BRT 2 Alternative




Source:  Parsons Brinckerhoff, 2006

## *Light Rail Transit Alternatives*

The eight LRT alternatives are described using a combination of a numeric (1,2,3,or 4) and alphabetic (A or C) designation. The numbers designate the four possible routings west of Louisiana Avenue in St. Louis Park. The letters designate the two possible routes east of Louisiana Avenue in St. Louis Park.

Alternatives numbered "1" designate routes that use the HCRRA's Southwest Corridor through Eden Prairie, Minnetonka, Hopkins, to Louisiana Avenue in St. Louis Park. Alternatives numbered "2" designate routes that use TH 5 and I-494 rights-of-way through Eden Prairie and Minnetonka and HCRRA's Southwest Corridor through Hopkins to Louisiana Avenue in St. Louis Park. Alternatives numbered "3" use a combination of new exclusive rights-of-way through Eden Prairie, Minnetonka and part of Hopkins, then use the HCRRA's Southwest Corridor through Hopkins to Louisiana Avenue in St. Louis Park. Alternatives numbered "4" designate shortened routes using the HCRRA's Southwest Corridor from Shady Oak Road in Minnetonka to Louisiana Avenue in St. Louis Park. These alternatives do not provide direct LRT service to areas of Minnetonka west of Shady Oak Road and Eden Prairie. LRT alternatives 1 through 4 mirror those resulting from the HCRRA's *Southwest Rail Transit Study, 2003*.

Alternatives with the letter "A" designate routes that use the HCRRA's Southwest Corridor through St. Louis Park, and the HCRRA's Kenilworth and Cedar Lake Corridors in Minneapolis. Alternatives with the letter "C" designate routes that use the HCRRA's Southwest Corridor in St. Louis Park, the HCRRA's Midtown Corridor in Minneapolis, and a shallow tunnel under Nicollet Avenue in Minneapolis. In general, the "A" and "C" routings are similar to those contained in the HCRRA's Draft Environmental Impact Statement (DEIS) Hennepin County LRT System, 1988.

### Light Rail Transit – A Alternatives

LRT A alternatives enter downtown Minneapolis from the northwest, either connecting to the Intermodal Station or along Hennepin Avenue, from there turning into the Hiawatha LRT line at 5th Street. LRT A options have the ability to interline with Hiawatha trains, for a seamless trip between Eden Prairie and Minneapolis-St. Paul International Airport and the Mall of America in Bloomington.

Under all LRT A alternatives it would be necessary to remove the existing freight railroad track from the HCRRA Kenilworth Corridor. In 1999, St. Louis Park in partnership with Hennepin County and Mn/DOT convened the Southwest Railroad Advisory Task Force to study freight rail issues affecting St. Louis Park. After the task force concluded their work, the St. Louis Park City Council adopted a position that "freight rail from the west headed for St. Paul should continue to travel through the Kenilworth corridor in Minneapolis unless and until such time as a viable form of mass transit displaces it….If at a future date, it is determined that the Kenilworth Corridor is the most feasible route for mass transit and that freight rail and a mass transit system cannot coexist in that corridor, freight rail traffic will be re-routed through St. Louis Park. This is to be accomplished by constructing a northerly connection on the Golden Auto Site and a connection on the iron triangle property." (citation Page 1, May 23, 2001)

Consistent with the conclusion of the St. Louis Park Rail Task Force position statement, since mass transit is assumed the freight rail traffic in Kenilworth would be relocated to the Canadian Pacific's north-south line (the MNS Subdivision) located west of TH 100, then east on the BNSF's Wayzata Subdivision. This requires construction of a new connection on the Golden Auto Site in the northwest corner between the CP Bass Lake Subdivision and the MNS Subdivision, and restoration of the Iron Triangle, a former connection in the southeast corner between the BNSF Wayzata Subdivision and the MNS Subdivision.

LRT 1A
The LRT 1A alternative operates from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The alignment begins near the intersection of TH 5 and the HCRRA's Southwest Corridor. From that point the route enters a new exclusive light rail transit (LRT) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lakes Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lakes Corridor to street level, where it enters Royalston Avenue. In Royalston Avenue the route operates on exclusive LRT guideway in the median of Royalston Avenue to 7$^{th}$ Street. At 7$^{th}$ Street the route enters a shallow tunnel under 7$^{th}$ Street to 5$^{th}$ Street. At 5$^{th}$ Street the route connects directly to the Intermodal Station at end of the existing Hiawatha LRT tracks though downtown Minneapolis.

*Potential Route Variations*
Two route variations are included in the LRT 1A alternative, one in Eden Prairie and the other in downtown Minneapolis.

Under the LRT 1A alternative as described above, the LRT route must cross the TC&W Railroad tracks near TH 62. The TH 62 overpass and the existing grades in that area make the crossing difficult. To avoid this potentially difficult and costly crossing, a minor route variation that uses the TC&W and Canadian Pacific right-of-way will be evaluated. Under this variation the route would turn into the railroad right-of-way after passing below TH 62, and run next to the railroad tracks to a location near the Minnetonka-Hopkins city limits. At that point the route would cross beneath the freight tracks and turn north, following new right-of-way until it reaches the HCRRA's Southwest Corridor. The route then enters the HCRRA's Southwest Corridor and proceeds towards Minneapolis.

The second route variation uses Dunwoody Boulevard and Hennepin Avenue rather than Royalston Avenue to access downtown Minneapolis. Under this variation the route leaves the HCRRA's Cedar Lake Park Corridor at the new Van White Boulevard and enters Dunwoody Boulevard and Hennepin Avenue to 5$^{th}$ Street in downtown Minneapolis. While this route variation can interline with the Hiawatha LRT line eastbound it cannot interline with the Hiawatha LRT line westbound to access the Warehouse and Intermodal stations.

*Stations*
LRT 1A station locations are listed below. All stations west of Van White Boulevard in Minneapolis are assumed to include park-and-ride facilities. A center platform configuration is proposed unless otherwise noted.

- TH 5, Eden Prairie – The proposed site is located in the northeast corner of TH 5 and the HCRRA Southwest Corridor LRT Trail right-of-way. Access to and from the site would be via re-routed Venture Lane.
- TH 62, Eden Prairie/Minnetonka – The proposed site is located south of TH 62, in the southeast corner of West 62nd Street and the HCRRA Southwest Corridor property, between Industrial Drive on the west and Carlson Drive on the east. Access to and from the site would be via Carlson Drive and West 62nd Street.
- Rowland Road, Minnetonka – The proposed site is located in the southeast corner of Rowland and Baker Roads, just east of I-494 and west of the HCRRA Southwest Corridor property. Access would be via Rowland and Baker Roads. An alternative site, required as part of the potential route variation, is located in the northeast corner of Rowland Road and the HCRRA Southwest Corridor and is accessed via Rowland Rd.
- Shady Oak Road, Minnetonka – The proposed site is located east of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17th Avenue.
- 8thAvenue, Hopkins – The proposed site is located between 8th and 5th Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a reconstructed intersection at 8th Avenue.
- Blake Road, Hopkins - The proposed site is located northwest of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2nd Avenue NE.
- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36th Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.
- West Lake Street, Minneapolis - The proposed site is located southeast of the HCRRA Southwest Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.
- 21st Street, Minneapolis - The proposed site is located in the southwest corner of West 21st Street and the HCRRA Southwest Corridor property. Access to the site would be via West 21st Street and Upton Avenue South.
- Penn Avenue, Minneapolis – The proposed site is located north of the HCRRA Southwest Corridor property, south of Penn Avenue and south of I-394. Access to the station area would be via Penn Avenue. Pedestrian access to the station platforms would be via a bridge over the BNSF freight railroad adjacent to the HCRRA Southwest Corridor property.
- Van White Boulevard, Minneapolis - The proposed site is located north of the HCRRA Southwest Corridor property, adjacent to the planned Van White Boulevard. This station is assumed to be constructed in coordination with planned mixed-use development in that location. Access to the station area would be via Van White Boulevard.

- Royalston Avenue North, Minneapolis – the proposed site is located within Royalston Avenue south of 5th Avenue North, southwest of 7th Street North. Access would be via Royalston, 5th, 7th, and Olson Memorial Highway
- (Hennepin Avenue Variation) – Under this variation, these stations are proposed to be located on Hennepin Avenue, in the blocks between 11th and 12th Streets and between 7th and 8th Streets.

*Infrastructure Improvements Required*
LRT 1A requires the Kenilworth Corridor freight rail relocation described previously. LRT 1A requires the construction of a new two-track rail line approximately 30 feet wide in HCRRA right-of-way through the Southwest, Kenilworth and Cedar Lake Park Corridors, and the construction of on-line stations within the guideway. LRT 1A requires a grade separation to cross the TC&W Railroad, either at TH 62 or near the Hopkins-Minnetonka city limits, and a grade separation at Excelsior Boulevard in Hopkins. LRT 1A requires realignment of Glenwood Avenue and new structures over the BNSF Railroad to transition from the Cedar Lake Corridor to street level at Royalston Avenue, and a short shallow tunnel under 7th Street to 5th Street. The Hennepin Avenue variation of LRT 1A is assumed to require the widening of Dunwoody Boulevard, and reconstruction of Hennepin Avenue from I-94 to 5th Street in Minneapolis.

*Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Freight Rail Relocation*
**LRT 2A requires the Kenilworth Corridor freight rail relocation described previously.**

*Connecting Transit Service - LRT 1A*
**TH 5 Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service is eliminated.

**TH 62 Station**: Routes 661 and 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing part of the alignment of existing route 681, which will not operate from SouthWest Station on TH 212. The route separates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Rowland Station**: No routes serve this station. .

**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 661, 615, 664 and 665 serve this station. Changes to Route 12 are described below under West Lake Station. Changes to route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand) in the LRT 1A alternative. Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 is increased in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of route 17 and Route 615 serve this station. Changes to this route are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of is Route 17, Route 604 and Route 615 would serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and would operate from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

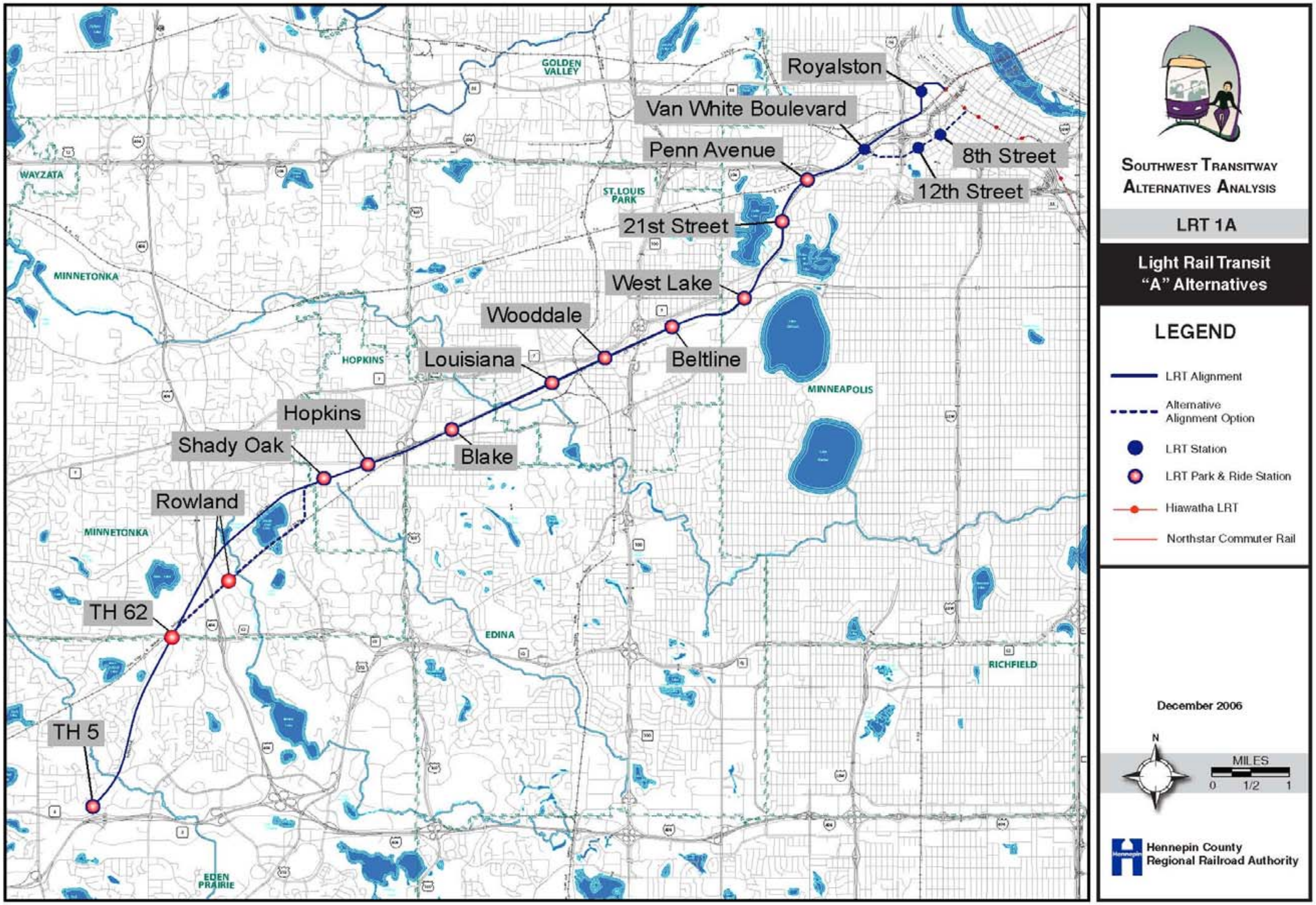
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station:** Route 25 connects to this station. Changes to route 25 are described above under West Lake Station.

## Figure D-5 LRT 1A Alternative




*Source: Parsons Brinckerhoff, 2006*

LRT 2A

LRT 2A operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The alignment begins south of TH 5 at Mitchell Road in Eden Prairie. From that point the route follows along the south side of TH 5, crossing under Prairie Center Drive. As it approaches the I-494/TH 5 interchange, the route climbs and crosses over TH 5, descending along the west side of the I-494 exit ramp to TH 5. It continues north along the west side of I-494 to the HCRRA's Southwest Corridor, where it turns east and crosses under the freeway.

After entering the Southwest Corridor, the route continues in an exclusive LRT guideway to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lake Park Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lakes Corridor to street level where it enters Royalston Avenue. In Royalston Avenue the route operates on exclusive LRT guideway in the median of Royalston Avenue to 7$^{th}$ Street. At 7$^{th}$ Street the route enters a shallow tunnel under 7$^{th}$ Street to 5$^{th}$ Street. At 5$^{th}$ Street the route connects directly to the end of the existing Hiawatha LRT tracks through downtown Minneapolis.

*Potential Route Variation*

This route variation uses Dunwoody Boulevard and Hennepin Avenue rather than Royalston Avenue to access downtown Minneapolis. Under this variation the route leaves the HCRRA's Cedar Lakes Corridor at the new Van White Boulevard and enters Dunwoody Boulevard and Hennepin Avenue to 5$^{th}$ Street in downtown Minneapolis. While this route variation can interline with the Hiawatha LRT line eastbound it cannot interline with the Hiawatha LRT line westbound to access the Warehouse and Intermodal stations.

*Stations*

LRT 2A station locations are listed below. All stations west of Van White Boulevard are assumed to include park-and-ride facilities. A center platform configuration is assumed unless otherwise noted.

- Mitchell Road, Eden Prairie – The proposed site is located west of Mitchell Road, south of TH 5, north of Lone Oak Road. Access would be via Mitchell and Loan Oak Roads.
- SouthWest Station, Eden Prairie - The proposed station expands the current SouthWest Metro Transit Station parking facility in the northwest corner of Technology Drive and Prairie Center Drive. Access to the site would be via Technology Drive.
- Valley View Road, Eden Prairie - The proposed site is located near the northwest corner of I-494 and Plaza Drive. Access would be from Valley View Road to Plaza Drive and a new drive connected to Plaza Drive.
- TH 62, Eden Prairie/Minnetonka – The proposed site is located south of TH 62, just west of I-494, east of Baker Road and north of Holesek Lane. Access would be via Baker Road and Pinnacle Drive.

- Rowland Road, Minnetonka – The proposed site is located in the southeast corner of Rowland and Baker Roads, just east of I-494. Access would be via Rowland and Baker Roads.
- Shady Oak Road, Minnetonka – The proposed site is located east of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17th Avenue.
- 8th Avenue, Hopkins – The proposed site is located between 8th and 5th Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a reconstructed intersection at 8th Avenue.
- Blake Road, Hopkins - The proposed site is located northwest of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2nd Avenue NE.
- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36th Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.
- West Lake Street, Minneapolis - The proposed site is located between the HCRRA Southwest Corridor property and Whole Foods grocery store, on the southeast side of the HCRRA Southeast Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.
- 21st Street, Minneapolis - The proposed site is located in the southwest corner of West 21st Street and the HCRRA Southwest Corridor property. Access to the site would be via West 21st Street and Upton Avenue South.
- Penn Avenue, Minneapolis – The proposed site is located north of the HCRRA Southwest Corridor property, south of Penn Avenue and south of I-394. Access to the station area would be via Penn Avenue. Pedestrian access to the station platforms would be via a bridge over the BNSF freight railroad adjacent to the HCRRA Southwest Corridor property.
- Van White Boulevard, Minneapolis - The proposed site is located north of the HCRRA Southwest Corridor property, adjacent to the planned Van White Boulevard. This station is assumed to be constructed in coordination with planned mixed-use development in that location. Auto access to the station area would be via Van White Boulevard.
- Royalston Avenue North, Minneapolis – the proposed site is located within Royalston Avenue south of 5th Avenue North, southwest of 7th Street North. Access would be via Royalston, 5th, 7th, and Olson Memorial Highway
- (Hennepin Avenue Variation) – Under this variation, these stations are proposed to be located on Hennepin Avenue, in the blocks between 11th and 12th Streets and between 7th and 8th Streets.

*Infrastructure Improvements Required*
LRT 2A requires the Kenilworth Corridor freight rail relocation described previously. LRT 2A requires the construction of a new two-track rail line approximately 30 feet wide along the south side of TH 5 and the east side of I-494 through Eden Prairie and Minnetonka,

and within HCRRA right-of-way through the Southwest, Kenilworth and Cedar Lake Park Corridors, and the construction of on-line stations within the guideway. LRT 2A requires a short tunnel under Prairie Center Drive, a flyover structure across TH 5, and new bridges in the I-494 right-of-way at the Valley View exit ramp, TH 62, and the TC&W Railroad. It also requires a grade separation at Excelsior Boulevard in Hopkins. LRT 2A requires realignment of Glenwood Avenue and a new structure over the BNSF Railroad to transition from the Cedar Lake Corridor to street level at Royalston Avenue, and a short shallow tunnel under 7th Street to 5th Street. The Hennepin Avenue variation of LRT 2A is assumed to require the widening of Dunwoody Boulevard, and reconstruction of Hennepin Avenue from I-94 to 5th Street in Minneapolis.

*Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Freight Rail Relocation*
**LRT 2A requires the Kenilworth Corridor freight rail relocation described previously.**

*Connecting Transit Service - LRT 2A*
**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service is eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit’s bus operations.

Routes 680, 685, 685A, 691, 694, 698 and 699A are not changed under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which now operates only in the clockwise direction, operates in both directions in the LRT 2A alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also operates bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to Routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via TH 212, TH 62, and I-35W, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, Route 690, 690A and 690B are combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. 690 continues to use its existing alignment of TH 212 to TH 169 and I-394.

**Valley View Station**: Routes 685 and 685A serve this station. Apart from a stop at the station, these routes are not be changed under this alternative.

**TH 62 Station**: Routes 661 and the 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

The 681 Circulator is described above under SouthWest Station.

**Rowland Station**: No routes serve this station.

**Shady Oak Station**: Route 12 serves this station. Changes to route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station. Changes to route 12 are described below under West Lake Station. Changes to route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency would be 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36$^{th}$ Street branch of route 17 and Route 615 serve this station. Changes to this route are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36$^{th}$ Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale Station and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and would operate from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis would be eliminated. Service frequency increases slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

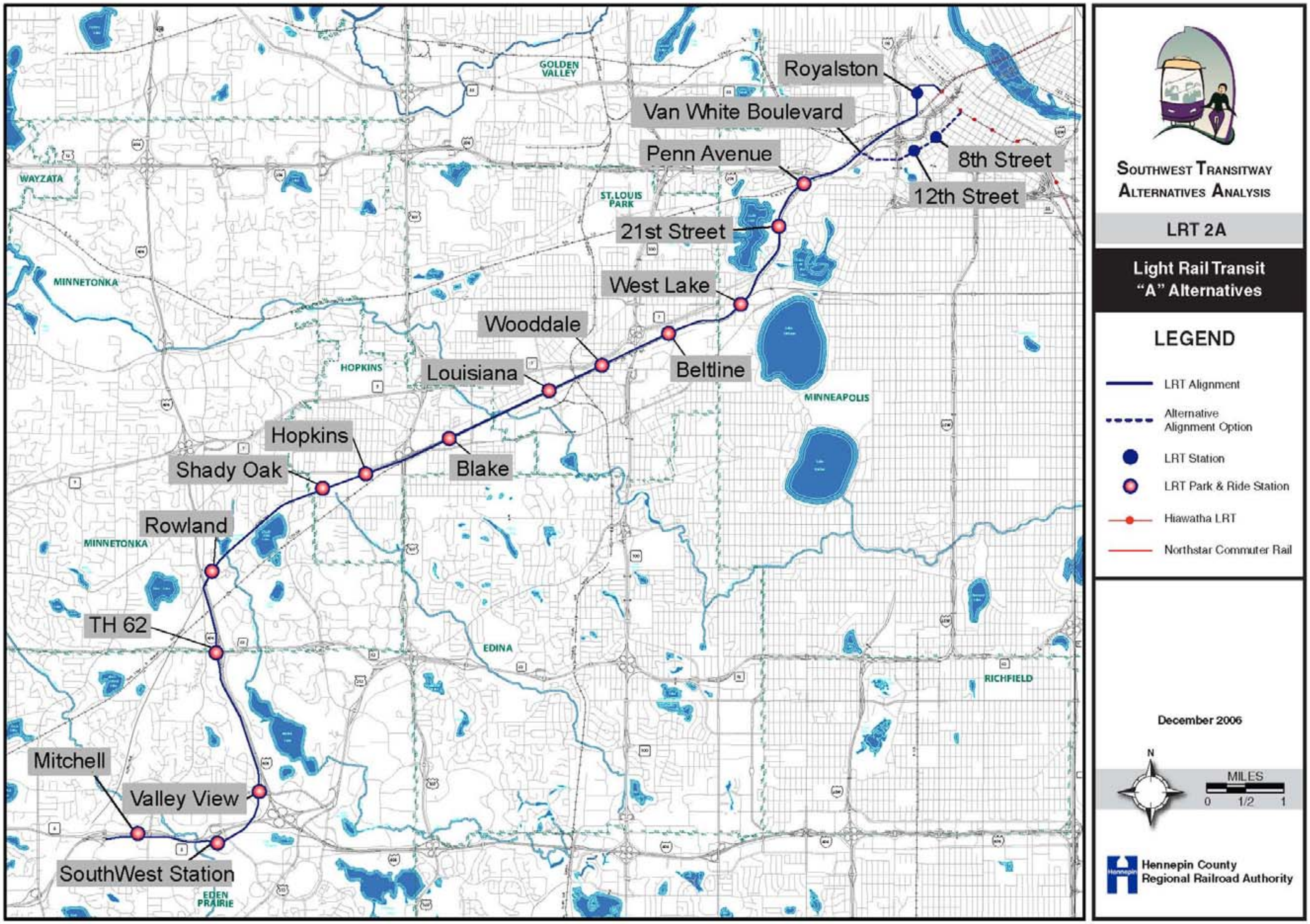
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station:** Route 25 connects to this station.  Changes to route 25 are described above under West Lake Station.

Figure D-6  LRT 2A Alternative




*Source:  Parsons Brinckerhoff, 2006*

LRT 3A

LRT 3A operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The route begins south of TH 5 at Mitchell Road in Eden Prairie. From that point the route follows along the south side of TH 5, crossing under Prairie Center Drive. It turns south along the east side of Prairie Center Drive, then turns east into new right-of-way located behind the existing properties on the north side of Singletree Lane. The route continues along the south side of Leona Road to Flying Cloud Drive, where it turns north. It runs along the east side of Flying Cloud Drive, over I-494 and into the east side of the TH 212 right-of-way.

The route then swings east and north along new right-of-way through the Golden Triangle area. After crossing Shady Oak Road, the route crosses over TH 212 into the City West area, then crosses over TH 62 into the Opus area of Minnetonka. The route follows new right-of-way through Opus, crossing under Smetana Road and continuing north along the Minnetonka-Hopkins city limits. After reaching the HCRRA's Southwest Corridor, the route turns east and follows an exclusive LRT guideway to West Lake Street in Minneapolis.

Just north of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lake Park Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lakes Corridor to street level where it enters Royalston Avenue. In Royalston Avenue the route operates on exclusive LRT guideway in the median of Royalston Avenue to $7^{th}$ Street. At $7^{th}$ Street the route enters a shallow tunnel under $7^{th}$ Street to $5^{th}$ Street. At $5^{th}$ Street the route connects directly to the end of the existing Hiawatha LRT tracks through downtown Minneapolis.

*Potential Route Variation*

This alternative includes a route variation in Eden Prairie. After serving the SouthWest station, the route would cross under Prairie Center Drive and continue along the north side of Technology Drive. It then turns northeast, crossing over I-494 and intersecting Flying Cloud Drive. The route follows along the east side of Flying Cloud Drive and into the east side of the TH 212 right-of-way. The variation does not include an Eden Prairie Town Center station.

LRT 3A also includes a route variation using Dunwoody Boulevard and Hennepin Avenue rather than Royalston Avenue to access downtown Minneapolis. Under this variation the route leaves the HCRRA's Cedar Lake Park Corridor at the new Van White Boulevard and enters Dunwoody Boulevard and Hennepin Avenue to $5^{th}$ Street in downtown Minneapolis. While this route variation can interline with the Hiawatha LRT line eastbound it cannot interline with the Hiawatha LRT line westbound to access the Warehouse and Intermodal stations.

*Stations*

LRT 3A station locations are listed below. All stations west of Van White Boulevard are assumed to include park-and-ride facilities. A center platform consideration is assumed unless otherwise noted.

- Mitchell Road, Eden Prairie – The proposed site is located west of Mitchell Road, south of TH 5, north of Lone Oak Road. Access would be via Mitchell and Loan Oak Roads.
- SouthWest Station, Eden Prairie - The proposed station expands the current SouthWest Metro Transit Station parking facility in the northwest corner of Technology Drive and Prairie Center Drive. Access to the site would be via Technology Drive.
- Eden Prairie Town Center, Eden Prairie – The proposed site is located north of Singletree Lane, and east of a new north-south roadway. Access to and from the site would be via Singletree Lane and the new roadway extension.
- Golden Triangle, Eden Prairie - The proposed site is located west of TH 212 at the east edge of the former Best Buy Site. Access would be via an extended West 70th Street.
- City West, Eden Prairie - The proposed site is located on the southwest side of TH 62, adjacent to or constructed in conjunction with the planned City West development at this location. Access would be via Shady Oak Rd, West 62nd Street, and new development roads.
- OPUS, Minnetonka – The proposed site is located in the southeast corner of the Bren Road East and Bren Road West one-way-pair divergence. Access would be from the two Bren Roads.
- Shady Oak Road, Minnetonka – The proposed site is located east of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17th Avenue.
- 8thAvenue, Hopkins – The proposed site is located between 8th and 5th Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a breconstructed intersection at 8th Avenue.
- Blake Road, Hopkins - The proposed site is located northwest of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2nd Avenue NE.
- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36th Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.
- West Lake Street, Minneapolis - The proposed site is located between the HCRRA Southwest Corridor property and Whole Foods grocery store, on the southeast side of the HCRRA Southwest Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.
- 21st Street, Minneapolis - The proposed site is located in the southwest corner of West 21st Street and the HCRRA Southwest Corridor property. Access to the site would be via West 21st Street and Upton Avenue South.
- Penn Avenue, Minneapolis – The proposed site is located north of the HCRRA Southwest Corridor property, south of Penn Avenue and south of I-394. Access to the station area would be via Penn Avenue. Pedestrian access to the station

platforms would be via a bridge over the BNSF freight railroad adjacent to the HCRRA Southwest Corridor property.

- Van White Boulevard, Minneapolis - The proposed site is located north of the HCRRA Southwest Corridor property, adjacent to the planned Van White Boulevard. This station is assumed to be constructed in coordination with planned mixed-use development in that location. Auto access to the station area would be via Van White Boulevard.
- Royalston Avenue North, Minneapolis – the proposed site is located within Royalston Avenue south of 5th Avenue North, southwest of 7th Street North. Access would be via Royalston, 5th, 7th, and Olson Memorial Highway
- (Hennepin Avenue Variation) – Under this variation, these stations are proposed to be located on Hennepin Avenue, in the blocks between 11th and 12th Streets and between 7th and 8th Streets.

*Infrastructure Improvements Required*

LRT 3A requires the Kenilworth Corridor freight rail relocation described previously. LRT 3A requires the construction of a new two-track rail line approximately 30 feet wide through the Southwest Corridor, Kenilworth and Cedar Lake Park Corridors, and the construction of on-line stations within the guideway. New right-of–way and tracks are required along the south side of TH 5 from Mitchell Road to Prairie Center Drive, through the Eden Prairie Center area, along Flying Cloud Drive over I-494, through the Golden Triangle area, across TH 212 to City West, across TH 62 to Opus, and along the Hopkins-Minnetonka city limits to the HCRRA Southwest Corridor. LRT 3A requires grade separations at Prairie Center Drive, I-494, Flying Cloud Drive, TH 212, TH 62, Smetana Road, the TC&W Railroad, and Excelsior Boulevard. LRT 3A requires realignment of Glenwood Avenue and a new structure over the BNSF Railroad to transition the alignment from the Cedar Lake Park Corridor to street level at Royalston Avenue, and a short shallow tunnel under 7th Street to 5th Street. The Hennepin Avenue variation of LRT 3A is assumed to require the widening of Dunwoody Boulevard, and reconstruction of Hennepin Avenue from I-94 to 5th Street in Minneapolis.

*Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 (to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Freight Rail Relocation*

**LRT 3A requires the Kenilworth Corridor freight rail relocation described previously.**

*LRT 3A Connecting Transit Service*

**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 is increased from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service will be eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Routes 680, 685, 685A, 691, 694, 698 and 699A are be changed under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which now operates only in the clockwise direction, operates in both directions in the LRT 3A alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also is operates bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via TH 212, TH 62, and I-35W, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, routes 690, 690A and 690B are combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. Route 690 continues to use its existing alignment of TH 212 to TH 169 and I-394.

**Eden Prairie Town Center Station**: Routes 636 and 681 Circulator serve this station. Route 636 is described above under TH5 Station. Route 681 is described above under SouthWest Station.

**Golden Triangle Station**: Routes 631 and 681 Circulator serve this station. Route 631 is described above under TH5 Station. Route 681 is described above under SouthWest Station.

**City West Station**: No bus routes serve this station.

**Opus Station**: Routes 12 and 661 serve this station. Changes to Route 12 are described below under West Lake Station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency.  The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Shady Oak Station**: Route 12 serve this station.  Changes to route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station.  Changes to Route 12 are described below under West Lake Station.  Changes to route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand).  Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes.  The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612.  Route 664 will offer an off-peak service similar to the discontinued 612.  The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of route 17 and Route 615 serve this station.  Changes to this route are described above under Blake Station.  Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 would serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale Station and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remains unchanged).

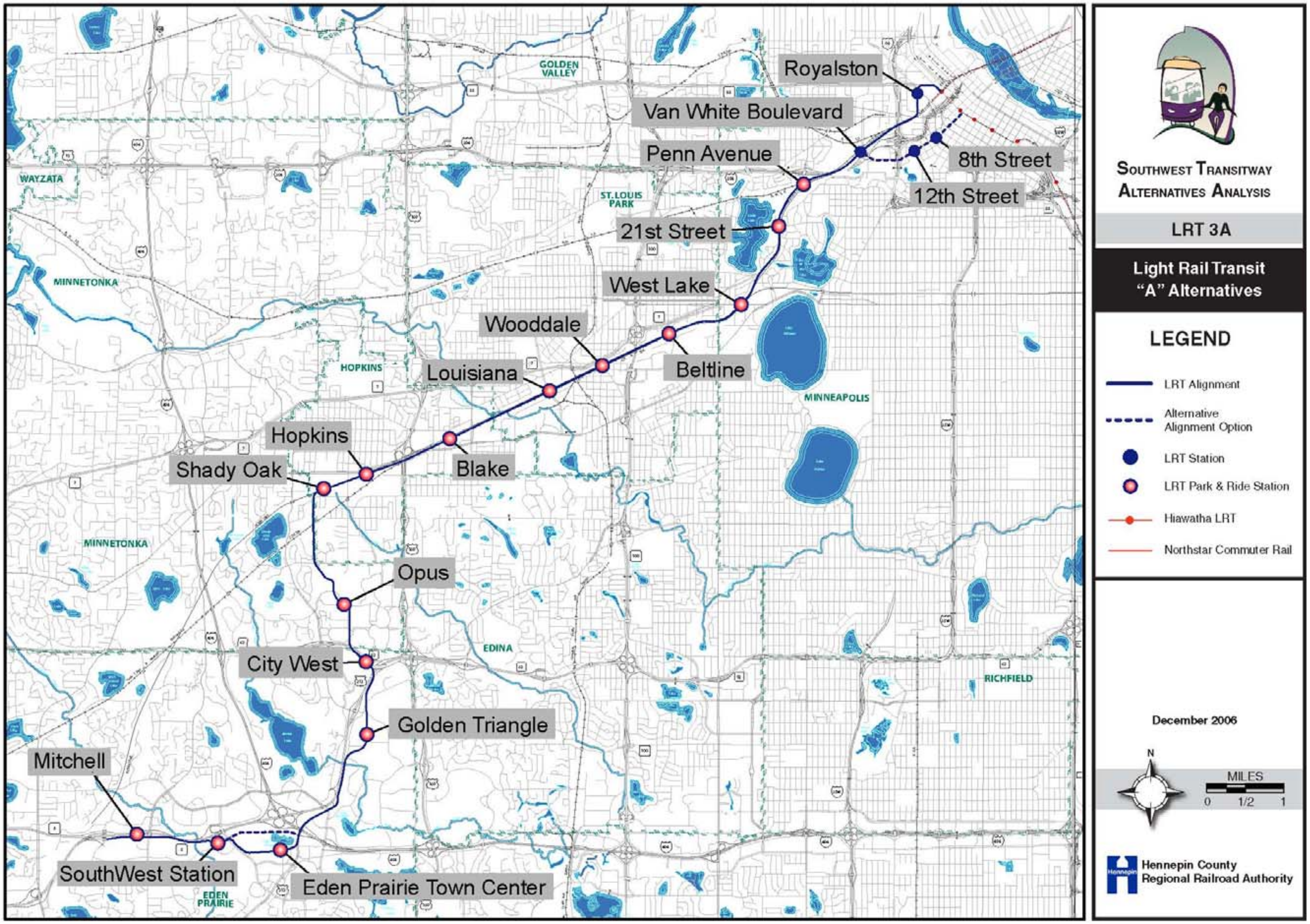
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station:** Route 25 connects to this station. Changes to Route 25 are described above under West Lake Station.

## Figure D-7  LRT 3A Alternative




***Source:  Parsons Brinckerhoff, 2006***

LRT 4A

The LRT 4A alternative is assumed to operate from Shady Oak Road in Minnetonka to downtown Minneapolis, providing service to Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The route begins near the intersection of Shady Oak Road and the HCRRA's Southwest Corridor. From Shady Oak Road the route enters a new exclusive light rail transit (LRT) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lake Park Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lakes Corridor to street level where it enters Royalston Avenue. In Royalston Avenue the route operates on exclusive LRT guideway in the median of Royalston Avenue to 7$^{th}$ Street. At 7$^{th}$ Street the route enters a shallow tunnel under 7$^{th}$ Street to 5$^{th}$ Street. At 5$^{th}$ Street the route connects directly to the end of the existing Hiawatha LRT tracks through downtown Minneapolis.

LRT 4A includes a route variation using Dunwoody Boulevard and Hennepin Avenue rather than Royalston Avenue to access downtown Minneapolis. Under this variation the route leaves the HCRRA's Cedar Lake Park Corridor at the new Van White Boulevard and enters Dunwoody Boulevard and Hennepin Avenue to 5$^{th}$ Street in downtown Minneapolis. While this route variation can interline with the Hiawatha LRT line eastbound it cannot interline with the Hiawatha LRT line westbound to access the Warehouse and Intermodal stations.

*Stations*

LRT 4A station locations are listed below. All stations west of Van White Boulevard are assumed to include park-and-ride facilities. A center platform configuration is assumed unless otherwise noted.

- Shady Oak Road, Minnetonka – The proposed site is located east of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17$^{th}$ Avenue.
- 8$^{th}$Avenue, Hopkins – The proposed site is located between 8$^{th}$ and 5$^{th}$ Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a reconstructed intersection at 8$^{th}$ Avenue.
- Blake Road, Hopkins - The proposed site is located northwest of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2$^{nd}$ Avenue NE.
- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36$^{th}$ Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.

- West Lake Street, Minneapolis - The proposed site is located between the HCRRA Southwest Corridor property and Whole Foods grocery store, on the southeast side of the HCRRA Southwest Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.
- 21st Street, Minneapolis - The proposed site is located in the southwest corner of West 21st Street and the HCRRA Southwest Corridor property. Access to the site would be via West 21st Street and Upton Avenue South.
- Penn Avenue, Minneapolis – The proposed site is located north of the HCRRA Southwest Corridor property, south of Penn Avenue and south of I-394. Access to the station area would be via Penn Avenue. Pedestrian access to the station platforms would be via a bridge over the BNSF freight railroad adjacent to the HCRRA Southwest Corridor property.
- Van White Boulevard, Minneapolis - The proposed site is located north of the HCRRA Southwest Corridor property, adjacent to the planned Van White Boulevard. This station is assumed to be constructed in coordination with planned mixed-use development in that location. Auto access to the station area would be via Van White Boulevard.
- Royalston Avenue North, Minneapolis – the proposed site is located within Royalston Avenue south of 5th Avenue North, southwest of 7th Street North. Access would be via Royalston, 5th, 7th, and Olson Memorial Highway
- (Hennepin Avenue Variation) – Under this variation, these stations are proposed to be located on Hennepin Avenue, in the blocks between 11th and 12th Streets and between 7th and 8th Streets.

*Infrastructure Improvements Required*
LRT 4A requires the Kenilworth Corridor freight rail relocation described previously. LRT 4A requires the construction of a new two-track rail line approximately 30 feet wide in HCRRA right-of-way through the Southwest, Kenilworth and Cedar Lake Park Corridors, and the construction of on-line stations within the guideway. It also requires a grade separation at Excelsior Boulevard in Hopkins. LRT 4A requires realignment of Glenwood Avenue and a new structure over the BNSF Railroad to transition the alignment from the Cedar Lake Park Corridor to street level at Royalston Avenue, and a short shallow tunnel under 7th Street to 5th Street. The Hennepin Avenue variation of LRT 4A is assumed to require the widening of Dunwoody Boulevard, and reconstruction of Hennepin Avenue from I-94 to 5th Street in Minneapolis.

*Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Freight Rail Relocation*
**LRT 4A requires the Kenilworth Corridor freight rail relocation described previously.**

*LRT 4A Connecting Transit Service*
**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under West Lake Station.

**Hopkins Station**: Routes 12, 615, 661, 664, 665 and Limited Stop Route "A" serve this station. Changes to route 12 are described below under West Lake Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand) in the LRT 4A alternative. Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued Route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and would operate at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 665 is increased in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

Limited Stop Route "A" is a version of the new long-distance service route from Eden Prairie that features as one of the key new routes in the Enhanced Bus and BRT alternatives. In this alternative, the route terminates at Hopkins Station. Travelers to downtown Minneapolis transfer there to the light rail line. The route operates from the TH 5 park-and-ride at Wallace Road to Hopkins via TH 5, TH 212, and TH 169. The route essentially meets every other LRT trip, operating at a 20 minute headway early morning and midday, 15 minutes during the peak periods and 30 minutes in the evenings.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency would increase from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and is increased in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of route 17 and Route 615 serve this station. Changes to this route are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, 21, 25, and 53 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale Station and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remains unchanged).

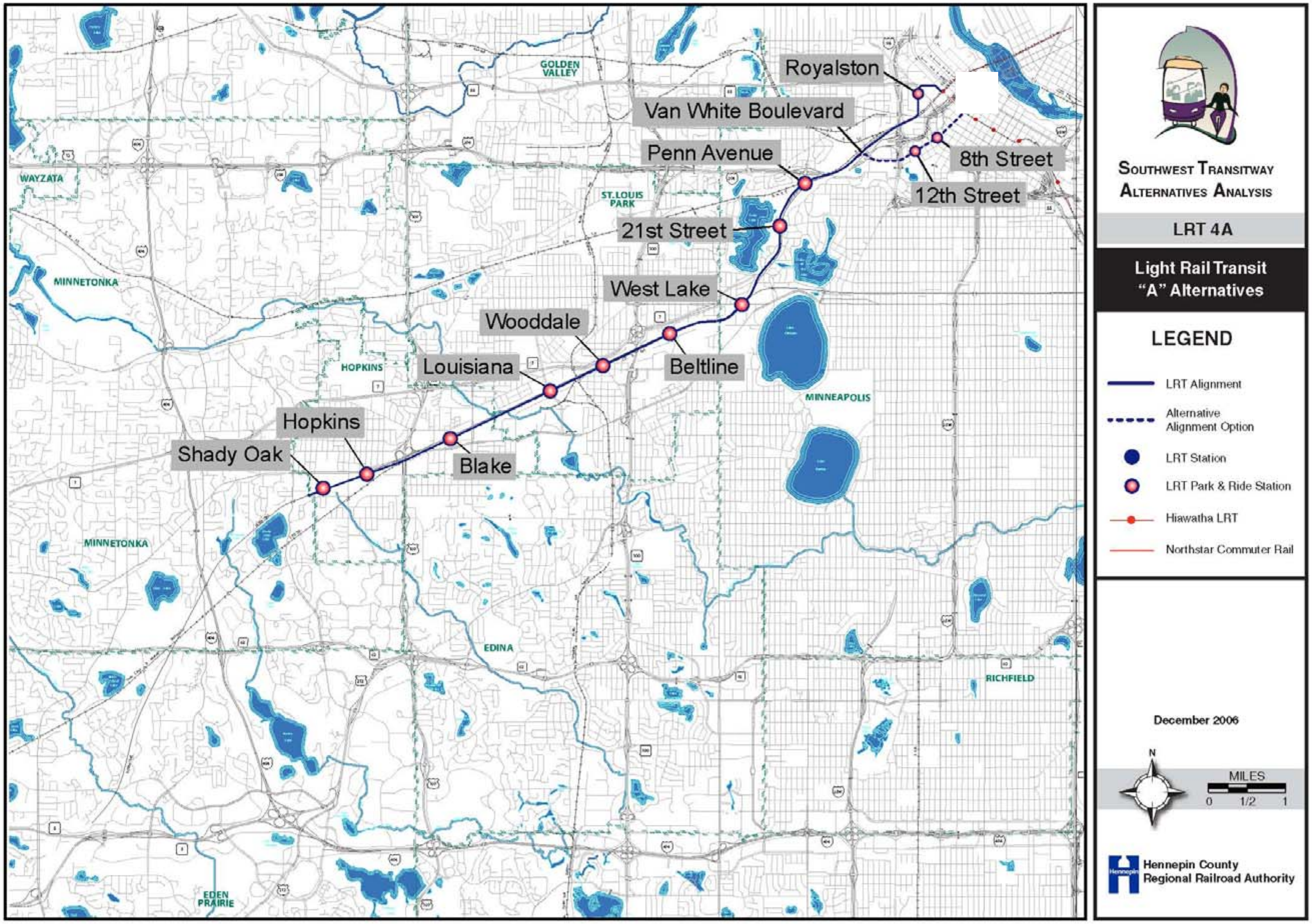
Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown Station to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**21st Street Station**: Route 25 connects to this station. Changes to route 25 are described above under West Lake Station.

**Figure D-8  LRT 4A Alternative**




*Source:  Parsons Brinckerhoff, 2006*

## Light Rail Transit – C Alternatives

LRT C alternatives enter downtown Minneapolis from the Midtown Corridor to the south, connecting to Hiawatha LRT through a transfer at 4th Street. LRT C alternatives penetrate the core of downtown Minneapolis perpendicular to Hiawatha LRT, providing service to the Minneapolis Convention Center and several major hotels.

Under all "C" alternatives, in order to serve the proposed stations at Wooddale Avenue, Beltline Boulevard, and West Lake Street the rights-of-way owned by the HCRRA and the Canadian Pacific (CP) freight rail company must be exchanged and a grade separated crossing of the LRT and freight rail tracks must be constructed between Louisiana Avenue and Wooddale Avenue. This exchange allows freight rail operations to be located to the north of the LRT service. Under this alternative freight rail service is assumed to continue to operate in the HCRRA's Kenilworth Corridor in Minneapolis.

LRT 1C

LRT 1C operates from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The route begins near the intersection of TH 5 and the HCRRA's Southwest Corridor. From that point the route enters a new exclusive light rail transit (LRT) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis. Just east of West Lake Street the route enters a new exclusive LRT guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive LRT guideway in a cut and cover tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2nd and Marquette Avenues.

*Potential Route Variation*

Under the LRT 1C alignment described above, the LRT route must cross the TC&W Railroad tracks near TH 62. The TH 62 overpass and the existing grades in that area make the crossing difficult. To avoid this potentially difficult and costly crossing, a minor route variation that uses the TC&W and Canadian Pacific right-of-way will be evaluated. Under this variation the route would turn into the railroad right-of-way after passing below TH 62, and run next to the railroad tracks to a location near the Minnetonka-Hopkins city limits. At that point the route would cross beneath the freight tracks and turn north, following new right-of-way until it reaches the HCRRA's Southwest Corridor. The route then enters the HCRRA's Southwest Corridor and proceeds towards Minneapolis.

*Stations*

LRT 1C station locations are listed below. All stations west of Van White Boulevard are assumed to include park-and-ride facilities. A center platform configuration is assumed unless otherwise noted.

- TH 5, Eden Prairie – The proposed site is located in the northeast corner of TH 5 and the HCRRA Southwest Corridor LRT Trail right-of-way. Access to and from the site would be via re-routed Venture Lane.
- TH 62, Eden Prairie/Minnetonka – The proposed site is located south of TH 62, in the southeast corner of West 62nd Street and the HCRRA Southeast Corridor property, between Industrial Drive on the west and Carlson Drive on the east. Access to and from the site would be via Carlson Drive and West 62nd Street.

- Rowland Road, Minnetonka – The proposed site is located in the southeast corner of Rowland and Baker Roads, just east of I-494 and west of the HCRRA Southwest Corridor property. Access would be via Rowland and Baker Roads. An alternative site, required as part of the potential route variation, is located in the northeast corner of Rowland Road and the HCRRA Southwest Corridor and is accessed by Rowland Road.
- Shady Oak Road, Minnetonka – The proposed site is located east of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17th Avenue.
- 8thAvenue, Hopkins – The proposed site is located between 8th and 5th Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a reconstructed intersection at 8th Avenue.
- Blake Road, Hopkins - The proposed site is located northwest of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2nd Avenue NE.
- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36th Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.
- West Lake Street, Minneapolis - The proposed site is located between the HCRRA Southwest Corridor property and Whole Foods grocery store, on the southeast side of the HCRRA Southwest Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.
- Uptown/Hennepin Avenue South, Minneapolis – The proposed site is located on the east side of Hennepin Avenue within the HCRRA Midtown Corridor property. This station may be developed in coordination with proposed development in the southeast corner of Hennepin Avenue and the Midtown Corridor. Access to the site would be via vertical circulation from the existing Uptown Transit Station and/or the proposed development.
- Lyndale Avenue South, Minneapolis – The proposed site extends beneath the Lyndale Avenue South roadway overpass to the east toward Girard Avenue South, within the HCRRA Midtown Corridor property. Access would be via vertical circulation from Lyndale.
- 28th Street, Minneapolis – The proposed site is north of 28th Street in a shallow open cut within the Nicollet Avenue South right-of-way. Access would be via 27th Street and 28th Street.
- Franklin Avenue, Minneapolis - The proposed site is south of Franklin Avenue in a shallow open cut within the Nicollet Avenue South right-of-way. Access would be via Franklin Avenue and 22nd Street.
- Nicollet Mall at 12th, 8th and 4th Streets, downtown Minneapolis – These stations are proposed to be located on the Nicollet Mall, in the blocks between 11th and 12th Streets, 7th and 8th Streets, and 4th and 5th Streets.
- Marquette/Second Avenues at 12th and 7th Streets, downtown Minneapolis – The alignment is split at these stations, with eastbound trains on 2nd Avenue and

westbound trains on Marquette Avenue. The stations are proposed to be located on 2nd Avenue and Marquette Avenue, in the blocks between 11th and 12th Streets and between 6th and 7th Streets.

*Infrastructure Improvements Required*
LRT 1C requires the construction of a new two-track rail line approximately 30 feet wide in HCRRA right-of-way through the Southwest and Midtown Corridors, and the construction of on-line stations within the guideway. LRT 1C requires grade separations at the TC&W crossing near TH 62 in Minnetonka, at Excelsior Boulevard in Hopkins, and back across to the south side of the freight tracks near Wooddale Avenue. The existing freight track would be reconstructed from Wooddale Avenue to West Lake Street. LRT 1C requires a shallow tunnel under Nicollet Avenue between 28th Street and Franklin Avenue in Minneapolis, and reconstruction of either Nicollet Mall or the Marquette/2nd pair in downtown.

*Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Freight Rail Right-of-Way Exchange*
LRT 1 C requires the freight rail right-of-way exchange described previously.

*LRT 1 C Connecting Transit Service*
**TH 5 Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 increases from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service will be eliminated.

**TH 62 Station**: Routes 661, 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) in the LRT 1C alternative and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing part of the alignment of existing route 681, which will not operate from SouthWest Station on TH 212. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Rowland Station**: No routes serve this station.

**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under Uptown Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station. Changes to Route 12 are described below under Uptown Station. Changes to route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the light rail line.

Route 665 is increased in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of route 17 and Route 615 serve this station. Changes to this route are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, and 25 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 12 are described below under Uptown Station.

Changes to Route 17 are described above under Blake Station.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**Uptown Station**: Routes 6, 12, 17, 21, 23, 53, 114, and 115 serve this station. Routes 6, 21, 23, 53, 114 and 115 are unchanged under this alternative.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remains unchanged).

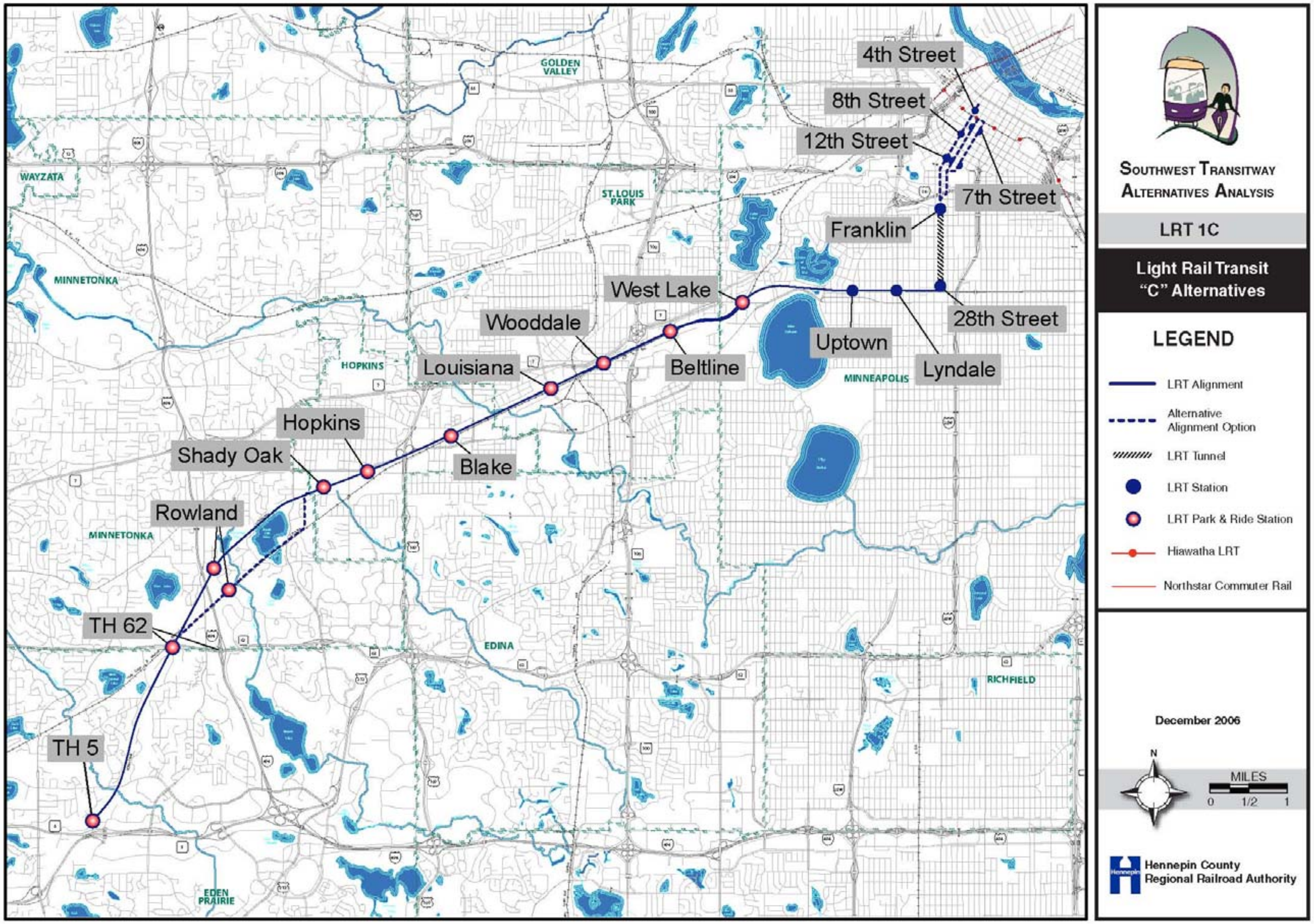
Changes to Route 17 are described above under Blake Station.

**Lyndale Station**: Routes 4, 21, 53, and 113 serve this station. These routes are unchanged under the alternative.

**28th Street Station**: Routes 18, 21, 53 and 568 serve this station. These routes are unchanged under the alternative.

**Franklin Station**: Routes 2, 18, 53 and 568 serve this station. These routes are unchanged under the alternative.

## Figure D-9 LRT 1C Alternative




*Source: Parsons Brinckerhoff, 2006*

LRT 2C

LRT 2C operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The alignment begins south of TH 5 at Mitchell Road in Eden Prairie. From that point the route follows along the south side of TH 5, crossing under Prairie Center Drive. As it approaches the I-494/TH 5 interchange, the route climbs and crosses over TH 5, descending along the west side of the I-494 exit ramp to TH 5. It continues north along the west side of I-494 to the HCRRA's Southwest Corridor, where it turns east and crosses under the freeway.

After entering the Southwest Corridor, the route continues in an exclusive LRT guideway to West Lake Street in Minneapolis. Just east of West Lake Street the route enters a new exclusive LRT guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive LRT guideway in a cut and cover tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2nd and Marquette Avenues.

*Stations*

LRT 2C station locations are listed below. All stations west of Van White Boulevard are assumed to include park-and-ride facilities. A center platform configuration is assumed unless otherwise noted.

- Mitchell Road, Eden Prairie – The proposed site is located west of Mitchell Road, south of TH 5, north of Lone Oak Road. Access would be via Mitchell and Loan Oak Roads.
- SouthWest Station, Eden Prairie - The proposed station expands the current SouthWest Metro Transit Station parking facility in the northwest corner of Technology Drive and Prairie Center Drive. Access to the site would be via Technology Drive.
- Valley View Road, Eden Prairie - The proposed site is located in the northwest corner of I-494 and Plaza Drive. Access would be via a new drive connected to Plaza Drive.
- TH 62, Eden Prairie/Minnetonka – The proposed site is located south of TH 62, just west of I-494, east of Baker Road and north of Holesek Lane. Access would be via Baker Road and Pinnacle Drive.
- Rowland Road, Minnetonka – The proposed site is located in the southeast corner of Rowland and Baker Roads, just east of I-494. Access would be via Rowland and Baker Roads.
- Shady Oak Road, Minnetonka – The proposed site is located east of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17th Avenue.
- 8thAvenue, Hopkins – The proposed site is located between 8th and 5th Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a reconstructed intersection at 8th Avenue.
- Blake Road, Hopkins - The proposed site is located northwest of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2nd Avenue NE.

- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36th Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.
- West Lake Street, Minneapolis - The proposed site is located between the HCRRA Southwest Corridor property and Whole Foods grocery store, on the southeast side of the HCRRA Southwest Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.
- Uptown/Hennepin Avenue South, Minneapolis – The proposed site is located on the east side of Hennepin Avenue within the HCRRA Midtown Corridor property. This station may be developed in coordination with proposed development in the southeast corner of Hennepin Avenue and the Midtown Corridor. Access to the site would be via vertical circulation from the existing Uptown Transit Station and/or the proposed development.
- Lyndale Avenue South, Minneapolis – The proposed site extends beneath the Lyndale Avenue South roadway overpass to the east toward Girard Avenue South, within the HCRRA Midtown Corridor property. Access would be via vertical circulation from Lyndale.
- 28th Street, Minneapolis – The proposed site is north of 28th Street in a shallow open cut within the Nicollet Avenue South right-of-way. Access would be via 27th Street and 28th Street.
- Franklin Avenue, Minneapolis - The proposed site is south of Franklin Avenue in a shallow open cut within the Nicollet Avenue South right-of-way. Access would be via Franklin Avenue and 22nd Street.
- Nicollet Mall at 12th, 8th and 4th Streets, downtown Minneapolis – These stations are proposed to be located on the Nicollet Mall, in the blocks between 11th and 12th Streets, 7th and 8th Streets, and 4th and 5th Streets.
- Marquette/Second Avenues at 12th and 7th Streets, downtown Minneapolis – The alignment is split at these stations, with eastbound trains on 2nd Avenue and westbound trains on Marquette Avenue. The stations are proposed to be located on 2nd Avenue and Marquette Avenue, in the blocks between 11th and 12th Streets and between 6th and 7th Streets.

*Infrastructure Improvements Required*

LRT 2C requires the construction of a new two-track rail line approximately 30 feet wide along the south side of TH 5 and the east side of I-494 through Eden Prairie and Minnetonka, and within HCRRA right-of-way through the Southwest and Midtown Corridors, and the construction of on-line stations within the guideway. LRT 2C requires a short tunnel under Prairie Center Drive, a flyover structure across TH 5, and new bridges in the I-494 right-of-way at the Valley View exit ramp, TH 62, and the TC&W Railroad. It also requires grade separations at Excelsior Boulevard in Hopkins and back across to the south side of the freight tracks near Wooddale Avenue. The existing freight track would be reconstructed from Wooddale Avenue to West Lake Street. LRT 2C requires a shallow tunnel under Nicollet Avenue between 28th Street and Franklin

Avenue in Minneapolis, and reconstruction of either Nicollet Mall or the Marquette/2nd pair in downtown.

*Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Freight Rail Right-of-Way Exchange*
LRT 2 C requires the freight rail right-of-way exchange described previously.

*LRT 2C Connecting Transit Service*
**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and Surrounding communities to Eden Prairie Town Center and SouthWest Station. Service on Route 631 increases from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service is eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Routes 680, 685, 685A, 691, 694, 698 and 699A are unchanged under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which now operates only in the clockwise direction, is operated in both directions in the LRT 2C alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also is operated bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to Routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via TH 212, TH 62, and I-35W, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing Route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a

60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, route 690, 690A and 690B is combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. 690 continues to use its existing alignment of TH 212 to TH 169 and I-394.

**Valley View Station**: Routes 685 and 685A. Apart from a stop at the station, these routes are not be changed under this alternative.

**TH 62 Station**: Routes 661 and the 681 Circulator serve this station.

Route 661 is a recently discontinued Metro Transit route that would be reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and would operate at a 30 minute peak/60 minute off-peak service frequency. The route would operate at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and would operate from 6:00 am to midnight.

The 681 Circulator is described above under SouthWest Station.

**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under Uptown Station.

**Rowland Station**: No routes serve this station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station.

Changes to Route 12 are described below under Uptown Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route would operate to midnight.

Changes to Route 661 are described above under TH 62 Station.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of route 17 and Route 615 serve this station. Changes to this route are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, and 25 serve this station.

The 6 Shuttle is a new route operates along France Avenue serving Edina between Southdale and the West Lake Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 12 are described below under Uptown Station.

Changes to Route 17 are described above under Blake Station.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**Uptown Station**: Routes 6, 12, 17, 21, 23, 53, 114, and 115 serve this station. Routes 6, 21, 23, 53, 114 and 115 are unchanged under this alternative.
Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies are increased slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remains unchanged).

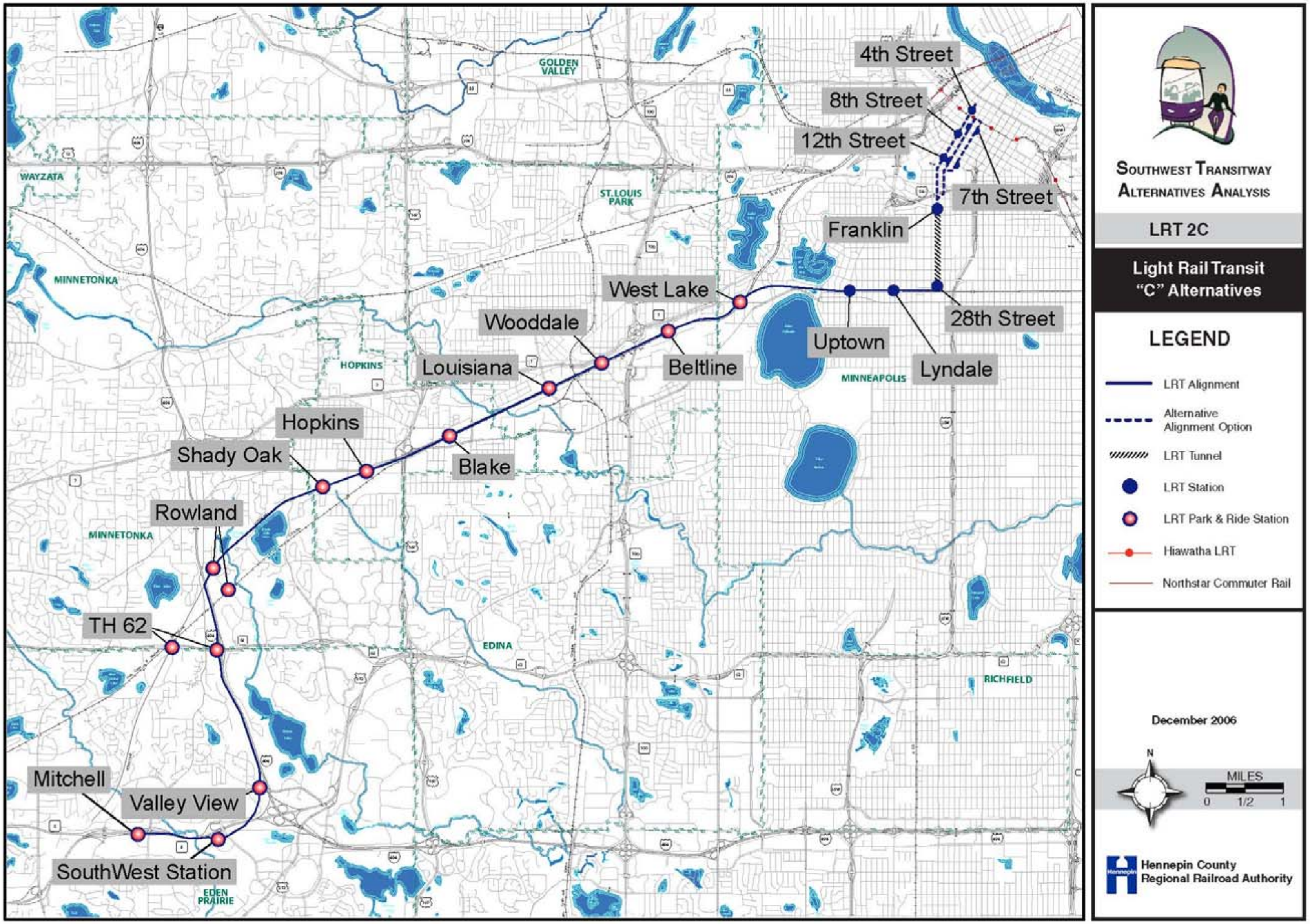
Changes to Route 17 are described above under Blake Station.

**Lyndale Station**: Routes 4, 21, 53, and 113 serve this station. These routes are unchanged under the alternative.

**28th Street Station**: Routes 18, 21, 53 and 568 serve this station.  These routes are be unchanged under the alternative.

**Franklin Station**: Routes 2, 18, 53 and 568 serve this station.  These routes are unchanged under the alternative.

Figure D-10 LRT 2C Alternative




***Source: Parsons Brinckerhoff, 2006***

LRT 3C

LRT 3C operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The route begins south of TH 5 at Mitchell Road in Eden Prairie. From that point the route follows along the south side of TH 5, crossing under Prairie Center Drive. It turns south along the east side of Prairie Center Drive, then turns east into new right-of-way located behind the existing properties on the north side of Singletree Lane. The route continues along the south side of Leona Road to Flying Cloud Drive, where it turns north. It runs along the east side of Flying Cloud Drive, over I-494 and into the east side of the TH 212 right-of-way. The route then swings east and north along new right-of-way through the Golden Triangle area.

After crossing Shady Oak Road, the route crosses over TH 212 into the City West area, then crosses over TH 62 into the Opus area of Minnetonka. The route follows new right-of-way through Opus, crossing under Smetana Road and continuing north along the Minnetonka-Hopkins city limits. After reaching the HCRRA's Southwest Corridor, the route turns east and follows an exclusive LRT guideway to West Lake Street in Minneapolis.

Just east of West Lake Street the route enters a new exclusive LRT guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive LRT guideway in a cut and cover tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2$^{nd}$ and Marquette Avenues.

*Potential Route Variation*

This alternative includes a route variation in Eden Prairie. After serving the SouthWest station, the route would cross under Prairie Center Drive and continue along the north side of Technology Drive. It then turns northeast, crossing over I-494 and intersecting Flying Cloud Drive. The route follows along the east side of Flying Cloud Drive and into the east side of the TH 212 right-of-way. The variation does not include an Eden Prairie Center station.

*Stations*

LRT 3C station locations are listed below. All stations west of Van White Boulevard are assumed to include park-and-ride facilities. A center platform configuration is assumed unless otherwise noted.

- Mitchell Road, Eden Prairie – The proposed site is located west of Mitchell Road, south of TH 5, north of Lone Oak Road. Access would be via Mitchell and Loan Oak Roads.
- SouthWest Station, Eden Prairie - The proposed station expands the current SouthWest Metro Transit Station parking facility in the northwest corner of Technology Drive and Prairie Center Drive. Access to the site would be via Technology Drive.
- Eden Prairie Town Center, Eden Prairie – The proposed site is located north of Singletree Lane, and east of a new extended north-south roadway. Access to and from the site would be via Singletree Lane and the new roadway extension.

- Golden Triangle, Eden Prairie - The proposed site is located west of TH 212 at the east edge of the former Best Buy Site. Access would be via an extended West 70th Street.
- City West, Eden Prairie - The proposed site is located on the southwest side of TH 62, adjacent to or constructed in conjunction with the planned City West development at this location. Access would be via Shady Oak Road, West 62nd Street, and new development roads.
- OPUS, Minnetonka – The proposed site is located in the southeast corner of the Bren Road East and Bren Road West one-way-pair divergence. Access would be from the two Bren Roads.
- Shady Oak Road, Minnetonka – The proposed site is located west of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17th Avenue.
- 8thAvenue, Hopkins – The proposed site is located between 8th and 5th Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a breconstructed intersection at 8th Avenue.
- Blake Road, Hopkins - The proposed site is located northwest of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2nd Avenue NE.
- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36th Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.
- West Lake Street, Minneapolis - The proposed site is located between the HCRRA Southwest Corridor property and Whole Foods grocery store, on the southeast side of the HCRRA Southwest Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.
- Uptown/Hennepin Avenue South, Minneapolis – The proposed site is located on the east side of Hennepin Avenue within the HCRRA Midtown Corridor property. This station may be developed in coordination with proposed development in the southeast corner of Hennepin Avenue and the Midtown Corridor. Access to the site would be via vertical circulation from the existing Uptown Transit Station and/or the proposed development.
- Lyndale Avenue South, Minneapolis – The proposed site extends beneath the Lyndale Avenue South roadway overpass to the east toward Girard Avenue South, within the HCRRA Midtown Corridor property. Access would be via vertical circulation from Lyndale.
- 28th Street, Minneapolis – The proposed site is north of 28th Street in a shallow open cut within the Nicollet Avenue South right-of-way. Access would be via 27th Street and 28th Street.
- Franklin Avenue, Minneapolis - The proposed site is south of Franklin Avenue in a shallow open cut within the Nicollet Avenue South right-of-way. Access would be via Franklin Avenue and 22nd Street.

- Nicollet Mall at 12th, 8th and 4th Streets, downtown Minneapolis – These stations are proposed to be located on the Nicollet Mall, in the blocks between 11th and 12th Streets, 7th and 8th Streets, and 4th and 5th Streets.
- Marquette/Second Avenues at 12th and 7th Streets, downtown Minneapolis – The alignment is split at these stations, with eastbound trains on 2nd Avenue and westbound trains on Marquette Avenue. The stations are proposed to be located on 2nd Avenue and Marquette Avenue, in the blocks between 11th and 12th Streets and between 6th and 7th Streets.

*Infrastructure Improvements Required*
LRT 3C requires the construction of a new two-track rail line approximately 30 feet wide through the Southwest and Midtown Corridors, and the construction of on-line stations within the guideway. New right-of–way and tracks are required along the south side of TH 5 from Mitchell Road to Prairie Center Drive, through the Eden Prairie Center area, along Flying Cloud Drive over I-494, through the Golden Triangle area, across TH 212 to City West, across TH 62 to Opus, and along the Hopkins-Minnetonka city limits to the HCRRA Southwest Corridor. LRT 3C requires grade separations at Prairie Center Drive, I-494, Flying Cloud Drive, TH 212, TH 62, Smetana Road, and the TC&W Railroad. It also requires grade separations at Excelsior Boulevard in Hopkins and back across to the south side of the freight tracks near Wooddale Avenue. LRT 3C requires a shallow tunnel under Nicollet Avenue between 28th Street and Franklin Avenue in Minneapolis, and reconstruction of either Nicollet Mall or the Marquette/2nd pair in downtown.

*Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Freight Rail Right-of-Way Exchange*
LRT 3 C requires the freight rail right-of-way exchange described previously.

*LRT 3C Connecting Transit Service*
**Mitchell Road Station**: Routes 631 and 636 serve this station.

Routes 631 and 636 are circulators that connect Eden Prairie and surrounding communities to Eden Prairie Town Center and SouthWest Stations. Service on Route 631 increases from hourly service to a frequency of 15 minutes during peak periods, and service operates hourly in the evenings until 10:00 PM. Route 636 remains unchanged during peak periods, and midday service is eliminated.

**SouthWest Station**: SouthWest Metro Transit Routes 603, 631, 636, 680, 681, 681 Circulator, 685, 685A, 690, 690A, 690B, 691, 694, 698, and 699A serve this station, which also serves as the hub of SouthWest Metro Transit's bus operations.

Routes 680, 685, 685A, 691, 694, 698 and 699A are unchanged under this alternative.

Route 603 is a circulator that serves the area surrounding Eden Prairie Town Center. The circulator, which now operates only in the clockwise direction, operates in both directions in the LRT 3C alternative, effectively doubling the existing 30 minute peak, 60 minute off-peak frequency. Service also is operated bi-directionally on an hourly headway in the evenings until 10:00 PM.

Changes to Routes 631 and 636 are described above under TH 5.

Route 681 is combined with 690 and 690A to operate a high frequency bi-directional service between SouthWest Station and downtown Minneapolis via TH 212, TH 62, and I-35W, and the off-highway segment of its alignment serving the Golden Triangle area is eliminated.

Route 681 Circulator is a new route serving Eden Prairie and Golden Triangle, replacing the eliminated segment of the existing route 681 serving the Golden Triangle area. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

As noted above, Routes 690, 690A and 690B are combined with route 681 to provide high frequency, bi-directional service between SouthWest Station and downtown Minneapolis. 690 continues to use its existing alignment of TH 212 to TH 169 and I-394.

**Eden Prairie Town Center Station**: Routes 636 and 681 Circulator serve this station. Route 636 is described above under TH5 Station. Route 681 is described above under SouthWest Station.

**Golden Triangle Station**: Routes 631 and 681 Circulator would serve this station. Route 631 is described above under TH5 Station. Route 681 is described above under SouthWest Station.

**City West Station**: No bus routes serve this station.

**Opus Station**: Routes 12 and 661 serve this station. Changes to Route 12 are described below under Uptown Station.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

**Shady Oak Station**: Route 12 serves this station. Changes to Route 12 are described below under Uptown Station.

**Hopkins Station**: Routes 12, 615, 661, 664 and 665 serve this station. Changes to Route 12 are described below under Uptown Station. Changes to Route 661 are described above under TH 62 Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued Route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the light rail line.

Route 665 be increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of route 17 and Route 615 serve this station. Changes to this route are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and Routes 12, 17, and 25 serve this station.

The 6 Shuttle is a new route t operates along France Avenue serving Edina between Southdale and the West Lake Station.  The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 12 are described below under Uptown Station.

Changes to Route 17 are described above under Blake Station.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**Uptown Station**: Routes 6, 12, 17, 21, 23, 53, 114, and 115 serve this station.  Routes 6, 21, 23, 53, 114 and 115 are unchanged under this alternative.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies increase slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

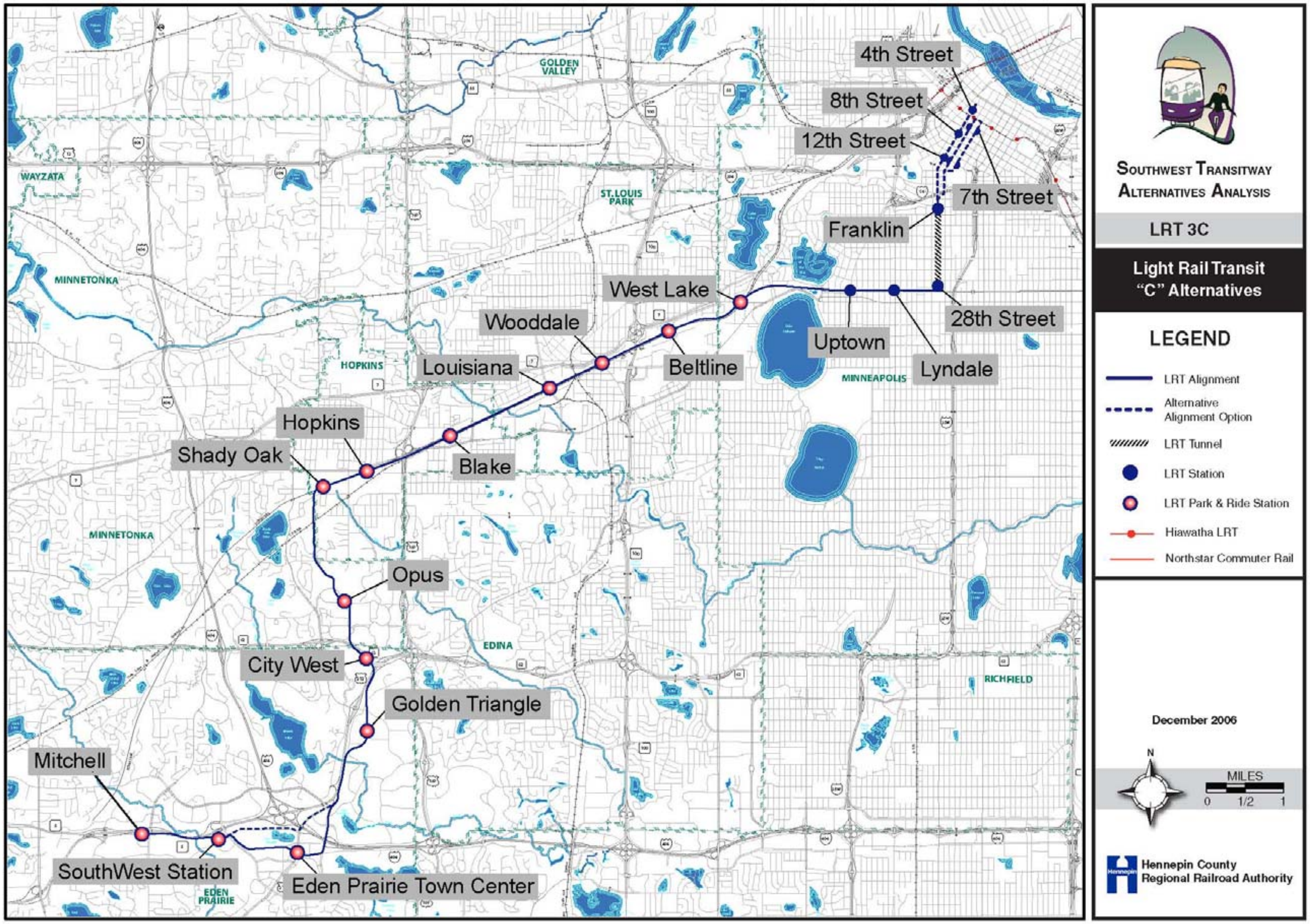
Changes to Route 17 are described above under Blake Station.

**Lyndale Station**: Routes 4, 21, 53, and 113 serve this station.  These routes are unchanged under the alternative.

**28th Street Station**: Routes 18, 21, 53 and 568 serve this station.  These routes are unchanged under the alternative.

**Franklin Station**: Routes 2, 18, 53 and 568 serve this station.  These routes are unchanged under the alternative.

**Figure D-11 LRT 3C Alternative**




***Source: Parsons Brinckerhoff, 2006.***

LRT 4C

LRT 4C operates from Shady Oak Road in Minnetonka to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

The alignment begins near the intersection of Shady Oak Road and the HCRRA's Southwest Corridor. From Shady Oak Road the route enters a new exclusive light rail transit (LRT) guideway in the HCRRA's Southwest Corridor to West Lake Street in Minneapolis. Just east of West Lake Street the route enters a new exclusive LRT guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive LRT guideway in a cut and cover tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2nd and Marquette Avenues.

*Infrastructure Improvements Required*

LRT 4C requires the construction of a new two-track rail line approximately 30 feet wide in HCRRA right-of-way through the Southwest and Midtown Corridors, and the construction of on-line stations within the guideway. It also requires grade separations at Excelsior Boulevard in Hopkins and back across to the south side of the freight tracks near Wooddale Avenue. LRT 4C requires a shallow tunnel under Nicollet Avenue between 28th Street and Franklin Avenue in Minneapolis, and reconstruction of either Nicollet Mall or the Marquette/2nd pair in downtown.

*Stations*

LRT 4C station locations are listed below. All stations west of Van White Boulevard are assumed to include park-and-ride facilities. A center platform configuration is assumed unless otherwise noted.

- Shady Oak Road, Minnetonka – The proposed site is located east of Shady Oak Road and north of the HCRRA Southwest Corridor property, at the site of Hennepin Technical College. Access to and from the site would be via extended 17th Avenue.
- 8thAvenue, Hopkins – The proposed site is located between 8th and 5th Avenues South, north of the HCRRA Southwest Corridor property. Access to the site would be via a reconstructed intersection at 8th Avenue.
- Blake Road, Hopkins - The proposed site is located northwest of the Blake Road/HCRRA Southwest Corridor intersection. Access to the site would be via Blake Road and 2nd Avenue NE.
- Louisiana Avenue, St. Louis Park - The proposed site is located in the northeast corner of Louisiana Avenue and the HCRRA Southwest Corridor property. Access to the site would be via Louisiana Avenue.
- Wooddale Avenue, St. Louis Park - The proposed site is located in the southeast corner of the Wooddale Avenue intersection with the HCRRA Southwest Corridor property. Access to the site would be via Wooddale and Yosemite Avenues and West 36th Street.
- Beltline Boulevard, St. Louis Park - The proposed site is located in the southeast corner of the Beltline Boulevard intersection with the HCRRA Southwest Corridor property. Access to the site would be via Beltline Boulevard and Park Glen Road.
- West Lake Street, Minneapolis - The proposed site is located between the HCRRA Southwest Corridor property and Whole Foods grocery store, on the southeast side

of the HCRRA Southwest Corridor property. Access to the site would be via re-routed West 31st Street and Abbott Avenue South.

- Uptown/Hennepin Avenue South, Minneapolis – The proposed site is located on the east side of Hennepin Avenue within the HCRRA Midtown Corridor property. This station may be developed in coordination with proposed development in the southeast corner of Hennepin Avenue and the Midtown Corridor. Access to the site would be via vertical circulation from the existing Uptown Transit Station and/or the proposed development.
- Lyndale Avenue South, Minneapolis – The proposed site extends beneath the Lyndale Avenue South roadway overpass to the east toward Girard Avenue South, within the HCRRA Midtown Corridor property. Access would be via vertical circulation from Lyndale.
- 28th Street, Minneapolis – The proposed site is north of 28th Street in a shallow open cut within the Nicollet Avenue South right-of-way. Access would be via 27th Street and 28th Street.
- Franklin Avenue, Minneapolis - The proposed site is south of Franklin Avenue in a shallow open cut within the Nicollet Avenue South right-of-way. Access would be via Franklin Avenue and 22nd Street.
- Nicollet Mall at 12th, 8th and 4th Streets, downtown Minneapolis – These stations are proposed to be located on the Nicollet Mall, in the blocks between 11th and 12th Streets, 7th and 8th Streets, and 4th and 5th Streets.
- Marquette/Second Avenues at 12th and 7th Streets, downtown Minneapolis – The alignment is split at these stations, with eastbound trains on 2nd Avenue and westbound trains on Marquette Avenue. The stations are proposed to be located on 2nd Avenue and Marquette Avenue, in the blocks between 11th and 12th Streets and between 6th and 7th Streets.

*Service Plan*

| | Morning (4:00 - 6:00 AM) | Morning Peak (6:00- 9:00 AM) | Mid-Day (9:00 AM – 3:00 PM) | PM Peak (3:00- 6:00 PM) | Evening (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| Weekday | 15-30 | 7.5 | 10 | 7.5 | 15-30 |
| Saturday | 15-30 | 15-30 | 10 | 10 to 7:30 PM) | 15-30 |
| Sunday/ Holiday | 15-30 | 15-30 (to 10:00 AM) | 10 | 10 | 15-30 |

*Freight Rail Right-of-Way Exchange*
LRT 4C requires the freight rail right-of-way exchange described previously.

*LRT 4C Connecting Transit Service*
**Shady Oak Station**: Route 12 serves this station. Changes to route 12 are described below under Uptown Station.

**Hopkins Station**: Routes 12, 615, 661, 664, 665 and Limited Stop Route “A” serve this station. Changes to route 12 are described below under Uptown Station.

Route 615, which currently runs between the Ridgedale Shopping Center in Minnetonka and Excelsior and Grand, is extended to the Beltline Station (which is near Excelsior and Grand). Peak frequency increases from 60 to 30 minutes, and off peak frequency is 60 minutes. The route operates to midnight.

Route 661 is a recently discontinued Metro Transit route that is reinstated with a slightly modified alignment (eliminating its branch to Golden Triangle) and operates at a 30 minute peak/60 minute off-peak service frequency. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Route 664 is extended from its current terminus south on CR 101 to cover a portion of the former alignment of the recently discontinued route 612. Route 664 will offer an off-peak service similar to the discontinued 612. The route terminates at Hopkins Station, with passengers completing their travel to downtown Minneapolis on the Light rail line.

Route 665 increases in service frequency from 3 trips during each peak period, in the peak direction only, to a 30 minute headway (6 trips) during each peak period in the peak direction, and a 60 minute headway (3 trips) during each peak period, in the off peak direction.

Limited Stop Route "A" is a version of the new long-distance service route from Eden Prairie that features as one of the key new routes in the Enhanced Bus and BRT alternatives. In this alternative, the route terminates at Hopkins Station. Travelers to downtown Minneapolis transfer there to the light rail line. The route operates from the TH 5 park-and-ride at Wallace Road to Hopkins Station via TH 5, TH 212, and TH 169. The route would essentially meet every other LRT trip, operating at a 20 minute headway early morning and midday, 15 minutes during the peak periods and 30 minutes in the evenings.

**Blake Station**: Routes 17, 615, and 668 serve this station.

Route 17 Lake Street branch is extended to Blake Station, and service frequency increases from 3 trips in the peak direction and 2 trips in the off-peak during each peak period to 30 minute headways (6 trips in each direction) during the peak period.

Changes to Route 615 are described above under Hopkins Station.

Route 668 is extended to connect to Blake Station and the Library-Lane loop is eliminated.

**Louisiana Avenue Station**: Route 604 serves this station.

Route 604 is extended to Beltline Station, and increases in service frequency from 2 trips in each direction during each peak period to a 30 minute headway (6 trips) in each direction during each peak period.

**Wooddale Station**: The 36th Street branch of route 17 and Route 615 serve this station. Changes to this route are described above under Blake Station. Changes to Route 615 are described under Hopkins Station.

**Beltline Station**: The 36th Street branch of Route 17, Route 604 and Route 615 would serve this station.

Changes to Route 17 are described above under Blake Station.

Changes to Route 604 are described above under Louisiana Avenue Station.

Changes to Route 615 are described above under Hopkins Station.

**West Lake Station**: The 6 Shuttle route and routes 12, 17, and 25 serve this station.

The 6 Shuttle is a new route that operates along France Avenue serving Edina between Southdale Station and the West Park Station. The route operates at a 30 minute headway in each direction during each peak period and a 60 minute headway during the midday and evening period, and operates from 6:00 am to midnight.

Changes to Route 12 are described below under Uptown Station.

Changes to Route 17 are described above under Blake Station.

Routes 21 and 53 are extended from Uptown to connect to this station to provide crosstown connectivity along Lake Avenue.

Route 25 is extended south to connect to this station to provide service to the Kenwood Park area.

**Uptown Station**: Routes 6, 12, 17, 21, 23, 53, 114, and 115 serve this station. Routes 6, 21, 23, 53, 114 and 115 are unchanged under this alternative.

Route 12 terminates at this station and its segment connecting to downtown Minneapolis is eliminated, and service frequencies increase slightly to 15 minutes bi-directional, all day on the trunk portion of the route (frequencies on the branches remain unchanged).

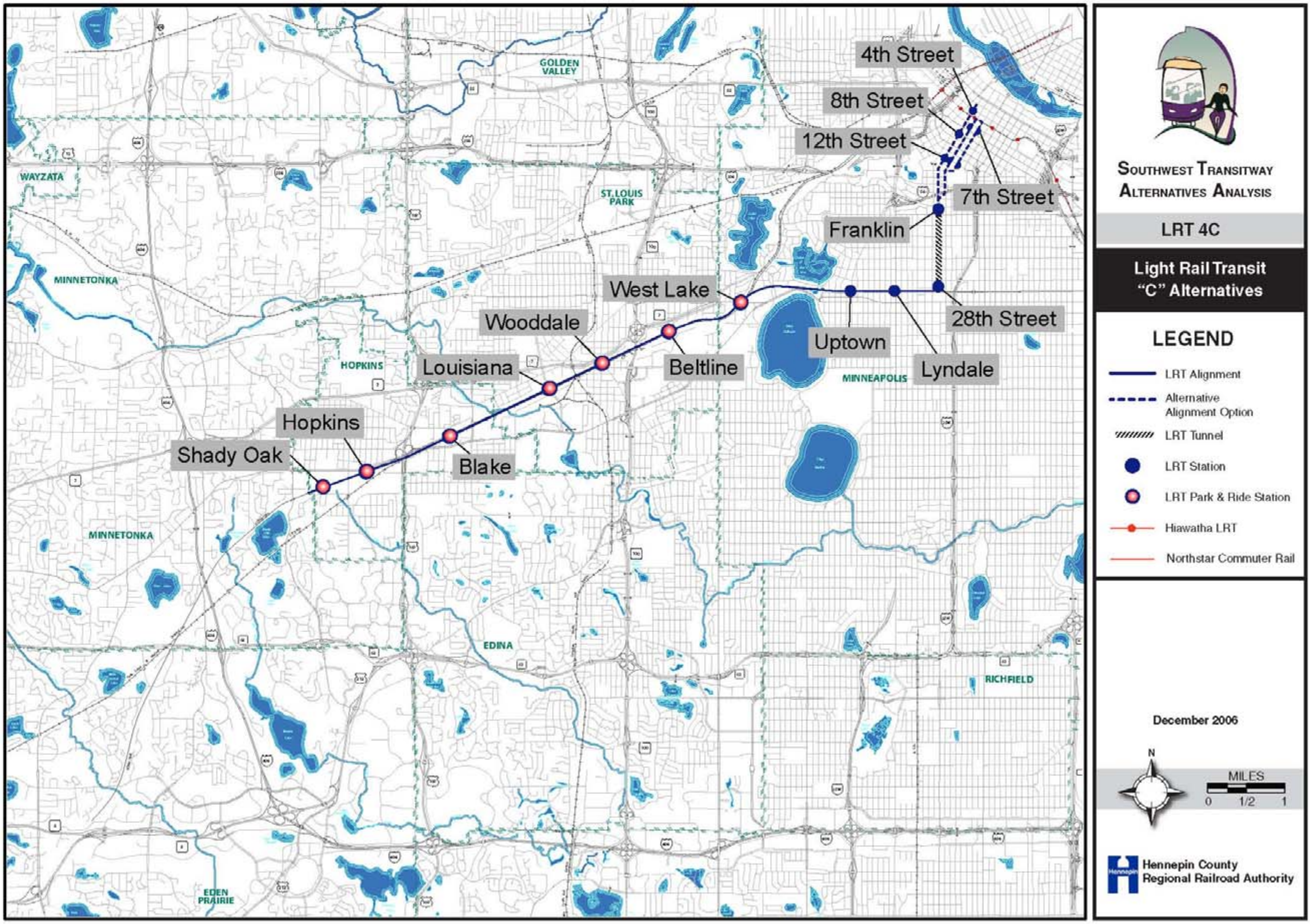
Changes to Route 17 are described above under Blake Station.

**Lyndale Station**: Routes 4, 21, 53, and 113 serve this station. These routes are unchanged under the alternative.

**28th Street Station**: Routes 18, 21, 53 and 568 serve this station. These routes are unchanged under the alternative.

**Franklin Station**: Routes 2, 18, 53 and 568 serve this station. These routes are unchanged under the alternative.

## Figure D-12 LRT 4C Alternative




*Source: Parsons Brinckerhoff, 2006*

## Appendix E: References


*Stage 1 Hennepin County LRT System Plan*

*29th Street and Southwest Busway Feasibility Study*

*Mn/DOT Exclusive Busway Study*

*Southwest Rail Transit Study*

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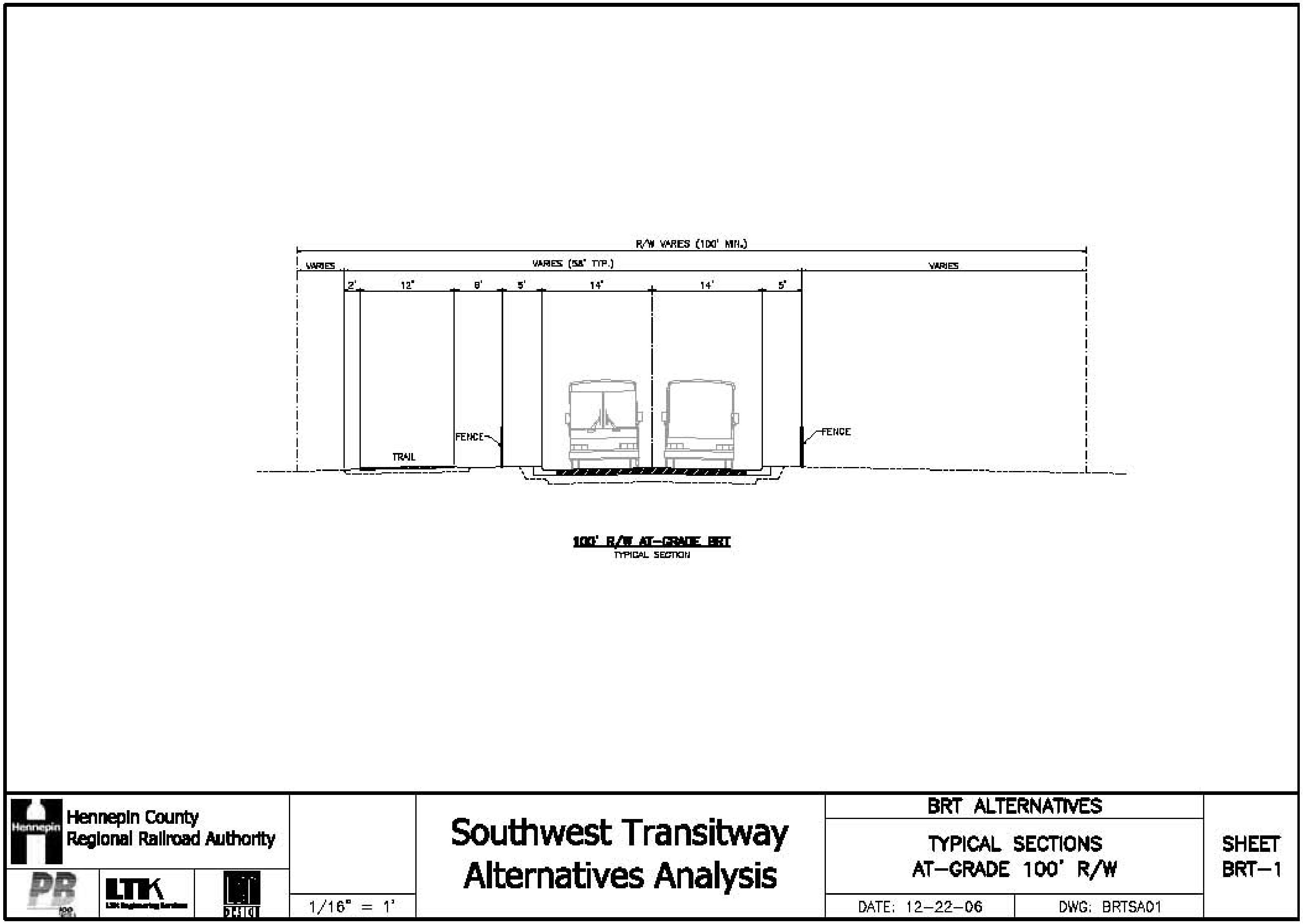
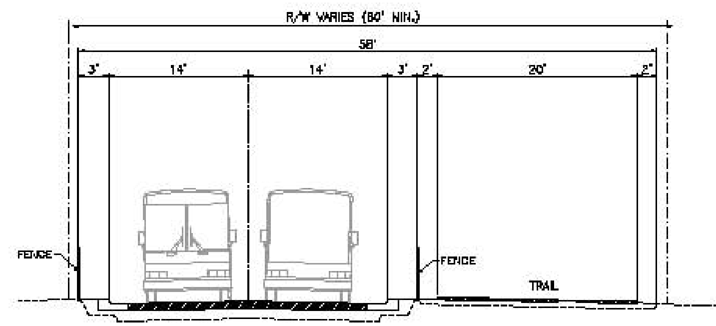
http://www.elevated.org/

Sound Transit
http://www.soundtransit.org/sounder/sounder.htm

Taxi 2000 Corporation
http://www.skywebexpress.com/

# Appendix F:  BRT Alternatives Typical Sections


R/W VARIES (100' MIN.)
VARIES
VARIES (58' TYP.)
VARIES
2'
12'
8'
5'
14'
14'
5'
FENCE
FENCE
TRAIL
100' R/W AT-GRADE BRT
TYPICAL SECTION
Hennepin County
Regional Railroad Authority
1/16" = 1'
Southwest Transitway
Alternatives Analysis
BRT ALTERNATIVES
TYPICAL SECTIONS
AT-GRADE 100' R/W
DATE: 12-22-06
DWG: BRTSA01
SHEET
BRT-1




60' R/W AT-GRADE BRT
TYPICAL SECTION

| | | | | |
|---|---|---|---|---|
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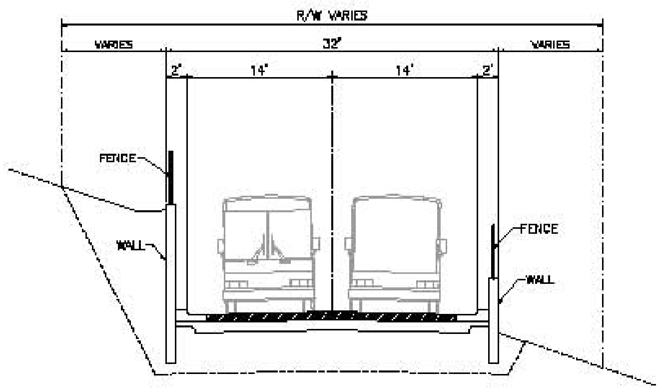



**RETAINED CUT AND FILL BRT**
TYPICAL SECTION

Hennepin County
Regional Railroad Authority

1/16" = 1'

# Southwest Transitway
# Alternatives Analysis

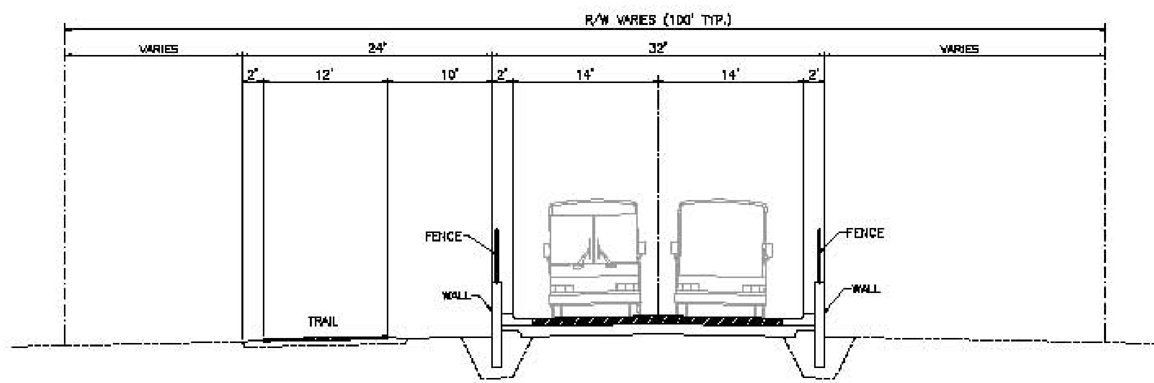
BRT ALTERNATIVES

TYPICAL SECTIONS
RETAINED CUT AND FILL

DATE: 12-22-06

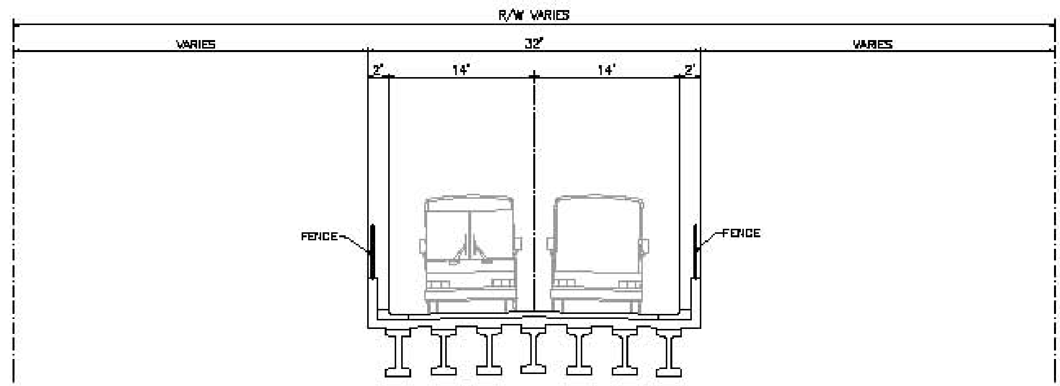
DWG: BRTSA03

SHEET
BRT-3




**RETAINED FILL BRT**
TYPICAL SECTION

| | | | | |
|---|---|---|---|---|
| Hennepin County Regional Railroad Authority | 1/16" = 1' | Southwest Transitway Alternatives Analysis | BRT ALTERNATIVES<br>TYPICAL SECTIONS RETAINED FILL<br>DATE: 12-22-06 DWG: BRTSA04 | SHEET BRT-4 |




**AERIAL STRUCTURE BRT**
TYPICAL SECTION

Hennepin County
Regional Railroad Authority

1/16" = 1'

# Southwest Transitway Alternatives Analysis

BRT ALTERNATIVES

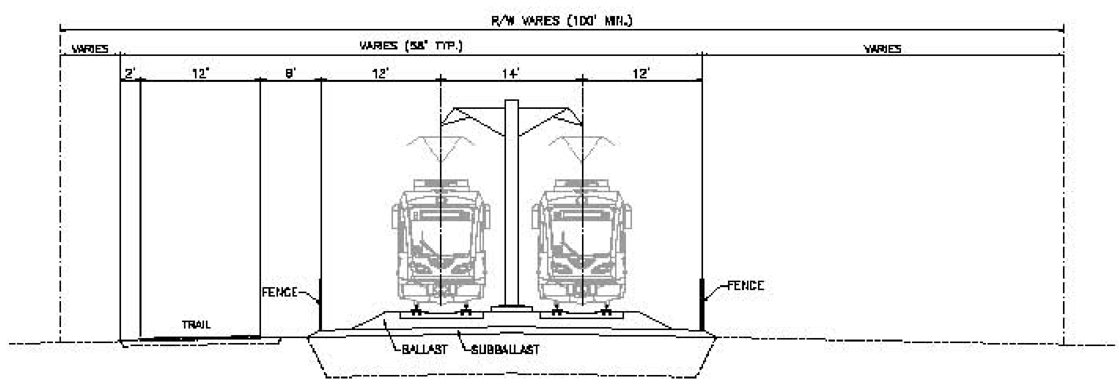
TYPICAL SECTIONS
AERIAL STRUCTURE

DATE: 12-22-06

DWG: BRTSA05

SHEET
BRT-5

# Appendix G: LRT Alternatives Typical Sections




100' R/W AT-GRADE LRT
TYPICAL SECTION

| | | | | |
|---|---|---|---|---|
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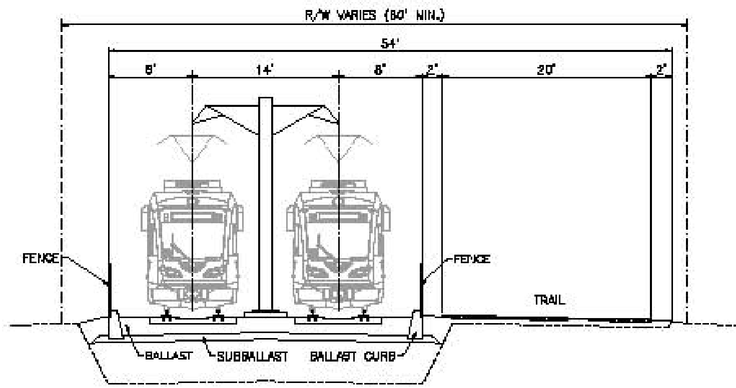
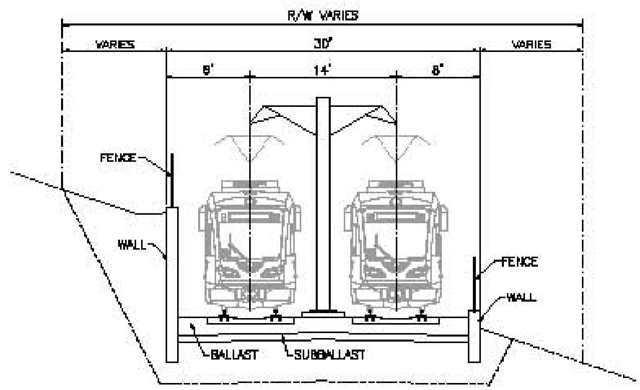



60' R/W AT-GRADE LRT
TYPICAL SECTION

| | | | | |
|---|---|---|---|---|
| Hennepin County Regional Railroad Authority | | Southwest Transitway Alternatives Analysis | LRT ALTERNATIVES<br>TYPICAL SECTIONS AT-GRADE 60' R/W | SHEET LRT-2 |
| PB, LTK | 1/16" = 1' | | DATE: 12-22-06 / DWG: LRTSA02 | |




**RETAINED CUT AND FILL LRT**
TYPICAL SECTION

| | | | | |
|---|---|---|---|---|
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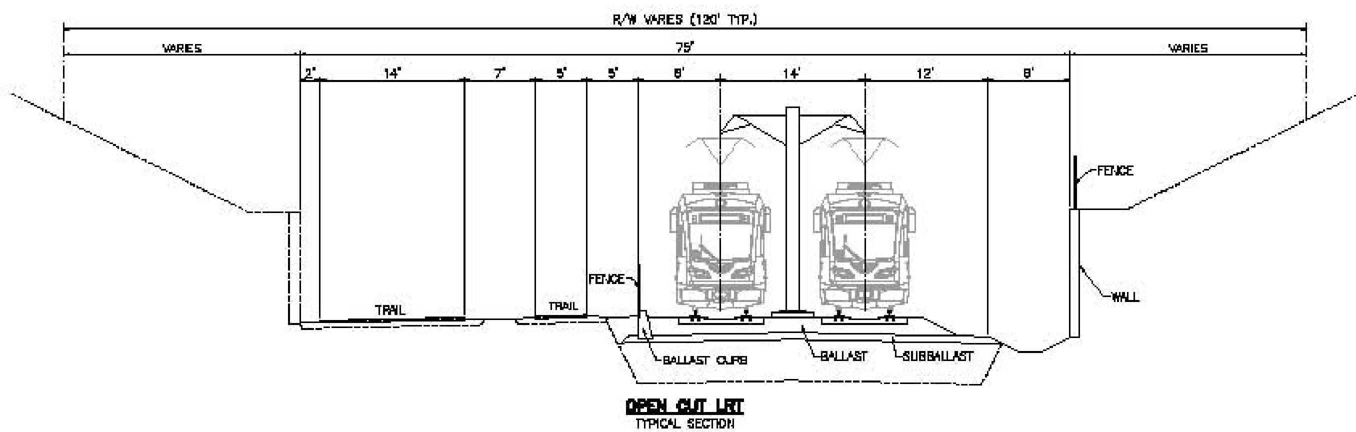


| | | | | |
|---|---|---|---|---|
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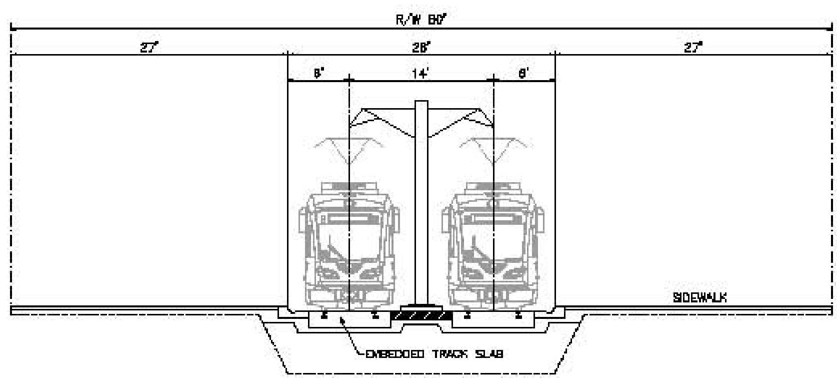


**EMBEDDED TRACK LRT**
TYPICAL SECTION

| | | | | |
|---|---|---|---|---|
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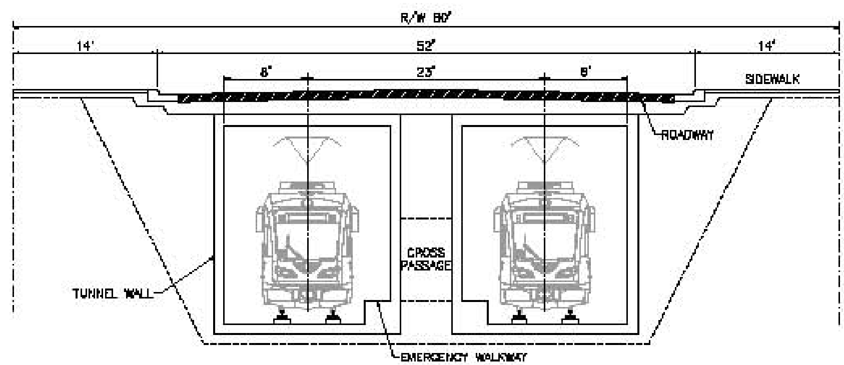
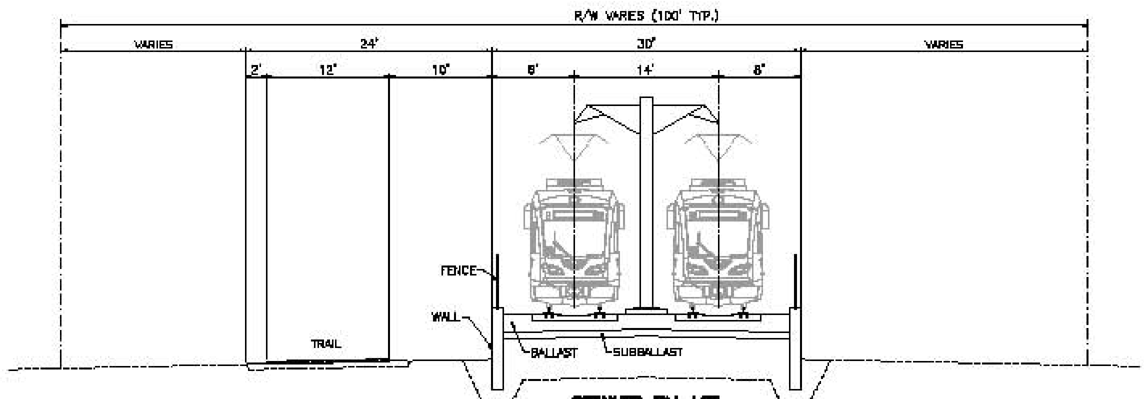



CUT-AND-COVER TUNNEL LRT
TYPICAL SECTION

| | | | | |
|---|---|---|---|---|
| Hennepin County Regional Railroad Authority | 1/16" = 1' | Southwest Transitway Alternatives Analysis | LRT ALTERNATIVES<br>TYPICAL SECTIONS<br>CUT AND COVER TUNNEL<br>DATE: 12-22-06 DWG: LRTSA06 | SHEET LRT-6 |




RETAINED FILL LRT
TYPICAL SECTION

| | | | | |
|---|---|---|---|---|
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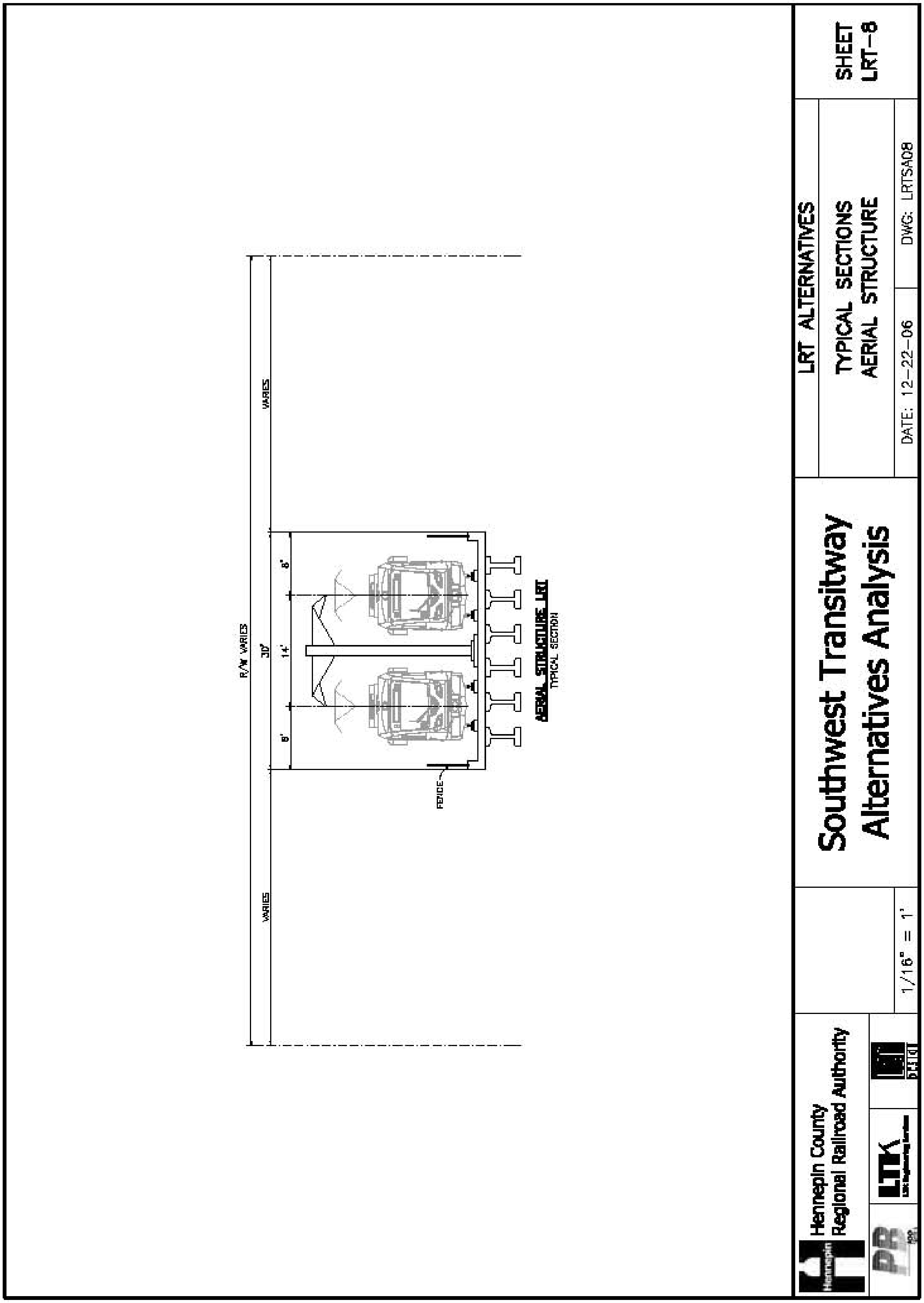

R/W VARIES
VARIES
30'
8'
14'
8'
VARIES
FENCE
AERIAL STRUCTURE LRT
TYPICAL SECTION
Hennepin County
Regional Railroad Authority
1/16" = 1'
Southwest Transitway
Alternatives Analysis
LRT ALTERNATIVES
TYPICAL SECTIONS
AERIAL STRUCTURE
DATE: 12-22-06
DWG: LRTSA08
SHEET
LRT-8

# Southwest Transitway Alternatives Analysis

# Technical Memorandum No. 2
# Goals and Objectives

**Prepared for**
**Hennepin County Regional Railroad Authority**

**Prepared by:**

**PB Americas, Inc. (PB)**

**January 2007**

# Table of Contents

# 1. Introduction

This technical memorandum documents the methodology, assumptions, and results of the identification of Goals and Objectives for the Southwest Transitway Alternatives Analysis (Southwest Transitway AA).

# 2. Background and Assumptions

When developing the goals for the Southwest Transitway, the Southwest Transitway Technical and Policy Advisory Committees began by reviewing the goals developed for a Southwest Rail Transitway during the *Southwest Rail Transit Study, 2003*. This was done in an effort to build upon previous planning efforts conducted for the proposed Southwest Transitway.

### *Southwest Rail Transit Study, 2003*

In 2003, Hennepin County Regional Railroad Authority (HCRRA) completed a feasibility study of rail transit in the Southwest Transitway Corridor. As part of that study, the following goals were established for a Southwest Rail Transitway:

- Improve mobility
- Efficiently and effectively move people
- Provide a reliable, competitive travel choice
- Serve population and employment concentrations
- Reasonable capital and operating costs
- Protect the environment
- Enhance the study area and region's quality of life
- Promote economic development and redevelopment

During the *Southwest Rail Transit Study*, these goals were used to develop performance measures to evaluate which rail transit technology and alignment alternatives should be considered for future evaluation.

In the current *Southwest Transitway AA*, the Southwest Transitway Technical and Policy Advisory Committees reviewed these goals and refined them into a new set of Southwest Transitway Goals based upon the transportation needs outlined in *Technical Memorandum No. 1, Purpose and Need Statement.*

# 3. Methodology

The *Southwest Transitway AA* is intended to be compliant with current Federal Transit Administration (FTA) guidelines and as such provides a more comprehensive analysis of potential transportation solutions than the previous *Southwest Rail Transit Study, 2003*. To address how well the alternatives evaluated also meet the transportation goals and objectives of the state, region and corridor communities, those goals developed in the previous *Southwest Rail Transit Study* were refined, as necessary.

On February 11, 2005, the Southwest Transitway Technical Advisory Committee (TAC) developed goals and objectives and forwarded them for consideration by the Southwest Transitway Policy Advisory Committee (PAC). On March 2, 2005, the Southwest Transitway PAC unanimously approved the goals and objectives forwarded by the Southwest Transitway TAC. These goals and objectives are shown in the following section.

Southwest Transitway AA Goals:

1. Improve Mobility
2. Provide a Cost-Effective, Efficient Travel Option
3. Protect the Environment
4. Preserve and Protect the Quality of Life in the Study Area and the Region
5. Support Economic Development

In addition, the Southwest Transitway PAC decided to prioritize the goals into two tiers. Tier one goals are those that must be achieved in order for a project to move forward. Tier two goals are those that should be achieved once it is determined a viable project exists. The tier one goals are Improve Mobility and Provide a Cost-Effective, Efficient Travel Option. The tier two goals are Protect the Environment, Preserve and Protect the Quality of Life in the Study Area and the Region, and Support Economic Development.

These goals and related objectives are based upon the identified transportation needs in the study area as described in *Technical Memorandum No. 1, Purpose and Need Statement*. They were used to develop alternatives to address transportation needs, and form the basis of the evaluation measures which led to the selection of a local preferred course of action.

# 4. Results: Southwest Transitway Goals and Objectives

Tier 1 goals are defined as those goals that must be achieved or a project does not exist.

## GOAL 1: Improve mobility

*Objectives:*

- Provide a travel option competitive with other modes in terms of journey time
- Provide a reliable travel option that improves mobility throughout the day
- Provide a travel option that serves population and employment concentrations
- Provide a travel option that adds capacity and access to the regional and local transportation system
- Provide a travel option that serves people who depend on transit
- Provide a travel option that enhances pedestrian and bicycle activity and access to community nodes

## GOAL 2: Provide a cost-effective, efficient travel option

*Objectives:*

- Provide a travel option with acceptable capital and operating costs
- Provide a travel option that efficiently and effectively moves people
- Provide a travel option that integrates efficiently with other modes and avoids substantial negative impacts to the existing roadway system
- Provide a travel option that supports regional system efficiency

Tier 2 goals are defined as goals to be achieved assuming a project results from the application of the Tier 1 goals.

## GOAL 3: Protect the environment

*Objectives:*

- Provide a travel option beneficial to the region's air quality
- Provide a travel option that avoids or minimizes alterations to environmentally sensitive areas
- Provide a travel option that supports efficient, compact land use that facilitates accessibility
- Provide a travel option that avoids major environmental impacts on adjacent properties, such as noise and vibration

## GOAL 4: Preserve and protect the quality of life in the study area and the region

*Objectives:*

- Provide a travel option that contributes to the economic health of the study area and region through improving mobility and access
- Provide a travel option that is sensitively designed with respect to existing neighborhoods and property values
- Provide a travel option that protects and enhances access to public service and recreational facilities
- Provide a travel option that supports sound planning and design of transit stations and park-and-ride lots
- Provide a travel option that enhances the image and use of transit services in the region

## GOAL 5: Support economic development

*Objectives:*

- Provide a travel option that supports economic development and redevelopment with improved access to transit stations
- Provide a travel option that supports local sustainable development/redevelopment goals
- Provide a transportation system element that facilitates more efficient land development patterns and saves infrastructure costs
- Provide a travel option that accommodates future regional growth in locations consistent with local plans and the potential for increased transit ridership

## *Southwest Transitway Alternatives Analysis*

# *Technical Memorandum No. 1*
# *Purpose and Need*

***Prepared for:***
***Hennepin County Regional Railroad Authority***

***Prepared by:***

***PB Americas, Inc. (PB)***

***January 2007***

# Table of Contents



# List of Tables

## List of Figures

# 1. Introduction

## Purpose

This technical memorandum documents the methodology, assumptions, and results of the identification of the Purpose and Need task for the *Southwest Transitway Alternatives Analysis (Southwest Transitway AA)*.

## Background

The Hennepin County Regional Railroad Authority (HCRRA) was established to acquire abandoned freight rail corridors to preserve them for transportation uses and to conduct rail transit planning. In keeping with that mission, HCRRA commissioned an Alternatives Analysis for the Southwest Transitway to identify, analyze, and compare the benefits, costs and impacts of a range of transit options to determine a locally preferred course of action.

The Southwest Transitway study area includes the Cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, as well as portions of southwest and downtown Minneapolis (Figure 1).

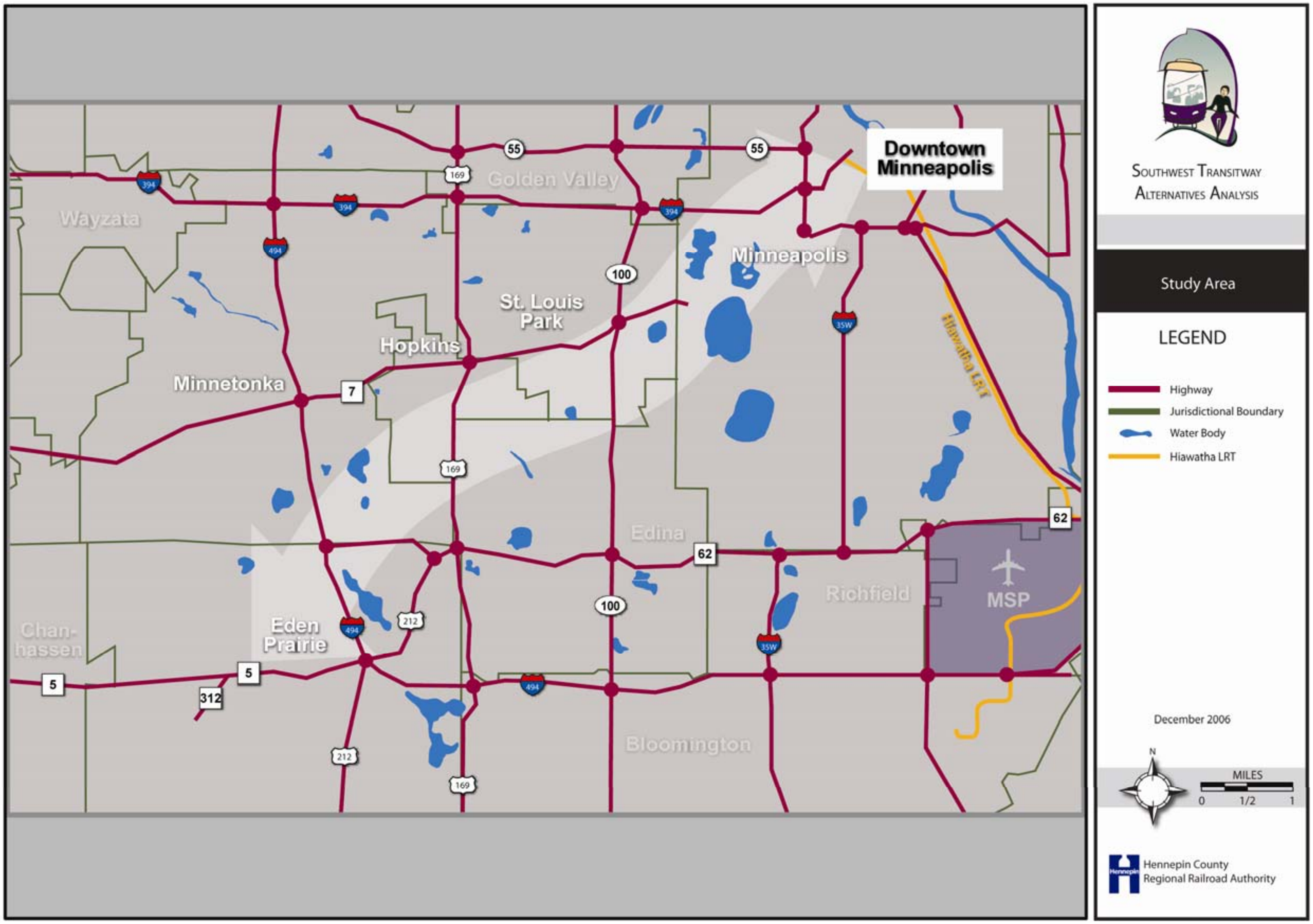
This technical memorandum documents the changing demographics, travel behavior and resulting transportation problems in the study area and region. It describes the proposed strategy for managing the region's transportation system. It also discusses the purpose and need for the project and identifies the goals and objectives for a proposed Southwest Transitway.

## Summary Problem Statement

The Southwest Transitway study area encompasses many features of Minnesota's famed quality of life. Its attractiveness has produced, and is projected to continue to produce population and employment growth that overloads the area's regional highways. Congestion has led to lengthened travel times for both drivers and transit users. In response, the region invested in highway capacity and operational improvements along with express and local bus transit service, accomplishing what it can within fiscal and environmental constraints.

The Metropolitan Council (Council) projects the Twin Cities metropolitan area will add nearly 40 percent more people and jobs by 2030. According to the Council, by 2030 Southwest cities will account for 17 percent of all regional residents, 18 percent of regional households, and 25 percent of all regional employment.

## Figure 1  Study Area




Source: Parsons Brinckerhoff, 2006.

Current and programmed roadway improvements to the regional highway network notwithstanding, the Metropolitan Council projects that the network will not keep pace with travel demand. Transit service in the corridor, while extensive, operates primarily on the congested roadway system. To maintain mobility, the transportation system must find additional ways to effectively get people to their destinations and sustain business activity.

In the Metropolitan Council's 2004 survey of metropolitan area residents, Twin Cities residents identified transportation as the most important problem in the region, for the fourth year in a row. When queried further, residents identified three primary solutions: optimizing the existing system, adding more freeway lanes, and expanding the rail system. These proposed solutions reflect the region's transportation plans, and projects like a Southwest Transitway are seen as part of the solution.

In 2002 the HCRRA commissioned a random sample separate survey of Southwest corridor residents to better understand their views on the area's transportation problems and potential solutions. The survey was conduced by CJ Olson, Inc. According to the results of the survey, 66 percent surveyed believed that a combination of both highway improvements and transit will effectively address congestion within the Southwest metropolitan area. In addition, over 71 percent of those surveyed supported light rail transit (LRT) as the best solution for dealing with their transportation problems.

The intent of the Southwest Transitway is to improve mobility, further develop multi-modal options and increase transportation choices for the traveling public. The Southwest Transitway AA will define, evaluate, and recommend selection of a transit option which meets the goals established by the Southwest Transitway communities. Those goals are to:

- Improve mobility;
- Provide a cost-effective, efficient travel option;
- Protect the environment;
- Preserve and protect the quality of life in the study area and the region; and
- Support economic development

## Study Management

In 1980, The Hennepin County Regional Railroad Authority (HCRRA) was established as a separate political entity by county resolution in accordance with Minnesota law. HCRRA's purpose is to acquire abandoned freight rail corridors in order to preserve them for future transportation use and to conduct transit planning. In this capacity, the HCRRA is leading the effort for the Southwest Transitway Alternatives Analysis.

The HCRRA maintains over 52 miles of former freight rail corridors, which accommodate 37 miles of bicycle and pedestrian trails, and leases 80 properties to private and public entities. The seven members of the Hennepin County Board of Commissioners comprise the Authority.

Two committees, the Southwest Transitway Policy Advisory Committee (PAC) and the Southwest Transitway Technical Advisory Committee (TAC), were established to provide guidance on policy and technical issues, respectively, throughout the Southwest Transitway AA.

### Southwest Transitway Policy Advisory Committee (PAC)

The Southwest Transitway PAC is composed of elected, government and organizational officials from the following:

- The cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, Edina and Minneapolis
- Hennepin County
- Metropolitan Council
- Metro Transit and SouthWest Metro Transit
- Three Rivers Park District
- Twin West Chamber and Eden Prairie Chamber of Commerce

Southwest Transitway PAC members provide policy guidance throughout the study process. Members met at project milestones in the previous study and will continue to do so with this alternatives analysis to facilitate project analyses and deliverables.

### Southwest Transitway Technical Advisory Committee (TAC)

The Southwest Transitway TAC is composed of technical staff from the following:

- The cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, Edina and Minneapolis
- Hennepin County
- Metropolitan Council
- Metro Transit and SouthWest Metro transit
- Three Rivers Park District
- The Minnesota Department of Transportation (Mn/DOT)
- Twin Cities & Western Railroad Company

Southwest Transitway TAC members provide technical assistance and consideration throughout the study process. Members met monthly throughout the development of this alternative analysis to review technical work products and provide technical assistance. All project deliverables are reviewed by the Southwest Transitway TAC. The Southwest Transitway TAC also develops recommendations on the goals and objectives, alternative alignments, the screening process and the preferred alternative.

# 2. Southwest Transitway Planning Context

## Southwest Transitway History

The Southwest Transitway study area has a rich history within the Twin Cities metropolitan area. As early as 1988, the Southwest Transitway was considered a potential LRT corridor serving communities from Minneapolis to Hopkins. The following briefly describes the planning history of the Southwest Transitway:

*Comprehensive Light Rail Transit (LRT) System Plan, Hennepin County 1988*
In 1988, the HCRRA completed a Comprehensive Light Rail Transit System Plan that identified the Southwest Corridor from Minneapolis to Hopkins as a future LRT corridor.

*29th Street and Southwest Busway Feasibility Study, Hennepin County, February 2000*
In 1999, Hennepin County and Metro Transit initiated a study to determine the feasibility of constructing and operating a limited-stop, rapid-transit busway located within the HCRRA's Southwest Corridor from Hopkins to Minneapolis.
The study concluded that based on the ridership forecast and cost estimates that the busway was 'technically' feasible.

*Twin Cities Exclusive Busway Study, Mn/DOT, August 2000*
In 2000, Mn/DOT conducted a study to ascertain the cost of constructing and operating an exclusive busway system by the year 2020. Findings recommended three potential exclusive busway corridors for implementation by 2010. These three potential corridors were the Southwest Corridor, St. Paul Northeast Corridor and the Minneapolis Northwest Corridor.

*Southwest Rail Transit Study, 2003*
In 2002, the HCRRA, in partnership with the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park and Minneapolis commissioned a Southwest Rail Transit Study to determine if rail transit should be part of the transportation strategy for the Southwest metro area. The study evaluated numerous light rail transit (LRT) routes and a diesel multiple unit (DMU) route.

The study concluded that study should continue for LRT for the following four alternatives:

- LRT 1A: from TH 312 in Eden Prairie to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor
- LRT 2A: from the SouthWest Metro Transit Station in Eden Prairie to downtown Minneapolis via I-494, the HCRRA property, and the Kenilworth Corridor
- LRT 3A: from the SouthWest Metro Transit Station in Eden Prairie to downtown Minneapolis via the Eden Prairie Center Mall, the Golden Triangle, Opus, downtown Hopkins, the HCRRA property, and the Kenilworth Corridor
- LRT 4A: from downtown Hopkins to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor.

*2030 Transportation Policy Plan (TPP),2004*
In 2004, the Metropolitan Council published the 2030 Transportation Policy Plan, which details policies and strategies to mitigate congestion and improve the mobility of the Region over the next 30 years. The TPP, also includes the 2030 Transit System Plan, which identifies the Southwest Transitway as a Tier 2 Transitway for implementation post 2020.

## Local Comprehensive Plans

Each of the study area communities has referenced the Southwest Transitway within their local comprehensive plans. The following are excerpts from these comprehensive plans pertaining to the Southwest Transitway.

Eden Prairie
"Transit rail options for the City are anticipated, as Hennepin County acquired the old Chicago Northwestern Railroad right-of-way through Eden Prairie in 1990 for a future Light Rail Transit (LRT) System…Possible completion of the system would occur around 2015. Until LRT is developed, the right-of-way will be available for public use as a recreational trail. It is the stated goal of this Comprehensive Plan that the City will support regional transit initiatives such as Light Rail Transit and Commuter Rail."
*(Comprehensive Plan Vision Goals and Policies, December 17, 2002)*

Hopkins
"The City will encourage the HCRRA to construct the Minneapolis Southwest Corridor light rail transit line as soon as feasible, including the planned station in Hopkins….The City supports the proposed locations for the light rail transit station in Hopkins and will work HCRRA on station planning and design…The City will publicize the expected location of the LRT station in the community in order to promote the use of this new travel mode and also to make the general public aware of the easy access Hopkins enjoys to central city (and from the central city outward)." *(Comprehensive Plan December 21, 1999)*

Minneapolis
"Light Rail Transit is considered a high priority investment for express transit corridors in both regional and city transit plans…Minneapolis will continue to aggressively pursue transit improvements in corridors, which serve major transit origins and destinations, with the eventual goal of a region-wide rail system, including light rail (LRT) and commercial rail." *(The Minneapolis Plan 2000)*

Minnetonka
"The City will work with existing and new employers located in the City to ensure that employers support transit use and carpooling by their employees." *(Comprehensive Plan (April 1999)*

St. Louis Park
"A new location was recently identified as part of the Southwest Regional Trail connecting the Hopkins trailhead to the future Midtown Greenway in Minneapolis. The regional trail has been named 'LRT'…this railroad corridor is designated as a future light

rail transit route and may be developed as a dedicated busway in the interim."
*(Comprehensive Plan 2000-2010)*

Hennepin County
"Hennepin County and its departments are committed to supporting a multitude of travel modes…The Hennepin County Regional Rail Authority will continue to lend strong support for the development and implementation of LRT and provide for interim bus, pedestrian and bicycle uses along their future LRT corridors." *(Hennepin County Transportation Systems Plan 03/27/2004)*

# 3. Demographics

During the ten year period between 1990 and 2000, the Twin Cities Metropolitan Area experienced strong growth, which is anticipated to continue in the future. According to the US Census, this region added 430,000 new residents and 290,000 new jobs between 1990 and 2000. This equates to a 17 percent increase in population and a 23 percent increase in jobs.

By 2030, the Metropolitan Council projects another 37 percent increase in population and 36 percent increase in jobs for the region. In raw numbers, during the 30 year period between 2000 and 2030, the region anticipates adding nearly one million people and over half a million jobs. This sustained growth will continue to have a major impact on the region's transportation system.

## Study Area Population

*1980-1990*
While most study area communities increased in population from 1980 to 1990, it was Eden Prairie and Minnetonka that experienced the most substantial growth. From 1980 to 1990, Eden Prairie nearly tripled its population while Minnetonka had increased its population by over a quarter.

*1990-2000*
All study area communities experienced additional population growth between 1990 and 2000. Eden Prairie experienced the most gain with a 40 percent increase in population. These population changes are further detailed in Table 1.

*2000-2030*
This growth in population is expected to continue over the next thirty years. Between 2000 and 2030, the population for all study area communities is projected to increase, which is depicted in Table 2. St. Louis Park and Eden Prairie are expected to have the strongest percent growth with 17 percent and 15 percent, respectively.

### Table 1 Study Area Population Trends (1980 – 2000)

| Locality | 1980 | 1990 | Percent Change | 2000 | Percent Change |
|---|---|---|---|---|---|
| Eden Prairie | 16,300 | 39,300 | 141% | 54,900 | 40% |
| Minnetonka | 38,700 | 48,400 | 25% | 51,000 | 5% |
| Hopkins | 15,300 | 16,500 | 8% | 17,000 | 3% |
| St. Louis Park | 42,900 | 43,800 | 2% | 44,100 | 1% |
| Minneapolis | 37,100 | 368,400 | -1% | 383,000 | 4% |
| Total | 484,200 | 516,400 | 7% | 550,000 | 7% |

Source: U.S. Census and Metropolitan Council

### Table 2 Projected Study Area Population (2000 – 2030)

| Locality | 2000 | 2030 | Percent Change |
|---|---|---|---|
| Eden Prairie | 54,900 | 63,000 | 15% |
| Minnetonka | 51,000 | 53,500 | 5% |
| Hopkins | 17,000 | 18,900 | 11% |
| St. Louis Park | 44,100 | 51,500 | 17% |
| Minneapolis | 383,000 | 435,000 | 14% |
| Total | 550,000 | 621,900 | 13% |

Source: U.S. Census and Metropolitan Council

## Study Area Employment

*1990-2000*
According to the U.S. Census, between 1990 and 2000 the Twin Cities Metropolitan Area added approximately 290,000 new jobs, which increased the job base by 23 percent. During this same period, the study area cities' share of the added jobs was over 43,000 new jobs, increasing their job base by 17 percent.

Nearly half of all jobs in the study area are located in downtown Minneapolis, which is currently the highest traffic generator in the region. Downtown Minneapolis is home to many corporate headquarters, including Target Corporation, American Express, Wells Fargo and Excel Energy. It is also the cultural and entertainment center of the region, with the Guthrie Theatre, Walker Art Center, Orchestra Hall, the HHH Metrodome, and the Target Center Arena. The Downtown Council estimates that downtown Minneapolis will add 40,000 new jobs to its 2004 employment base of 162,000 jobs.

The remaining study area employment is dispersed throughout the other study area cities. Concentrations are located in the Park Commons and Wooddale areas of St. Louis Park, downtown Hopkins, the Opus development in Minnetonka, and the Golden Triangle and Eden Prairie Center Mall areas of Eden Prairie.

Study area communities employment trends are detailed in the Table 3.

### Table 3 Study Area Employment Trends (1990 – 2000)

| Locality | 1990 | 2000 | Percent Change |
|---|---|---|---|
| Eden Prairie | 36,100 | 49,400 | 37% |
| Minnetonka | 35,500 | 50,500 | 42% |
| Hopkins | 12,300 | 11,800 | -4% |
| St. Louis Park | 36,800 | 40,700 | 11% |
| Minneapolis - CBD | 128,400 | 139,800 | 9% |
| Total | 249,100 | 292,200 | 17% |

Source: U.S. Census and Metropolitan Council

*2000-2030*
This employment growth is expected to continue. By 2030, the Metropolitan Council projects adding over 500,000 jobs within the region, which is a 36 percent increase.

All Southwest study area communities are projected to experience job growth during the next thirty years. As detailed in Table 4, a 38 percent increase is projected for Hopkins, with substantial gains projected for other study area communities as well.

### Table 4 Projected Study Area Employment Projections (2000 – 2030)

| Locality | 2000 | 2010 | Percent Change | 2020 | Percent Change | 2030 | Percent Change (2020 – 2030) | Percent Change (2000 – 2030) |
|---|---|---|---|---|---|---|---|---|
| Eden Prairie | 49,400 | 55,000 | 11% | 62,000 | 13% | 65,000 | 5% | 32% |
| Minnetonka | 50,500 | 53,800 | 7% | 56,000 | 4% | 58,600 | 5% | 16% |
| Hopkins | 11,800 | 13,600 | 15% | 14,800 | 9% | 16,300 | 10% | 38% |
| St. Louis Park | 40,700 | 46,200 | 14% | 50,500 | 9% | 52,500 | 4% | 29% |
| Minneapolis | 301,800 | 317,000 | 5% | 332,500 | 5% | 346,500 | 4% | 15% |
| Total | 454,200 | 485,600 | 7% | 515,800 | 6% | 538,900 | 5% | 84% |

Source: Metropolitan Council

## 4. Impact on the Transportation System

Over the past 30 years changing demographic and development patterns in the region have resulted in increased travel. The excess roadway capacity created in the 1970s to accommodate projected population growth has been quickly depleted as people travel more than had been forecasted. The result has been increased congestion, increased delays, more pollution, and an increase in the economic costs of operating a business in the region. With constraints on transportation funding and the social and environmental consequences of roadway expansion, congestion is anticipated to continue to grow.

A number of factors explain the increase in travel demand within this region. These include increases in the number of households, the average number of vehicles per household, the number of multiple-worker households, and the dispersion of jobs and housing throughout the region.

Since the mid-1980s vehicle miles of travel (VMT) has outpaced the population growth in this region. In 1970, people made an average of 2.7 daily trips per capita, with an average trip length of just less than 5 miles. By 2000, the average had increased to 4.2 daily trips per capita and the average trip length had increased to 6.5 miles. The Metropolitan Council projects this trend to continue through 2030, with vehicle miles of travel increasing by 51 percent over the Year 2000 while population increases by 17 percent. [1]

In 1970, the regional road system experienced 10 congested lane miles; by 2000 that number rose to 183 congested lane miles. The Minnesota Department of Transportation (Mn/DOT) projects that by 2025 that number will more than double to 491 congested lane miles. The Texas Transportation Institute's 2004 Urban Mobility Report lists Minneapolis as experiencing a faster increase in delay than its population group average from 1982 to 2002. According to Mn/DOT, the demand for travel in the southwestern metro area has increased substantially since the 1980s and is expected to continue to increase significantly. Between 1980 and 2000, traffic on the major interstates and highways in the Southwest study area increased by between 79 and 150 percent.

The increase in travel demand has impacts on regional residents. According to the Metropolitan Council, Twin Cities' residents spent a total of 54.6 million hours in roadway congestion in 2002, which is the equivalent of approximately 6,200 years or $740 million in lost time. When including fuel for each traveler in the peak period, this amounts to an overall cost to the region of $970 million.

[1] In the year 2000, daily person-trips for all modes totaled 11,670,000, of which 10,800,000 were motorized trips. This was an increase of 16% from 1990. Daily person-trips are expected to grow to 15 million by 2030. Total vehicle-miles traveled (VMT) is expected to increase to 86 million in 2030 from 57 million in 2000, which is a 51% increase. The 2000 Travel Behavior Inventory (TBI) found that 93% of the trips within the metro area both begin and end in the region, demonstrating the travel demand within the region.

Although the region has implemented several transit advantages to include bus shoulder lanes, meter ramp bypasses and HOV lanes, optimizing travel times remain elusive. Buses within the Southwest study area still share portions of their travel with mixed traffic. Without a dedicated transitway, journey time savings are difficult to achieve.

## Travel Demand and Patterns

According to an analysis of the Metropolitan Council's 2005 Travel Demand Model, approximately one-quarter of all trips in the Twin Cities Metropolitan area currently begin or end within the Southwest Transitway's demand area. The demand area produces and attracts a combined total of 3.4 million daily trips in 2005; this represents just over 27% of the approximately 12.9 million daily trips in the 7-county Twin Cities Metropolitan Area. In the 2030 Metropolitan Council Travel Demand Model, the demand area continues to capture approximately a quarter of all metropolitan area trips. Roughly 24% (or 3.9 million) of the 16.3 million daily regional trips in the 2030 model either begin or end within the demand area.

The analysis also examined existing and future trip-making patterns, or travel demand, (referred to as the demand area in some sources). This analysis showed that, in both 2005 and 2030, a substantial amount of trips that begin within the demand corridor also end in the demand corridor.

For this analysis, the demand corridor (shown in Figure 2) consists of traffic analysis zones within a varying buffer zone around the four alignments identified in the *Southwest Rail Transit Study*. Beginning at the Southwest corner of the transitway, the buffer zone extends 5 miles on either side of the four alignments, and narrows as the alignments approach downtown Minneapolis. This buffer was reduced near downtown Minneapolis based on the assumption that the downtown area would serve as either the beginning or the end for most trips along the Southwest Transitway. This assumption was based on relatively high numbers of trip origins and destinations that occur within downtown Minneapolis.

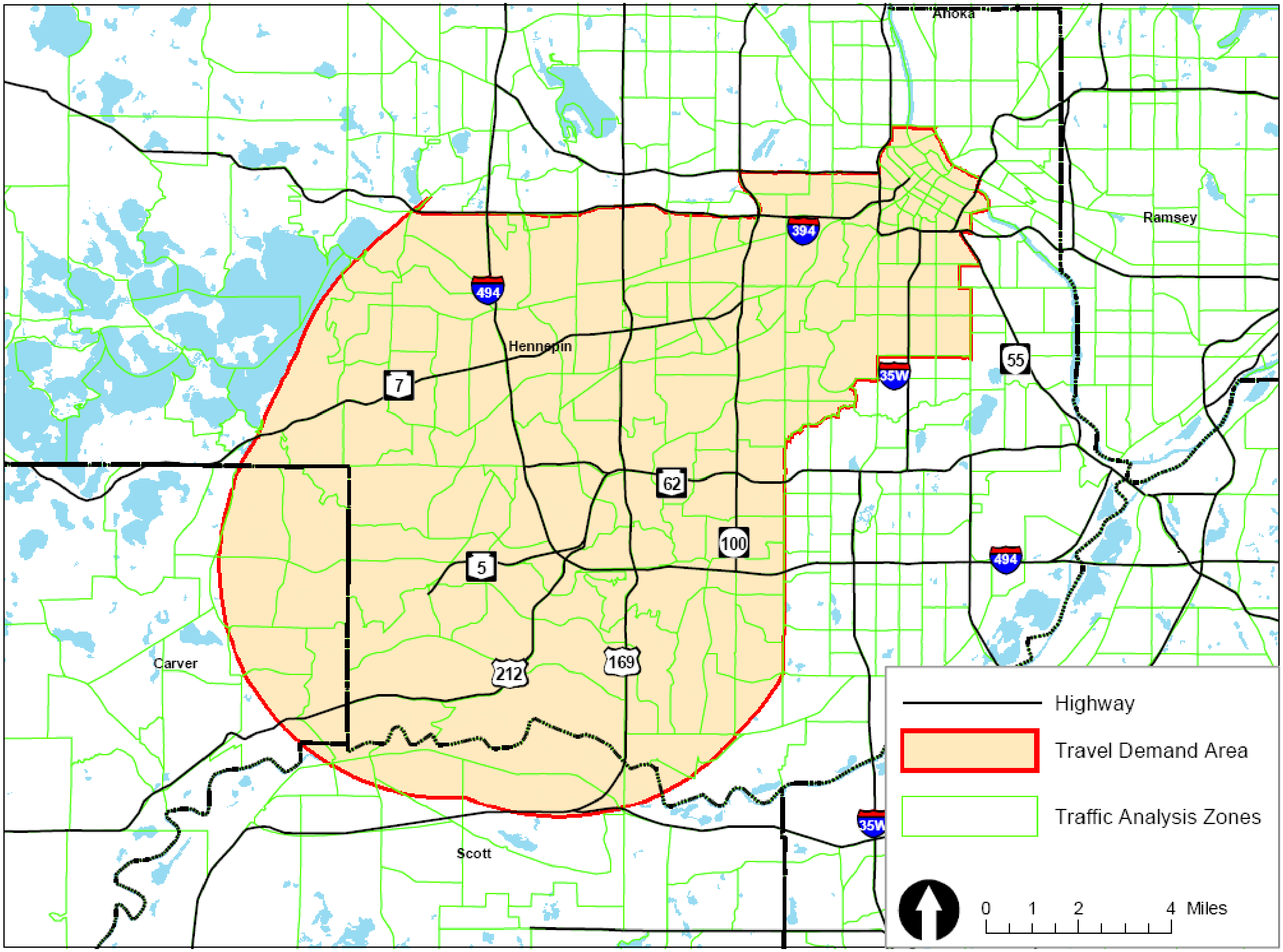
Trips are defined as one-way trips made by all persons throughout the day using all modes (including transit and non-motorized travel). Trips originating in a particular area are referred to as trip productions; trips ending in a particular area are referred to as trip attractions. The analysis looked at two types of trips: the total number of daily trips and the number of daily home-based work trips. Total trips encompass trips made for all purposes (including both work and non-work trips). Home based works trips consist solely of trips that occur between the traveler's home and workplace, in either direction (e.g. work-to-home and home-to-work). Home-based work trips were differentiated from other trips since work commutes are likely to constitute a major market for transit trips, particularly during peak periods.

In the 2005 model, the demand corridor produces approximately 2.2 million trips and attracts roughly 2.6 millions trips. These demand corridor productions and attractions increase to 2.5 million and 2.9 million, respectively, in the 2030 model. At a regional level, this means that 17% of all 2005 trips in the 7-county area begin in the demand corridor, and 20% end within the demand corridor.  2030 trips show a similar pattern, with 15% of all regional trips originating in the demand area, and 18% ending in the demand area.

A large amount of these trips both begin and end within the demand corridor.  In both the 2005 and 2030 models, 65% of all trips originating in the demand corridor have destinations within the corridor.  In 2005, of the 2.2 million trip productions in the demand corridor, 1.45 million have attractions within the corridor.  In 2030, the number of trips with both productions and attractions within the demand corridor increases to over 1.6 million.

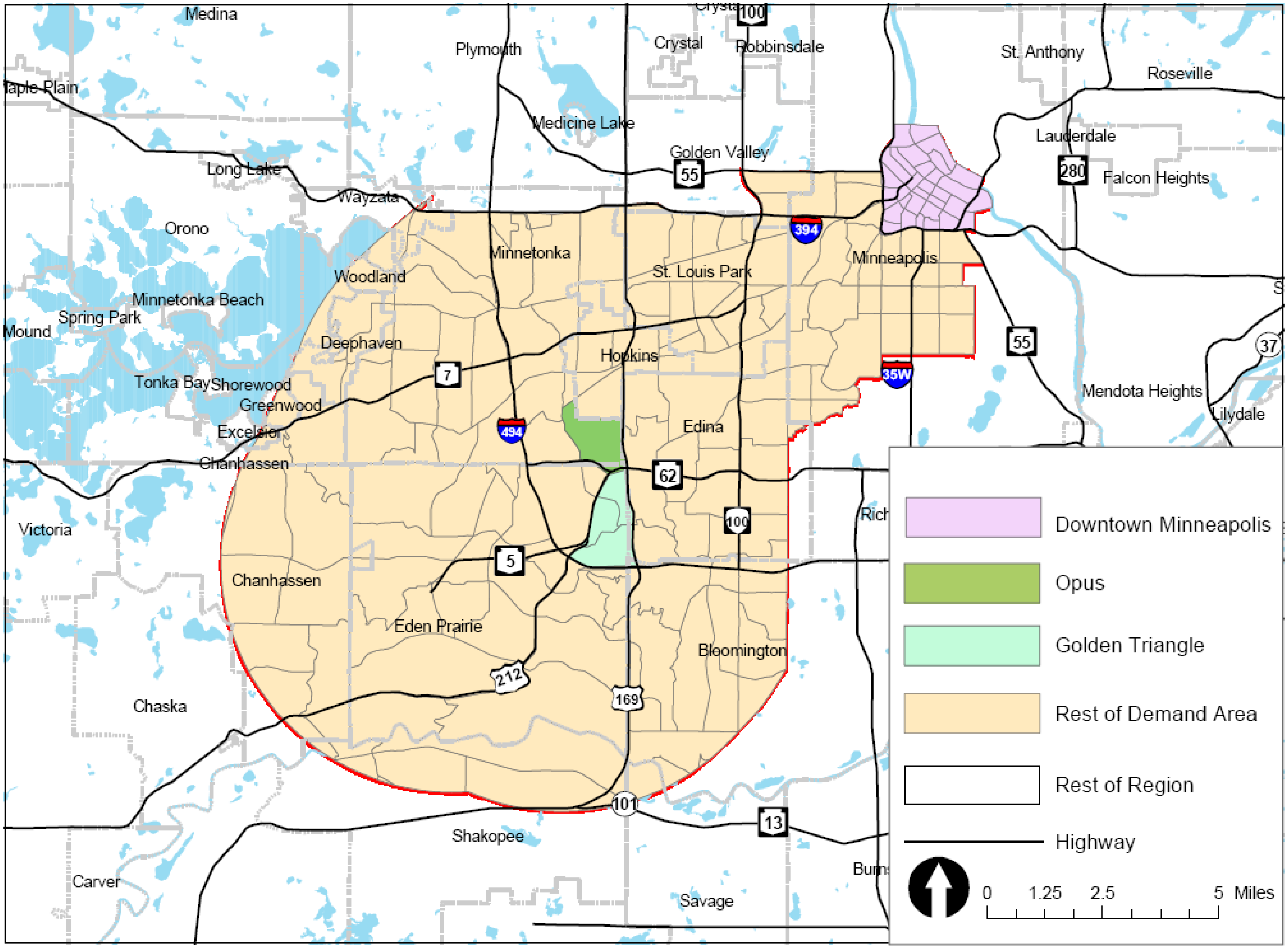
To further distinguish trip making patterns within the corridor, the analysis also examined the travel demand for three districts within the corridor: downtown Minneapolis, the Golden Triangle and the Opus Development in Minnetonka.  These areas represented large concentrations of employment, as determined by an examination of home-based work attractions.  Figure 3 shows the different districts examined in the analysis.

**Figure 2 Travel Demand Corridor**




Source: Parsons Brinckerhoff

**Figure 3  Analysis Districts in the Travel Demand Corridor**




Source:  Parsons Brinckerhoff

Table 5 summarizes 2030 productions and attractions for total trips and home-based work trips within three subsets: 1) the entire demand corridor; 2) each district within the corridor; and 3) the entire region. The table includes only 2030 numbers because travel patterns between the three subsets are similar for both 2005 and 2030 model trips; although the magnitude of 2030 trips is higher, the distribution of travel between each district, the study area, and the rest of the region is similar to the distribution of 2005 trips.

In Table 5, the sum of the horizontal rows identifies the number of attractions by district. The sum of the vertical columns represents the number of productions by district. The shaded areas represent the attractions that begin within the study area or the trip productions that end within in the demand corridor. The numbers in bold type signify trips with both productions and attractions within demand corridor.

### Table 5 Daily Total Trips, 2030

| Attractions / Productions | Downtown | Opus | Golden Triangle | Rest of Corridor | Outside of Corridor | Total Within Corridor | Total Productions |
|---|---|---|---|---|---|---|---|
| **Downtown** | 126,800 | 400 | 500 | 50,600 | 135,500 | **178,300** | 313,800 |
| **Opus** | 600 | 2,200 | 400 | 8,900 | 5,900 | **12,100** | 18,000 |
| **Golden Triangle** | 200 | 200 | 1,700 | 4,500 | 4,200 | **6,600** | 10,800 |
| **Rest of Corridor** | 124,200 | 18,300 | 24,000 | 1,248,200 | 737,700 | **1,414,600** | 2,152,300 |
| **Outside Corridor** | 398,200 | 18,800 | 25,500 | 939,500 | 12,410,700 | 1,382,100 | 13,792,800 |
| **Total Within Corridor** | **251,800** | **21,100** | **26,500** | **1,312,200** | 883,300 | **1,611,600** | 2,494,900 |
| **Total Attractions** | 650,000 | 40,000 | 52,000 | 2,251,700 | 13,294,000 | 2,993,600 | 16,287,700 |

Source: Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

The Downtown Minneapolis district accounts for a substantial portion of these trips with both productions and attractions within the demand corridor. In both the 2005 and 2030 models, roughly 40% of all downtown Minneapolis attractions also originate within the demand corridor. In 2005, this means that just over 200,000 of the 520,000 downtown Minneapolis trip attractions are produced within the demand corridor. In 2030, 252,000 of the 650,000 trips attracted to the downtown are produced in the demand corridor.

The majority of trips attracted to the Golden Triangle and the Opus also originate within the demand corridor. In the 2005 and 2030 models, over half of all trips attracted to the

Golden Triangle and to Opus are also produced within the demand corridor. In 2030, out of 40,000 attractions to the Opus district, 21,100 are produced in the demand corridor. For that same year, 26,500 of the 52,000 Golden Triangle trip attractions are produced within the demand corridor.

The analysis of home-based work trips showed similar results; a majority of the trips that begin within the demand corridor also end within the demand corridor. Table 6 summarizes the home-based work productions and attractions for each district.

Approximately 325,000 daily home-based work trips begin in the corridor in 2005; of these trips roughly 166,000 end in the demand corridor. In 2030, the number of demand corridor home-based work attractions increases to 349,000; nearly 195,000 of these trips end in the demand corridor.

The significant numbers of home-based work trips with both origins and destinations in the demand corridor is likely the result of the mixture of both housing and employment within the demand corridor. Dense concentrations of home-based work attractions are found within the Southwest demand corridor. As shown in Figures 4 and 5, which shows the home-based work trip attractions per square-mile for 2005 and 2030 respectively, high concentrations of work attractions form a radial pattern from downtown Minneapolis to the southwest. Much of this concentration lies within three districts analyzed: Opus, the Golden Triangle, and Downtown Minneapolis. In 2030, Figure 5 also shows growing employment density in Eden Prairie south of the beltway.

### Table 6 Daily Home-Based Work, 2030

| Attractions / Productions | Down-town | Opus | Golden Triangle | Rest of Corridor | Outside of Corridor | Total Within Corridor | Total Productions |
|---|---|---|---|---|---|---|---|
| **Downtown** | 10,000 | 100 | 100 | 3,500 | 11,800 | **13,700** | 25,500 |
| **Opus** | 200 | 100 | 100 | 1,000 | 1,200 | **1,500** | 2,700 |
| **Golden Triangle** | <100 | <100 | <100 | <100 | <100 | **<100** | <100 |
| **Rest of Corridor** | 42,700 | 4,500 | 8,000 | 124,300 | 141,400 | **179,700** | 321,000 |
| **Outside Corridor** | 177,500 | 8,000 | 13,500 | 236,600 | 1,670,900 | 435,700 | 2,106,600 |
| **Total Within Corridor** | **53,000** | **4,800** | **8,200** | **128,900** | 154,400 | **194,900** | 349,200 |
| **Total Attractions** | 230,500 | 12,800 | 21,700 | 365,500 | 1,825,300 | 630,500 | 2,455,800 |

Source: Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

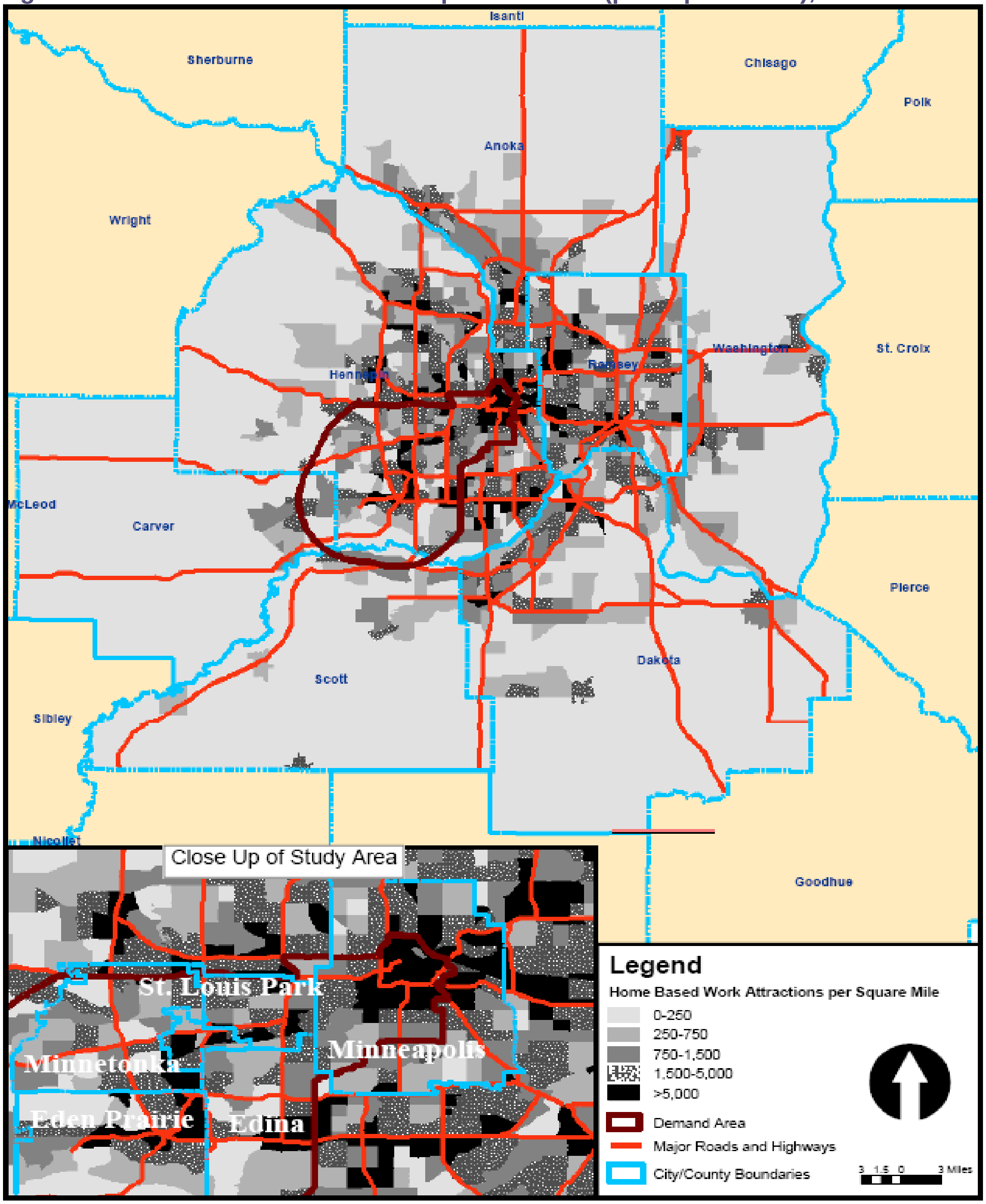
Downtown Minneapolis alone accounts nearly half of all home-based work trip attractions within the demand corridor (176,000 in 2005 and 230,000 in 2030). Of these downtown trip attractions, nearly 22% of home-based work trips attracted to Downtown Minneapolis also originate with the demand corridor in both the 2005 and 2030 model.

Figures 6 and 7 illustrate, respectively, the 2005 and 2030 geographic distribution of trip productions per square mile for all regional home-based work trips attracted to downtown Minneapolis – in other words, where work trips to Downtown come from. As the map shows, high concentrations of downtown Minneapolis trip attractions are produced in the surrounding communities of South Minneapolis, St. Louis Park, and Hopkins in 2005.

In the 2030, this concentration increases in each of those cities, and spreads further southwest. Among the downtown home-based work trip attractions that are produced outside the demand corridor, communities immediately to the north, east and south show the highest concentration of downtown home-based work origins. In 2030, this demand also spreads out, especially in the communities to the north and southeast of the Minneapolis downtown area.

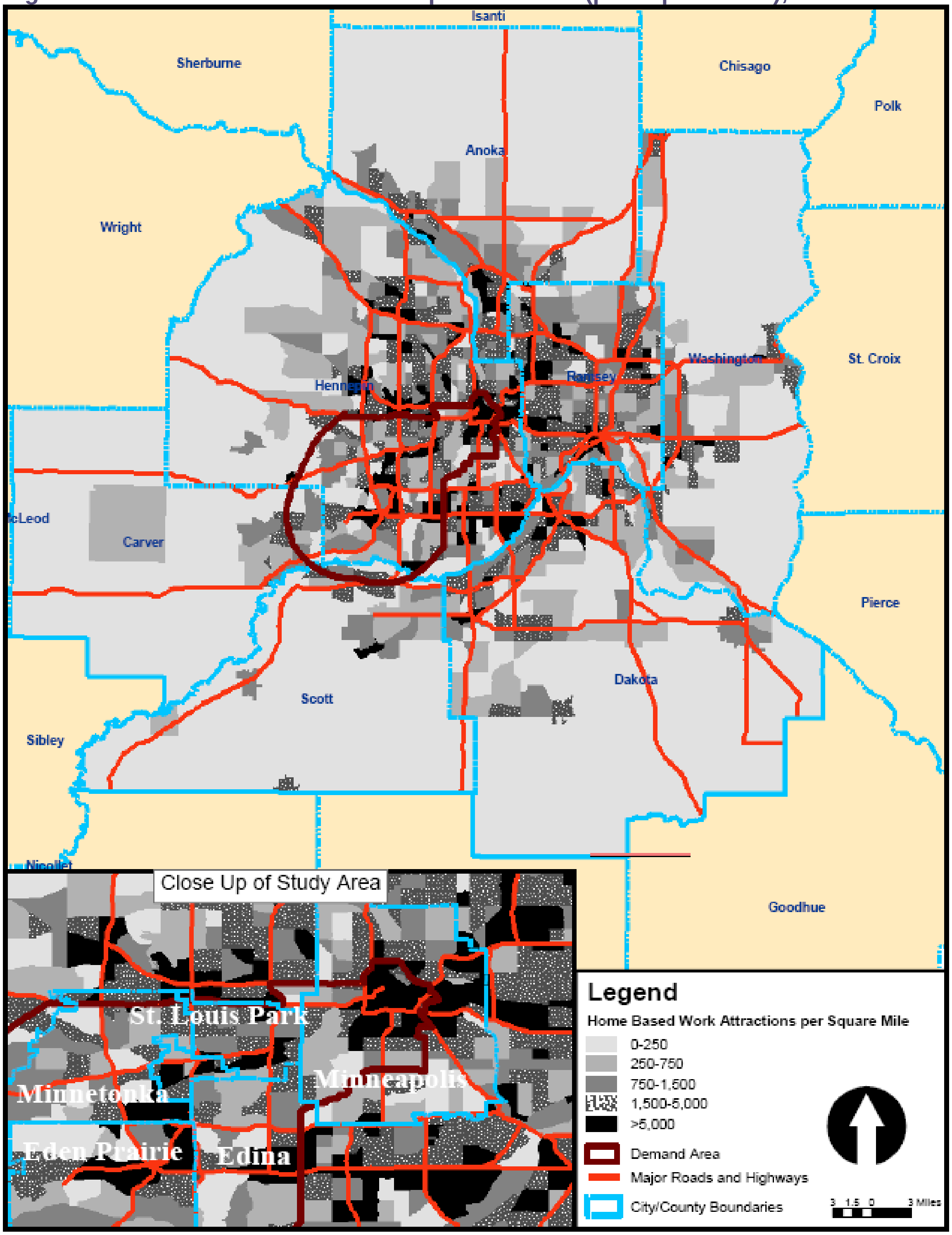
The Opus district attracts nearly 13,000 daily home-based trips in both the 2005 and 2030 models the Golden Triangle district attracts over 21,300 home-based work trips in 2005, and 21,800 in 2030. Forty percent of both the Opus and Golden Triangle home-based work attractions are also produced within the demand corridor.

## Figure 4  Total Home-Based Work Trip Attractions (per Square Mile), 2005



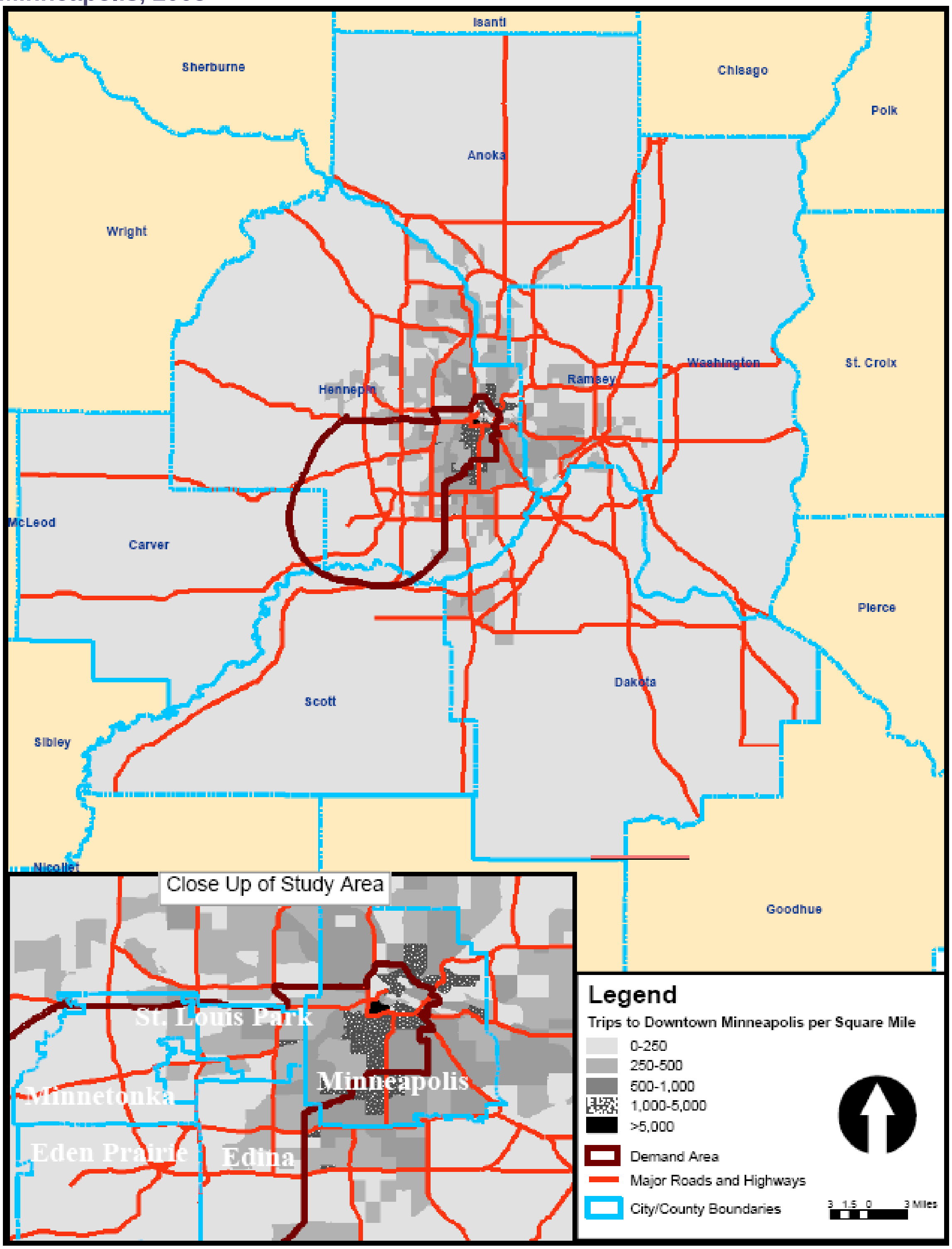

Source:  Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

Figure 5 Total Home-Based Work Trip Attractions (per Square Mile), 2030



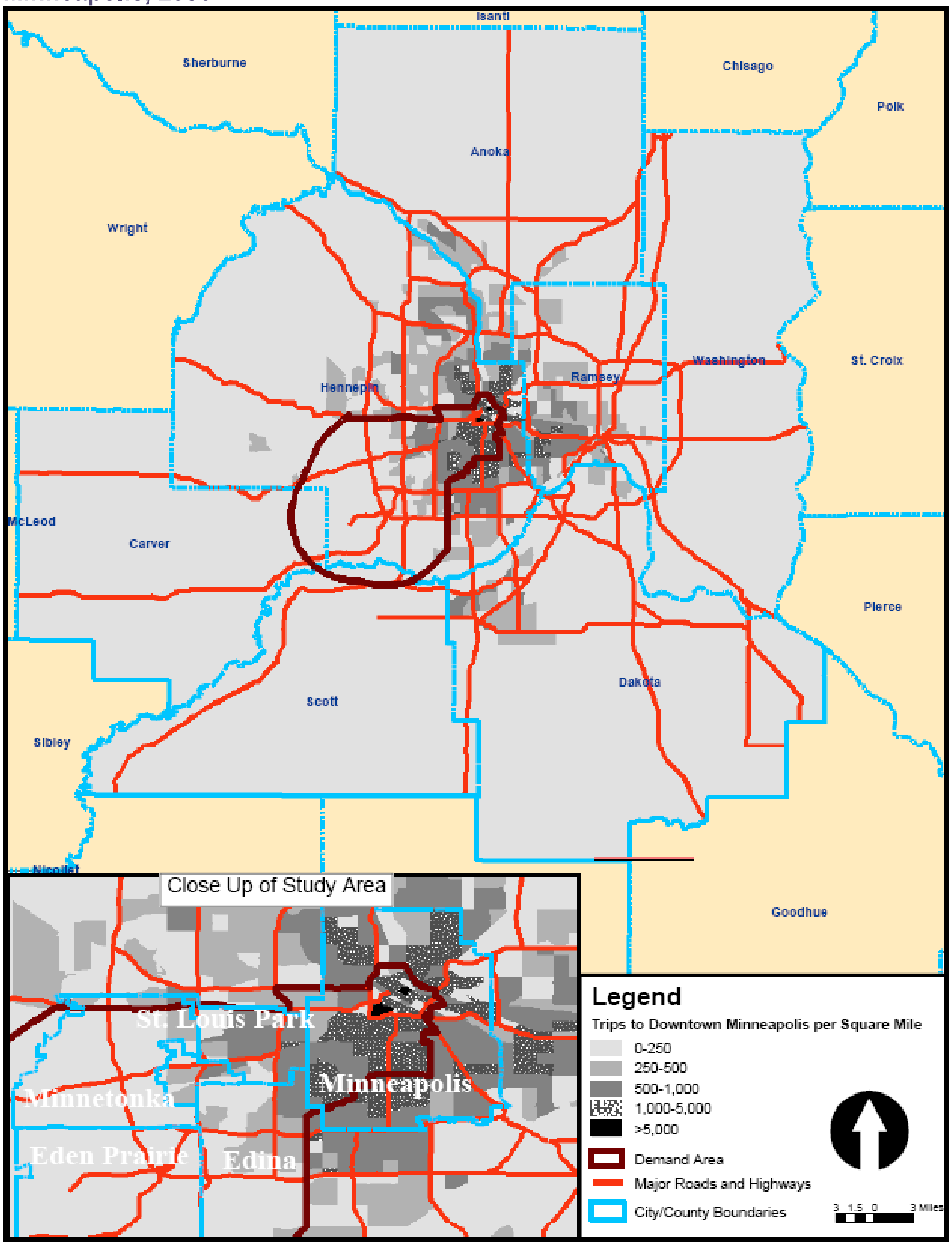

Source: Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

## Figure 6 Origins of Home-Based Work Trips (per Square Mile) to Downtown Minneapolis, 2005




Source: Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

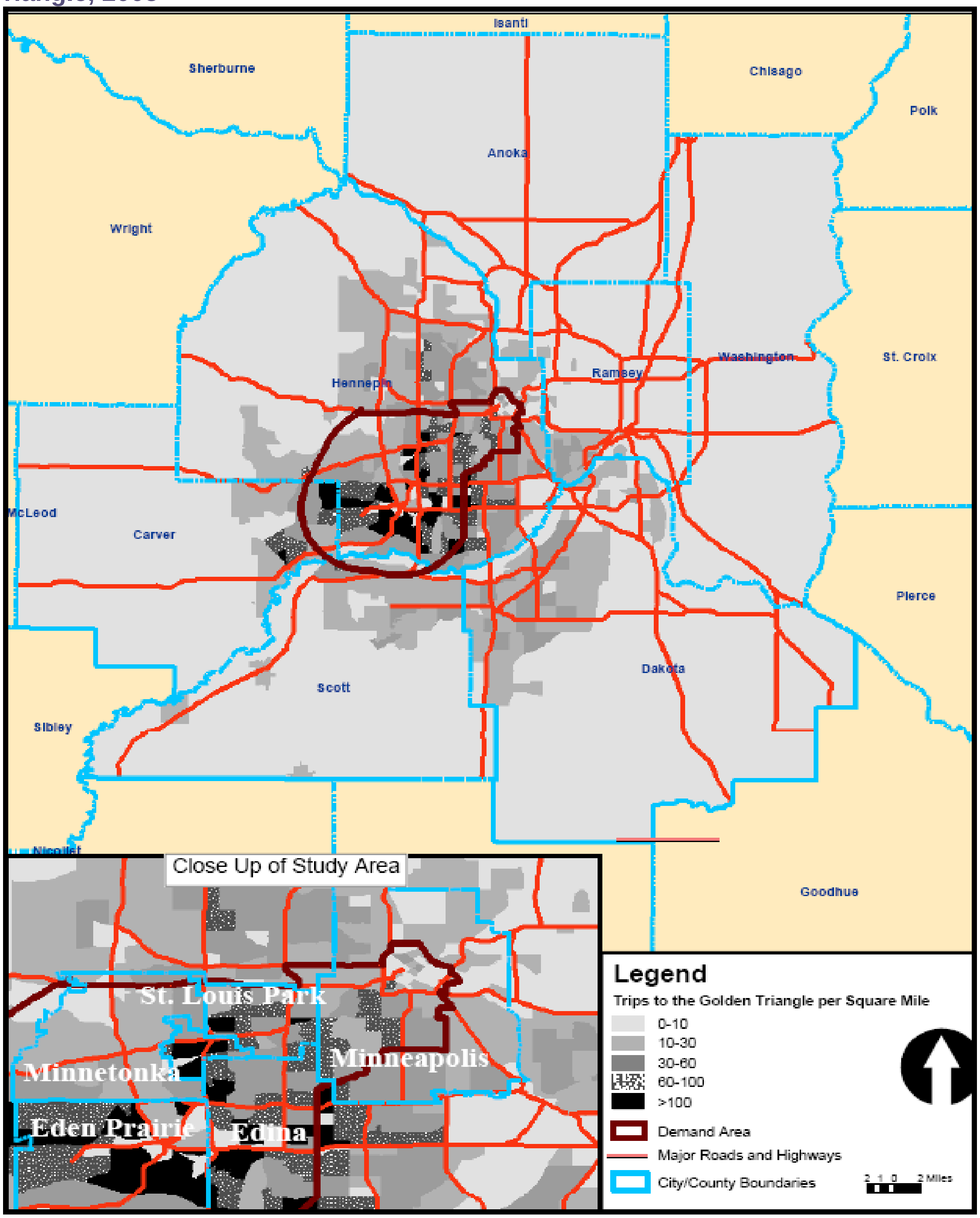
**Figure 7 Origins of Home-Based Work Trips (per Square Mile) to Downtown Minneapolis, 2030**




Source: Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

Figures 8 and 9 illustrate, respectively, the 2005 and 2030 geographic distribution of trip productions per square mile for all regional home-based work trips attracted to the Golden Triangle district.

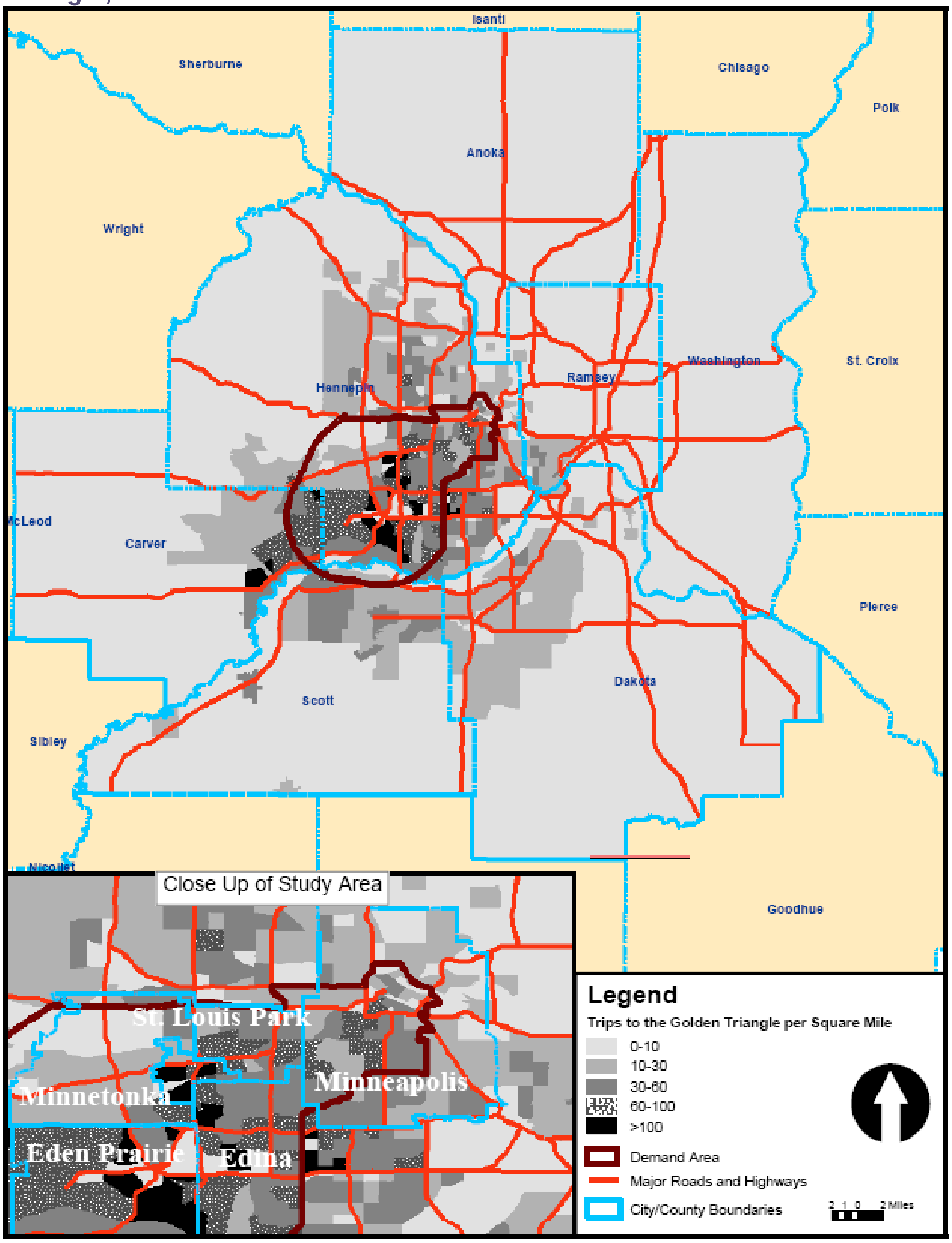
**Figure 8 Origins of Home-Based Work Trips (per Square Mile) to the Golden Triangle, 2005**




Source: Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

Both maps show high concentrations of downtown trips attractions produced within the demand corridor communities of South Minneapolis, St. Louis Park, Hopkins, Minnetonka and Eden Prairie.

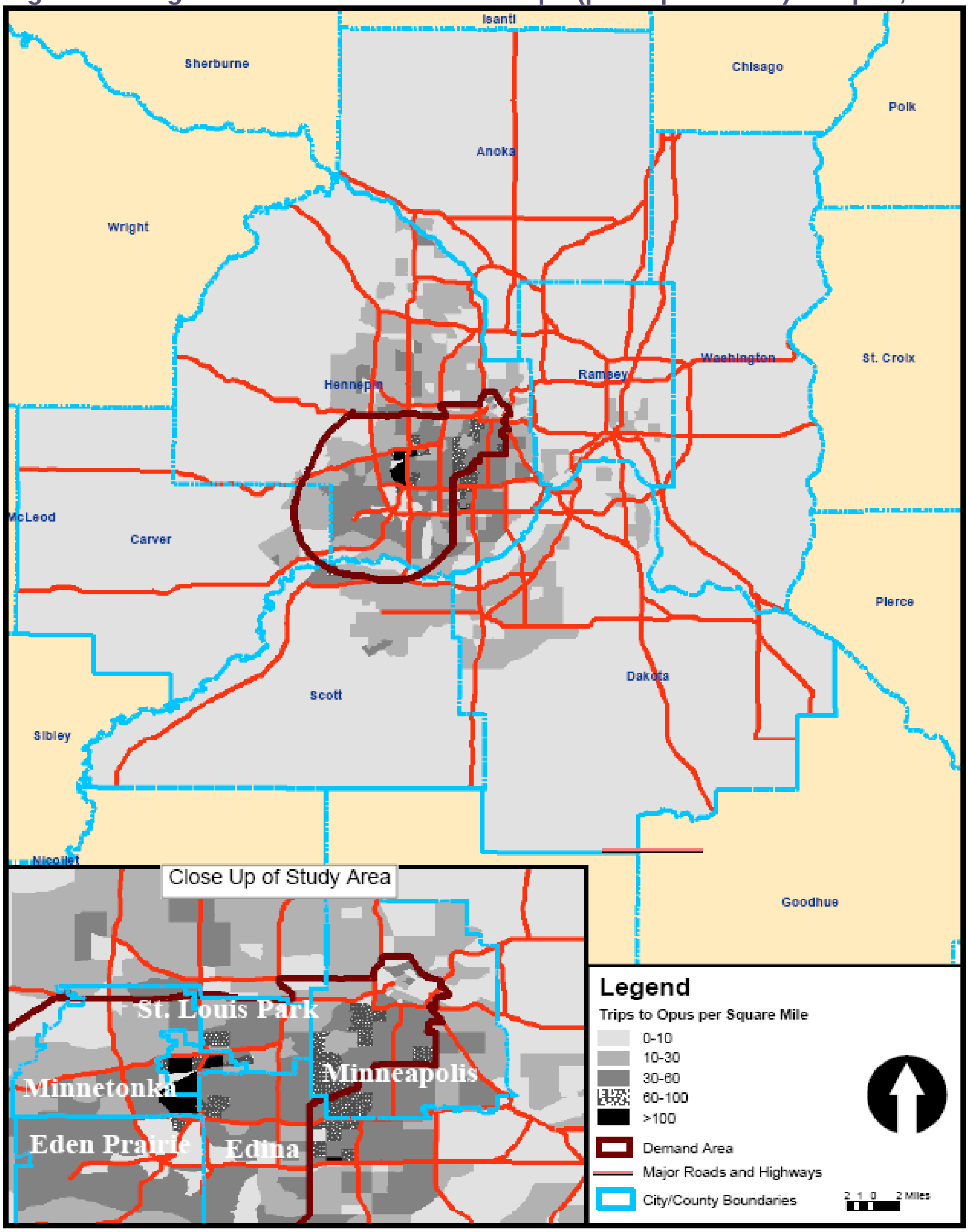
### Figure 9 Origins of Home-Based Work Trips (per Square Mile) to the Golden Triangle, 2030




Source: Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

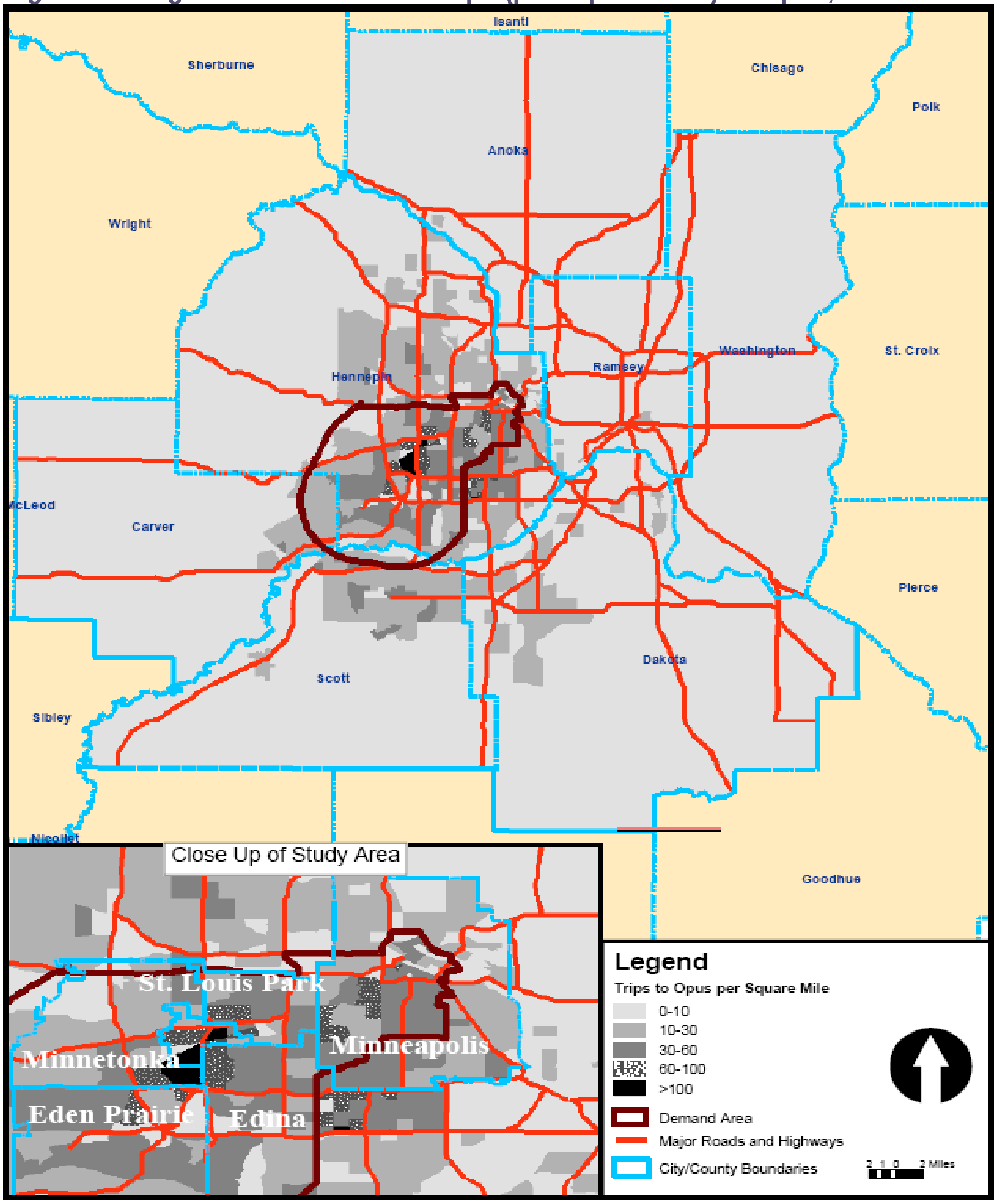
Figures 10 and 11 illustrate respectively, the 2005 and 2030 geographic distribution of trip productions per square mile for all regional home-based work trips attracted to the Opus district. As the maps illustrate, high concentration of home-based work trips to the Opus district originate within demand corridor cities, especially cities north of Opus, such as Minneapolis, Minnetonka and Hopkins.

### Figure 10 Origins of Home-Based Work Trips (per Square Mile) to Opus, 2005




Source: Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

## Figure 11 Origins of Home-Based Trips (per Square Mile) to Opus, 2030




Source: Parsons Brinckerhoff, Data from Metropolitan Council Travel Demand Model

### Future Conditions

For major roadway segments in the Southwest Transitway study area, average annual daily traffic is forecasted to grow by 49 percent between 2000 and 2020. As daily travel for work, education, shopping and other purposes continues to outpace the capacity of the transportation system, congestion and delay will continue to result.

Travel times greater than 60 minutes are anticipated to substantially increase by 2030. In 2000, travelers from Southwest Transitway study area communities could reach many destinations within the metro area within 30 to 60 minutes. Figures 12-14, which follow, illustrate the projected decline in accessibility for travel to these same destinations by 2030 from Minneapolis, St. Louis Park and Eden Prairie.

Roadway improvements have not kept pace with transportation demand. The result has been increased congestion, delay, pollution, and business costs. This trend is projected to continue, exacerbating the problem. According to both the Metropolitan Council and Mn/DOT, funding for transportation, both roadways and transit, will be insufficient to meet the demand. Planned and funded improvements include the widening of I-494, new interchanges along Highway 169, reconstruction of Highway 100, and bridge improvements along Shady Oak Road over the HCRRA Southwest Transitway. Even with those capacity increases, Mn/DOT projects traffic will increase on Southwest area highways by 49 percent, adding 826,000 vehicles per day to the 1.7 million vehicles on study area roads in 2002.

- **Transportation System Plan (TSP)**

  Mn/DOT Metro Division's *Transportation System Plan* (TSP) is the long-range plan for maintaining and improving the Twin Cities highway system. The TSP, currently being updated to 2030, is a comprehensive planning foundation upon which the system and strategy decisions are made. The TSP is intended to bridge the gap between the policy direction contained in the Metropolitan Council's TPP and specific roadway projects. In its TSP to 2025, Mn/DOT anticipates that expansion and improvement projects on the metro area highway system would total more than $2.4 billion between 2001 and 2025. Mn/DOT also documented that the metropolitan area's transportation needs total $9 billion between 2001 and 2025.

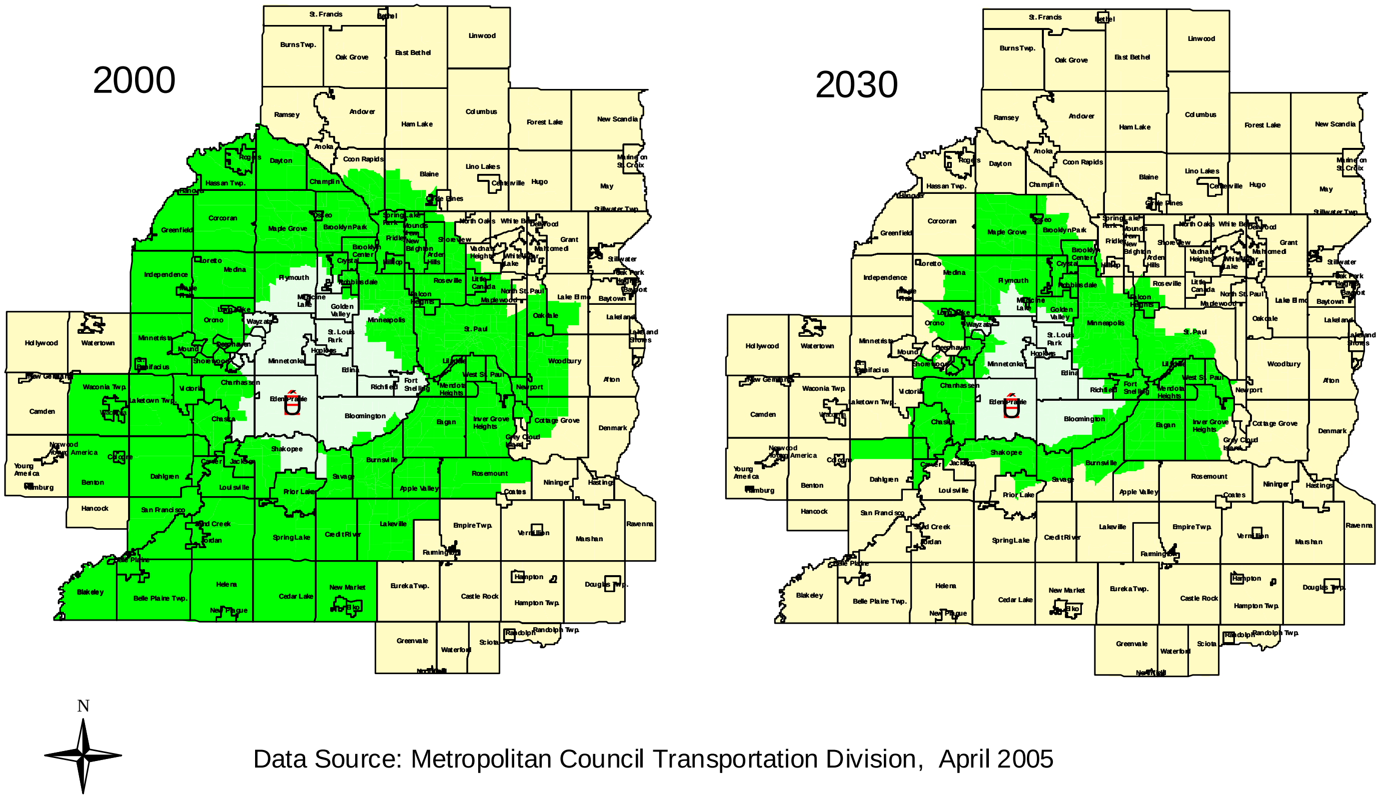
- **2030 Transit System Plan**

  The Metropolitan Council's *2030 Transit System Plan* is the region's long-range plan for transit investments. The Council targets a 50% increase in regional transit ridership by 2020, and a 100% increase by 2030 through increased bus service and implementing a series of transitways in key regional corridor. The transitways may use light rail, commuter rail, or bus rapid transit technologies.

**Figure 12  2000 & 2030 PM Peak Hour Travel Times from Eden Prairie**

Jurisdictional Boundaries
Travel Time From Origin in Minutes
0 - 30
30 - 60
Greater than 60
Eden Prairie Origin

Comparison of 2000 & 2030 PM Peak Hour Travel Times from Eden Prairie




Data Source: Metropolitan Council Transportation Division,  April 2005

**Figure 13 2000 & 2030 PM Peak Hour Travel Times from Minneapolis**

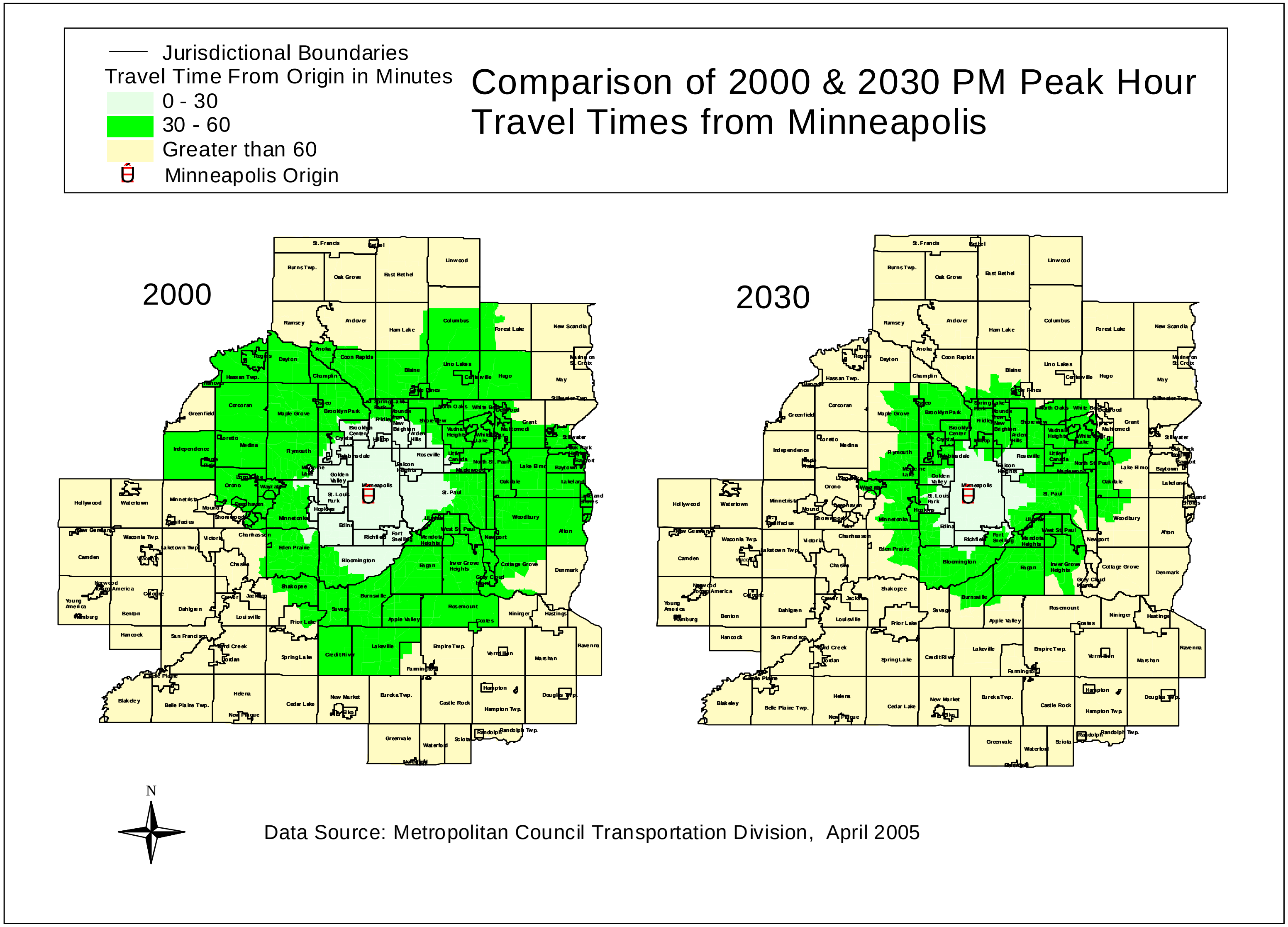
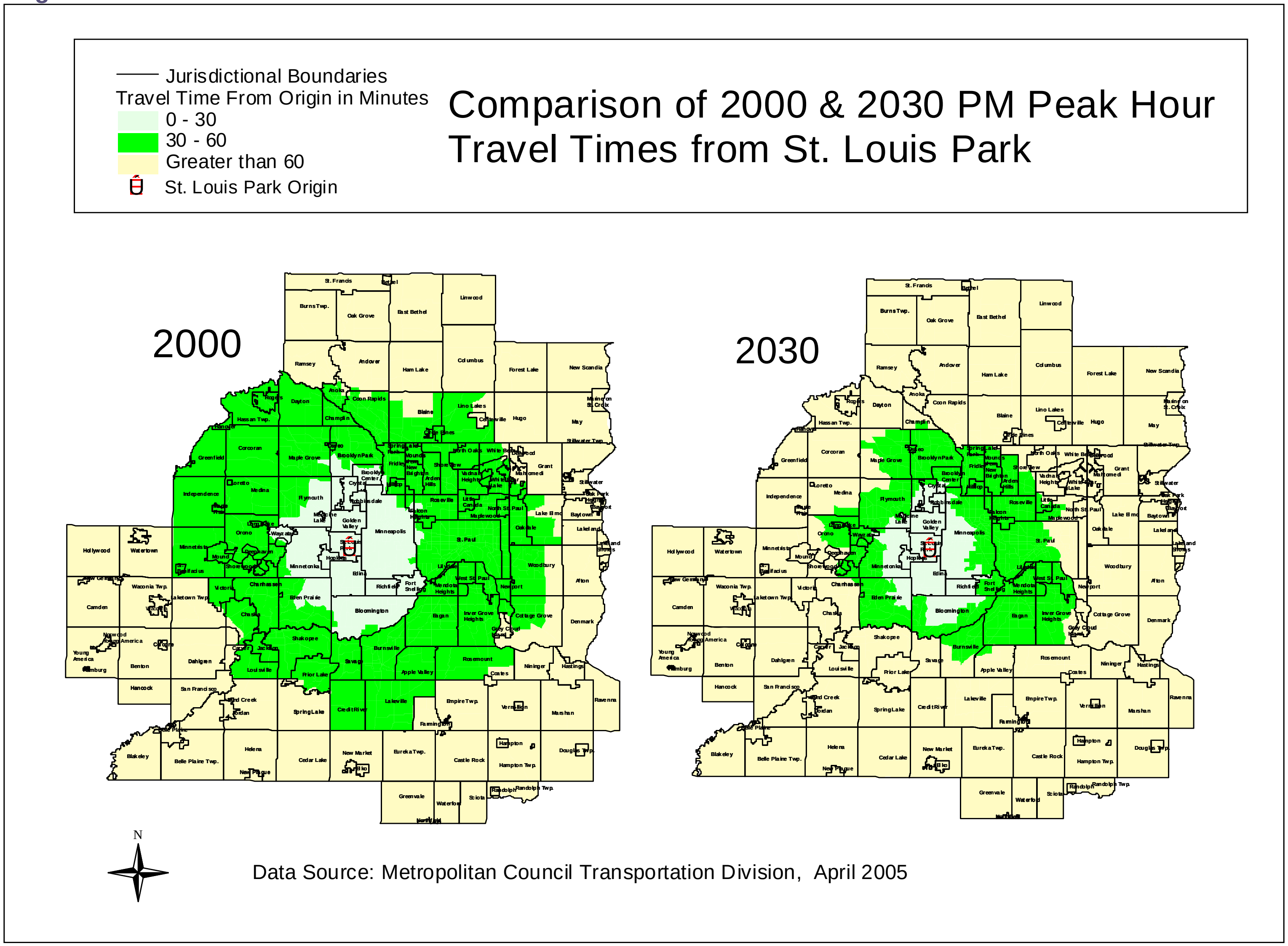


**Figure 14  2000 & 2030 PM Peak Hour Travel Times from St. Louis Park**



A system of transitways is a key component of this plan because transitways provide a travel time advantage over single-occupant automobiles, improve transit service reliability, and boost the potential for transit-oriented development, all goals and objectives of the Southwest Transitway AA.

The Council projected that implementing the transitway system could save approximately $2 billion in local roads and utilities, save $2 billion through reducing time lost in congestion, reduce automobile trips by 245,000 annually in the region, reduce vehicle miles traveled by 550 miles annually, save 27 million gallons of fuel, and reduce carbon monoxide emissions by 6,600 tons annually.

The overall planned increases include the Southwest Transitway, identified as a future transitway on dedicated right-of-way. Figure 15 illustrates the Metropolitan Council's planned 2030 Transitway System.

## 5. Southwest Transitway Need

In 2005, just over 27 percent of the Twin Cities regional daily trips occur within the seven-county metropolitan area. With Southwest Transitway communities projected to encompass 25 percent of the regional employment base by 2030, the Twin Cities region needs to maintain the ability to travel to, from, and through Southwest Transitway communities efficiently, and at acceptable cost. The five communities which make up the Southwest Transitway study area need to accommodate additional transportation capacity while preserving the corridor's business advantages, environmental features, and quality of life for residents.

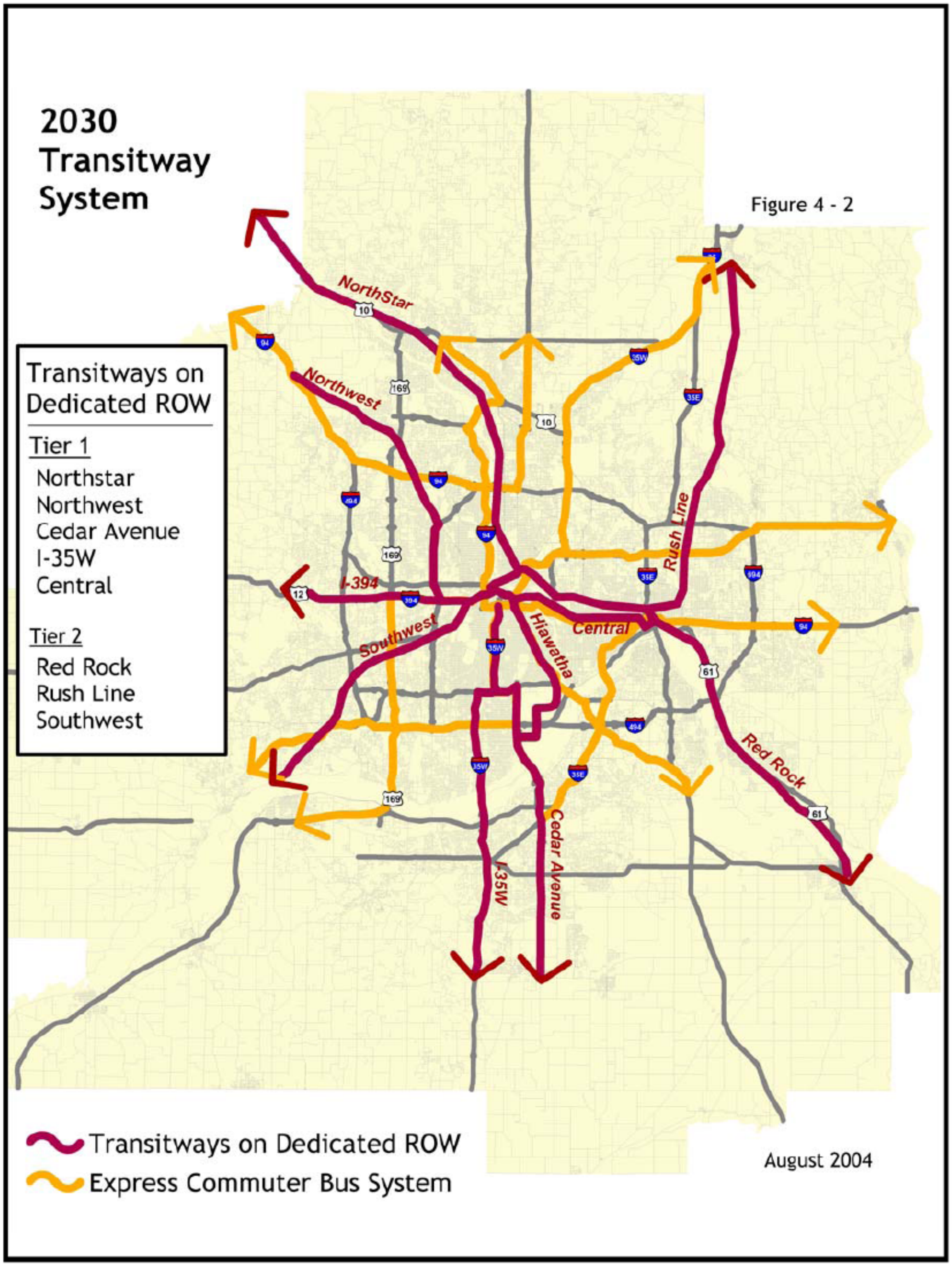
## 6. Southwest Transitway Goals and Objectives

To address these needs, the cities and agencies participating in planning for the corridor identified goals and objectives for the Southwest Transitway AA. On February 11, 2005, the Southwest Transitway Technical Advisory Committee (TAC) developed a proposed set of goals and related objectives for consideration by the Southwest Transitway Policy Advisory Committee (PAC). On March 2, 2005, the PAC unanimously approved the following goals and objectives for a Southwest Transitway. These goals and objectives serve as the foundation for evaluating the proposed alternatives.

The Southwest Transitway AA Goals are:

1. Improve Mobility
2. Provide a Cost-Effective, Efficient Travel Option
3. Protect the Environment
4. Preserve and Protect the Quality of Life in the Study Area and the Region
5. Support Economic Development

**Figure 15 Transitway System Map**




Source: Metropolitan Council, 2004

In addition, the PAC decided to prioritize the goals into two tiers. Tier one goals are those that must be achieved in order for a project to move forward. Tier two goals are those that should be achieved once it is determined a viable project exists. The tier one goals are Improve Mobility and Provide a Cost-Effective, Efficient Travel Option. The tier two goals are Protect the Environment, Preserve and Protect the Quality of Life in the Study Area and the Region, and Support Economic Development.

These goals and objectives will then be used to assist in the development of alternatives to address transportation needs. They also will form the basis for the development of the evaluation measures which, when applied to the alternatives, lead to the selection of a local preferred course of action.

## Improve Mobility

***Objectives:***

- Provide a travel option competitive with other modes in terms of journey time
- Provide a reliable travel option that improves mobility throughout the day
- Provide a travel option that serves population and employment concentrations
- Provide a travel option that adds capacity and access to the regional and local transportation system
- Provide a travel option that serves people who depend on transit
- Provide a travel option that enhances pedestrian and bicycle activity and access to community nodes

## Provide a Cost-effective, Efficient Travel Option

***Objectives:***

- Provide a travel option with acceptable capital and operating costs
- Provide a travel option that efficiently and effectively moves people
- Provide a travel option that integrates efficiently with other modes and avoids significant negative impacts to the existing roadway system
- Provide a travel option that supports regional system efficiency

## Protect the Environment

***Objectives:***

- Provide a travel option beneficial to the region's air quality
- Provide a travel option that avoids or minimizes alterations to environmentally sensitive areas
- Provide a travel option that supports efficient, compact land use that facilitates accessibility
- Provide a travel option that avoids significant environmental impacts on adjacent properties, such as noise and vibration

### Preserve and Protect the Quality of Life in the Study Area and the Region

***Objectives:***

- Provide a travel option that contributes to the economic health of the study area and region through improving mobility and access
- Provide a travel option that is sensitively designed with respect to existing neighborhoods and property values
- Provide a travel option that protects and enhances access to public service and recreational facilities
- Provide a travel option that supports sound planning and design of transit stations and park-and-ride lots
- Provide a travel option that enhances the image and use of transit services in the region

### Support Economic Development

***Objectives:***

- Provide a travel option that supports economic development and redevelopment with improved access to transit stations
- Provide a travel option that supports local sustainable development/redevelopment goals
- Provide a transportation system element that facilitates more efficient land development patterns and saves infrastructure costs
- Provide a travel option that accommodates future regional growth in locations consistent with local plans and the potential for increased ridership

These goals and objectives will be utilized at future points in the Southwest Transitway AA to assist in the evaluation of the study alternatives.

## 7. Supporting Documentation

The Appendix to this document includes supporting information on land use, transit service, and other transportation characteristics of the corridor.

# Appendix

## Transit Dependency in Southwest Transitway Communities

Based on current Census data, Minneapolis is home to the highest percentage of zero-car households. Hopkins and St. Louis Park have the highest percentages of elderly residents; while Hopkins has the highest percentage of mobility impaired residents.

**Table A-1 Study Area Characteristics as a Percent of Community Population**

| Community | Percent Elderly | Percent Mobility Limitation | Percent Zero-car Households |
|---|---|---|---|
| Eden Prairie | 5% | 1% | 1% |
| Hopkins | 15% | 4% | 11% |
| Minneapolis | 9% | 3% | 23% |
| Minnetonka | 14% | 2% | 3% |
| St. Louis Park | 15% | 3% | 8% |

Source: United States Census Bureau, 2000 Census

Another indicator used to identify the transit dependent population is the number of vehicles per household. Based on the results of the Metropolitan Council's Travel Behavior Inventory Home Interview Survey (2000), the number of households by vehicle availability and county was identified. The mean number of vehicles per household in 2000 for Hennepin County excluding Minneapolis, and for Minneapolis only, is 1.83 and 1.34 respectively. Table A-2 reports the results for Hennepin County.

**Table A-2 Number of Households by Vehicle Availability for Hennepin County**

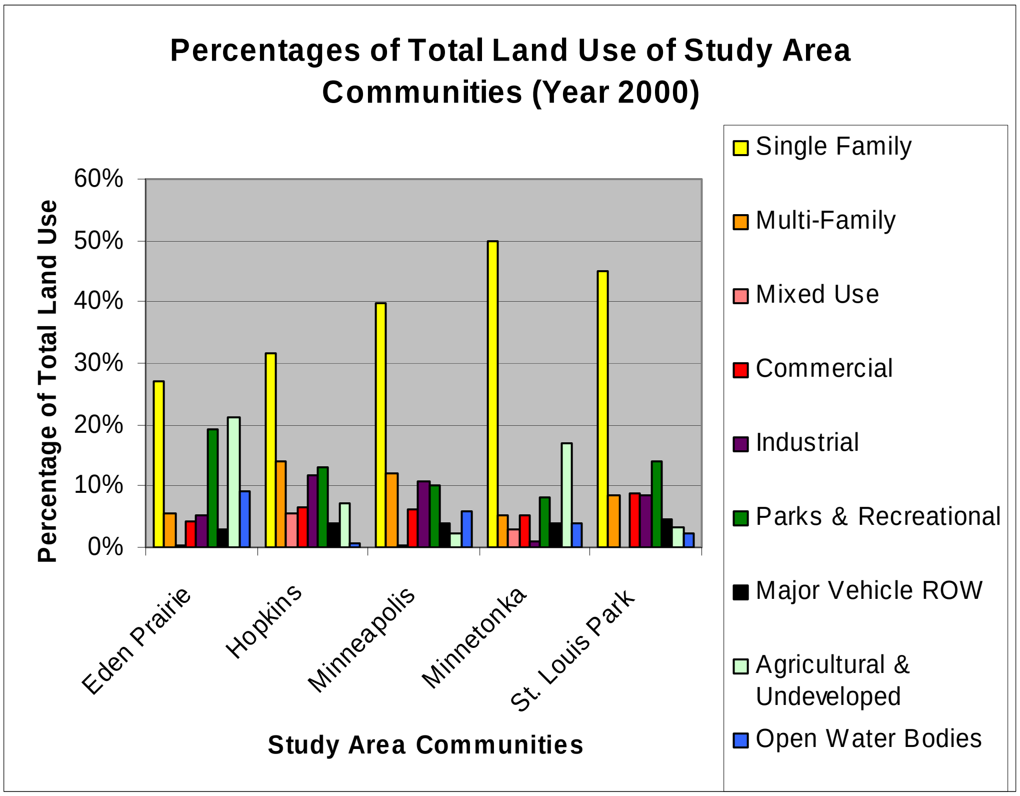
| Vehicles Per Household | Hennepin County excluding Minneapolis | Minneapolis |
|---|---|---|
| 0 | 8,064 | 28,644 |
| 1 | 104,548 | 67,990 |
| 2 | 143,900 | 51,841 |
| 3 | 36,957 | 10,421 |
| 4 | 9,522 | 2,964 |
| 5+ | 3,448 | 490 |
| Total | 306,439 | 162,350 |
| Mean # Vehicles | 1.83 | 1.34 |

Source: Metropolitan Council Travel Behavior Inventory Home Interview Survey, 2000

## Land Use

While various types of land development are present in each of the five study area communities, single family residential land use predominates. In all cases, commercial and industrial properties comprise less than 15 percent of each city's overall land use, although the Southwest Transitway study area includes several commercial and industrial areas along transportation routes. Based on the regionally defined land use categories, Figure A-1 illustrates the land use categories present within the study area

### Figure A-1 Land Use Percentages within Study Area Communities




Source: Metropolitan Council, Land Use Summaries, 2005

Each Southwest Transitway city has pursued development and redevelopment planning for areas within its boundaries, including several areas within the Southwest Transitway study area. Notable areas for redevelopment potential include the industrial corridor paralleling downtown St. Louis Park and Hopkins, the Golden Triangle area of Eden Prairie, and portions of the Opus development in Minnetonka.

## Study Area Roadway Network

The roadway network in the Southwest Transitway study area is a comprehensive system of urban interstate freeways, major highways, arterial roadways and local collector and access streets.

As detailed in Table A-3, the Southwest study area has roadway segments that experience substantial annual average daily traffic (AADT), which is projected to continue. For example, the roadway segment of I-494 and Hwy 169 east had an AADT of 106,000 in 2002, which is expected to increase 98% to 210,000 by 2030. Another roadway segment expected to have a substantial increase is I-494 and 62 south with an AADT of 69,000 in 2002, which is project to increase 96% to 135,000 by 2030.

Overall, AADT for roadway segments in the Southwest study area, as shown in Table A-3, is forecasted to grow by 49%. As with other growing areas within the Twin Cities, transportation demand continues to increase out pacing available roadway capacity.

## Study Area Transit Service

The Twin Cities has an extensive transit system composed of a regional transit agency and opt-out agencies that together provide express and local bus service.
Two transit operators currently provide transit service to study area communities. These are Metro Transit and SouthWest Metro Transit. Metro Transit is the regional transit agency within the Metropolitan Council, and is one of the largest transit agencies in the United States. Metro Transit provides express, limited-stop, and local bus service throughout the metropolitan area. Metro Transit also operates the Hiawatha Light Rail Transit line within Hennepin County. SouthWest Metro Transit is an “opt-out agency” (i.e. opt-out from Metro Transit service) that provides express bus routes to downtown Minneapolis and the University of Minnesota, as well as limited local bus service to the communities of Eden Prairie, Chanhassen and Chaska. SouthWest Metro Transit also provides connections to Metro Transit and other opt-out agencies’ routes and services.

Both providers operate on the regional highway system and local roads. Working in collaboration with the Minnesota Department of Transportation (Mn/DOT), the region has provided a network of transit advantages for buses, including the following high occupancy vehicle (HOV) lanes, HOV bypass ramps at freeway entrance ramps, and a BRT-like system on freeway shoulders in the metro area for exclusive use by buses.

There are several transit advantages available within the Southwest Transitway study area. As illustrated in Figure A-2, these advantages include bus shoulder lanes (depicted in red), ramp meter bypasses (depicted in blue) and HOV lanes (depicted in green).

## Table A-3 Average Annual Daily Traffic (AADT) for Southwest Study Area Roadway Segments

| Location | 2002 * | 2030 **** Forecast | Forecasted Growth (2000-2020) | Growth % (2000-2020) |
|---|---|---|---|---|
| 35W and 62 (north of interchange) | 168,000 | 230,000 | 62,000 | 37% |
| 35W and I-494 (north) | 97,000 | 157,000 | 60,000 | 62% |
| 62 and Hwy 100 (east) | 97,000 | 130,000 | 33,000 | 34% |
| 62 and Hwy 169 (east) | 93,000 | 84,000 | -9,000 | -10% |
| 62 and I-494 (east) | 35,000 | 55,000 | 20,000 | 57% |
| I-494 and Hwy 100 (east) | 146,000 | 260,000 | 114,000 | 78% |
| I-494 and Hwy 169 (east) | 106,000 | 210,000 | 104,000 | 98% |
| I-494 and Hwy 212 (east) | 91,000 | 150,000 | 59,000 | 65% |
| I-494 and 62 (south) | 69,000 | 135,000 | 66,000 | 96% |
| I-494 and I-394 (south) | 93,000 | 165,000 | 72,000 | 77% |
| Hwy 100 and Minnetonka Blvd (north) | 102,000 | 144,000 | 42,000 | 41% |
| Hwy 100 and Excelsior Blvd (south) | 99,000 | 135,000 | 36,000 | 36% |
| Hwy 100 and Hwy 62 (north) | 96,000 | 130,000 | 34,000 | 35% |
| Hwy 100 and I-494 (north) | 77,000 | 105,000 | 28,000 | 36% |
| Hwy 169 and Minnetonka Blvd (north) | 97,000 | 132,000 | 35,000 | 36% |
| Hwy 169 and Hwy 62 (north) | 87,000 | 120,000 | 33,000 | 38% |
| Hwy 169 and I-494 (north) | 56,000 | 84,000 | 28,000 | 50% |
| Minnetonka Blvd and Hwy 100 (east) | 21,600 ** | 14,000 | -7,600 | -35% |
| Minnetonka Blvd and I-494 (east) | 13,900 *** | 18,500 | 4,600 | 33% |
| Hwy 7/CR 25 and Hwy 100 (east) | 26,300 ** | 34,000 | 7,700 | 29% |
| Hwy 7 and I-494 (east) | 30,000 | 34,000 | 4,000 | 13% |
| **Totals** | **1,700,800** | **2,526,500** | **825,700** | **49%** |

Sources:

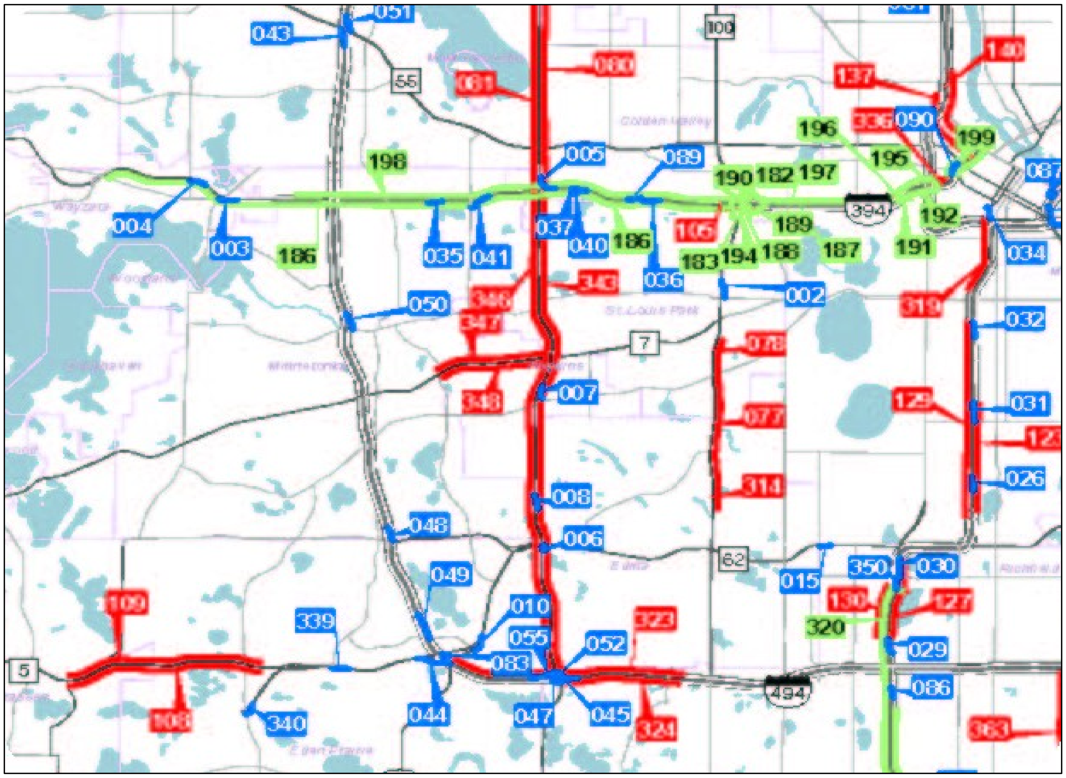
* 2002 AADT taken from 2002 Trunk Highway Traffic Volumes St. Paul-Minneapolis and Suburban Area Map prepared by the Minnesota Department of Transportation Office of Transportation Data and Analysis

** 2003 AADT taken from 2003 Traffic Volumes Street Series St. Paul-Minneapolis Seven County Area Map, Sheet 4E, prepared by the Minnesota Department of Transportation Program Support Group

*** 2003 AADT taken from 2003 Traffic Volumes Street Series St. Paul-Minneapolis Seven County Area Map, Sheet 4D, prepared by the Minnesota Department of Transportation Program Support Group

**** 2030 Traffic Projections provided by the Metropolitan Council, 2/4/05

**Figure A-2 Transit Advantages for Southwest Study Area**




Source: Metro Transit, October 2004

Note: red indicates bus shoulder lanes, blue indicates ramp meter bypasses and green indicates HOV lanes.

## Metro Transit

Currently, Metro Transit operates twenty-six routes within the study area. Of the 25 routes, seven are local, three are limited stop, and fifteen are express route services. Table A-4 provides further details of these routes to include the service area, ridership and hours of operation.

A number of transit facilities are located in the study area, including transit centers and park-and-ride lots positioned to offer efficient access to regional roadways.

## SouthWest Metro Transit

Ridership increased 20 percent to 603,000 annual trips on SouthWest Metro Transit buses in 2004, with an average of 1,500 passengers taking two trips per day. The agency operates a total of 23 routes and 60 buses, primarily over-the-road coaches, with several standard 40-foot and small local circulator buses as well. Of the 23 routes SouthWest Metro Transit operates, eleven are local and twelve are express route services. Table A-5 details these routes to include service area, service time and ridership.

Service to the University of Minnesota is a growing market as demonstrated by the strong ridership of the Route 690. Routes 690, 693 and 694 made up nearly 25 percent of all express service to downtown Minneapolis in 2001. The agency's local routes serve Eden Prairie's Golden Triangle business park and other retail and commercial development.

SouthWest Metro Transit planned and implemented the successful SouthWest Metro Station transit oriented development around its 900-space parking ramp and station. On an average day, 800 of the 900 spaces are filled. Based on the success in Eden Prairie, SouthWest Metro Transit continues to expand its transit oriented development and new facilities in Chanhassen and Chaska, along the new Highway 212 Transitway southwest of the study area.

## Southwest Transitway Park-and-Ride Lots

The Twin Cities' Region has an extensive park-and-ride lot program that also serves the study area. Facilities within the study area include transit oriented development, transit centers and park-and-ride lots. As detailed in Figure A-3, there are several park-and-ride lots within the study area that are near or at capacity, indicating the continual need for this type of transportation service.

## Bicycle and Pedestrian Trails

There are several bicycle and pedestrian trails within the study area. The Hennepin County Regional Railroad Authority (HCRRA) owns the property that houses the Southwest LRT trail, the Kenilworth trail and Midtown Greenway trail. These trails are located on property abandoned by the freight rail companies and acquired by the HCRRA. The HCRRA allows trails to operate on their property by interim use permit. The HCRRA does not own, operate, or maintain the trails located on its property.

### Table A-4 Major Routes Operated by Metro Transit within the Southwest Study Area

| Route | Type of Route | Service Times | Communities Served | Est. Peak Headway | Est. Off-Peak Headway | Est. Average Weekday Ridership |
|---|---|---|---|---|---|---|
| 6 | Local | All day | Downtown Minneapolis, Edina | 5-7 | 10-15 | 4,696 |
| 9 | Local | | | | | 3,164 |
| 12 | Limited Stop | All day | Minnetonka, Hopkins, Downtown Minneapolis | 15-20 | 30 | 2,352 |
| 17 | Local | All day | Hopkins, St. Louis Park, Downtown Minneapolis | 5-15 | | 6,457 |
| 604 | Local | All day | St. Louis Park | 60 | 60 | 90 |
| 605 | Local | All day | St. Louis Park | 60 | 60 | 98 |
| 612 | Local | All day | Hopkins & Minnetonka | 60 | 60 | 43 |
| 614 | Local | All day | Hopkins & Minnetonka | 60 | 60 | 92 |
| 641 | Express | Peak | Minnetonka, Downtown Minneapolis | N/A | N/A | 11 |
| 643 | Limited Stop | Peak | Minnetonka, St. Louis Park, Golden Valley, Downtown Minneapolis | 30-50 | N/A | 105 |
| 649 | Limited Stop | Peak | St. Louis Park, Downtown Minneapolis | 15-30 | N/A | 260 |
| 652 | Express | Peak | University of Minnesota | | N/A | 219 |
| 661 | Express | Peak | Minnetonka, Hopkins, Eden Prairie | 30-60 | N/A | 26 |
| 663 | Express | Peak | Minnetonka, St. Louis Park, Golden Valley, Downtown Minneapolis | 15-60 | N/A | 354 |
| 664 | Express | Peak | Minnetonka, Hopkins, St. Louis Park, Downtown Minneapolis | N/A | N/A | 164 |
| 665 | Express | Peak | Minnetonka, Hopkins, Downtown Minneapolis | N/A | N/A | 120 |
| 667 | Express | Peak | Minnetonka, Hopkins, St. Louis Park, Downtown Minneapolis | N/A | N/A | 489 |
| 668 | Express | Peak | Minnetonka, Hopkins, St. Louis Park, Downtown Minneapolis | N/A | N/A | 295 |
| 670 | Express | Peak | Orono, Tonka Bay, Shorewood, Minnetonka, Hopkins, Downtown Minneapolis | N/A | N/A | 130 |
| 671 | Express | Peak | Shorewood, Excelsior, Greenwood, Deep Haven, Minnetonka, Downtown Minneapolis | N/A | N/A | 172 |
| 672 | Express | Peak | Orono, Long Lake, Wayzata, Downtown Minneapolis | 20-35 | N/A | 482 |
| 673 | Express | Peak | Minnetonka, Downtown Minneapolis | 10-20 | N/A | 566 |
| 674 | Express | Peak | Orono, Long Lake, Wayzata, Downtown Minneapolis | N/A | N/A | 153 |
| 675 | Express | Peak | Mound, Wayzata, Minnetonka, Golden Valley, St. Louis Park, Downtown Minneapolis | 30-60 | N/A | 1,358 |
| 677 | Express | Peak | Mound, Wayzata, Minnetonka, Golden Valley, St. Louis Park, Downtown Minneapolis | N/A | N/A | 245 |

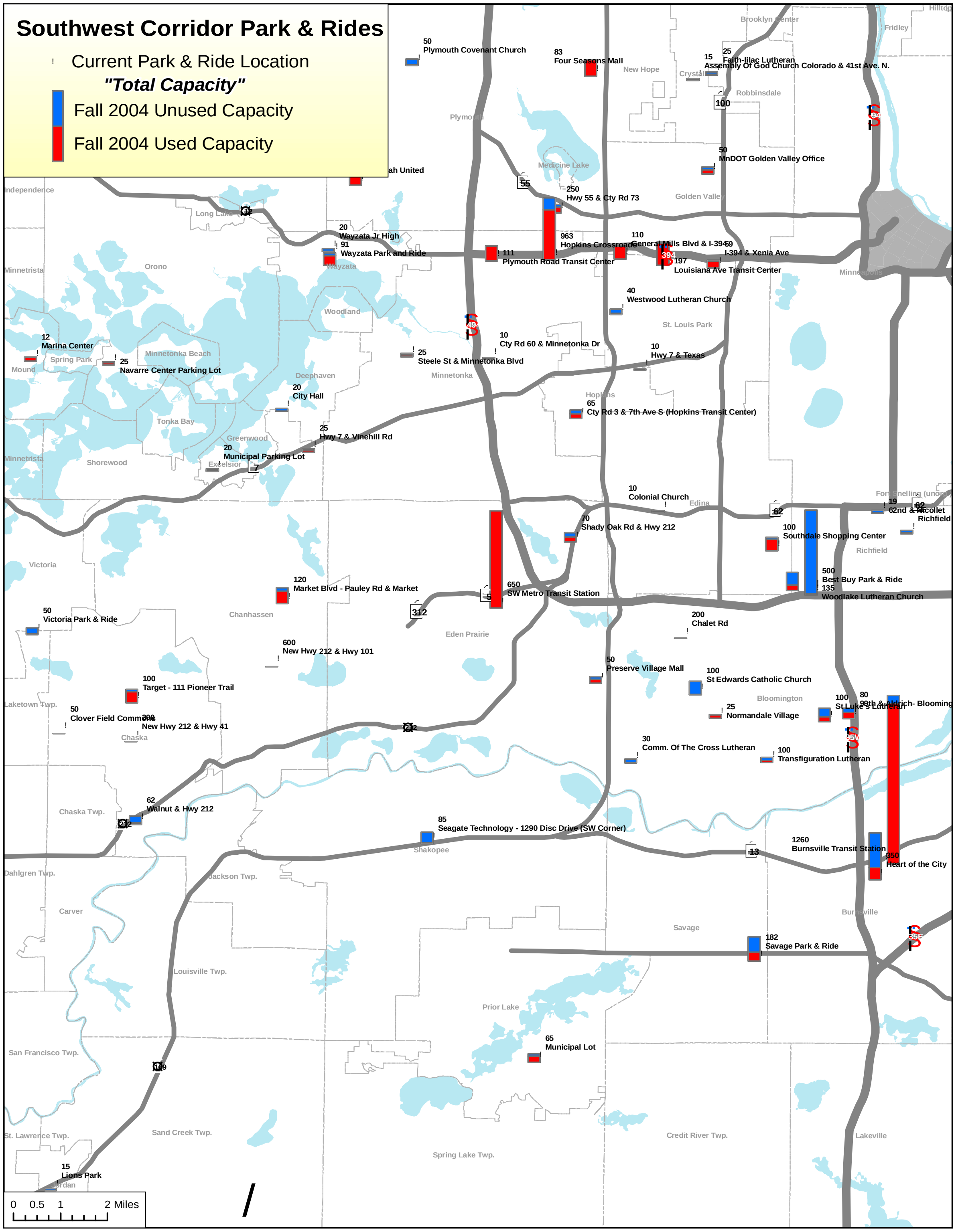
Source: Metro Transit, October 2004.

**Table A-5 Major Routes Operated by SouthWest Metro Transit within the Southwest Study Area**

| Route | Type of Route | Service Times | Communities Served | Est. Average Weekday Ridership |
|---|---|---|---|---|
| 603 | Local | All Day | Eden Prairie, Chanhassen, Chaska | 62 |
| 126 | Local | Mid-day | | |
| 631 | Local | All Day | Normandale, Southdale, Eden Prairie, Chanhassen | 55 |
| 632 | Local | All Day | Eden Prairie | 10 |
| 633 | Local | All Day | | 21 |
| 636 | Local | All Day | Eden Prairie, Chanhassen, Chaska | 35 |
| 680 | Local | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie | 93 |
| 681 | Local | All Day | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 285 |
| 682 | Local | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 189 |
| 685 | Local | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie | 135 |
| 686 | Local | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie | 30 |
| 687 | Express | | | 40 |
| 688 | Express | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 32 |
| 689 | Express | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 37 |
| 690 | Express | All Day | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 1,019 |
| 691 | Express | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 24 |
| 692 | Express | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 194 |
| 693 | Express | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie | 47 |
| 694 | Express | Mid-day | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 89 |
| 695 | Express | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 75 |
| 697 | Express | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 11 |
| 698 | Express | Mid-day | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 40 |
| 699 | Express | Peak | Downtown Minneapolis, University of Minnesota, Eden Prairie, Chanhassen, Chaska, Victoria | 190 |

Source: SouthWest Metro Transit, 2005

## Figure A-3 Southwest Corridor Park-and-Ride Lots




Source: Metro Transit, 2005

## Freight Railroads

Two active freight lines currently operate parallel to or within the study area. The Twin Cities & Western Railroad Company operates service within the study area from Minneapolis to St. Louis Park and Hopkins westward toward South Dakota. The Burlington Northern & Santa Fe (BNSF) Railway Company also operates freight service in the study area, along the Cedar Lake rail line through northern sections of St. Louis Park, Hopkins and Minnetonka. This rail line eventually diverges into three separate lines terminating in Seattle, Washington (the proposed Northstar commuter rail Transitway location); Aberdeen, South Dakota; and Kansas City, Missouri. A third rail line, abandoned by Canadian Pacific Railway, was acquired by the HCRRA in the early 1990's and later converted to interim trail use, as noted above. An additional north-south line extends through St. Louis Park in the eastern end of the corridor.

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# 9.0 Next Steps

## 9.1 Overview

This chapter identifies the next steps in the Federal Transit Administration New Starts Program project development process.

## 9.2 Background and Assumptions

The project development process for FTA New Starts projects are illustrated in Figure 9.1. This process includes the Alternatives Analysis (AA), Environmental Impact Statement (Draft and Final), Preliminary Engineering (PE), Final Design (FD), Full Funding Grant Agreement (FFGA), and Construction.

## 9.3 Environmental Impact Statement

The environmental review process required by the National Environmental Policy Act (NEPA) and related laws includes environmental impact analyses and the preparation of documentation for public review. The refinement of project costs, benefits, and impacts is further undertaken as part of the environmental review process, along with documentation of the project sponsor's ability to manage the development, implementation and operation of the project.

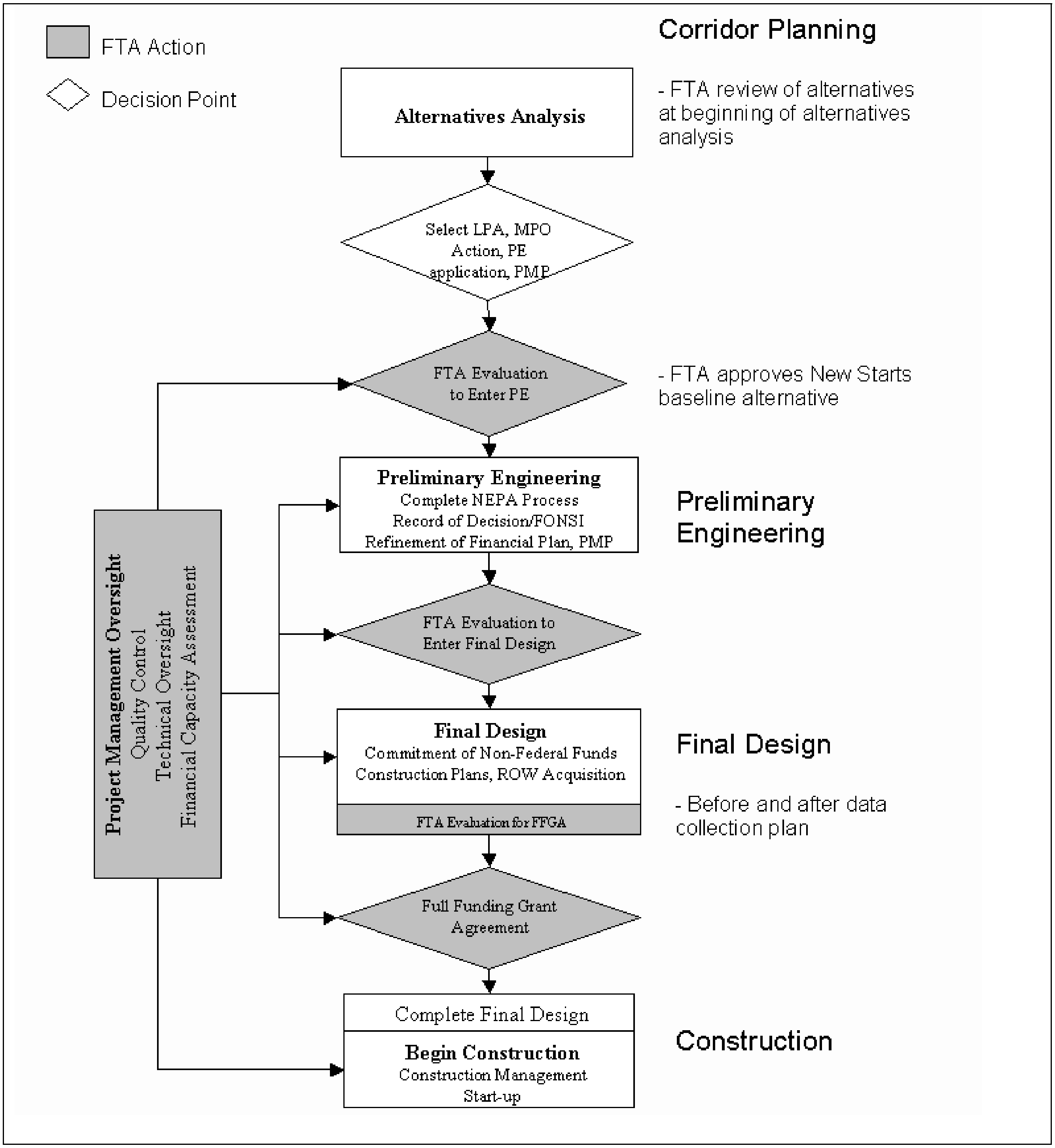
Typically fixed-guideway projects funded through the FTA New Starts program involve significant environmental and community impacts and that require preparation of an Environmental Impact Statement (EIS) which is completed as a Draft (DEIS), followed by a Final Environmental Impact Statement (FEIS). The scoping process is the first step in the DEIS process and confirms decisions made during the AA phase of project development. In the case of the Southwest Transitway, the DEIS process will be used to evaluate the potential environmental impacts of the proposed alternatives in order to select a Locally Preferred Alternative (LPA) for inclusion in the Metropolitan Council's long-range transportation plan, the Transportation Policy Plan (TPP).

The FEIS is completed during the Preliminary Engineering phase of project development, after an LPA has been identified. The FEIS addresses comments and questions generated from the public review of the DEIS, and focuses on the avoidance and mitigation of impacts. Mitigation decisions often require substantive collaboration with local, state, and Federal resource agencies, and may require significant additional analysis and refinement of the LPA's design concept in order to adequately mitigate identified environmental, socioeconomic, and transportation impacts. The FTA requires that local project sponsors provide firm commitments to implementing the required mitigation measures.

## 9.4 Preliminary Engineering

Once the LPA is selected and adopted into the region's long range plan, and the project has progressed through NEPA scoping, a project may request permission from FTA to enter into the Preliminary Engineering (PE) phase of project development. Preliminary Engineering includes additional engineering analysis, refining the design work done in earlier planning phases and results in the completion of all environmental requirements. Preliminary Engineering also typically marks the beginning of FTA's project management oversight function.

## Figure 9.1 Planning and Project Development Process for New Starts Projects




Source: FTA, Advancing Major Transit Investments through Planning and Project Development - January 2003

Preliminary Engineering results in a level of design that permits a high degree of confidence in the identification of the full costs, benefits, and impacts of the Locally Preferred Alternative (LPA). In contrast to alternatives analysis, which involves an evaluation of multiple alternatives at a relatively broad level of detail, Preliminary Engineering requires a higher degree of detailed analysis on a single alternative. Preliminary Engineering generates more detailed analysis on how to implement the preferred solution, mitigate undesirable impacts, and estimate capital costs at a much higher level of detail than necessary in earlier planning.

## 9.5 Final Design

Engineering, operating, funding and project management plans are completed during Final Design. This last phase of project development includes right-of-way acquisition, utility relocation, the preparation of final construction plans (including construction management plans), detailed specifications, construction cost estimates, and bid documents. The project's financial plan is finalized, and a plan for the collection and analysis of data needed to undertake a *Before and After Study* is developed.

Current FTA procedures require that project sponsors seeking a Full Funding Grant Agreement (FFGA) submit a complete plan for the collection and analysis of information to identify the impacts of their projects and the accuracy of their forecasts. This requirement reflects the FTA's desire to develop a greater understanding of the actual benefits of New Starts projects, once implemented and in operation. The FTA also requires Before and After Studies to learn the degree to which forecasts prepared as part of project planning and development are realized and the reasons why.

## 9.6 Full Funding Grant Agreement (FFGA)

A Full Funding Grant Agreement (FFGA) defines the terms of the Federal commitment to a specific project, including funding. Upon receipt of a FFGA, the Federal funding commitment has been finalized, and additional Federal project funding will not be recommended. Additional costs beyond the scope of the Federal commitment are the responsibility of the grantee. Firm funding commitments, embodied in FFGAs, are not made until the final design process has progressed to the point where costs, benefits, and impacts are accurately forecasted.

## 9.7 Construction

Construction typically follows completion of Final Design, when funding and project management are fully in place, although alternative approaches are possible. As an example, the Hiawatha project used the "design-build" construction approach. Design-build allows construction to begin on fully-designed elements while other elements are finalizing design. This method is used in some cases to shorten construction periods for major highway and transit projects.

# 8.0 Recommendation

## 8.1 Overview

This chapter presents the preliminary recommendation of the Southwest Technical Advisory Committee (TAC), the final recommendation of the Southwest Policy Advisory Committee (PAC), and the final action of the Hennepin County Regional Railroad Authority (HCRRA).

## 8.2 Background and Assumptions

When the Southwest Alternatives Analysis (AA) began, the HCRRA assembled the Southwest TAC and PAC to provide both technical and policy guidance to the project team. In fulfillment of this charge, the Southwest TAC worked with the project team to develop a preliminary recommendation based upon the technical analysis conducted, and on comments received from public involvement activities. The TAC's preliminary recommendation was shared with the public during a two-month intensive public outreach process.

Feedback received on the preliminary Southwest TAC recommendation was shared with the Southwest PAC. After considering the public feedback the Southwest PAC developed a final recommendation, which was then forwarded to the HCRRA. After receiving the final recommendation, the HCRRA held a public hearing in order to receive additional public comments prior to taking action.

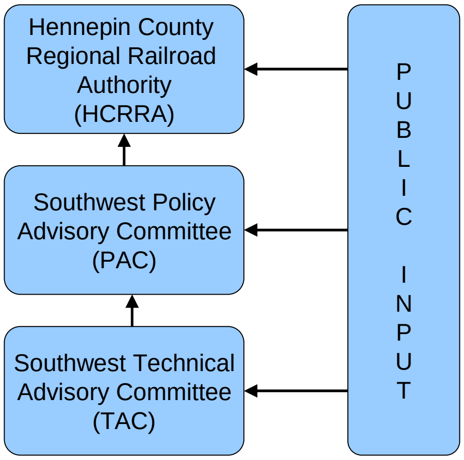
## 8.3 Recommendations

### 8.3.1 Southwest Technical Advisory Committee (TAC) Preliminary Recommendation

After comparing the benefits, costs and impacts of the light rail transit (LRT) and bus rapid transit (BRT) alternatives, the Southwest TAC recommended retaining the three LRT alternatives, LRT 3A, LRT 3C and LRT 1A, as well as the Enhanced Bus alternative for further evaluation in the next phase of project development, the Draft Environmental Impact Statement (DEIS). The DEIS process was assumed to include a screening or tiering process where the information generated as part of the mandatory local comprehensive plan updates would be incorporated into the evaluation process. In addition, the Southwest TAC recommended that the Metropolitan Council raise the priority of the Southwest Transitway in the region's long-range transportation plan, the *Transportation Policy Plan* (TPP).

The three LRT alternatives, LRT 1A, LRT 3A, and LRT 3C, were recommended for inclusion in the Draft Environmental Impact Statement (DEIS) project phase because they were superior at addressing the Southwest Transitway goals of improving mobility, providing a cost-effective and efficient travel option, protecting the environment, preserving the quality of life, and supporting economic development. The three LRT alternatives were found to carry more riders; attract more new riders to the transit system; be more cost-effective; be more operationally efficient; provide transit service to those most in need; provide connections to workplaces, medical facilities, shopping centers and other activity centers in the southwest metropolitan area; and create opportunities for further economic development in the southwest metropolitan area.

## Figure 8.1 Study Management




The Southwest TAC recommendations were received by the PAC in September 2006. The Southwest PAC requested that public comment be received on the preliminary recommendation. Public comment was solicited during the months of October and November through public open houses, a study sponsored website (www.southwesttransitway.org), presentations and meetings with interested groups, city council briefings, and news articles and network television coverage. A detailed description of the public outreach activities is included in Chapter 2, Public Involvement, and a summary of comments on the study recommendations is included in Appendix C of this report.

### 8.3.2 Southwest Policy Advisory Committee (PAC) Final Recommendation

On December 13, 2006, the Southwest PAC met to consider the public comments received and to form a final recommendation.

In general, the public comments received supported the Southwest TAC's recommendation to continue to consider light rail transit (LRT) as the transitway technology best suited to serve the travel needs of the southwest metropolitan area. There was also a general consensus that the LRT 1A alternative was inferior to the LRT 3A and LRT 3C alternatives in addressing the travel needs and supporting economic development in the southwest metropolitan area.

After considering the public comment received, the Southwest PAC concurred with the Southwest TAC recommendation with one caveat, that LRT 1A be retained as an option to be considered only in the event that LRT 3A and LRT 3C prove to be infeasible during the Draft Environmental Impact Statement (DEIS) process.

Therefore the Southwest PAC recommended the following:

1. That the HCRRA conduct the next phase of transitway development, the DEIS process;

2. That LRT 3A, LRT 3C, LRT 1A, and the Enhanced Bus alternative be included in the DEIS as potential alternatives;

3. That LRT 1A be pursued only if LRT 3A and LRT 3C are found to be infeasible during the DEIS process; and,

4. That the Metropolitan Council raise the priority of the Southwest Transitway in the *Transportation Policy Plan* (TPP).

The Southwest PAC recommendation was forwarded to the HCRRA in early 2007.

Figure 8.2 illustrates the three light rail transit alternatives included in the final Southwest PAC recommendation.  Figure 8.3 illustrates the Enhanced Bus alternative also included in the Southwest PAC recommendation as the FTA required baseline alternative.

The formal resolutions passed by the Southwest PAC are contained in Appendix A of this report.

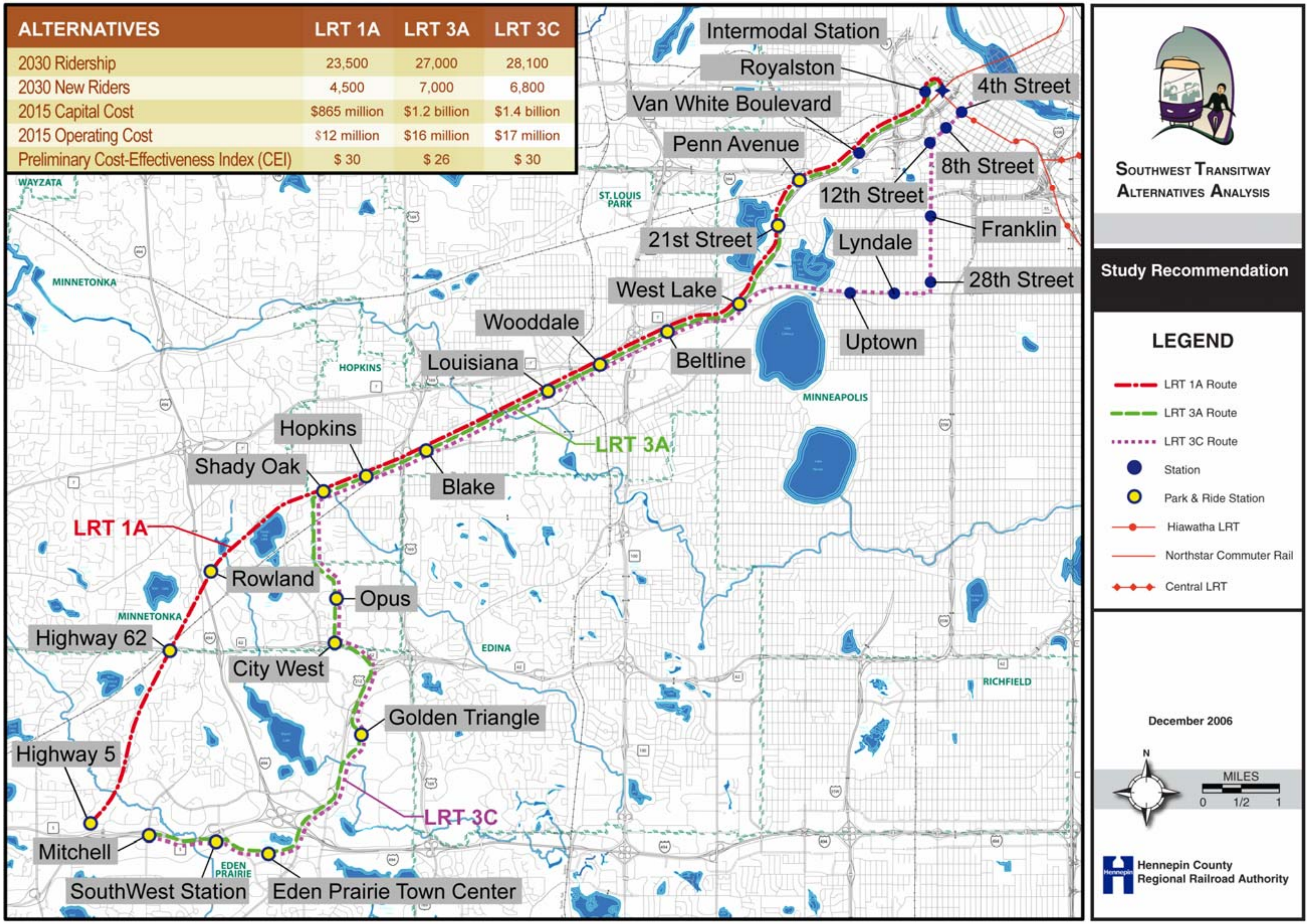
## 8.4 Hennepin County Regional Railroad Authority (HCRRA) Action

The HCRRA received the Southwest PAC's final recommendation on January 9, 2007.  At that time the HCRRA scheduled a public hearing for the Southwest PAC's final recommendation for January 23, 2007.

Fourteen people testified at the January 23rd public hearing.  In general, all those who testified supported the recommendation to proceed into the DEIS phase with light rail transit (LRT) as the preferred technology.  The general area of debate expressed by those testifying was over which routing alignment ("A", referred to as Kenilworth, or "C", referred to as Midtown/Nicollet) was preferred in Minneapolis.

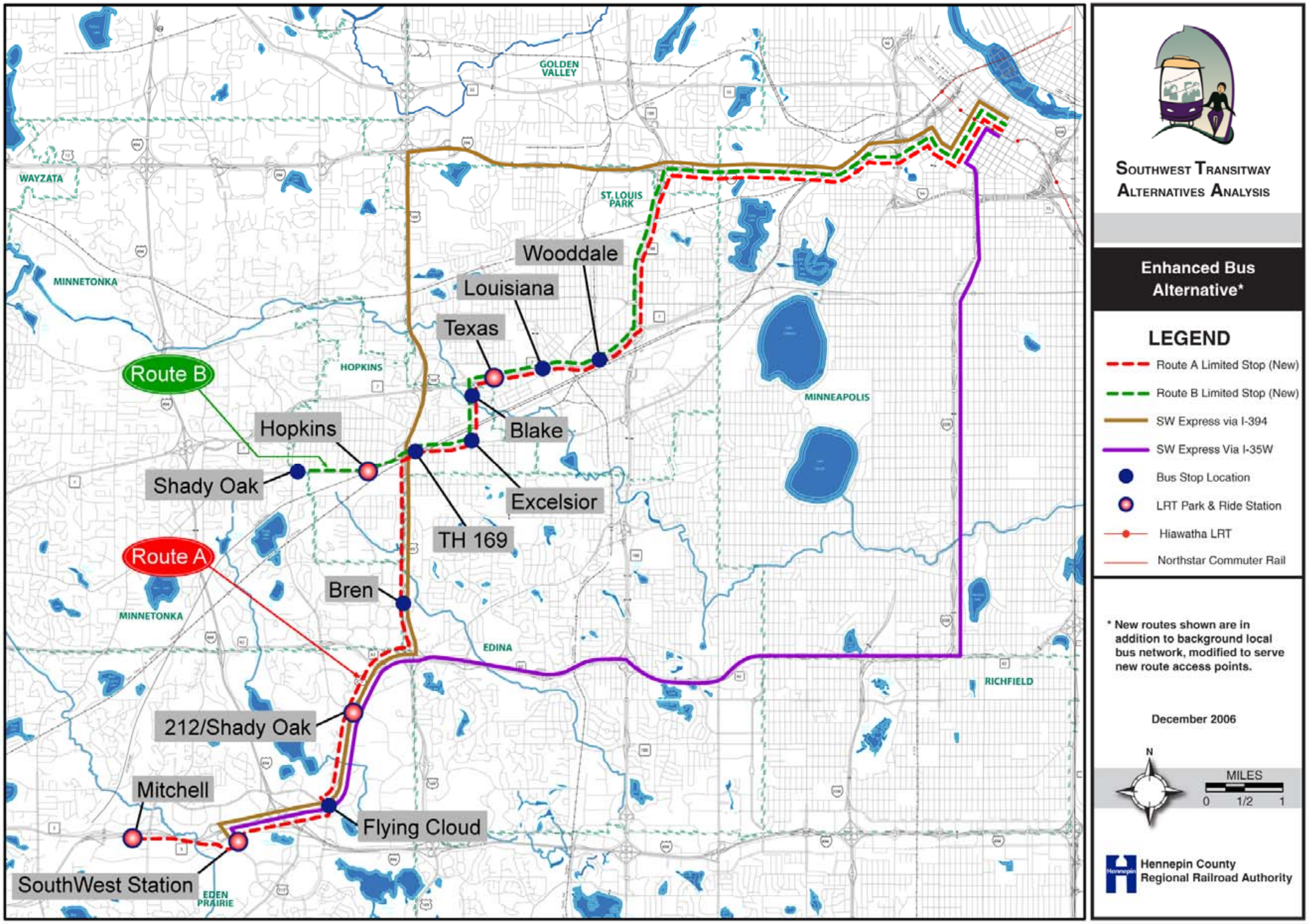
On February 13, 2007, the HCRRA voted unanimously to accept the Southwest PAC's final recommendation.  The formal HCRRA resolution is contained in Appendix A of this report.

## Figure 8.2 Study Recommendation



| ALTERNATIVES | LRT 1A | LRT 3A | LRT 3C |
|---|---|---|---|
| 2030 Ridership | 23,500 | 27,000 | 28,100 |
| 2030 New Riders | 4,500 | 7,000 | 6,800 |
| 2015 Capital Cost | $865 million | $1.2 billion | $1.4 billion |
| 2015 Operating Cost | $12 million | $16 million | $17 million |
| Preliminary Cost-Effectiveness Index (CEI) | $ 30 | $ 26 | $ 30 |

## Figure 8.3 Enhanced Bus Alternative



# 7.0 Evaluation

## 7.1 Overview

This chapter describes the evaluation process and documents the evaluation results of the Southwest Transitway Alternatives Analysis (AA). Detailed information on the Southwest Transitway AA evaluation results are included in *Technical Memorandum No. 4, Evaluation Process and Results*.

The purpose of the evaluation was to identify key benefits, costs and impacts of each alternative in order to identify those alternatives most likely to successfully address the Southwest Transitway goals of improving mobility, providing a cost-effective/efficient travel option, protecting the environment, preserving the quality of life, and supporting economic development. After conducting a thorough evaluation of the alternatives only these alternatives were recommended for further study.

## 7.2 Background and Assumptions

To develop the evaluation measures, the Southwest Technical Advisory Committee (TAC) considered the Southwest Transitway goals and the Federal Transit Administration (FTA) New Starts Project Justification Evaluation Criteria.

### 7.2.1 Southwest Transitway Goals

The goals adopted by the Southwest Policy Advisory Committee (PAC) include the following:

1. Improve Mobility
2. Provide a Cost-Effective and Efficient Travel Option
3. Protect the Environment
4. Preserve the Quality of Life
5. Support Economic Development

### 7.2.2 Federal Transit Administration New Starts Evaluation Criteria

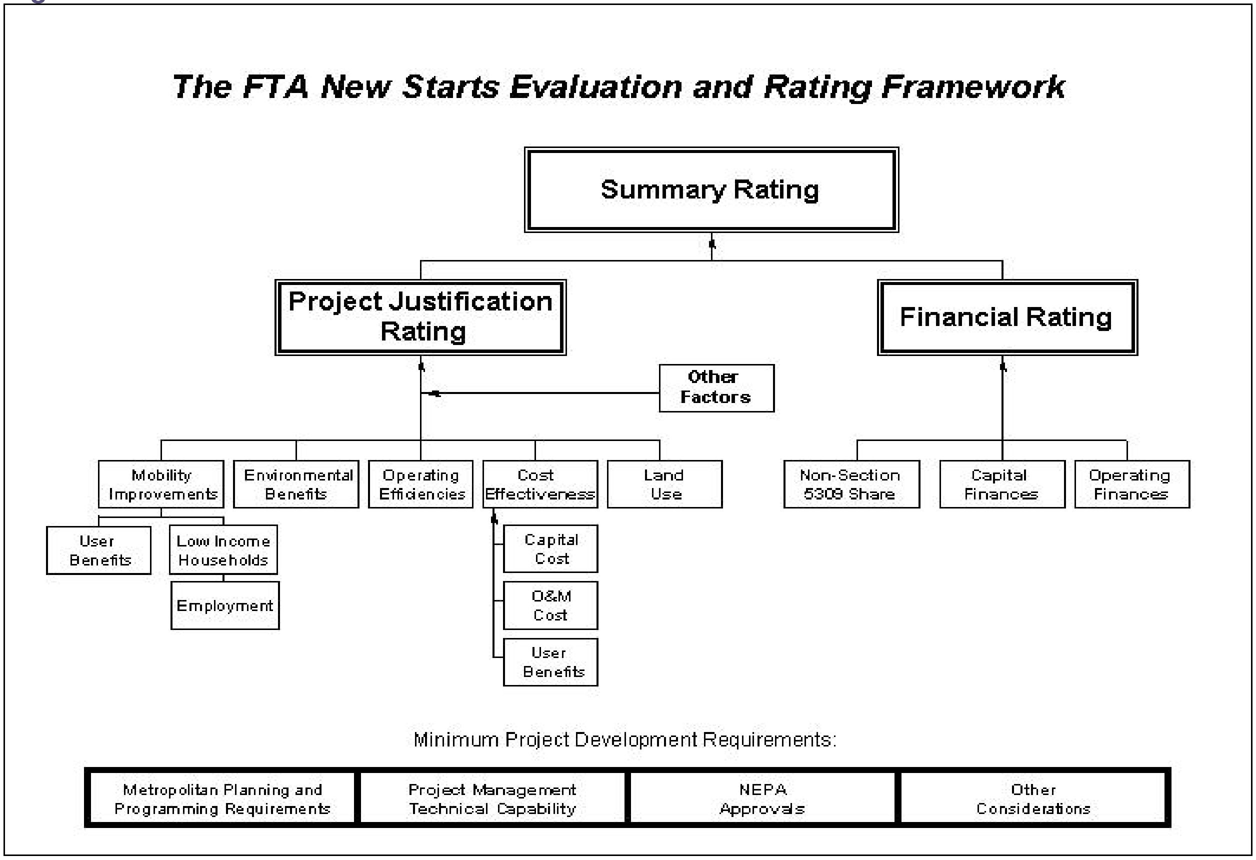
The FTA rates projects requesting Section 5309 New Starts funding in the areas of project justification and local financial commitment. These ratings are then combined into an overall project rating. Figure 7.1 graphically depicts the FTA New Starts Evaluation Process.

The FTA New Starts project evaluation is an on-going process. FTA evaluation and rating occurs annually in support of budget recommendations presented in the *Annual Report on New Starts* and when a project sponsor requests FTA approval to advance their proposed New Starts project into Preliminary Engineering and Final Design. Consequently, as proposed New Starts projects proceed through the project development process, information concerning costs, benefits and impacts are updated as the project becomes more refined and the ratings are updated to reflect this new information.

### 7.2.3 Project Justification Rating

The FTA requires that proposed New Starts projects be justified based upon their performance in the areas of mobility improvement, environmental benefits, operating efficiencies, cost-effectiveness and land use. These five criteria comprise the New Starts Project Justification Criteria, which are outlined in more detail in Table 7.1.

## Figure 7.1 FTA New Starts Evaluation Process




Source: Annual Report on New Starts, Proposed Allocation of Funds for Fiscal Year 2007, Report of the Secretary of Transportation to the United States Congress, Pursuant to 49 U.S.C. 5309(k), Appendix B: FY 2007 Evaluation and Rating Process, page B-6.

## Table 7.1 New Starts Project Justification Criteria and Supporting Measures and Categories

| Criterion | Measures/Categories |
|---|---|
| Cost Effectiveness | • Incremental Cost per Hour of Transportation System User Benefit |
| Transit-Supportive Land Use and Future Patterns | • Existing Land Use<br>• Transit-Supportive Plans and Policies<br>• Performance and Impacts of Policies |
| Mobility Improvements | • Normalized Travel Time Savings (Transportation System User Benefit per Project Passenger Mile)<br>• Low-Income Households Served<br>• Employment Near Stations |
| Operating Efficiencies | • System Operating Cost per Passenger Mile |
| Environmental Benefits | • Change in Regional Pollutant Emissions<br>• Change in Regional Energy Consumption<br>• EPA Air Quality Designation |

Source: *Annual Report on New Starts, Proposed Allocation of Funds for Fiscal Year 2007, Report of the Secretary of Transportation to the United States Congress, Pursuant to 49 U.S.C. 5309(k)(1), Appendix B: FY 2007 Evaluation and Rating Process*, page B-8.

### 7.2.4 Local Financial Commitment Rating

In addition to meeting the project justification criteria, the FTA requires that proposed New Starts projects be supported by an acceptable degree of local financial commitment, including evidence of stable and dependable financing sources to construct, maintain and operate the transit system.

The FY 2007 Local Financial Commitment evaluation measures were:

- The proposed share of total project costs from sources other than the Section 5309 New Starts program, including Federal formula and flexible funds, the local match required by Federal law, and any additional capital funding;
- The strength of the proposed capital financing plan; and
- The ability of the sponsoring agency to fund operation and maintenance of the entire system as planned once the guideway project is built.

## 7.3 Southwest Transitway Evaluation Process

After reviewing the FTA New Starts Criteria and considering the Southwest Transitway goals, the Southwest TAC developed and the Southwest PAC approved a set of evaluation measures. These evaluation measures attempt to incorporate the FTA New Starts Project Justification Criteria while at the same time addressing the adopted Southwest Transitway goals. For the most part the FTA New Starts Project Justification Criteria are included in the Southwest Transitway evaluation measures. However, the New Starts Local Financial Commitment Criteria were not included in the Southwest Transitway AA evaluation measures because the Southwest TAC and PAC considered it premature to focus on financing until it was known if a viable project existed.

Future project entry into the later Preliminary Engineering phase will require FTA approval based on the FTA's assessment of the material produced in the AA and the agency's project ratings. The complete Federal evaluation process for the Southwest Transitway will occur during a future phase of project development; however, as discussed above, many of the local evaluation measures mirror the current FTA evaluation measures, and thus give some early indication as to how the Southwest Transitway may be rated by FTA once a locally preferred alternative is submitted to FTA.

For purposes of evaluating the alternatives, the Southwest Transitway PAC prioritized the goals into two tiers. Tier One goals are those that must be achieved in order for a viable project to exist. Tier Two goals are those that should be achieved assuming a viable project exists. Tier One goals are (1) Improve Mobility and (2) Provide a Cost-Effective, Efficient Travel Option. Tier Two goals are (3) Protect the Environment, (4) Preserve the Quality of Life in the Study Area and the Region, and (5) Support Economic Development.

Both quantitative and qualitative data for the alternatives was developed for all transitway alternatives. The raw data was translated into ratings indicating how well each alternative addressed the Southwest Transitway goals and evaluation measures. The following ratings were used:

- Alternative strongly supports goal
- Alternative supports goal
- Alternative does not support goal

Tables 7.2 through 7.6 identify the ratings for each alternative with respect to the five goals. Tables containing the raw data for each of the evaluation measures can be found in *Technical Memorandum No. 4, Evaluation Process and Results*.

## 7.4 Southwest Transitway Evaluation Measures

The evaluation measures for each goal are listed below.

### Goal 1: Improve Mobility

- Project Ridership (2030)
- New Transit Riders (2030)
- Travel Time Savings (2030)
- Transportation Capacity
- Travel Time Competitiveness
- System Integration
- Transit Dependent Populations Served
- Jobs and Population Served

### Goal 2: Provide a Cost-Effective and Efficient Travel Option

- Capital Cost (2015)
- Operating Cost (2015)
- Preliminary Cost-Effectiveness Index (CEI)
- Peer City Comparisons
- Potential Impact to Street Network

### Goal 3: Protect the Environment

- Vehicle Miles of Travel
- Emissions
- Potentially affected natural environment
- Potentially affected residences
- Inventory of compact land use at stations

### Goal 4: Preserve the Quality of Life

- Anticipated impact of vehicle technology on property values
- Access to community amenities (libraries, parks, trails)
- Access to employment opportunities for low-income households (2030)
- Intermodal connections
- Integration and documentation of transit-oriented development (TOD) opportunities/plans in local comprehensive plans
- Transit ridership forecast (2030)
- Potential for intensification of land use around stations
- Consistency with regional growth plans
- Impact of park-and-ride lots on existing and planned development at stations
- Access to and accommodation of the existing and future trail system

### Goal 5: Support Economic Development

- TOD potential at station locations
- Jobs within 1/2 mile of stations (2030)
- Other activity generators (schools, medical facilities, entertainment venues, etc.) within ½ mile of stations.
- Consistency with local comprehensive plan goals regarding economic development and redevelopment at stations, including park-and-ride sites

## 7.5 Evaluation Results

### 7.5.1 Goal 1: Improve Mobility

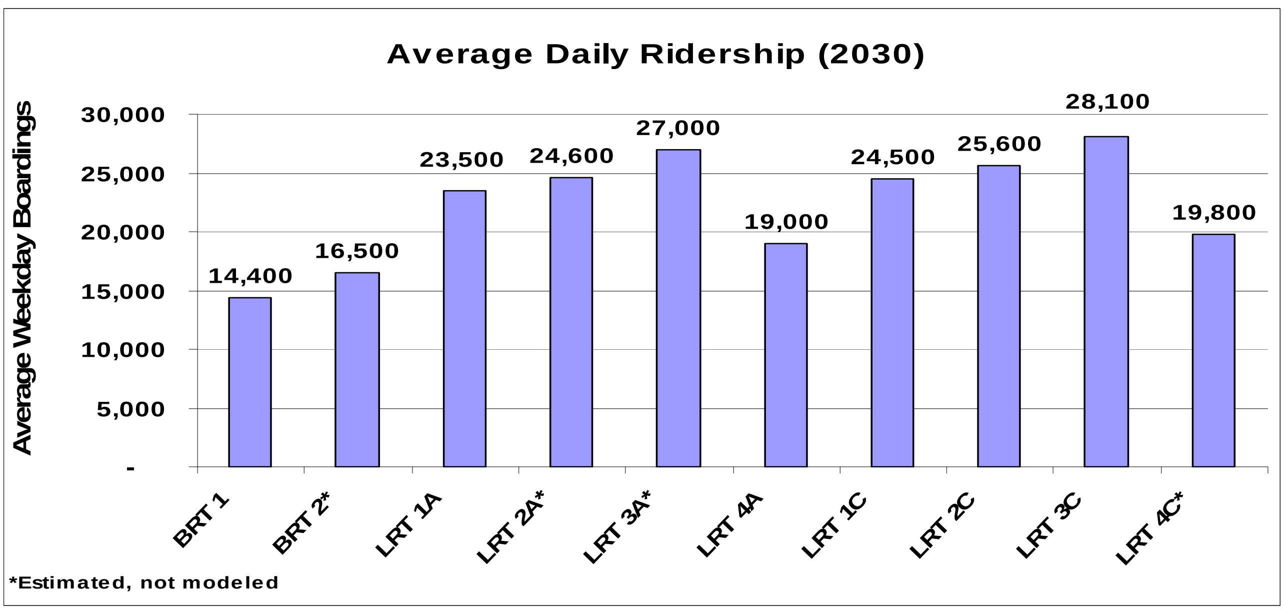
Each of the evaluation measures for Goal 1 was applied to the build alternatives described in Chapter 5, Definition of Alternatives. Resulting ratings are described below and summarized in Table 7.2.

Transit Ridership Forecast (2030) – Defined as the estimated number of transit riders in the forecast year of 2030 using the Metropolitan Council's travel demand model.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than 20,000 passengers per day |
| | Supports goal = | 15,000 to 20,000 passengers per day |
| | Does not support goal = | Less than 15,000 passengers per day |

Results:

**Figure 7.2 Average Daily Ridership (2030)**




LRT 1A, LRT 2A, LRT 3A, LRT 1C, LRT 2C and LRT 3C attract an average weekday ridership of over 20,000 passengers a day, and are therefore considered to strongly support the goal of improving mobility.

BRT 2, LRT 4A and LRT 4C attract an average weekday ridership of between 15,000 and 20,000 passengers a day, and are therefore considered to support the goal of improving mobility.

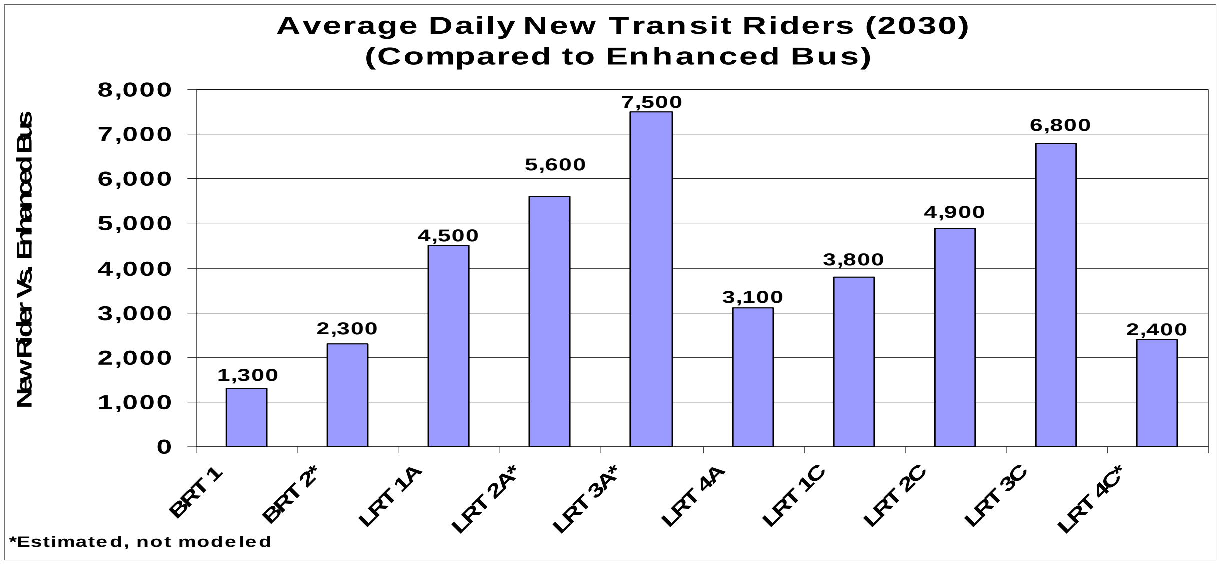
BRT 1 attracts an average weekday ridership of less than 15,000 and is therefore considered to not support the goal of improving mobility.

New Transit Riders (2030) - Defined as the estimated number of new transit riders compared to the Enhanced Bus alternative in the forecast year of 2030 using the Metropolitan Council's travel demand model.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than 4,000 new passengers per day |
| | Supports goal = | 2,000 to 4,000 new passengers per day |
| | Does not support goal = | Less than 2,000 new passengers per day |

Results:

**Figure 7.3 Average Daily New Transit Riders (2030) Compared to Enhanced Bus**




LRT 1A, LRT 2A, LRT 3A, LRT 2C and LRT 3C attract an average of over 4,000 new transit riders a day, and are therefore considered to strongly support the goal of improving mobility.

BRT 2, LRT 4A, LRT 1C and LRT 4C attract an average of between 2,000 and 4,000 new transit riders a day, and are therefore considered to support the goal of improving mobility.

BRT 1 attracts less than 2,000 new transit riders a day, and is therefore considered to not support the goal of improving mobility.

Travel Time Savings (2030) - Defined as the change in annual vehicle hours traveled (VHT) relative to the Enhanced Bus alternative in the forecast year of 2030 using the Metropolitan Council's travel demand model. This applies to automobile trips only.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than a 1% savings in VHT |
| | Supports goal = | 0 to 1% savings in VHT |
| | Does not support goal = | Increased VHT |

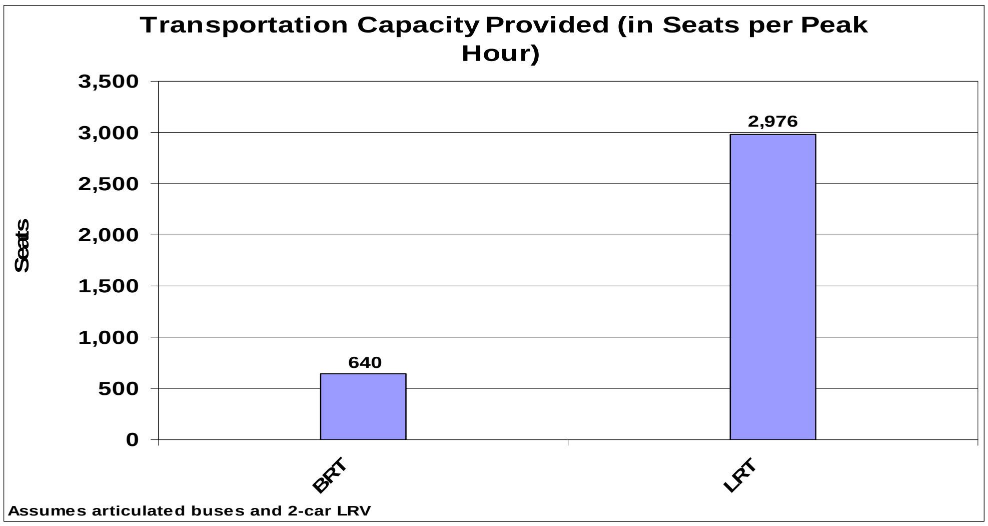
Results:
All 10 alternatives are projected to result in a reduction of vehicle hours of travel (VHT) of less than 1% and are therefore considered to support the goal of improving mobility.

Transportation Capacity Provided - Defined as the number of transit spaces provided by the alternative based upon vehicle capacity and frequency of service.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than 2,000 seats during a peak hour. |
| | Supports goal = | 1,000 to 2,000 seats during a peak hour. |
| | Does not support goal = | Less than 1,000 seats during a peak hour. |

Results:

**Figure 7.4 Transportation Capacity Provided (in Seats per Peak Hour)**




The BRT alternatives were estimated to provide 640 transit spaces during a peak hour; the LRT alternatives were estimated to provide 2,976 transit spaces during a peak hour. This was calculated by multiplying the vehicle capacity of the alternative by the number of trips during a peak hour. Using a 7.5 minute peak frequency, both the BRT and LRT alternatives would provide 8 trips per peak hour per direction. Because the BRT vehicles cannot be coupled into multiple-car trains, their passenger capacity is limited to 80 transit spaces per vehicle, assuming an articulated vehicle. This equates to 640 transit spaces per peak hour per direction. Because the LRT vehicles (LRVs) can be coupled into 2-and 3-car trains, with each LRV carrying 186 passengers, the passenger capacity per 2-car train set is 372. This equates to 2,976 transit spaces per peak hour per direction.

All LRT alternatives with 2-car trains can provide a peak hour, peak direction passenger capacity of 2,976 and are therefore considered to strongly support the goal of improving mobility.

BRT 1 and BRT 2 can provide a peak hour, peak direction passenger capacity of 640, and are therefore considered to not support the goal of improving mobility.

Travel Time Competitiveness - Defined as the estimated afternoon rush hour travel time via the proposed transitway versus the single occupant vehicle for a number of origin/destination pairs.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | 2 minutes faster than auto in 3 + cases. |
| | Supports goal = | +/- 2 minutes of auto in 3 + cases. |
| | Does not support goal = | 2 minutes slower than auto in 3 + cases. |

Results:
LRT 2C is the only alternative that provides travel times at least two minutes faster than an auto for three or more of the origin/destination pairs and is therefore considered to strongly support the goal of improving mobility.

LRT 1A, 2A, 3A, 4A, 1C, 3C and 4C provide travel times equivalent to automobile travel times in at least 3 of the origin/destination pairs and are therefore considered to support the goal of improving mobility.

The BRT alternatives provide travel times that are 2 minutes slower than an auto in three or more of the origin/destination pairs and are therefore considered to not support the goal of improving mobility.

System Integration - Defined as an alternative's ability to connect to existing and proposed transitways as identified in the Metropolitan Council's *Transportation Policy Plan* (TPP).

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Can be easily interlined with existing and planned transitways. |
| | Supports goal = | Transfer required at either north or south end. |
| | Does not support goal = | Transfer required at both north and south end. |

Results:
LRT 1A, 2A and 3A can be interlined with the Hiawatha and proposed Central LRT lines and are therefore considered to strongly support the goal of improving mobility.

LRT 1C, LRT 2C and LRT 3C require a transfer at the north end in downtown Minneapolis and LRT 4A requires a transfer at the south end and therefore are considered to support the goal of improved mobility.

The BRT and LRT 4C alternatives require transfers at both the north and south ends and therefore considered to not support the goal of improving mobility.

Transit Dependent Populations Served - Defined as the number of elderly (65 and older), youth (18 and younger), disabled, and zero-car households within ½ mile of stations based upon socioeconomic data contained in the 2000 Census. At the request of the Southwest Policy Advisory Committee (PAC), low income was also used as an indicator of transit dependency. Low-income households were defined as households with annual incomes less then 60% of the Median Family Income (MFI) in the 7-county metropolitan area. The MFI in 2000 was $59,358; 60% of that is $35,614.

Ratings: Strongly supports goal = Significant improvement over the Enhanced Bus alternative

Supports goal = Similar to or moderate improvement over the Enhanced Bus alternative

Does not support goal = Significantly below the Enhanced Bus alternative

Results:

**Figure 7.5 Number of Transit Dependent Persons Living Within ½-Mile of Stations**

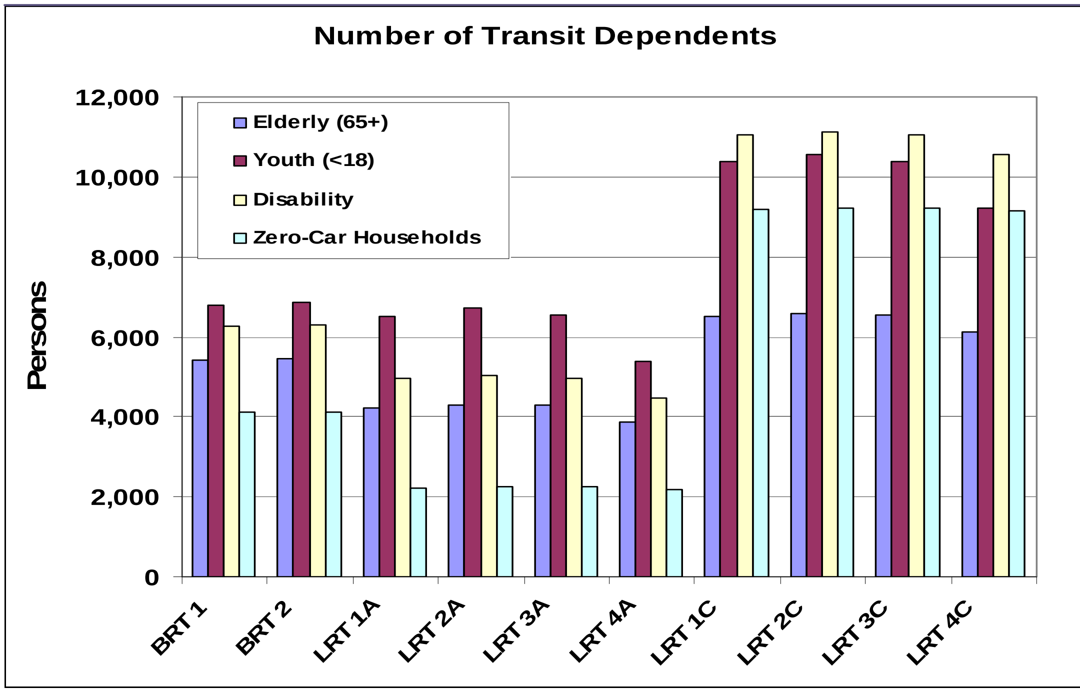
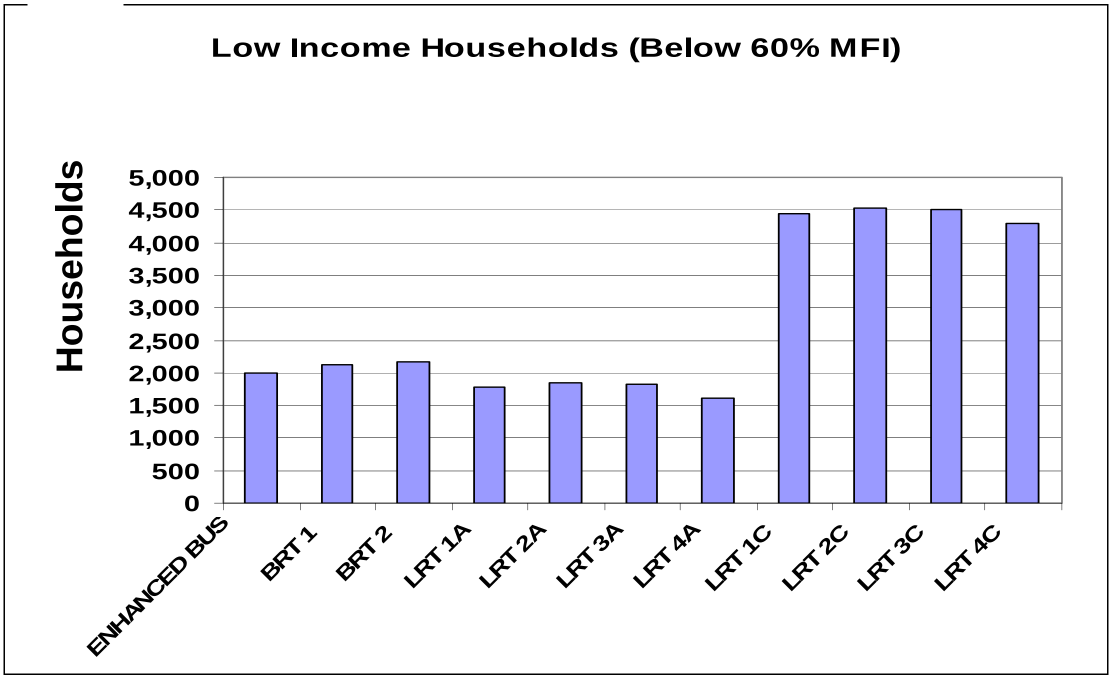


**Figure 7.6 Low Income Households Living Within ½-Mile of Stations**




Among the alternatives, LRT 1C, LRT 2C, LRT 3C and LRT 4C have the highest numbers of elderly (65 and older), youth (18 and younger), disabled, and zero-car households within ½ mile of stations in the forecast year of 2030 (Figure 7.5). LRT 1C, LRT 2C, LRT 3C and LRT 4C also have significantly higher populations of low income households within ½ mile of stations than does the Enhanced Bus alternative (Figure 7.6), and are therefore considered to strongly support the goal of serving transit dependent populations.

Compared to the LRT C alternatives, LRT 1A, LRT 2A, LRT 3A, LRT 4A, BRT 1 and BRT 2 have lower numbers of elderly (65 and older), youth (18 and younger), disabled, and zero-car households within ½ mile of stations in the forecast year of 2030. LRT 1A, LRT 2A, LRT 3A, LRT 4A, BRT 1 and BRT 2 also have similar or moderately higher populations of low income households within ½ mile of stations than the Enhanced Bus alternative, and are therefore considered to support the goal of transit dependent populations served.

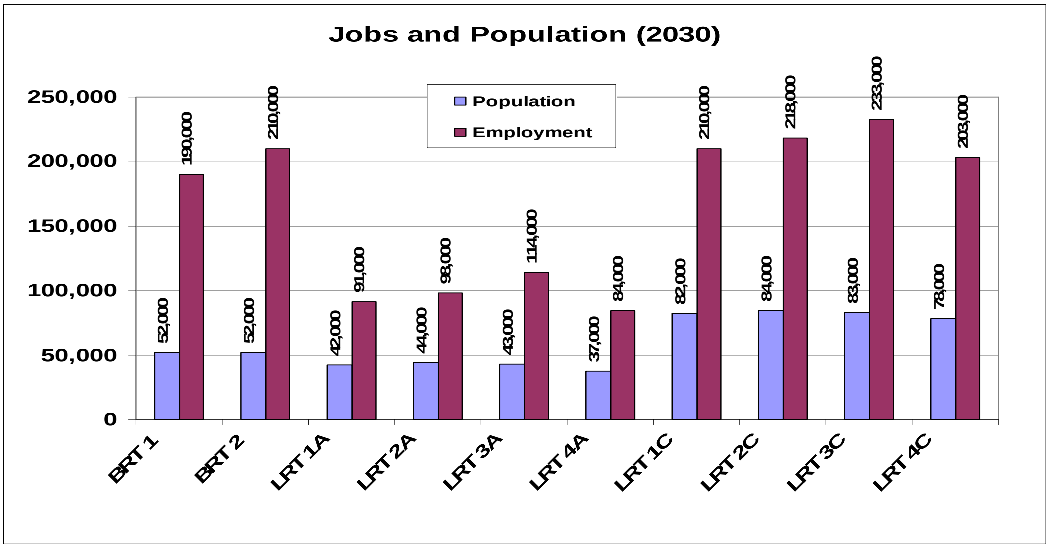
It is important to note that LRT A alternatives terminate at the proposed Intermodal Station, and therefore do not extend into downtown Minneapolis as Southwest alternatives, but rather through the Hiawatha LRT line. Populations within ½ mile of the Hiawatha LRT stations (Warehouse, Nicollet, Government Center, and Metrodome) that would be accessed by the LRT 1A, LRT 2A, LRT 3A and LRT 4A alternatives are not included in these calculations because these stations are not technically considered part of those Southwest LRT alternatives.

Jobs and Population within 1/2 mile of station (Year 2030) - Defined as jobs and population within ½ mile of stations in the forecast year of 2030 based upon socioeconomic forecasts contained in the Metropolitan Council's travel demand model. As explained previously, jobs and population within ½ mile of the Hiawatha LRT stations (Warehouse, Nicollet, Government Center and Metrodome) that would be utilized by the LRT 1A, LRT 2A, LRT 3A and LRT 4A alternatives are not included in these calculations.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than 70,000 people<br>More than 175,000 jobs |
| | Supports goal = | 35,000 to 70,000 people<br>75,000 to 175,000 jobs |
| | Does not support goal = | Less than 35,000 people<br>Less than 75,000 jobs |

Results:

**Figure 7.7 Jobs and Population Within ½-Mile of Stations (2030)**




LRT 1C, 2C, 3C and 4C serve more than 70,000 people and 175,000 jobs and are therefore considered to strongly support the goal of improving mobility.

LRT 1A, 2A, 3A and 4A serve between 35,000 to 70,000 people and between 75,000 to 175,000 jobs, and are therefore considered to support the goal of improving mobility. BRT 1 and BRT 2 serve between 35,000 to 70,000 people and over 175,000 jobs, and are therefore considered to support the goal of improving mobility.

## Table 7.2 Goal 1 Evaluation Ratings – Improve Mobility

| Alternatives | Forecast Ridership (2030) | New Transit Riders (2030) | Travel Time Savings (2030) | Transitway Transportation Capacity Provided in Peak Hour | Travel Time Competitiveness (Transit vs. Auto) | System Integration | Transit Dependent Populations | Population and Employment[2] (2030) | |
|---|---|---|---|---|---|---|---|---|---|
| **BRT 1** Eden Prairie to Minneapolis, HCRRA | ● | ● | ◑ | ● | ● | ● | ◑ | ◑ | ○ |
| **BRT 2**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/HCRRA | ◑ | ○ | ◑ | ● | ● | ● | ◑ | ◑ | ○ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/Kenilworth/ Royalston | ○ | ○ | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/HCRRA/ Kenilworth/Royalston | ○ | ○ | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/Royalston | ◑ | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ○ | ◑ | ◑ | ○ | ◑ | ◑ | ○ | ○ | ○ |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/HCRRA / Midtown/Nicollet | ○ | ○ | ◑ | ○ | ○ | ◑ | ○ | ○ | ○ |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/ Opus/HCRRA/ Midtown/Nicollet | ○ | ○ | ◑ | ○ | ◑ | ◑ | ○ | ○ | ○ |
| **LRT 4C**[1] **-** Hopkins to Minneapolis, HCRRA/Midtown/ Nicollet | ◑ | ◑ | ◑ | ○ | ◑ | ● | ○ | ○ | ○ |
| [1] Estimated not modeled | | | | | | | | | |
| [2]Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers. | | | | | | | | | |
| **Evaluation Breakpoints** | | | | | | | | | |
| ● Does not support goal | < 15 thousand | <2 thousand | Increased VHT | <1000 seats | >2 min slower than auto in 3 or more O/D pairs | Transfer required at north and south end | Below baseline alternative | <35 thousand | <75 thousand |
| ◑ Supports goal | 15-20 thousand | 2-4 thousand | 0-1% savings | 1000-2000 seats | Equivalent to auto (w/in 2 min) in 3 or more O/D pairs | Transfer required at either north or south end | Moderate improvement over baseline alternative | 35-70 thousand | 75-175 thousand |
| ○ Strongly supports goal | > 20 thousand | >4 thousand | >1% savings | >2000 seats | >2min faster than auto in 3 or more O/D pairs | Interlined with existing/planned transitway | Significant improvement over baseline alternative | >70 thousand | >175 thousand |

[1]Estimated not modeled

### 7.5.2 Goal 2: Provide a Cost-Effective and Efficient Travel Option

The performance of the alternatives under the evaluation measures for Goal 2 is described below and summarized in Table 7.3.

Capital Costs (2015) - Defined as the one-time costs to construct the transitway (guideway, stations, structures, right-of-way, engineering/design, administrations and contingencies), escalated from 2006 to 2015 using a 2.7% inflation rate.

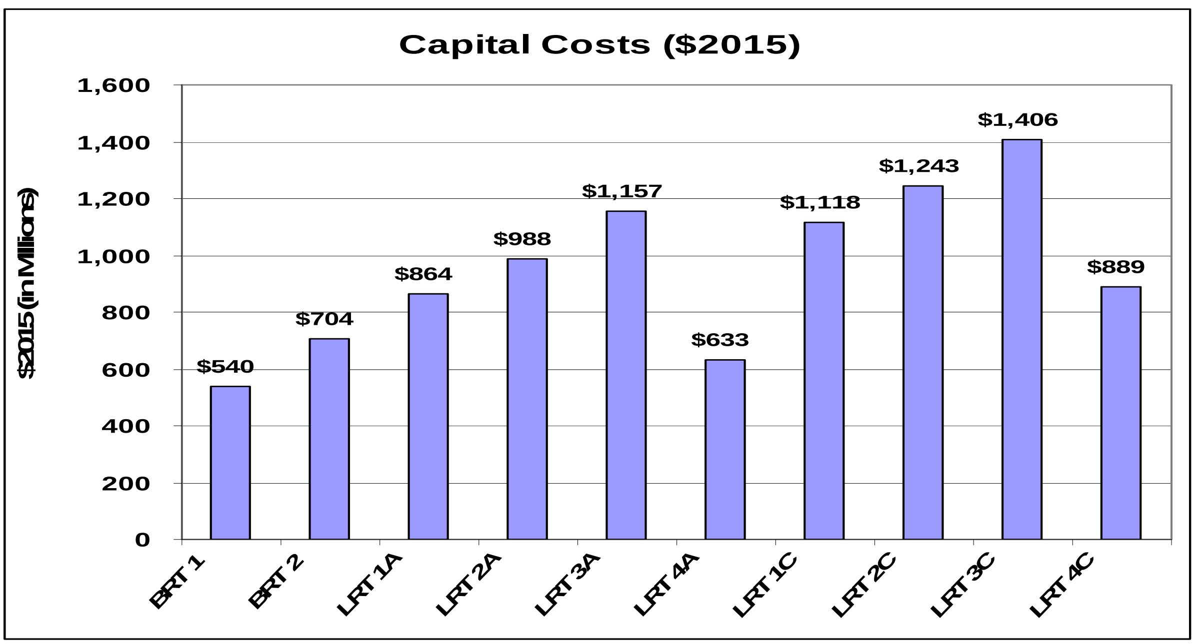
| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Less than $750 million total<br>Less than $40 million per mile |
| | Supports goal = | $750 million to $1.5 billion total<br>$40 to $90 million per mile |
| | Does not support goal = | More than $1.5 billion total<br>More than $90 million per mile |

Results:

BRT 1, BRT 2 and LRT 4A have estimated capital costs less than $750 million and are therefore considered to strongly support the goal of providing a cost-effective/efficient travel option.

LRT 1A, LRT 2A, LRT 3A, LRT 1C, LRT 2C, LRT 3C and LRT 4C have estimated capital costs between $750 million and $1.5 billion and are therefore considered to support the goal of providing a cost-effective/efficient travel option.

### Figure 7.8 Capital Costs (2015)

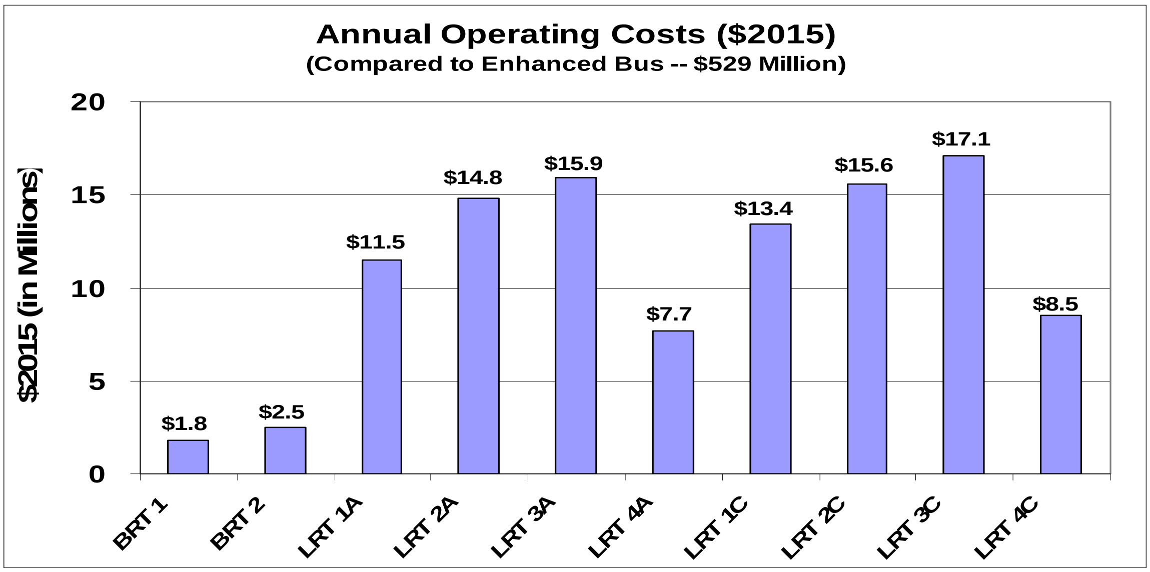


Operating Costs (2015) - Defined as the ongoing annual costs to operate and maintain the transitway alternative compared to the Enhanced Bus alternative, escalated from 2005 to 2015 using a 2.7 % inflation rate.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Less than $12 million annually |
| | Supports goal = | $12 million to $23 million annually |
| | Does not support goal = | More than $23 million annually |

Results:

**Figure 7.9 Annual Operating Costs ($2015) Above Enhanced Bus**




BRT1, BRT 2, LRT 1A and LRT 4A have projected operating costs of less than $12 million annually and are therefore considered to strongly support the goal of providing a cost-effective/efficient travel option.

LRT 2A, LRT 3A, LRT 1C, LRT 2C, LRT 3C and LRT 4C have projected operating costs between $12 million and $23 million annually and are therefore considered to support the goal of providing a cost-effective/efficient travel option.

FTA Cost-Effectiveness Index (CEI) - Defined as an alternative's annualized project cost (above the Enhanced Bus alternative) divided by its transportation system user benefits (above the Enhanced Bus alternative). User benefits are the traveler's time savings. Preliminary CEIs were calculated using the capital and operating costs and ridership estimated and/or projected at the AA-level of analysis.

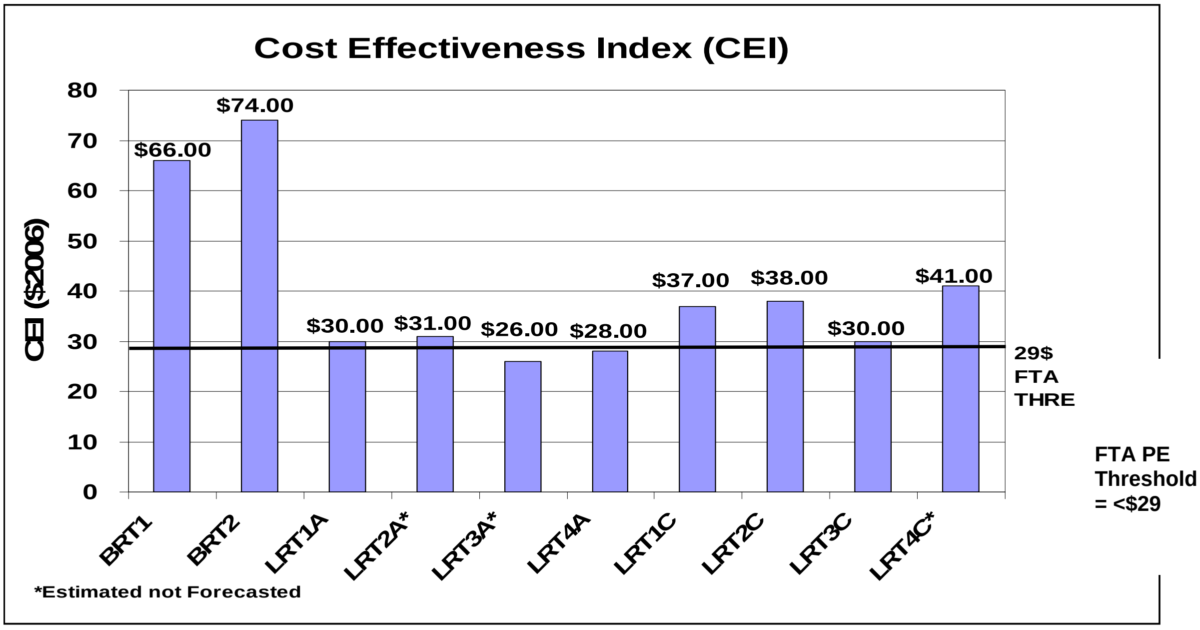
The FTA CEI threshold for approving a transitway to enter into Preliminary Engineering is $28.99 or less.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Less than $29 (under FTA threshold for PE) |
| | Supports goal = | $30 to $35 (exceed FTA threshold by no more |

| | |
|---|---|
| | than 20%) |
| Does not support goal = | More than $35 (exceeds FTA threshold by more than 20%) |

Results:

**Figure 7.10 Cost Effectiveness Index (CEI)**




LRT 3A and LRT 4A have preliminary CEIs that fall under the FTA threshold of $29 and are therefore considered to strongly support the goal of providing a cost-effective and efficient travel option.

LRT 1A, LRT 2A and LRT 3C have preliminary CEIs that exceed the FTA threshold by no more than 20% and are therefore considered to support the goal of providing a cost-effective and efficient travel option.

BRT1, BRT 2,LRT 1C, LRT 2C and LRT 4C have preliminary CEIs that exceed the FTA threshold by more than 20% and are therefore considered to not support the goal of providing a cost-effective and efficient travel option.

Peer City Comparisons – This evaluation compared the Southwest AA alternatives to existing peer city systems for operating costs/passenger mile, operating costs/trip, operating costs/revenue hour, and passengers/revenue hour. These are standard measures in the transit industry for effectiveness and efficiency. The data source is the 2004 National Transit Database (NTD).

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Better than range of peer systems |
| | Supports goal = | Within range of peer systems |
| | Does not support goal = | Worse than range of peer systems |

Results:
All LRT and BRT alternatives perform better than their peers in terms of passengers/revenue hour, and fall within the range of their peer cities for the three other comparisons (operating costs / trip, and operating costs / revenue hour). All LRT and BRT alternatives are therefore considered to support the goal of cost effectiveness and efficiency.

Potential Impact to Street Network - Defined as the identification of intersections likely to require a traffic analysis during future detailed environmental study phase.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Avoids impact to street network |
| | Supports goal = | Some potential impact to street network |
| | Does not support goal = | Potentially significant impact to street network |

Results:
BRT 1, BRT 2, LRT 1A, LRT 2A, LRT 3A and LRT 4A are considered to have some potential impact to the street network and are therefore considered to support the goal of providing a cost-effective/efficient travel option.

LRT 1C, LRT 2C, LRT 3C and LRT 4C are considered to have potentially significant impacts to the street network, particularly in downtown Minneapolis, and are therefore considered to not support the goal of providing a cost-effective/efficient travel option.

**Table 7.3 Goal 2 Evaluation Ratings – Provide a Cost-Effective and Efficient Travel Option**

| Alternatives | Transitway Capital Cost (2015) | | Transitway Operating Costs (Annual Increment over Enhanced Bus) (2015) | Preliminary Cost Effectiveness Index (CEI) (2006$)[1] | Peer City Comparison (2004) | | | | Intersections identified for analysis during EIS |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Per Mile | | | Operating cost / passenger mile[2] | Operating cost / trip | Operating cost / revenue vehicle hour | Passengers / hour | |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | ○ | ○ | ○ | ● | ◑ | ◑ | ◑ | ○ | ◑ |
| **BRT 2**[1]**-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/ HCRRA | ○ | ○ | ○ | ● | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/ HCRRA / Kenilworth/ Royalston | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ◑ | ○ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ○ | ◑ | ○ | ○ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ○ | ● |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/ HCRRA / Midtown/ Nicollet | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ○ | ● |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ● |
| **LRT 4C**[1] **-** Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ◑ | ● | ◑ | ◑ | ◑ | ○ | ● |

[1] Estimated not modeled

[2]FTA New Starts Evaluation Measure

| **Evaluation Breakpoints** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ● Does not support goal | >$1.5 billion | >$90 million | >$23 million (2015) | >$35.00 Exceeds FTA New Starts Threshold by >20% | Cost above range of peer systems | Cost above range of peer systems | Cost above range of peer systems | Below range of peer systems | Potentially significant impact to street network |
| □ Supports goal | $750-1.5 billion | $40-90 million | $12 million - $23 million (2015) | $20-35 Within 20% of FTA New Starts Threshold | Cost within range of peer systems | Cost within range of peer systems | Cost within range of peer systems | Within range of peer systems | Some impact to street network likely |
| ○ Strongly supports goal | <$750 million | <$40 million | <$12 million (2015) | <$29.00 Consistent w/FTA New Starts Threshold | Cost below range of peer systems | Cost below range of peer systems | Cost below range of peer systems | Above range of peer systems | Avoids impact to street network |

[1]Estimated not modeled

### 7.5.3 Goal 3: Protect the Environment

The performance of alternatives under the evaluation measures for Goal 3 is described below and summarized in Table 7.4.

Change in vehicle miles of travel (VMT) (2030) - Defined as the change in VMT in the forecast year of 2030 using the Metropolitan Council's travel demand model.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than a 5% reduction |
| | Supports goal = | 0 to 5% reduction |
| | Does not support goal = | No reduction |

Results:
All 10 alternatives are expected to result in a reduction in VMT of less than 5% and are therefore all considered to support the goal of protecting the environment.

Reduction in emissions of hydrocarbons (HC), volatile organic compounds (VOC), nitrous oxides ($NO_x$) and carbon monoxide (CO) in annual metric tons (Year 2030) - Defined as the change/reduction in emissions in the forecast year of 2030, based on change in VMT using the Metropolitan Council's travel demand model.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than a 5% reduction |
| | Supports goal = | 0 to 5% reduction |
| | Does not support goal = | No reduction |

Results:
BRT 1, BRT 2, LRT 1A, LRT 2A, LRT 3A, LRT 1C, LRT 2C and LRT 3C are expected to result in a reduction in HC, VOC, $NO_X$ and CO of less than 5% and are therefore considered to support the goal of protecting the environment.

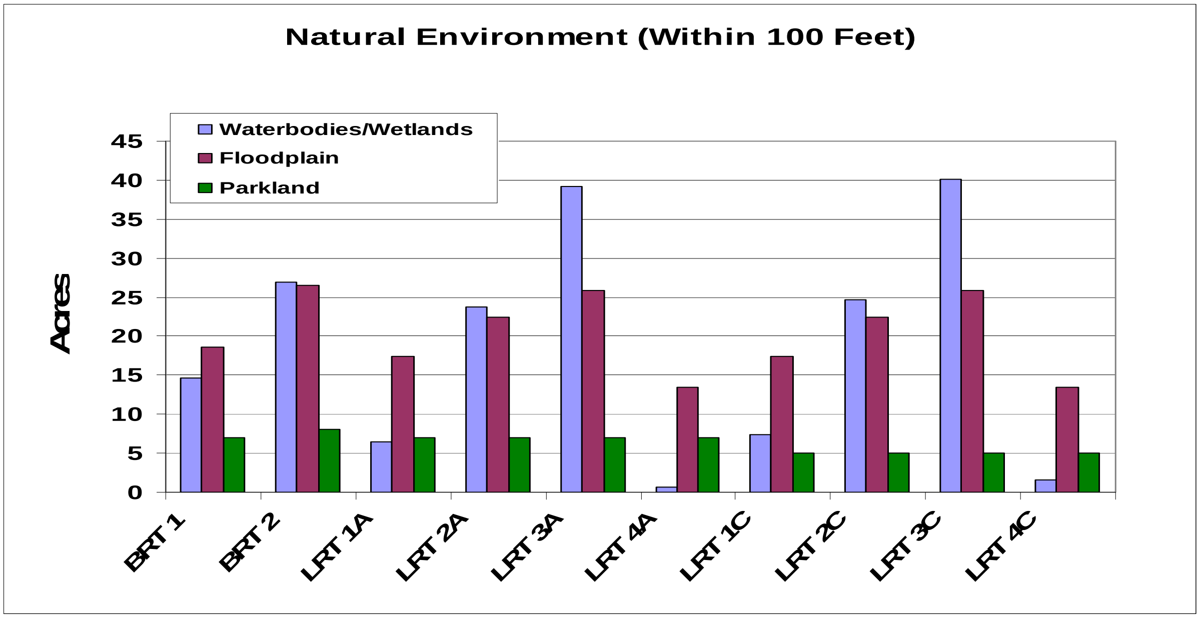
LRT 4A and LRT 4C are not expected to result in a reduction in HC, VOC, $NO_X$ and CO, and are therefore considered to not support the goal of protecting the environment.

Potentially affected natural environment (wetlands, waterbodies, parklands and floodplains) within 100 feet - Defined as the number of wetlands, waterbodies, parklands and floodplains within 100 feet of the center line of the proposed transitway. The MetroGIS database was used to compile this information.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Less than 25 acres combined |
| | Supports goal = | 20 to 50 acres combined |
| | Does not support goal = | More than 50 acres combined |

Results:

**Figure 7.11  Natural Environment (Within 100 Feet)**




Due to their shorter routes, LRT 4A and LRT 4C affect less than 25 acres of the natural environment and are therefore considered to strongly support the goal of protecting the environment.

BRT 1, LRT 1A and LRT 1C are expected to affect between 25 and 50 acres of the natural environment and are therefore considered to support the goal of protecting the environment.

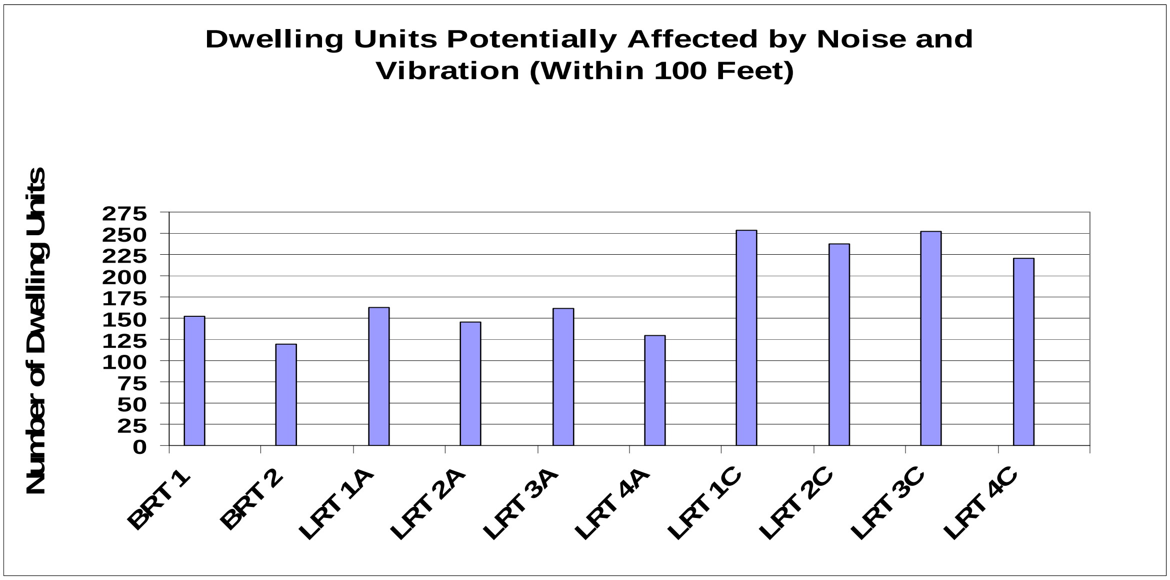
BRT 2, LRT 2A, LRT 3A, LRT 2C and LRT 3C are expected to affect more than 50 acres of the natural environment and are therefore considered to not support the goal of protecting the environment.

Residents potentially affected by noise or vibration - Defined as the number of dwelling units within 100 feet of the center of the proposed transitway which could potentially be affected by noise and vibration.  It should be noted that detailed noise and vibration studies need to be conducted to identify dwelling units actually affected by noise and vibration.  These detailed noise and vibration studies will be conducted at a later phase in the project development process.
For this analysis the MetroGIS database and county property information were used to compile the information.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Less then 50 units |
| | Supports goal = | 50 to 200 units |
| | Does not support goal = | More than 200 units |

Results:

**Figure 7.12 Dwelling Units Potentially Affected by Noise and Vibration (Within 100 Feet)**




BRT 1, BRT 2, LRT 1A, LRT 2A, LRT 3A and LRT 4A may affect between 50 and 200 dwelling units and are therefore considered to support the goal of protecting the environment.

LRT 1C, LRT 2C, LRT 3C and LRT 4C may affect more than 200 dwelling units and are therefore considered to not support the goal of protecting the environment.

Inventory of efficient, compact land use at station locations - Consistent with FTA New Starts criteria, this evaluation criterion utilizes population density per square mile and total corridor employment within ½ mile of stations as quantitative guidelines to assign land use ratings. Denser development at station areas promotes transit use and helps protect the environment by reducing auto trips and emissions, as well as the amount of land used by development (sprawl).

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than 10,000 persons per square mile<br>More than 175,000 jobs within ½ mile of stations |
| | Supports goal = | 3,333 to 10,000 persons per square mile<br>75,000 to 175,000 jobs within ½ mile of stations |
| | Does not support goal = | Less then 3,333 persons per square mile<br>Less than 75,000 jobs within ½ miles of stations |

Population
BRT 1, BRT 2, LRT 1A, LRT 2A, LRT 4A, LRT 1C, LRT 2C, LRT 3C and LRT 4C are projected to have a population density of between 3,333 to 10,000 persons per square mile in 2030 and are therefore considered to support the goal of protecting the environment.

LRT 3A is projected to have a population density of less than 3,333 persons per square mile in 2030 and is therefore considered to not support the goal of protecting the environment.

Results:

**Figure 7.13 Population Density Within ½ Mile of Station (2030)**

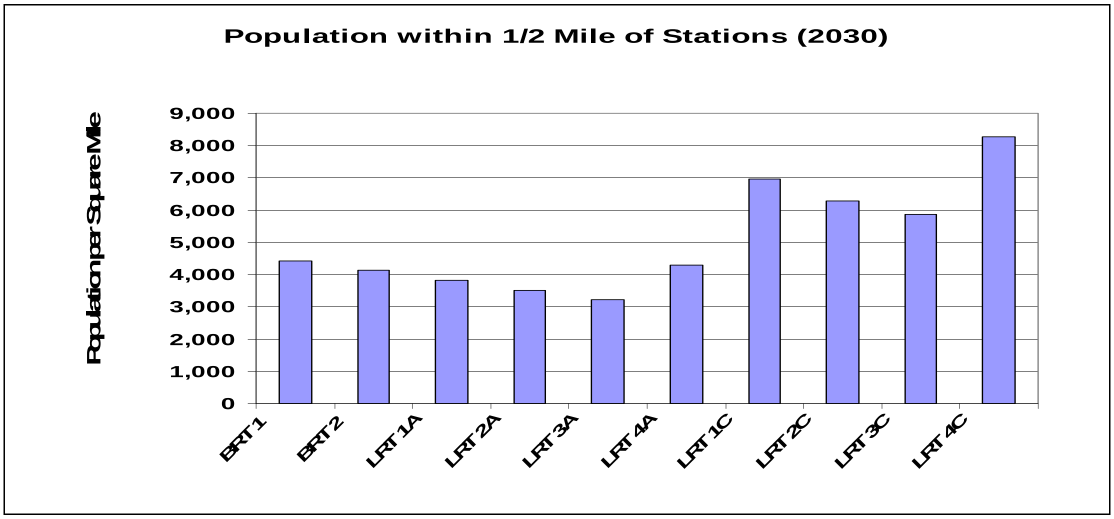
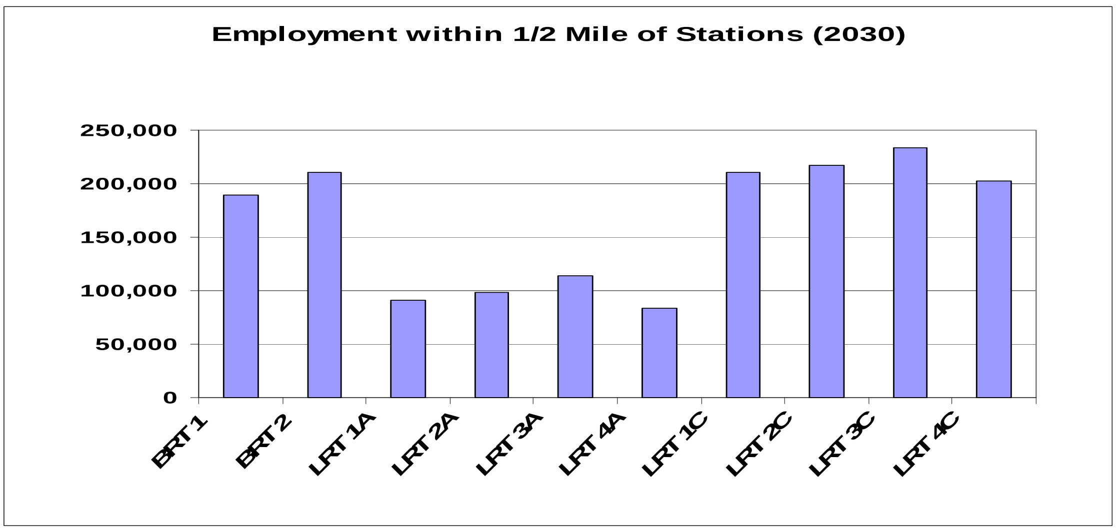



**Figure 7.14 Employment Within ½ Mile of Station (2030)**




Employment

BRT 1, BRT 2, LRT 1C, LRT 2C, LRT 3C and LRT 4C are projected to have more than 175,000 jobs within ½ mile of stations in 2030 and are therefore considered to strongly support the goal of protecting the environment.

LRT1A, LRT 2A, LRT 3A and LRT 4A are projected to have between 75,000 and 175,000 jobs within ½ mile of stations in 2030 and are therefore considered to support the goal of protecting the environment.

## Table 7.4 Goal 3 Evaluation Ratings – Protect the Environment

| Alternatives | Change in vehicle miles of travel (VMT) (Year 2030) | Reduction in VOC, NOX, CO in annual metric tons[2] (Year 2030) | Potentially affected natural environment within 100 feet | Dwelling units potentially affected by noise or vibration | Inventory of efficient, compact land use within 1/2 mile of stations FTA New Starts Criteria | |
|---|---|---|---|---|---|---|
| | | | | | Population Density per Square Mile | Employment[3] |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | ◑ | ◑ | ◑ | ◑ | ◑ | ○ |
| **BRT 2**[1]**-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/ HCRRA | ◑ | ◑ | ● | ◑ | ◑ | ○ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/ HCRRA / Kenilworth/ Royalston | ◑ | ◑ | ● | ◑ | ◑ | ◑ |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ● | ◑ | ● | ◑ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ● | ○ | ◑ | ◑ | ◑ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ◑ | ● | ◑ | ○ |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/ HCRRA / Midtown/ Nicollet | ◑ | ◑ | ● | ● | ◑ | ○ |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ◑ | ◑ | ● | ● | ◑ | ○ |
| **LRT 4C**[1] **-** Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ● | ○ | ● | ◑ | ○ |
| [1]Estimated not modeled | | | | | | |
| [2] FTA New Starts Evaluation Measure. Note: HC, a component of VOC, not picked up separately by Mobile6 model | | | | | | |
| [3]Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers. | | | | | | |
| **Evaluation Breakpoints** | | | | | | |
| ● Does not support goal | 0% Reduction | 0% Reduction | >50 acres of combined potentially affected wetland, parkland and floodplain | >200 units | <3,333 | <75,000 FTA Threshold for Low ranking |
| ◑ Supports goal | 0-5% Reduction | 0-5% Reduction | 25-50 acres | 50-200 units | 3,333-10,000 | 75,000-175,000 FTA Threshold for Low-Medium/ Medium ranking |
| ○ Strongly supports goal | >5% Reduction | >5% Reduction | <25 acres | <50 units | >10,000 | >175,000 FTA Threshold for High-Med/ High ranking |

[1]Estimated not modeled

### 7.5.4 Goal 4: Preserve the Quality of Life

The performance of the alternatives under the evaluation measures for Goal 4 is described below and summarized in Table 7.5.

Anticipated impact of vehicle technology on property values - Defined as the anticipated impact of LRT or BRT on property values based upon the results of national case studies.

| Ratings: | | |
|---|---|---|
| | Strongly supports goal = | Research indicates a definite positive impact at stations |
| | Supports goal = | Research indicates generally positive impact at stations |
| | Does not support goal = | Research does not support positive impact at stations. |

Results:
Numerous national studies indicate that property values often increase around well designed, fixed guideway transit stations. An annotated bibliography by Smith and Gihring[1] is included in the *Southwest Transitway AA Land Use Technical Memorandum.*

The national studies focus primarily on fixed guideway modes (LRT, commuter rail, heavy rail, dedicated BRT). The studies found a correlation between increased property values and proximity to fixed guideway stations.[2] While BRT has demonstrated viability for land use intensification[3], there are suggestions in the studies that BRT infrastructure can be perceived as less permanent than that of fixed rail systems, and therefore, developers may be less likely to invest in the adjacent land. The studies suggest that the closer the operation of a BRT system is to a local street bus service, the less likely it would be to influence an increase in property values. Conversely, the closer the operation of a BRT system becomes to a fixed guideway system, the more likely it would be to increase property values.

LRT 1A, LRT 2A, LRT 3A , LRT 4A, LRT 1C, LRT 2C, LRT 3C and LRT 4C are exclusive guideways and are therefore considered to strongly support the goal of preserving the quality of life.

The routes for BRT 1 and BRT 2 consist of a majority of exclusive bus-only guideways, with the remainder of the route being bus-only shoulders, and are therefore more like the fixed guideways of LRT than Enhanced Bus service. Therefore, BRT 1 and BRT 2 are considered to support the goal of preserving the quality of life.

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[1] Jeffery Smith and Thomas Gihring. "Financing Transit Systems Through Value Capture, An Annotated Bibliography", Victoria Transport Policy Institute, 2006.

[2] Litman, Todd, "Rail Transit in American, A Comprehensive Evaluation of Benefits", October 2004 Victoria Transport Policy Institute Produced with Support from the American Public Transportation Association.

[3] *TCRP Report 90: Bus Rapid Transit: Volume 1: Case Studies in Bus Rapid Transit*; Transportation Research Board, Washington D.C., 2003.

Access to community amenities (libraries, parks, trails) - Defined as the number of existing libraries, parks, and trails within ½ mile of station locations.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Amenities within ½ mile of all stations |
| | Supports goal = | Amenities within ½ mile of several stations |
| | Does not support goal = | No amenities within ½ mile of stations |

Results:
BRT 1, BRT 2, LRT 1A, LRT 2A, LRT 3A, LRT 4A, LRT 1C, LRT 2C, LRT 3C and LRT 4C have libraries, parks and trails within ½ mile of all stations and are therefore all considered to strongly support the goal of preserving the quality of life.

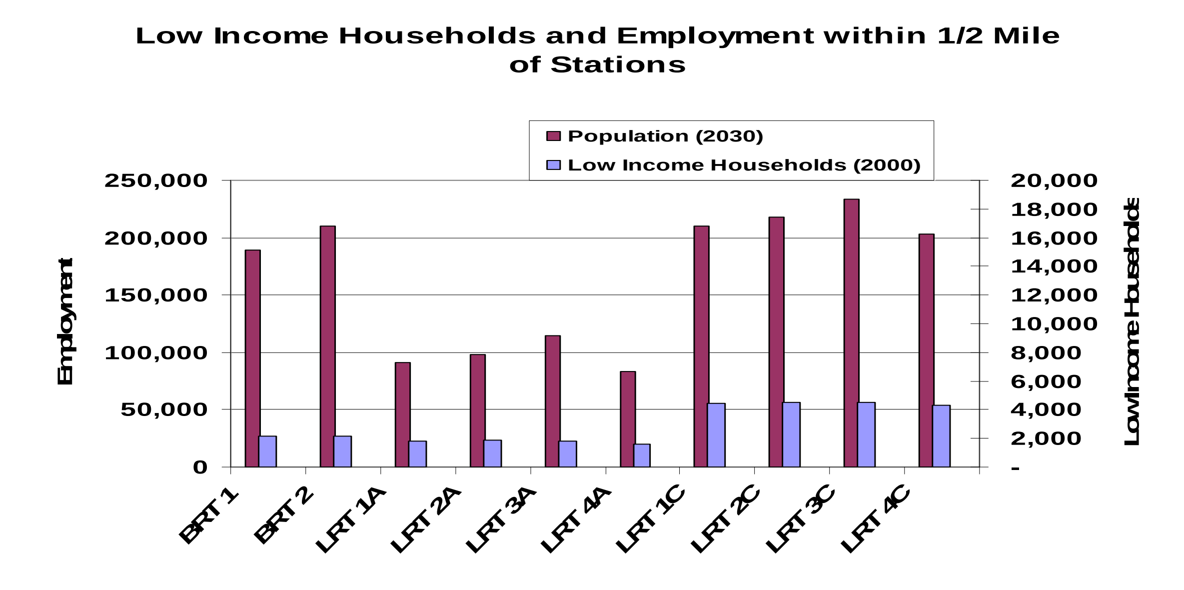
Access to employment opportunities for low-income households( 2030) - Defined as the number of jobs and low-income households (below poverty level) within ½ mile of stations in the forecast year of 2030 based upon socioeconomic projections contained in the Metropolitan Council's travel demand model. Again, the jobs within ½ mile of the Hiawatha LRT stations (Warehouse, Nicollet, Government Center and Metrodome) that would be utilized by the LRT 1A, LRT 2A, LRT 3A and LRT 4A alternatives are not included in these calculations.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than 4,000 low-income households<br>More than 175,000 jobs |
| | Supports goal = | 1,000 to 4,000 low-income households<br>75,000 to 175,000 jobs |
| | Does not support goal = | Less than 1,000 low-income households<br>Less than 75,000 jobs |

Results:
LRT 1C, LRT 2C, LRT 3C and LRT 4C are projected to have more than 4,000 low-income households within ½ mile of stations, and over 75,000 jobs within ½ mile of stations, and are therefore considered to strongly support the goal of preserving the quality of life.

BRT 1, BRT 2, LRT 1A, LRT 2A, LRT 3A and LRT 4A are projected to have between 1,000 and 4,000 low-income households within ½ mile of stations, and over 75,000 jobs within ½ of stations, and are therefore considered to support the goal of preserving the quality of life.

### Figure 7.15 Low Income Households and Employment Within ½ Mile of Station




Intermodal connections - Defined as a measure of the quality of the pedestrian, bicycle, transit, and auto connections to/from station locations.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | High at majority of stations |
| | Supports goal = | Moderate at majority of stations |
| | Does not support goal = | Poor at majority of stations |

Results:
BRT 1, LRT 1A, LRT 4A, LRT 1C and LRT 4C have a high number of stations with direct connections to the bike/ pedestrian trail, moderately good access to the majority of stations for connecting buses, and moderately good access to the majority of stations for automobiles at stations that provide park-and-ride, and are therefore considered to strongly support the goal of preserving the quality of life in terms of pedestrian and bicycle access, and to support the goal of preserving the quality of life in terms of other transit and auto connections.

BRT 2, LRT 2A, LRT 3A, LRT 2C and LRT 3C have a moderate number of direct connections to the bike/ pedestrian trail at the stations, moderately good access to the majority of stations for connecting buses, and moderately good access for the majority of stations that provide park-and-ride, and are therefore considered to support the goal of preserving the quality of life in terms of pedestrian and bicycle access and to support the goal of preserving the quality of life in terms of other transit and auto connections.

Integration and documentation of transit-oriented development (TOD) opportunities/plans in local comprehensive plans – Defined as documentation of general transit-supportive development provisions in approved municipal comprehensive plans.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | TOD exists and is planned throughout the alternative alignment |
| | Supports goal = | TOD exists and is planned in a majority of the alternative alignment |
| | Does not support goal = | No TOD planning in major portions of the alternative alignment |

Results:
Local comprehensive plans in all study area cities contain transit-supportive policies.

The LRT 3C alignment has existing TOD, and the majority of the stations have special area studies completed as part of their city's comprehensive plan. LRT 3C is therefore considered to strongly support the goal of preserving the quality of life.

The majority of stations in alternatives BRT 2, LRT 3A, LRT 4A, LRT 1C, LRT 2C and LRT 4C have special area studies completed as part of their city's comprehensive plan, and are therefore considered to support the goal of preserving the quality of life.

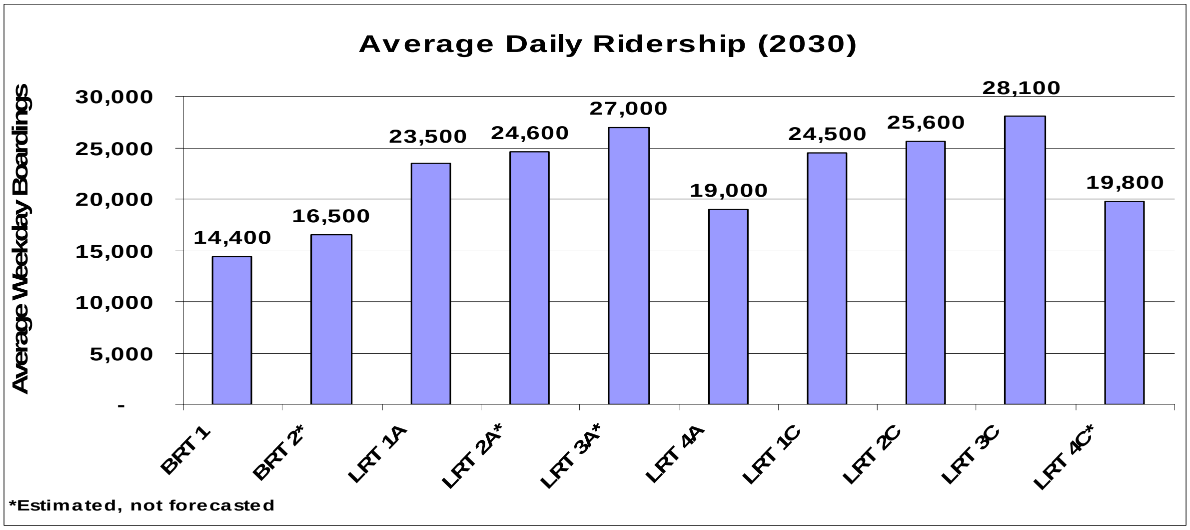
Less than half of the stations in alternatives BRT 1, LRT1A and LRT 2A have been identified for station area studies as part of their city's comprehensive plan. These alternatives are therefore considered to not support the goal of preserving the quality of life.

Transit Ridership Forecast (2030) – Defined as the number of transit riders in the forecast year of 2030, estimated using the Metropolitan Council's travel demand model.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than 20,000 passengers per day |
| | Supports goal = | 15,000 to 20,000 passengers per day |
| | Does not support goal = | Less than 15,000 passengers per day |

Results:

**Figure 7.16 Average Daily Ridership (2030)**




LRT 1A, LRT 2A, LRT 3A, LRT 4A, LRT 1C, LRT 2C, LRT 3C and LRT 4C attract an average weekday ridership of over 20,000 passengers a day, and are therefore considered to strongly support the goal of preserving the quality of life.

BRT 2, LRT 4A and LRT 4C attract an average weekday ridership of between 15,000 and 20,000 passengers a day, and are therefore considered to support the goal of preserving the quality of life.

BRT 1 attracts an average weekday ridership of less than 15,000 and is therefore considered to not support the goal of the goal of preserving the quality of life.

Potential for intensification of land use around stations - Defined as the anticipated intensification of land use around stations for LRT and BRT based upon the results of national studies.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Research documents significant intensification likely |
| | Supports goal = | Research limited but supports intensification for bus transit if fixed guideway |
| | Does not support goal = | Research does not support intensification |

Results:
National reports identify circumstances whereby intensification of land use (development or redevelopment) can be initiated by the introduction or enhancement of transit.[4] These

[4] Jeffery Smith and Thomas Gihring. "Financing Transit Systems Through Value Capture, An Annotated Bibliography," Victoria Transport Policy Institute, 2006

*TCRP Report 90:Bus Rapid Transit: Volume 1: Case Studies in Bus Rapid Transit*; Transportation Research Board, Washington D.C., 2003 studies and experiences also suggest that while transit by itself does not guarantee development around transit stations, transit can enhance and spur development, and supportive public policies can initiate or promote this effect.

Based on national research and the experience of other cities, LRT alternatives are anticipated to present the most significant potential for intensification of land use by virtue of the mode's success in attracting higher density development around fixed-guideway investments. The current intensification of development underway at Hiawatha LRT stations supports this assessment. LRT alternatives 1A, 2A, 3A, 4A, 1C, 2C, 3C and 4C are therefore considered to strongly support the goal of preserving the quality of life.

While BRT has demonstrated a modal viability for land use intensification,[5] there are suggestions in the studies that BRT can be perceived as less permanent than fixed rail systems, and therefore developers may be less likely to invest in the adjacent land. A reasonable hypothesis is that the closer the operation of a BRT system is to local street bus service, the less likely it would be to leverage the availability of transit to enhance and spur development.

The routes for BRT 1 and BRT 2 consist of a majority of exclusive bus-only guideways, with the remainder of the route being bus-only shoulders, and are therefore more like the fixed guideways of LRT than Enhanced Bus service. Therefore, BRT 1 and BRT 2 are considered to support the goal of preserving the quality of life.

<u>Consistency with regional growth plans</u> - Defined as documentation of consistency with *Metropolitan Council Blueprint, Transportation Policy Plan* (TPP) and *2030 Transit Plans*.

| | | |
|---|---|---|
| <u>Ratings</u>: | Strongly supports goal = | Fully consistent |
| | Supports goal = | Partially consistent |
| | Does not support goal = | Not consistent |

<u>Results</u>:
BRT1, BRT2, LRT 1A, LRT 2A, LRT 3A, LRT 4A, LRT 1C, LRT 2C, LRT 3C and LRT 4C are all fully consistent within the area of corridor adopted in the *Metropolitan Council Blueprint, Transportation Policy Plan* (TPP) and *2030 Transit Plan*, and are therefore considered to strongly support the goal of preserving the quality of life.

<u>Impact of park-and-ride lots on existing and planned development at stations</u> - Defined as calculation of percent of land used by park-and-ride related to station area parking supply.

| | | |
|---|---|---|
| <u>Ratings</u>: | Strongly supports goal = | Station able to accommodate demand in planned area |

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Robert Dunphy, et. al "Ten Principles for Successful Development Around Transit," Urban Land Institute 2003.

[5] *TCRP Report 90:Bus Rapid Transit: Volume 1: Case Studies in Bus Rapid Transit*; Transportation Research Board, Washington D.C., 2003

| | |
|---|---|
| Supports goal = | Station demand indicates shift to adjacent station required |
| Does not support goal = | Stations unable to accommodate demand |

Results:
Park-and-ride demand in BRT 1, BRT 2, LRT 1A, LRT 2A, LRT 3A, LRT 4A, LRT 1C, LRT 2C, LRT 3C and LRT 4C indicates a shift of parking is required from the Hopkins Station to adjacent stations. The Shady Oak and Blake Stations can accommodate the overflow parking. BRT 2, LRT 3A and LRT 3C park-and-ride demand indicates a shift of parking is required from the Eden Prairie Town Center Station to the SouthWest Metro Station, which can accommodate the demand. The westerly end of all the alternates requires some structured parking, which can be accommodated. All BRT and LRT alternatives are therefore considered to support the goal of preserving the quality of life.

Access to and accommodation of the existing and future trail system - Defined as access to existing and planned trails, and accommodation of trail system within the proposed transit project.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Continuous access throughout corridor, trail function maintained |
| | Supports goal = | Limited gaps in predominately available access, trail function maintained |
| | Does not support goal = | No access in significant segments of corridor |

Results:
BRT 1, LRT 1A, LRT 4A and LRT 4C have direct connections to the trail system throughout the corridor, and the trail system along these alternatives is maintained. These alternatives are therefore considered to strongly support the goal of preserving the quality of life.

LRT 3A and LRT 1C have limited gaps southwest of Shady Oak along LRT 3A and north of $28^{th}$ Street along LRT 1C, but predominately have access to the trail elsewhere throughout the corridor and are therefore considered to support the goal of preserving the quality of life.

LRT 2A and LRT 2C have no access west of Rowland for a significant segment of the corridor and are therefore considered to not support the goal of preserving the quality of life.

## Table 7.5 Goal 4 Evaluation Ratings – Preserve the Quality of Life

| Alternatives | Anticipated impact on property values[2] | Community amenities within 1/2 mile of stations | Employment opportunities for low income households within 1/2 mile of stations[3] | | Intermodal Connections at Stations | | | | Integration and documentation of TOD in local comprehensive plans | Intensification of land use around stations by mode | Forecast Ridership (2030) | Consistency with regional growth plans (qualitative) | Impact of park/ride lots on development at stations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low Income Households | Employment[4] | Pedestrian | Bicycle | Other Transit | Auto | | | | | |
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | ◑ | ○ | ◑ | ○ | ○ | ○ | ◑ | ◑ | ● | ◑ | ● | ○ | ◑ |
| **BRT 2**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/HCRRA | ◑ | ○ | ◑ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ◑ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ◑ | ○ | ○ | ◑ | ◑ | ● | ○ | ○ | ○ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/ HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ○ | ○ | ○ | ◑ |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ○ | ○ | ○ | ◑ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ○ | ○ | ◑ | ◑ | ○ | ○ | ◑ | ◑ | ◑ | ○ | ◑ | ○ | ◑ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ○ | ○ | ○ | ○ | ○ | ○ | ◑ | n/a | ◑ | ○ | ○ | ○ | ◑ |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/ HCRRA / Midtown/ Nicollet | ○ | ○ | ○ | ○ | ◑ | ◑ | ◑ | n/a | ◑ | ○ | ○ | ○ | ◑ |
| **LRT 3C -** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ○ | ○ | ○ | ○ | ◑ | ◑ | ◑ | n/a | ○ | ○ | ○ | ○ | ◑ |
| **LRT 4C**[1] **-**Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ○ | ○ | ○ | ○ | ○ | ○ | ◑ | n/a | ◑ | ○ | ◑ | ○ | ◑ |

[1]Estimated not modeled
[2]Based on national studies or national data
[3]Low Income Households from 2000 Census and defined as 60% of 7-county median family income ($59,358/$35,615); 2030 jobs from regional forecasts
[4]Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers.

**Evaluation Breakpoints**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ● Does not support goal | Research does not support positive impact at stations | No amenities w/in 1/2 mi. | <1,000 | <75,000 | Poor at majority of stations | No TOD planning in major portions of the alternative | Research does not support intensification | < 15 thousand | Not consistent | Stations unable to accommodate demand |
| ◑ Supports goal | Research supports general positive impact at stations | Amenities w/in 1/2 mi. of several stations | 1000-4,000 | 75,000 - 175,000 | Moderate at majority of stations | TOD exists and is planned in a majority of the alternative | Research limited but supports intensification for bus transit if fixed guideway | 15-20 thousand | Partially consistent | Station demand indicates shift to adjacent station required |
| ○ Strongly supports goal | Research supports definite postive impact at stations | Amenities w/in 1/2 mi. of all stations | >4000 | >175,000 | High at majority of stations | TOD exists and is planned throughout alternative | Research documents significant intensification | > 20 thousand | Fully consistent | Stations able to accommodate demand in planned area |

[1]Estimated not modeled

### 7.5.5 Goal 5: Support Economic Development

The performance of the alternatives under the evaluation measures for Goal 2 is described below and summarized in Table 7.6.

TOD potential at station locations - Defined as description of adaptability of station area land for TOD, and corridor and station economic development market potential for transit oriented and supportive development.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | Local comprehensive plans contain transit-supportive policies. TOD already present and/or multiple special area studies completed |
| | Supports goal = | Local comprehensive plans contain transit-supportive policies, special area studies proposed |
| | Does not support goal = | Limited TOD potential and/or planning |

Results:

LRT 3C has existing TOD and the majority of the stations are within a planned growth area, and is therefore considered to strongly support the goal of supporting economic development.

BRT 2, LRT 3A, LRT 4A, LRT 1C, LRT 2C and LRT 4C have the majority of stations within a planned growth area and are therefore considered to support the goal of supporting economic development.

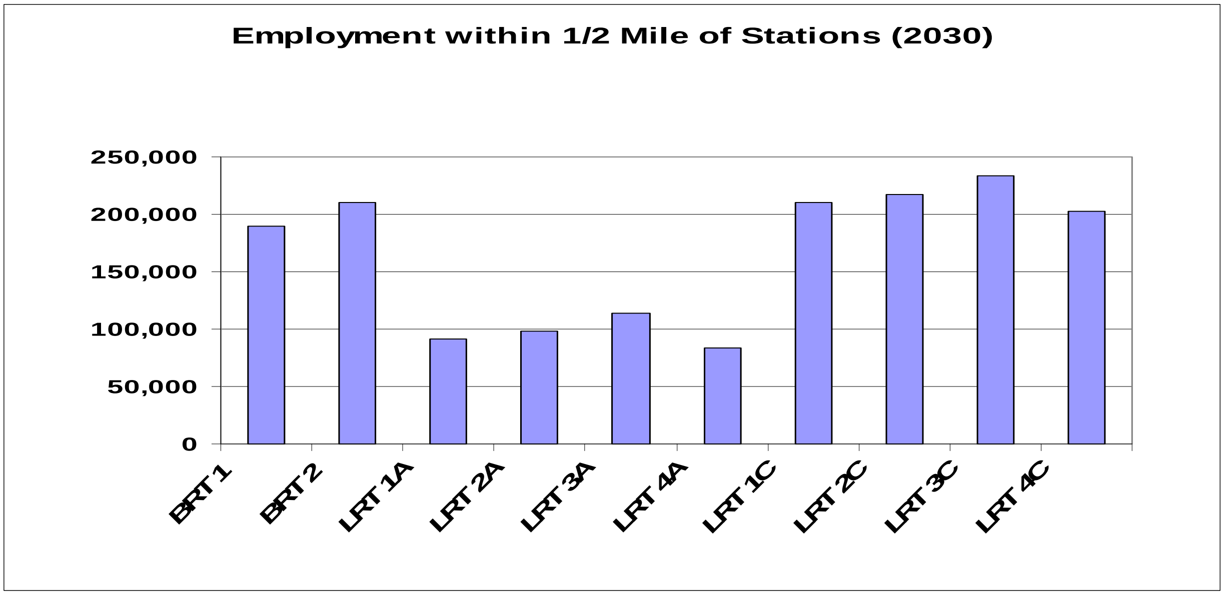
BRT 1, LRT1A and LRT 2A have major portions of the alternative outside a planned growth area and are therefore considered to not support the goal of supporting economic development.

Jobs within 1/2 mile of station (2030) - Defined as the number of jobs within ½ mile of stations based upon the Metropolitan Council's socioeconomic projects for the forecast year of 2030. As described previously, the jobs and population within ½ mile of the Hiawatha LRT stations that would be utilized by the LRT 1A, LRT 2A, LRT 3A and LRT 4A alternatives are not included in these calculations.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than 175,000 jobs |
| | Supports goal = | 75,000 to 175,000 jobs |
| | Does not support goal = | Less then 75,000 jobs |

Results:

### Figure 7.17 Employment Within ½ Mile of Stations (2030)




BRT 1, BRT 2, LRT 1C, LRT 2C, LRT 3C and LRT 4C are projected to serve more than 175,000 jobs and are therefore considered to strongly support the goal of supporting economic development.

LRT 1A, LRT 2A, LRT 3A and LRT 4A are projected to serve between 75,000 and 175,000 jobs and are therefore considered to support the goal of supporting economic development.

Other generators (schools, medical facilities, entertainment venues, etc.) - Defined as the number of schools, medical facilities, entertainment venues and other trip generators within ½ mile of stations.

| | | |
|---|---|---|
| Ratings: | Strongly supports goal = | More than 90 |
| | Supports goal = | 50 to 90 |
| | Does not support goal = | Less than 50 |

Results:
Maps showing the other generators within ½ mile of stations can be found in *Technical Memorandum No. 4, Evaluation Process and Results.*

BRT 2, LRT 1C, LRT 2C and LRT 3C would serve more than 90 activity generators and are therefore considered to strongly support the goal of supporting economic development.

BRT 1, LRT 1A, LRT 2A, LRT 3A, LRT 4A and LRT 4C would serve between 50 and 90 activity generators and are therefore considered to support the goal of supporting economic development.

Consistency with local comprehensive plan goals regarding economic development and redevelopment at stations, including park-and-ride sites - Defined as documentation of specific station area transit-supportive development provisions in approved municipal comprehensive plans

| Ratings: | | |
|---|---|---|
| | Strongly supports goal = | Comprehensive plans support TOD in all segments of alignment; redevelopment planning underway throughout the alignment |
| | Supports goal = | Comprehensive plans support development at stations in all segments of alignment |
| | Does not support goal = | Comprehensive plans do not support development in significant segment of alignment |

Results:
BRT 1, BRT 2, LRT 3A, LRT 4A, LRT 1C, LRT 3C and LRT 4C have comprehensive plans that support development in all segments of the alignment. Redevelopment planning is underway in all segments of these alignments and these alternatives are therefore considered to strongly support the economic development goal.

LRT 1A has comprehensive plans that support development at all the stations in all the segments of the alignment and therefore is considered to support the economic development goal.

LRT 2A and 2C have comprehensive plans that do not support development in a significant segment of the alignment along I-494, and these alternatives are therefore considered to not support the economic development goal.

## Table 7.6 Goal 5 Evaluation Ratings – Support Economic Development

| Alternatives | Existing & Planned TOD Potential at Station Locations (Qualitative) | Planned Jobs within 1/2 mile of station[2,3] (Year 2030) | Existing Other Generators within 1/2 mile of Stations | Consistency with local comprehensive plan goals regarding economic development & redevelopment at stations |
|---|---|---|---|---|
| **BRT 1 -** Eden Prairie to Minneapolis, HCRRA | ● | ○ | ◑ | ○ |
| **BRT 2**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ TH 169/ HCRRA | ◑ | ○ | ○ | ○ |
| **LRT 1A -** Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ● | ◑ | ◑ | ◑ |
| **LRT 2A**[1] **-** Eden Prairie to Minneapolis, I-494/ HCRRA/ Kenilworth/ Royalston | ● | ◑ | ◑ | ● |
| **LRT 3A**[1] **-** Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ◑ | ○ |
| **LRT 4A -** Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | ◑ | ○ |
| **LRT 1C -** Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ○ | ○ | ○ |
| **LRT 2C -** Eden Prairie to Minneapolis, I-494/ HCRRA/ Midtown/ Nicollet | ◑ | ○ | ○ | ● |
| **LRT 3C** - Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ○ | ○ | ○ | ○ |
| **LRT 4C**[1] **-** Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ○ | ◑ | ○ |

[1] Estimated not modeled

[2] FTA New Starts Evaluation Measure

[3] Because LRT A alternatives end at the Intermodal Station, these alternatives access downtown employment via the Hiawatha line. Downtown employment is therefore not reflected in "A" station area numbers.

**Evaluation Breakpoints**

| | | | | |
|---|---|---|---|---|
| ● Does not support goal | Local comprehensive plans contain transit supportive policies. TOD already present and/or multiple special area studies completed | <75K | <50 | Comprehensive plans do not support development in significant segment of alignment |
| ◑ Supports goal | Local comprehensive plans contain transit supportive policies, special area studies proposed | 75-175K | 50-90 | Comprehensive plans support development at stations in all segments of alignment |
| ○ Strongly supports goal | Limited TOD potential and/or planning | >175K | >90 | Comprehensive plans support TOD in all segments of alignment; redevelopment planning underway throughout alignment |

[1] Estimated not modeled

## 7.6 Summary of Evaluation

### Tier 1 Goals: Improve Mobility and Provide a Cost-Effective/Efficient Travel Option

Based upon the evaluation, LRT 1A, LRT 2A, LRT 3A and LRT 3C are considered to meet the goals of improving mobility and providing a cost-effective and efficient travel option.

BRT 1 and BRT 2 are considered to not meet the goals of improving mobility and providing a cost-effective/efficient travel option.

- Lower ridership than LRT - 14,400 to 16,500 vs. 23,500 to 28,100 passengers/day.

- Fewer new riders attracted to system - 1,300 to 2,300 vs. 3,800 to 7,500 new riders/day.

- Passenger capacity significantly lower than LRT - During a peak hour with a 7.5 minute headway a BRT system can serve 640 passengers while a LRT system can serve 2976 passengers. (This is due to LRT's ability to train vehicles)..

- System cannot accommodate peak hour demand - The estimated peak hour demand for BRT service is 2,000 passengers/hour which cannot be accommodated by a BRT operating on a 7.5 minute headway.

- Estimated to significantly exceed FTA's $29 CEI threshold for Preliminary Engineering - Estimated CEI of $66 to $74.

### LRT 4A

LRT 4A does not meet the Tier 1 goals because it does not adequately serve the travel demand that exists in the Southwest metro area. LRT 4A is already encompassed in the full-length "A" alternatives. A shortened version of the preferred alignments may be identified as a future minimum operating segment (MOS) if required in the future. In the event an MOS is required as the initial phase of staged implementation of the full alternative selected, detailed analysis of impacts and mitigation required to serve as an interim route terminus would be undertaken.

- Sufficient ridership demand to extend line to Eden Prairie
- Relatively high per mile capital cost

### LRT 1C, LRT 2C and LRT 4C

While LRT 1C, LRT 2C and LRT 4C are estimated to generate ridership levels equivalent to their "A" counterparts, they do not attract as many new transit riders, cannot be interlined with the Hiawatha and proposed Central LRT lines in downtown Minneapolis, are approximately $250 million higher in capital costs, and have a cost-effectiveness index that makes them unlikely to compete well for FTA New Starts Funding.

- Higher capital and operating costs compared to LRT 1A, 2A and 4A (approximately $250 million in 2015 dollars)

- Attract an equivalent number of passengers to LRT 1A, 2A and 4A
  (the "C" alternatives attract approximately 100 more passengers/day than the "A" alternatives)

- Attract fewer new riders than LRT 1A, 2A and 4A
  (the "C" alternatives attract approximately 700 fewer new passengers/day than the "A" alternatives)

- Cannot be interlined with the Hiawatha and/or Central LRT lines

- Estimated to exceed the FTA <$29 CEI threshold by more than 20%
  (LRT 1C = $ 37, LRT 3A = $ 38, LRT 3C = $ 41)

### Tier 2 Goals: Protect the Environment, Preserve Quality of Life, and Support Economic Development

LRT 1A, LRT 3A and LRT 3C are considered to meet the goals of protecting the environment, preserving the quality of life, and supporting economic development.

LRT 2A is considered to not meet the Tier 2 goal of supporting economic development.

LRT 1A, LRT 3A and LRT 3C are considered to meet the goals of preserving the environment, protecting the quality of life, and supporting economic development. LRT 2A was considered to not adequately meet the Tier 2 goals because it does not provide the reverse commute and economic development opportunities of LRT 3A and LRT 3C, nor the capital and operating cost advantages of LRT 1A.

- Lack of good opportunity for TOD

- No current city planning for development/redevelopment west of Shady Oak Road

Table 7.7 summarizes the evaluation ratings under each goal for each alternative.

## Table 7.7 Summary of Evaluation Ratings

| Alternatives | Tier 1 Goals | | | Tier 2 Goals | | | Recommendation |
|---|---|---|---|---|---|---|---|
| | Goal 1: Improve Mobility | Goal 2: Provide a Cost-Effective, Efficient Travel Option | Results | Goal 3: Protect the Enviroment | Goal 4: Preserve and Protect the Quality of Life in the Study Area and Region | Goal 5: Support Economic Development | |
| **Enhanced Bus** (Baseline) | **Carry forward as Baseline alternative (Required)** | | | **Carry forward as Baseline alternative (Required)** | | | **Carry forward as Baseline Alternative** |
| **BRT 1** - Eden Prairie to Minneapolis, HCRRA | ● | ● | Does not meet Tier 1 Goals; Do not carry forward | | | | |
| **BRT 2**[1] - Eden Prairie to Minneapolis, Golden Triangle/Opus/TH 169/HCRRA | ● | ● | Does not meet Tier 1 Goals; Do not carry forward | | | | |
| **LRT 1A** - Eden Prairie to Minneapolis, HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | Meets Tier 1 Goals; Carry Forward to Tier 2 | ◑ | ◑ | ◑ | **Carry forward for further analysis** |
| **LRT 2A**[1] - Eden Prairie to Minneapolis, I-494/HCRRA /Kenilworth/Royalston | ◑ | ◑ | Meets Tier 1 Goals; Carry Forward to Tier 2 | ◑ | ◑ | ◑ | **Other alternatives better meet Tier 2 Goals. Do not carry** |
| **LRT 3A**[1] - Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Kenilworth/ Royalston | ◑ | ◑ | Meets Tier 1 Goals; Carry Forward to Tier 2 | ◑ | ◑ | ○ | **Carry forward for further analysis** |
| **LRT 4A** - Hopkins to Minneapolis, HCRRA/ Kenilworth/ Royalston | ● | ◑ | Part of full alternative. Do not carry forward | | | | |
| **LRT 1C** - Eden Prairie to Minneapolis, HCRRA/ Midtown/ Nicollet | ◑ | ● | Does not meet Tier 1 Goals; Do not carry forward | | | | |
| **LRT 2C** - Eden Prairie to Minneapolis, I-494/ HCRRA/ Midtown/ Nicollet | ◑ | ● | Does not meet Tier 1 Goals; Do not carry forward | | | | |
| **LRT 3C** - Eden Prairie to Minneapolis, Golden Triangle/ Opus/ HCRRA/ Midtown/ Nicollet | ◑ | ◑ | Meets Tier 1 Goals; Carry Forward to Tier 2 | ◑ | ◑ | ○ | **Carry forward for further analysis** |
| **LRT 4C**[1] - Hopkins to Minneapolis, HCRRA/ Midtown/ Nicollet | ● | ● | Part of full alternative. Do not carry forward | | | | |

[1]Estimated not modeled

**Evaluation Breakpoints**

| | | Goal 3 | Goal 4 | Goal 5 | |
|---|---|---|---|---|---|
| ● Does not support goal | | Supports goal on fewer than 4 of 6 measures | Supports goal on fewer than 7 of 10 measures | Supports goal on fewer than 3 of 4 measures | |
| ◑ Supports goal | | Supports goal on 4 of 6 measures | Supports goal on 7 of 10 measures | Supports goal on 3 of 4 measures | |
| ○ Strongly supports goal | | Supports goal on all measures | Supports goal on all measures | Supports goal on all measures | |

[1]Estimated not Modeled

# 6.0 Technical Methodology

## 6.1 Overview

This chapter summarizes the technical methodology and the assumptions used to estimate transit ridership, capital costs, and operating costs for the alternatives evaluated in the Southwest Transitway Alternatives Analysis (AA).

## 6.2 Ridership Forecasts

### 6.2.1 Background and Assumptions

A travel demand model is used to forecast transit ridership and auto traffic volumes, given a set of input assumptions that describe the location of the population, commercial development (in terms of employment), and the roadway and transit system. The model allows the testing of various alternatives, and is a useful tool to forecast the travel-related impacts of new transit improvements. It is also useful in forecasting future demand for other modes, including non-motorized modes such as walk and bike.

The Southwest Transitway AA used the Twin Cities Regional Travel Demand Model to estimate transit ridership. The Twin Cities model is a traditional 4-step travel demand model, which includes trip generation, trip distribution, mode choice, and assignment steps. The model is calibrated, maintained, and updated by the Metropolitan Council.

The regional model was used for the following reasons:

- It covers the entire region and is therefore comprehensive in geography and trip-making.
- It is the model used for long range planning by the Metropolitan Council.
- It is the model used by the Central Corridor and Northstar transit planning studies to forecast demand for Federal and State review.
- It has been reviewed by the Federal Transit Administration (FTA) for compliance with standard planning model practices.
- It is structured to permit full multi-modal demand estimation.

The regional model includes the 7-county area served by the Metropolitan Council. In addition, the model also encompasses the 13-county "ring" surrounding the 7-county area. It was developed based on data collected in 2001 and 2002 from a comprehensive home-interview survey of over 6,000 households, and an extensive survey of travelers entering and leaving the region. Actual ridership data from the Hiawatha LRT line has been used to validate the model. Since its original development, the model has been refined to better reflect observed data. This was done during the FTA review of planning work for the Central Corridor. This review process enhances the credibility of the model results for the Southwest Transitway AA. The FTA's involvement in this type of model review has become a routine procedure in virtually all transit proposals that will eventually apply for federal funding assistance through the "New Starts" federal program. One important addition allowed by the FTA in the Twin Cities regional travel model is the "mode specific constant", which allows the model to recognize additional attractiveness (or preference of travelers) to choose to use rail over equally effective bus service during the off-peak period.

The model produces the following results for each of the modeled alternatives:

- Daily transit boardings by route (alternative)

- Daily station boardings and alightings
- Daily transit segment ridership
- Level of service by traffic analysis zone (TAZ )

The latter measure is used to determine "user benefits", which is a measure of the total traveler time and cost savings that result from the alternative compared with the Enhanced Bus alternative. User benefits are one of the inputs used to calculate the cost-effectiveness index, which is an important FTA measure in the overall evaluation of the alternatives for potential federal funding. More information about the cost-effectiveness index is found within *Technical Memorandum No. 6: Travel Demand Forecasting Methodology and Ridership Results.*

### 6.2.2 Key Assumptions

The two major categories of input data to the model are demand data (who is traveling) and transportation supply data (physical highway and transit routes and capacity). The former consists of:

- Socioeconomic data including population, households, retail and non-retail employment by small areas (called traffic analysis zones or TAZs).
- External travel demand, represented by future year traffic volumes at the periphery of the modeled "ring" (13-county) area.
- Forecasts for enplanements at the Minneapolis-St. Paul International Airport.

Transportation supply data is represented as "highway" (i.e., surface street) networks and transit networks. Highway networks consist of all principal and major arterials and collectors in the 7-county region. The 2030 network also includes the planned and programmed improvements included in the Metropolitan Council's long range transportation plan, the *2030Transportation Policy Plan 2030.* It is the same network used for the current Central Corridor and Northstar Commuter Rail planning studies. There are no differences in the highway network between the transit alternatives in the Southwest Transitway AA.

The model's transit networks are also based on the Metropolitan Council's long range transit plan, the *2030 Transit Plan*. The transit networks include (for year 2030) the Northstar, Rush Line and Red Rock Commuter Rail lines, the Central Corridor and Hiawatha Light Rail Transit (LRT) lines and the three bus rapid transit (BRT) systems: I-35W, Cedar and Bottineau. Transit networks vary among alternatives, reflecting the No Build, Enhanced Bus and variations of the LRT and BRT alternatives. In addition to the LRT or BRT guideways and stations themselves, the alternatives are also defined by the system of feeder bus and compatible local bus services provided within each alternative, as well as the availability of park-and-ride spaces at certain stations.

The assumptions for hours of service and frequency of service are consistent with the operating plans discussed in Chapter 5, Definition of Alternatives.

### 6.2.3 Methodology

To assure a fair comparison between alternatives, the model used the same highway network for each alternative. The model also used the same transit network outside the Southwest Transitway study area for each alternative. Changes in the transit network inside the Southwest Transitway study area were limited to those identified in the definition of alternatives and operating plans.

The model also assumed a common travel demand for each alternative. This helped ensure that changes in ridership ensued from the different transit services specific to each alternative, and not from unrelated factors. To maintain a common travel demand, the model alternatives used a common set of person-trip tables, which define the overall demand for travel, regardless of mode. These tables were established from the Enhanced Bus alternative model run.

The Southwest Transitway AA modeled 8 of the 11 alternatives studied. Ridership for the remaining alternatives was estimated using the differences between the modeled alternatives as “pivot points”. For instance, the BRT 2 alternative was interpolated outside the model by comparing the difference between the LRT 1 and LRT 3 alignment demand, then adding that difference to the BRT 1 modeled data. In another example, the relative difference between LRT 1A and LRT 1C was applied to LRT 2C to initially estimate the ridership for LRT 2A.

The modeled alternatives were also used to estimate ridership for potential alignment options. For example, ridership estimates for the Hennepin Avenue alignment options were developed “off-line”, based on changes in travel time and market accessibility.

More details about the methodology and assumptions used in the ridership estimates can be found in *Technical Memorandum No. 6: Travel Demand Forecasting Methodology and Ridership Results.*

## 6.3 Capital Costs

### 6.3.1 Background and Assumptions

Capital costs include the one-time expenditures to design and build the transitway. This includes right-of-way acquisition, bus guideways or rail trackwork, vehicles, structures, maintenance facilities, and signal, communication, and electrical systems.

The Southwest Transitway capital cost estimates are based on a conceptual level of design and reflect a number of assumptions about the scope of each alternative, design standards, unit costs, implementation schedule and inflation rates. The level of detail of the capital cost estimates corresponds with the current level of Southwest Transitway alternative definition, engineering, and environmental screening. The level of estimating detail typically increases as a project progresses from the AA to Preliminary Engineering and Final Design. As the level of design detail increases, more specificity in the cost estimates are realized which leads to the use lower contingencies in the cost estimate.

While the cost estimates include an allowance for contingencies that is intended to recognize the level of engineering available at this early stage, future project decisions may cause the cost estimates to increase or decrease. At this stage of analysis, the capital cost estimates are intended to be used primarily for making relative comparisons among the alternatives.

At the AA stage, the capital cost estimates are developed on a per unit basis. As additional studies are conducted, the capital cost estimates will be refined to reflect additional information.

### 6.3.2 Key Assumptions

The per unit capital costs were calculated for year 2006 and escalated to year 2015 by applying a compounded 2.7% annual escalation inflation rate, which is consistent with the escalation rate used for the Central Corridor in the *Central Corridor Draft Environmental Impact Statement, 2006.*

A large proportion of the potential right-of-way needed for several of the Southwest Transitway alternatives is already owned by the Hennepin County Regional Railroad Authority (HCRRA). This includes former railroad rights-of-way currently known as the Southwest Corridor, the Kenilworth Corridor, the Cedar Lake Corridor, and the Midtown Corridor. The Authority also owns land at several potential station sites along these Southwest Transitway alignments. The transfer costs for acquiring any needed rights-of-way already owned by the HCRRA are not included in these capital cost estimates.

Throughout this study there has been an emphasis on building upon previous work by the HCRRA and others related to the Southwest Transitway, and consistency with the Central Corridor planning work. With respect to the capital cost estimates, that was accomplished by reviewing and validating previous estimates for the Southwest Transitway and Central Corridor, and maintaining consistent assumptions wherever reasonably possible.

### 6.3.3 Methodology

Capital cost estimates were prepared using the format and procedures currently recommended by the FTA. The FTA methodology includes the use of standard cost categories (SCC) and groupings for organization of the data, as well as linked spreadsheets for development of forecast year estimates and annualized capital costs. The FTA SCC organization for capital cost estimates was developed for application on project phases ranging from AA to final design and construction. The FTA SCC format is documented in Table 6.1.

The Southwest Transitway AA capital cost estimates were developed using a segmented and tiered approach. Each of the BRT and LRT alternatives were divided into geographic segments, many of which are common to multiple alternatives. Within each geographic segment the estimates have been separated into the individual SCC categories. Finally, each of those SCC categories consists of multiple line-items with corresponding quantities and unit prices.

The methodology differs for corridor-wide cost elements such as vehicles and support facilities, and for “soft costs” such as professional services and unallocated contingencies. Cost for those elements were identified and added after the individual corridor segment estimates had been combined into the full alternative estimates.

**Table 6.1 FTA SCC Capital Cost Estimate Organization**

| |
|---|
| **10: Guideway**<br>Guideway grading and drainage; retaining walls, bridges and tunnels; LRT trackwork; BRT roadway construction; estimating contingency |
| **20: Stations**<br>Construction of station platforms, enclosures, canopies and fixtures; elevators, escalators and stairs; multi-story auto parking structures; estimating contingency |
| **30: Support Facilities**<br>Light-duty vehicle maintenance and storage facilities; LRT yard and yard trackwork; estimating contingency |
| **40: Sitework and Special Conditions**<br>Demolition, clearing, and earthwork; utilities and utility relocation; hazardous soil and water remediation; environmental mitigation; reconstruction of roadways, intersection, and non-guideway structures; construction of surface parking at stations; pedestrian and bicycle accommodations, sidewalks and trails; landscaping, fencing and lighting; estimating contingency |
| **50: Systems**<br>LRT train control signals and signal houses; LRT roadway crossing protection; LRT traction power substations; LRT overhead catenary system; communication systems; central control hardware and software; fare collection systems; roadway traffic signals; estimating contingency |
| **60: Right-of-way**<br>Acquisition of right-of-way or easements for guideway, stations; relocation of existing households and businesses; estimating contingency |
| **70: Vehicles**<br>Light rail vehicles, buses, non-revenue vehicles, spare parts; estimating contingency |
| **80: Professional Services**<br>Preliminary engineering; final design; project management for design and construction; construction administration and management; insurance; legal, permits review fees; surveys, testing, investigation, inspection; agency force account work |
| **90: Unallocated Contingency**<br>Overall project contingency and reserves |
| **100: Finance Changes**<br>Estimated expenses for local financing of project activities prior to Federal funding commitment |

Source: Federal Transit Administration, 2006

Further information about the methodology and assumptions used to calculate the capital costs can be found in *Technical Memorandum No. 7 Capital Cost Estimate*.

The capital cost estimates include two types of contingencies: allocated contingencies and unallocated contingencies. Allocated contingencies are contingencies that are associated with individual cost estimate categories. These contingencies are intended to compensate for unforeseen items of work, quantity fluctuations, and variances in unit costs that develop as the project progresses through the various stages of development. The level of contingency applied to each cost category reflects the relative potential variability of those costs. Table 6.2 lists the allocated contingencies by SCC category.

**Table 6.2 Allocated Contingencies**

| SCC Category | Allocated Contingency |
|---|---|
| 10: Guideway and Track Elements | 20% |
| 20: Stations | 20% |
| 30: Support Facilities | 20% |
| 40: Sitework and Special Conditions | 20% |
| 50: Systems | 20% |
| 60: Right-of-Way | 100% |
| 70: Vehicles | 5% |

Unallocated contingencies (SCC Category 90) are applied to the overall total capital cost estimate for each alternative. The estimates prepared for the Southwest Transitway AA include an unallocated contingency of 20%.

## 6.4 Operating Costs

### 6.4.1 Background and Assumptions

Annual operating and maintenance (O&M) costs consist of the ongoing costs of operating, maintaining, and managing the transit system. These costs typically include labor costs (wages, fringe benefits, and other costs) for bus and rail operators; fuel and electricity; parts, fluids and other materials for maintaining the vehicles; the non-labor operating costs of utilities and materials for cleaning and maintaining facilities; administrative costs; and insurance.

### 6.4.2 Key Assumptions

The annual operating and maintenance costs estimates for the Southwest Transitway alternatives assume all service identified in the Metropolitan Council's *2030 Transit Plan* is operational. The *2030 Transit Plan* includes an assumption that transit ridership will double through a combination of improved bus service and the implementation of numerous transitways. By 2030, the Metropolitan Council assumes the Hiawatha LRT line, the Northstar Commuter Rail line, the Central LRT line, the Cedar Avenue, I-35W and Bottineau Boulevard BRT lines, the Red Rock Commuter Rail, and the Rush Line Commuter Rail lines are implemented.

Operating and maintenance costs were estimated in 2005 dollars and then escalated to 2015 dollars at a compounded annual escalation rate of 2.7%, which is consistent with the escalation rate used for the *Central Corridor Draft Environmental Impact Statement (DEIS), 2006*.

### 6.4.3 Methodology

The methodology used to develop the annual operating and maintenance costs for each alternative is consistent with the requirements of the FTA's New Starts process. The annual operating and maintenance cost estimates include all transit service changes for the entire regional transit system. This ensures that the annual costs of operating all transit service, bus and rail, is included.

Annual operating and maintenance costs for the alternatives were estimated using a method called a multi-factor cost model. The cost model uses actual operating and maintenance costs that Metro Transit reports to the FTA's National Transit Database (NTD), a database maintained by the FTA to monitor and report the performance of mass transit agencies in the United States.

The cost model disaggregates these reported costs into categories that can be reasonably assumed to vary with quantities of service provided. For example, some categories of operating costs tend to vary by miles of service (such as fuel costs), while others vary by hours of service (such as driver labor and fringe benefits), or the number of required peak vehicles (such as vehicle cleaning).

The cost model then applies these cost categories to operating statistics that express the different quantities of service for each alternative. These operating statistics act as cost drivers for each alternative's operating and maintenance costs; cost categories for each alternative increase or decrease according to changes in operating statistics.

The Southwest Transitway AA cost model used four operating cost statistics:

- Vehicle revenue hours of service
- Vehicle revenue miles of service
- Number of vehicles required in maximum service
- Number of fixed guideway miles

The model used both outputs from the Twin Cities Regional Model and assumptions provided by Metro Transit staff to determine the operating statistics for each alternative.

Administrative costs are assumed to increase proportionally in response to changes in the volume of service based on their current proportion in the cost of operating the transit system. The model allows some cost items to remain "fixed" and invariable regardless of the volume of service operated.

A full breakdown of the O&M cost items and their assignment by cost categories is provided in *Technical Memorandum No. 8, Operating Cost Estimates*.

# 5.0 Definition of Alternatives

## 5.1 Overview

This chapter presents the transit alternatives evaluated in the Southwest Transitway Alternatives Analysis (AA). This discussion includes descriptions of the alignments, station locations and operating plans for each alternative. Full definitions of the alternatives are provided in *Technical Memorandum No. 3, Definition of Alternatives*.

The alternatives described in this chapter include refinements made over the course of the study as a result of feedback from the Technical and Policy Advisory Committees, study area communities, and public outreach efforts. At the end of each alternative description, the refinements made to the initial alternatives are identified.

## 5.2 Background and Assumptions

The process for defining and refining the Southwest Transitway alternatives included:

- Reviewing previous studies of the Southwest Transitway.
- Establishing a set of Southwest Transitway Goals and Objectives that address the Purpose and Need.
- Performing a transit technology review to identify which transit technologies address the study area's travel needs as documented in Chapter 3, Purpose and Need.
- Identifying general alignments (i.e., station locations and routings).
- Combining the selected transit technologies and alignments into an initial set of transitway alternatives for agency and public review and comment.
- Modifying the initial transitway alternatives into refined alternatives for evaluation based on comments received.

## 5.3 Study Review

The Southwest Transitway AA began with a review of previous studies related to the Southwest Transitway. These included local comprehensive plans, the Regional Blueprint, the Transportation Policy Plan (TPP), and all transit studies related directly to the Southwest Transitway including the 2003 Hennepin County Regional Railroad Authority (HCRRA) *Southwest Rail Transit Study* that is a predecessor to this AA.

## 5.4 Goals and Objectives

The Policy Advisory Committee (PAC) approved the following Southwest Transitway goals to address the mobility needs of the study area:

1. Improve Mobility
2. Provide a Cost-Effective and Efficient Travel Option
3. Protect the Environment
4. Preserve Quality of Life
5. Support Economic Development

The goals were prioritized into two tiers. Tier One goals are those that must be achieved in order for a viable project to exist. Tier Two goals are those that should be achieved assuming a viable project exists. Southwest Transitway goals and objectives are identified in Chapter 4 of this document.

## 5.5 Transit Technology Review

The next step in defining alternatives was to determine which transit technologies were most likely to address the travel needs of the study area. The Southwest Transitway AA reviewed a broad range of transit technologies including the following:

- **Conventional Diesel Bus (including use on HOV and shoulder bus lanes):** The diesel transit bus is the most commonly used transit vehicle in the world. Buses offer the flexibility of operation in mixed traffic on city streets and highways.

Conventional Diesel Bus

- **Bus Rapid Transit (BRT):** BRT combines the flexibility of buses with the frequency and travel time advantages of rail transit. BRT typically offers high capacity, high frequency bus operation in an exclusive bus-only roadway with on-line, high-amenity stations.

Proposed BRT Service in Eugene, Oregon

- **Light Rail Transit (LRT):** LRT is a medium- to high-capacity passenger rail technology that can be used for service in areas with mixed traffic and closely-spaced stops, and also for long-haul higher-speed trips on exclusive guideways. LRT vehicles are powered from an overhead electrification system. LRT service typically features on-line, high-amenity stations.

The Twin Cities Hiawatha LRT line

- **Streetcar (modern):** Streetcar technology is similar to light rail technology in terms of track gauge, overhead electrification, and regularly scheduled operations, but streetcars typically serve as local area distributors, and are more likely to share street rights-of-way with other vehicles or use semi-exclusive rights-of-way. Stops are typically similar to local street bus stops.

Streetcar in Portland, Oregon

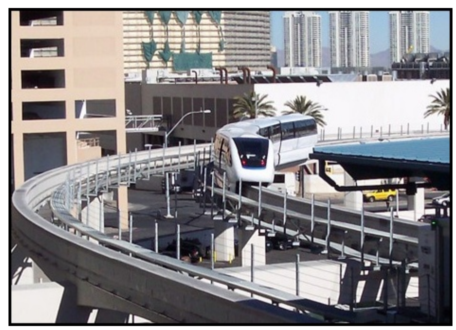
- **Heavy Rail Transit (subway):** Heavy rail, commonly referred to as a rapid transit or subway, is a high-capacity, high-speed transit service that operates on exclusive tracks with an electrified third rail and no grade crossings. High-amenity stations are standard features of rapid transit systems.

New York City subway

- **Commuter Rail (locomotive and diesel multiple unit)**: Commuter rail service is defined as passenger rail service operating on existing freight rail tracks into the city center in the morning and from the city center in the afternoon/evening. Service is typically between outer suburban or exurban areas and the city center. Commuter rail typically features high- amenity stations.

New Jersey Commuter Rail

- **Automated Guideway Transit (AGT)/ Monorail:** AGT/monorail systems are electric transit systems in which the vehicles are suspended from or straddle an exclusive guideway. An AGT/monorail system typically serves as a circulator/distributor within a relatively small geographic area. High-amenity stations are standard features of AGT systems.



Las Vegas Monorail

- **Personal Rapid Transit (PRT):** PRT is a transit system that provides point-to-point, demand responsive service to individuals or small groups. PRT is typically designed to serve as a circulator/distributor system providing service within business parks, airports, and campus environments, although this technology could also be used to provide service to/from line-haul transit systems.


Personal Rapid Transit Demonstration vehicle

Each transit technology was evaluated according to the following criteria:

- **Compatible with the study area's transit travel demand**
  The technology is easily able to accommodate the transit travel demand of the study area.

- **Proven Technology**
  The technology is fully implemented in other locations, with a history that can be researched and studied.

- **Compatible with existing infrastructure**
  The technology is compatible with existing and planned infrastructure and will not require a major retrofit of existing infrastructure.

- **Identified in the region's long-range transportation plan and other studies**
  The technology is identified as an option in the Metropolitan Council's long-range transportation plan, the *Transportation Policy Plan* (TPP) or in previous Southwest Transitway studies. The following studies have been completed documenting the feasibility of transit technologies for the Southwest Transitway: the *Hennepin County LRT System Draft Environmental Impact Statement (DEIS), 1989*; the *29th Street and Southwest Busway Feasibility Study, 2000*; the Minnesota Department of Transportation's *Exclusive Busway Study, 2000*; and the *Southwest Rail Transit Study, 2003.*

The results of this review, summarized in Table 5.1, identified conventional diesel bus, BRT and LRT for inclusion as feasible transit modes in the Southwest Transitway AA.

Conventional diesel buses were retained based upon the technology's ability to serve expected travel demand, flexibility, compatibility with existing infrastructure, and the fact that it is a proven technology. Conventional diesel buses are identified in the Metropolitan Council's *2030 Transit Plan* as the backbone of the regional transit system.

Bus rapid transit (BRT) was retained based upon its ability to serve expected travel demand, its compatibility with existing infrastructure, and the fact that it is a proven technology. BRT is identified in the Metropolitan Council's *2030 Transit Plan* as a potential transit technology to serve the travel demand in the Twin Cities. BRT was also determined to be a feasible transitway alternative in both the *29th Street and Southwest Busway Feasibility Study, 2000* and Mn/DOT's *Exclusive Busway Study, 2000.*

Light rail transit (LRT) was retained based upon its ability to serve expected travel demand, its compatibility with existing infrastructure (i.e., the Hiawatha LRT line), and the fact that it is a proven technology. LRT is identified in the Metropolitan Council's *2030 Transit Plan* as a potential transit technology to serve the travel demand in the Twin Cities. LRT was also determined to be a feasible transit technology in the *Southwest Rail Transit Study*, 2003.

Appendix A in *Technical Memorandum No. 3, Definition of Alternatives*, provides a more detailed discussion of the evaluation of each transit technology.

In July 2005, the Southwest Transitway TAC forwarded its recommendation of conventional bus, BRT and LRT to the Southwest Transitway PAC, who voted unanimously to retain these technologies for further study.

## Table 5.1 Transit Technology Review Results

| Modes | Compatibility with Travel Demand | Proven Technology | Compatibility with Existing Infrastructure | Identified in the Regional Transportation Plan | Recommendation |
|---|---|---|---|---|---|
| Conventional Bus | Fully Meets Criteria | Fully Meets Criteria | Fully Meets Criteria | Fully Meets Criteria | Retain |
| Bus Rapid Transit (BRT) | Fully Meets Criteria | Fully Meets Criteria | Fully Meets Criteria | Fully Meets Criteria | Retain |
| Light Rail Transit (LRT) | Fully Meets Criteria | Fully Meets Criteria | Fully Meets Criteria | Fully Meets Criteria | Retain |
| Streetcar (Modern)* | Partially Meets Criteria | Fully Meets Criteria | Partially Meets Criteria | Does Not Meet Criteria | Not Retain |
| Heavy Rail Transit | Does Not Meet Criteria | Fully Meets Criteria | Does Not Meet Criteria | Does Not Meet Criteria | Not Retain |
| Commuter Rail | Does Not Meet Criteria | Fully Meets Criteria | Fully Meets Criteria | Fully Meets Criteria | Not Retain |
| Monorail/AGT (Automated Guideway Transit) | Does Not Meet Criteria | Fully Meets Criteria | Does Not Meet Criteria | Does Not Meet Criteria | Not Retain |
| Personal Rapid Transit (PRT) | Does Not Meet Criteria | Does Not Meet Criteria | Does Not Meet Criteria | Does Not Meet Criteria | Not Retain |

**LEGEND**

| | |
|---|---|
| **Compatibility with Travel Demand:** | Ability of service type to accommodate expected travel demand |
| **Proven Technology:** | Fully implemented and able to be evaluated |
| **Compatibility with Existing Infrastructure:** | Does not require massive retrofit of existing infrastructure |
| **Identified in the Regional Transportation Plan:** | Identified in the Metropolitan Council's Transportation Policy Plan (TPP) |

*May be appropriate for intercity/local circulator service connecting to/from the corridor

- Fully Meets Criteria
- Partially Meets Criteria
- Does Not Meet Criteria

## 5.6 Identification of Alignments (Stations and Routes)

The next step in the process of defining alternatives was to identify the alignments, which are a combination of station locations and the routes linking them.

### 5.6.1 Station Locations

The guidelines for locating transit stops/stations included service to activity centers; accessibility by bus, auto, bicycle and walking; integration with the community and surrounding environment; and spacing appropriate for transit operations.

#### Activity Centers

Stations were located to serve concentrations of residential population, employment and destination/activity centers (e.g., shopping centers, medical centers, recreation areas).

#### Access to the Station

Stations were located in areas easily accessible by walking, bicycle, bus or automobile. Consideration was given to existing and planned roadways, bus routes, pedestrian and bicycle connections and availability of land for park-and-ride facilities.

#### Integration with the Community and the Environment

Stations were located to be compatible with the community and the natural environment. Considerations included compatibility with existing/proposed land use as identified in local comprehensive plans, the area's potential for transit oriented development or redevelopment, and avoiding environmental and community impacts.

#### Appropriate Spacing for Transit Operations

Stations were spaced approximately ½ to one mile apart, except in downtowns, where stations were spaced every few blocks.  This is typical spacing for BRT and LRT.

### 5.6.2 Routes

Following the identification of station locations, the second step in defining alignments was to determine the best route for connecting the stations.  The guidelines for selecting routes between stations included minimizing travel time, cost, and environmental and community impacts.

#### Travel Time

Routes were selected to minimize travel time between stations, as shorter overall travel times improve the attractiveness of the transit service and increase transit ridership.

#### Capital Costs

Routes were selected to minimize capital costs associated with right-of-way, structures, utilities, roadway construction and signal systems.

#### Operating Costs

Routes were selected to minimize operating and maintenance costs by selecting the most direct path between stations.

#### Environmental and Community Impacts

Routes were selected to minimize impacts to the existing environment and community including sensitive or protected natural resources, adjacent land uses, vehicular and pedestrian traffic and public safety.

## 5.7 Description of Alternatives

The next step in the process combined the technologies and alignments (station and routes) into an initial set of alternatives. The initial set of alternatives included a No Build which is required by the Federal Transit Administration (FTA); an improved conventional bus alternative called Enhanced Bus; two bus rapid transit (BRT) alternatives; and eight light rail transit (LRT) alternatives.

The initial alternatives were presented at three community open houses, several community meetings, and individual meetings with the affected cities to solicit comments. Subsequently, the alternatives were refined based upon comments received. Refinements were incorporated into the alternatives before they underwent the detailed evaluation described in Chapter 7, Evaluation.

### 5.7.1 No Build

The No Build alternative includes existing and committed infrastructure, facilities and services contained in the region's federally-approved transportation plan, the *Twin Cities 2030 Transportation Policy Plan* (TPP). A no build alternative provides an essential benchmark to test whether project alternatives improve future transit service compared to improvements planned to be implemented without the proposed project. The no build is also used in the subsequent environmental analysis phase of project development in this case an Environmental Impact Statement (EIS) to compare the environmental impacts of the project to projected conditions without the proposed alternatives.

***Transit Service and Facilities***

The 2030 No Build alternative assumes the future transit service network will closely resemble the dense route structure and extensive facilities of the existing system, with additions reflected in the regional travel model maintained by the Metropolitan Council. The regional travel model incorporates the facilities included in the TPP. By 2030, the current TPP identifies the following transitway services as operational: TH 212 SouthWest Metro Transit bus service to TH 101, Chanhassen and CSAH 41, Chaska; Northstar commuter rail service between Big Lake and Minneapolis; Central Corridor LRT service between downtown Minneapolis and downtown St. Paul via the University of Minnesota; Bottineau Boulevard BRT service between Rogers and downtown Minneapolis; Cedar Avenue BRT service between Apple Valley/Lakeville and the Mall of America in Bloomington; Red Rock commuter rail service between Hastings and downtown Minneapolis via St. Paul; and Rush Line commuter rail between Pine County and St. Paul.

***Roadway Facilities***

In the vicinity of the Southwest Transitway study area, major improvements programmed for implementation under the TPP include the following:

- Lane Additions: Additional highway lanes on I-494, TH 100, and I-35W.
- HOV lanes: Fully implemented on I-35W through Richfield and Minneapolis, with on-line stations for BRT service, identifying the improved I-35W as a transitway.
- Construction of new highway TH 212 from I-494 in Hennepin County into Carver County.
- Bus shoulder lane expansions on TH 62, I-494, TH 100, TH 169, TH 212, and TH 5, facilitating the planned Express Commuter Bus System on I-494, TH 5 and TH 169.
- Park-and-Ride lots: County Road 60/Minnetonka Boulevard, TH 212/TH 101, and TH 212/CSAH 41.

The No Build alternative is incorporated in the 2030 Twin Cities regional travel demand forecasting model, used to forecast ridership for the Southwest Transitway AA.

### 5.7.2 Enhanced Bus Alternative

The FTA requires development of a baseline bus option, the “best bus” alternative, for inclusion in an AA. The FTA defines baseline bus as:

> *“… the best than can be done for mobility without constructing a new transit guideway. An acceptable baseline alternative emphasizes transportation system upgrades such as intersection improvement, minor road widening, traffic engineering actions, bus route restructuring, shortened bus headways, expanded use of articulated buses, reserved bus lanes, contra-flow lanes for buses and High Occupancy Vehicles (HOVs) on freeways, special bus ramps on freeways, expanded park/ride facilities, express and limited-stop service, signalization improvement, and timed-transfer operations.”*[1]

In an AA, the best bus alternative, which is different from the no build alternative, is used as the basis for comparison to the “build” alternatives, which for this AA are defined as BRT and LRT. This is done to demonstrate whether a higher level of investment in a build alternative is justified. In the Southwest Transitway AA, the Enhanced Bus alternative is intended to be the best, or baseline, bus alternative.

The Enhanced Bus alternative includes two new limited-stop bus routes providing bi-directional service between Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and downtown Minneapolis; minor modifications to the existing express service; increased service frequencies; and restructured local service to provide access to stops along the new limited-stop routes.

***Limited-Stop Route “A” – Eden Prairie, Hopkins, St. Louis Park to Downtown Minneapolis***

This route begins at a park-and-ride lot at Mitchell Road and Technology Drive and operates in mixed traffic on Technology Drive, Flying Cloud Drive, Excelsior Boulevard, and TH 7; on bus-only shoulders on TH 169, TH 100, TH 5 and TH 212; and in the I-394 HOV lane to provide service through Eden Prairie, Minnetonka, Hopkins, St. Louis Park and downtown Minneapolis.

Limited-Stop Route “A” stops at Mitchell Road, SouthWest Station, Flying Cloud Drive, TH 212 at Shady Oak Road, TH 169 at Bren Road, TH 169 at Excelsior Boulevard, Excelsior Boulevard at Blake Road, Blake Road just south of TH 7, TH 7 and Texas Avenue, TH 7 and Louisiana Avenue, and TH 7 and Wooddale Avenue.

***Limited-Stop Route “B” – Minnetonka, Hopkins, St. Louis Park to Downtown Minneapolis***

This route begins at the intersection of Shady Oak Road and Excelsior Boulevard and operates in mixed traffic on Excelsior Boulevard, Blake Road, and TH 7; on bus-only shoulders on TH 100; and in the I-394 HOV lane to provide service through Minnetonka, Hopkins, St. Louis Park and downtown Minneapolis.

Limited-Stop Route “B” stops at the intersections of Shady Oak Road and Excelsior Boulevard, Excelsior Boulevard and 8th Avenue, Excelsior Boulevard and TH 169, Excelsior Boulevard and Blake Road, Blake Road and TH 7, TH 7 and Texas Avenue, TH 7 and Louisiana Avenue, and TH 7 and Wooddale Avenue.

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[1] *Annual Report on New Starts, FY 2007 New Starts Evaluation and Rating Process*.

Table 5.2 summarizes the operating plan for the Enhanced Bus alternative limited stop routes. The detailed Enhanced Bus operating plan is contained in *Technical Memorandum No.5, Operating Plans*.

**Table 5.2 Enhanced Bus Service Plan – Frequency (Minutes between Buses) and Hours**

| | **Morning** (4:00 - 6:00 AM) | **AM Peak** (6:00- 9:00 AM) | **Mid-Day** (9:00 AM - 3:00 PM) | **PM Peak** (3:00- 6:00 PM) | **Evening** (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | | | | | |
| Route "A" | 20 minutes | 15 minutes | 20 minutes | 15 minutes | 30 minutes |
| Route "B" | 20 minutes | 15 minutes | 20 minutes | 15 minutes | 30 minutes |
| Combined (A & B) | 10 minutes | 7.5 minutes | 10 minutes | 7.5 minutes | 15 minutes |
| | | | | | |
| **Weekend** | No service | No service | No service | No service | No service |

Figure 5.1 illustrates the Enhanced Bus alternative, showing Limited-Stop routes A and B. The new routes are in addition to the local bus network, modified to serve new route access points.

The initial Enhanced Bus Alternative was developed in direct consultation with Metro Transit and SouthWest Transit staff. The transit operating plan for the Enhanced Bus alternative is generally carried through as an element of the BRT and LRT alternatives so that ridership forecast differences result from characteristics of the alternative and not from the level of transit service provided.

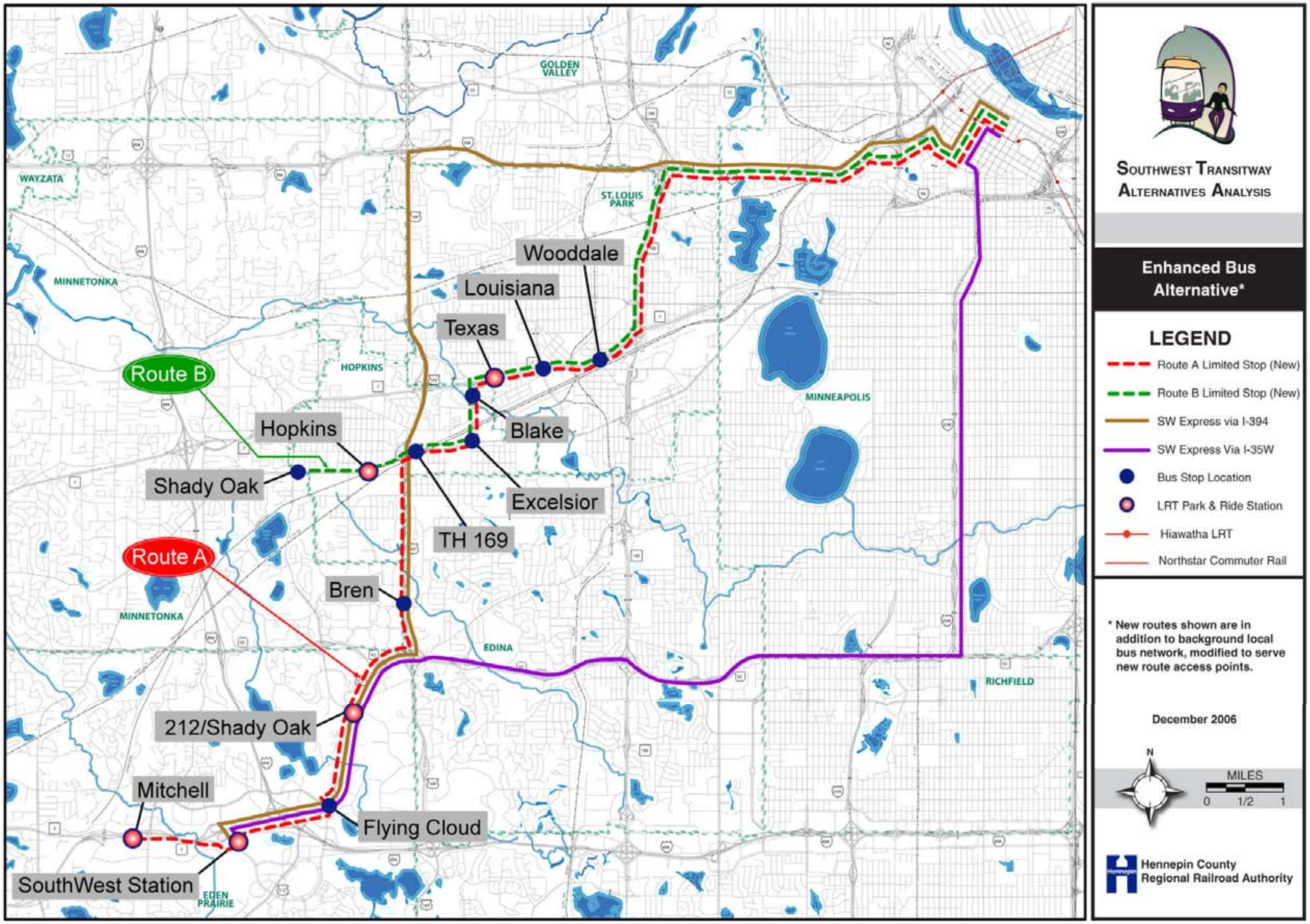
***Refinement***

No public or agency comments were received to warrant changes to the initial Enhanced Bus alternative. The initial Enhanced Bus alternative became the final Enhanced Bus alternative.

### 5.7.3 Build Alternatives

For the Southwest Transitway, the build alternatives, defined as those requiring major infrastructure improvements, are either BRT or LRT. Table 5.3 presents the key characteristics of these two technologies.

## Figure 5.1 Enhanced Bus



### Table 5.3 Characteristics of BRT and LRT

| Characteristic | BRT | LRT |
|---|---|---|
| | | |
| **Service Type** | High frequency (7.5 minute peak), bi-directional, line-haul, limited-stop, seven days per week. | High frequency (7.5 minute peak), bi-directional, line-haul, limited-stop, seven days per week. |
| **Service Hours** | Weekday: 4:00 AM to 2:00 AM<br>Weekend/Holiday: 4:00 AM to 2:00 AM | Weekday: 4:00 AM to 2:00 AM<br>Weekend/Holiday: 4:00 AM to 2:00 AM |
| **Station Spacing** | Downtown: ¼ to ½ mile<br>First ring: ½ to 1 mile<br>Second ring: 1 to 2 miles | Downtown: ¼ to ½ mile<br>First ring: ½ to 1 mile<br>Second ring: 1 to 2 miles |
| **Fare Collection** | Proof of Payment | Proof of Payment |
| **Stations** | High amenity, on-line with park-and-ride where appropriate. | High amenity, on-line with park-and-ride where appropriate. |
| **Dedicated Guideway** | Two-lane bus only roadway with bypass lanes at station locations (approximately 28 feet in width) | Two exclusive tracks (approximately 30 feet in width) |
| **Vehicles** | Low-floor, diesel hybrid vehicles with branding | Light rail vehicles |
| **Intelligent Transportation System (ITS)** | Signal priority and pre-emption where feasible | Signal priority and pre-emption where feasible. |

### 5.7.3.1 Bus Rapid Transit (BRT) Alternatives

Effective bus rapid transit service is defined as frequent, direct, easy to understand, comfortable, reliable, operationally efficient, and above all, rapid. Bus rapid transit encompasses a wide variety of potential features, allowing the BRT concept to be tailored to the needs and resources of the community for which it is proposed. For the Southwest Transitway, BRT alternatives were identified as offering high-capacity, high-frequency bus operation in an exclusive, bus-only, two-lane roadway ("guideway"), with on-line, high-amenity stations. Passing lanes are provided at stations.

Two BRT alternatives, labeled BRT 1 and BRT 2, were designed to serve the travel needs of the study area. In developing these BRT alternatives the consultant team reviewed the *29th Street and Southwest Busway Feasibility Study, 2000, Mn/DOT's Exclusive Busway Study, 2000,* and the Federal Transit Administration's Report*, the Characteristics of Bus Rapid Transit*.

In order to ensure that the ridership differences that the travel demand model shows between the Enhanced Bus (baseline) alternative and BRT alternatives are due to the BRT technology, two routes similar in structure and operations to the Enhanced Bus Limited-Stop Routes "A" and "B" are assumed to operate as the Southwest BRT alternatives in the BRT guideway. These two primary bus routes operate on the BRT guideway under both BRT alternatives. These routes combine with existing and planned express and local routes to provide overall BRT service within the guideway. Limited-Stop Route "A" operates along the entire length of the guideway and stops at all BRT stations. Limited-Stop Route "B" enters the guideway in Hopkins and also stops at all BRT stations.

In addition to the new Limited-Stop routes, SouthWest Metro Transit and Metro Transit express routes would use the BRT exclusive two-lane roadway for portions of their routes. In contrast to the Limited-Stop routes, express buses would not stop at BRT stations once they have entered the guideway. The BRT operating plans also include a number of feeder buses which provide local service to BRT stations. The feeder bus plan for each BRT alternative is described in *Technical Memorandum No.5, Operating Plans*.

The new Limited-Stop "A" and "B" routes provide overlapping service from the Shady Oak Station to Minneapolis, combining to offer 7.5-minute headways from Shady Oak into downtown Minneapolis. Table 5.4 summarizes the service plan for the BRT routes which stop at all stations.

### Table 5.4 BRT Limited-Stop Service Plan – Frequency (Minutes between Buses) and Hours

| | **Morning** (4:00 - 6:00 AM) | **AM Peak** (6:00- 9:00 AM) | **Mid-Day** (9:00 AM - 3:00 PM) | **PM Peak** (3:00- 6:00 PM) | **Evening** (6:00 PM - 2:00AM) |
|---|---|---|---|---|---|
| **Weekday** | | | | | |
| Entire Guideway Routes BRT 1-1 and BRT 2-1 (Route "A") | 20 minutes | 15 minutes | 20 minutes | 15 minutes | 30 minutes |
| Hopkins to Downtown Routes BRT 1-2 and BRT 2-2 (Route "B") | 20 minutes | 15 minutes | 20 minutes | 15 minutes | 30 minutes |
| Combined (A & B) | 10 minutes | 7.5 minutes | 10 minutes | 7.5 minutes | 15 minutes |
| **Weekend** | 15-60 minutes | 15-60 minutes | 10-20 minutes | 10-20 minutes | 15-60 minutes |

More information on the BRT operating plans can be found in *Technical Memorandum No.5, Operating Plans*.

The alignment for the BRT guideway for both BRT alternatives is described below:

## BRT 1 – Initial Alternative

The exclusive bus-only guideway in the BRT 1 alternative extends from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. The two primary routes operating on this guideway, BRT 1-1 and BRT 1-2, provide overlapping service from Shady Oak Road to Minneapolis, combining to offer 7.5 -minute headways from Shady Oak into downtown Minneapolis.

***Routing***

*BRT 1-1 (Route A – Eden Prairie to Minneapolis)*
The route begins near the intersection of TH 5 and the HCRRA's Southwest right-of-way. From that point the route enters a new exclusive (bus-only) guideway in the HCRRA's Southwest right-of-way to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive guideway in the HCRRA's Cedar Lake Corridor. When it reaches the new Van White

Boulevard, the route exits the exclusive guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis. The route ends at the intersection of 5th Street and Hennepin Avenue, adjacent to the existing Hiawatha LRT line, then loops around using 3rd and 4th Streets.

*BRT 1-2 (Route B – Minnetonka to Minneapolis)*
This route begins at Shady Oak Road and the HCRRA's Southwest right-of-way. From that point the route enters new exclusive guideway in the HCRRA's Southwest right-of-way to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive guideway in the HCRRA's Cedar Lake Corridor. When it reaches the new Van White Boulevard, the route exits the exclusive guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis. The route ends at the intersection of 5th Street and Hennepin Avenue, adjacent to the existing Hiawatha LRT line, then loops around using 3rd and 4th Streets.

#### *Guideway*

A new exclusive two-lane bus-only roadway with station passing lanes would be constructed in the HCRRA's Southwest right-of-way from TH 5 to West Lake Street, in the Kenilworth Corridor from West Lake Street to Penn Avenue, and the Cedar Lake Corridor from Penn Avenue to Dunwoody Boulevard. The existing bus lanes on Hennepin Avenue would be used for access throughout downtown Minneapolis.

#### *Stations*

BRT 1 provides service to the following BRT stations: TH 5, TH 62, Rowland Road, Shady Oak Road, Hopkins, TH 169, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, 12th Street, 8th Street, and 4th Street.

### BRT 1 – Refined Alternative

Based upon comments received, the initial BRT 1 alternative was modified as follows:

- The initial alternative did not include a Penn Avenue Station. In response to comments from the Bryn Mawr neighborhood, a station was added at Penn Avenue.
- To provide better feeder bus connections, the station originally identified at TH 169 was moved to Blake Road.

Figure 5.2 illustrates refined alternative BRT 1. The detailed description of BRT 1 is contained in *Technical Memorandum No. 3, Description of Alternatives.*

### BRT 2 – Initial Alternative

The exclusive bus-only guideway in the BRT 2 alternative extends from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis. As with BRT 1, the two primary routes, BRT 2-1 and BRT 2-2, provide overlapping service from Shady Oak Road to Minneapolis, combining to offer 7.5-minute headways from Shady Oak into downtown Minneapolis.

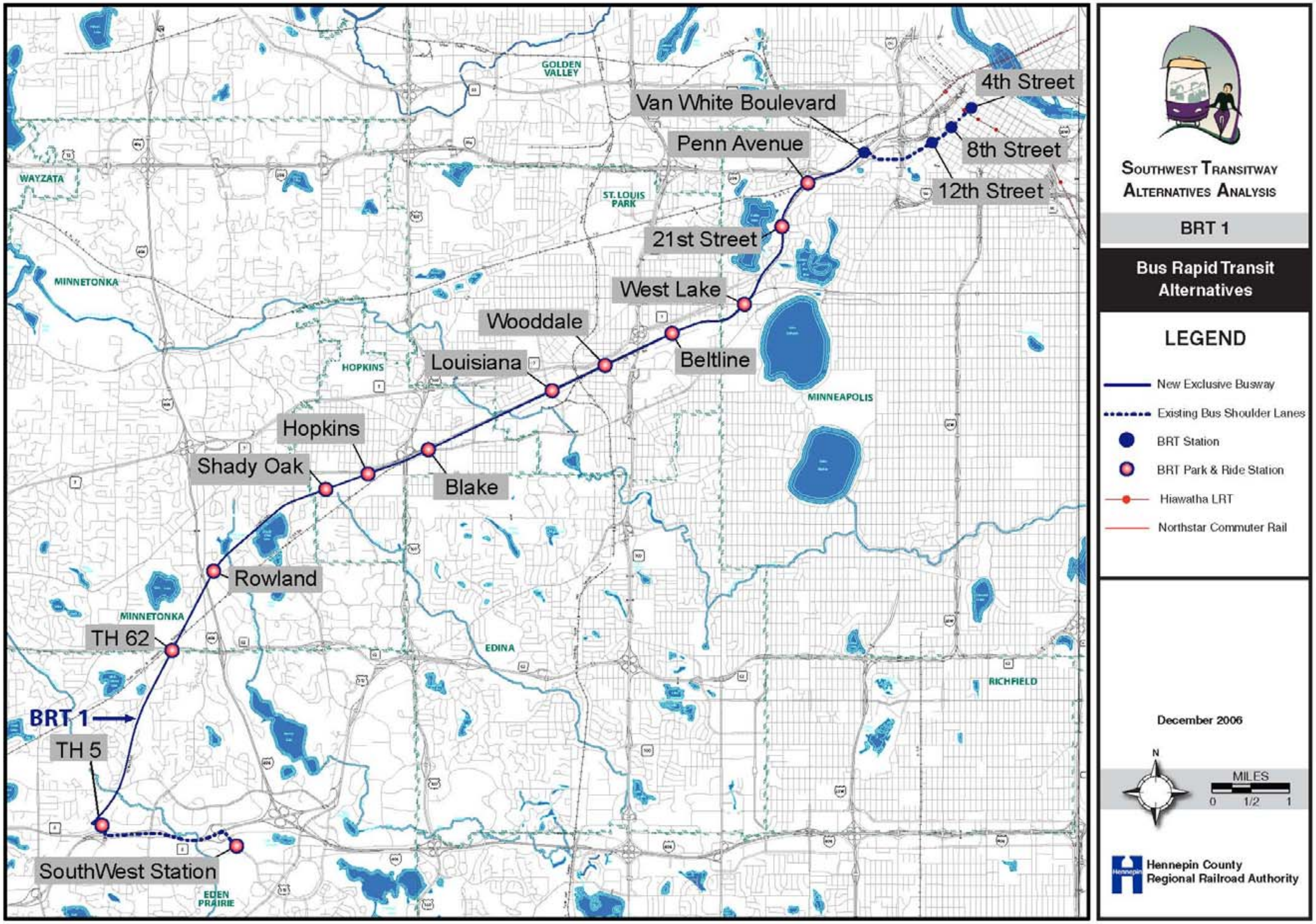
#### *Routing*

*BRT 2-1 (Route A: Eden Prairie to Minneapolis)*

The route begins near the intersection of TH 5 and HCRRA's Southwest Corridor right-of-way in Eden Prairie. From that point the route uses the existing bus-only shoulders along TH 5 to the Prairie Center Drive interchange, where it enters new reserved bus-only lanes along Prairie Center Drive. It follows Prairie Center Drive south, then turns east into new reserved bus-only lanes along Singletree Lane and new right-of-way to Prairie Center Drive. At Prairie Center Drive, it turns north and continues in new bus-only shoulders to TH 212. At TH 212, the route enters an exclusive (bus-only) guideway along the east side of the TH 212 right-of-way, then swings east and north along new right-of-way through the Golden Triangle area. After crossing Shady Oak Road, the exclusive guideway crosses over TH 212 into the City West area, then crosses over TH 62 into the Opus area of Minnetonka. At Bren Road the route leaves the bus-only guideway and follows new reserved bus-only lanes along Bren Road to the TH 169 interchange. At TH 169 the route follows the existing bus-only shoulders north to Excelsior Boulevard, where it then enters an exclusive guideway located in the HCRRA's Southwest right-of-way.

For this alternative, the exclusive guideway in the HCRRA's Southwest right-of-way begins near Shady Oak Road. It continues east, passing under TH 169, where it is joined by the route branch coming north from Bren Road. The combined route continues in the exclusive guideway to West Lake Street in Minneapolis.

## Figure 5.2 BRT 1



Just north of West Lake Street the route enters an exclusive guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive guideway in the HCRRA's Cedar Lake Corridor. When it reaches the new Van White Boulevard, the route exits the exclusive guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis. The route ends at the intersection of 5th Street and Hennepin Avenue, adjacent to the existing Hiawatha LRT line, then loops around using 3rd and 4th Streets.

<u>*BRT 2-2 (Route B – Minnetonka to Minneapolis)*</u>
This route begins at Shady Oak Road and the HCRRA's Southwest right-of-way. From that point the route enters new exclusive guideway in the HCRRA's Southwest right-of-way to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive guideway in the HCRRA's Cedar Lake Corridor. When it reaches the new Van White Boulevard, the route exits the exclusive guideway and follows new reserved bus-only lanes along Dunwoody Boulevard and Hennepin Avenue into downtown Minneapolis. The route ends at the intersection of 5th Street and Hennepin Avenue, adjacent to the existing Hiawatha LRT line, then loops around using 3rd and 4th Streets.

#### *Guideway*

BRT 2 uses bus-only shoulder lanes on TH 5, Prairie Center Drive, Singletree Lane, Flying Cloud Drive, portions of TH 212, Bren Road, and TH 169. New sections of two-lane bus-only roadway with station passing lanes would be constructed to extend Singletree Lane near Eden Prairie Center, and enter the Golden Triangle, City West and Opus areas. A new, exclusive two-lane bus-only roadway would also be constructed in the HCRRA's Southwest right-of-way from the Shady Oak Road station to West Lake Street, in the Kenilworth Corridor from West Lake Street to Penn Avenue, and in the Cedar Lake Corridor from Penn Avenue to Dunwoody Boulevard. The existing bus lanes on Hennepin Avenue would be used for access throughout downtown Minneapolis.

#### *Potential Route Variations*

This alternative includes a route variation in Eden Prairie. After serving the SouthWest Metro Transit station, the route could continue east on bus-only shoulders along TH 5. Once it passes under I-494 and Valley View Road, the route would enter an exclusive guideway that carries it into the Golden Triangle area. This variation does not include an Eden Prairie Center station.

#### *Stations*

BRT 2 provides service to the following BRT stations: TH 5, SouthWest Station, Eden Prairie Center, Golden Triangle, City West, Opus, Shady Oak Road, Hopkins, TH 169, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, 12th Street, 8th Street, and 5th Street.

### BRT 2 – Refined Alternative

Based upon comments received, the initial BRT 2 alternative was modified as follows:

- The initial alternative did not include a Penn Avenue Station. In response to comments from the Bryn Mawr neighborhood, a station was added at Penn Avenue.
- In the initial alternative, the terminal station was located at TH 5. To avoid an additional freeway crossing, the terminal station was moved from the south side of TH 5 to Mitchell Road.
- In the initial alternative, westbound vehicles were proposed to use TH 5 between the SouthWest Metro Transit Station and Mitchell Road. For operating efficiency, westbound vehicles are proposed to use Technology Drive rather than TH 5.
- In the initial alternative, the BRT guideway crossed I-494 at Eden Prairie Center. The

refinement includes crossing I-494 at Flying Cloud Drive rather than at Prairie Center Drive.

- To provide better integration with Eden Prairie's plan for the Major Center Area, the Eden Prairie Center Station was moved west about 1/3 miles and re-named the Eden Prairie Town Center station.
- To provide better feeder bus connections, the station originally identified at TH 169 was moved to Blake Road.

Figure 5.3 illustrates refined alternative BRT 2. More information about BRT 2 can be found in *Technical Memorandum No.3, Definition of Alternatives*.

#### 5.7.3.2 Light Rail Transit (LRT) Alternatives

Light rail transit is a medium- to high-capacity passenger rail service than can be used both for service in areas with mixed traffic and closely-spaced stops, and also for long-haul higher-speed trips on exclusive guideways. LRT service is characterized by train service that is frequent, direct, easy to understand, comfortable, reliable, operationally efficient and rapid. LRT typically operates in exclusive or semi-exclusive rights-of-way and is powered by an overhead electrification system. LRT typically features on-line, high-amenity stations.

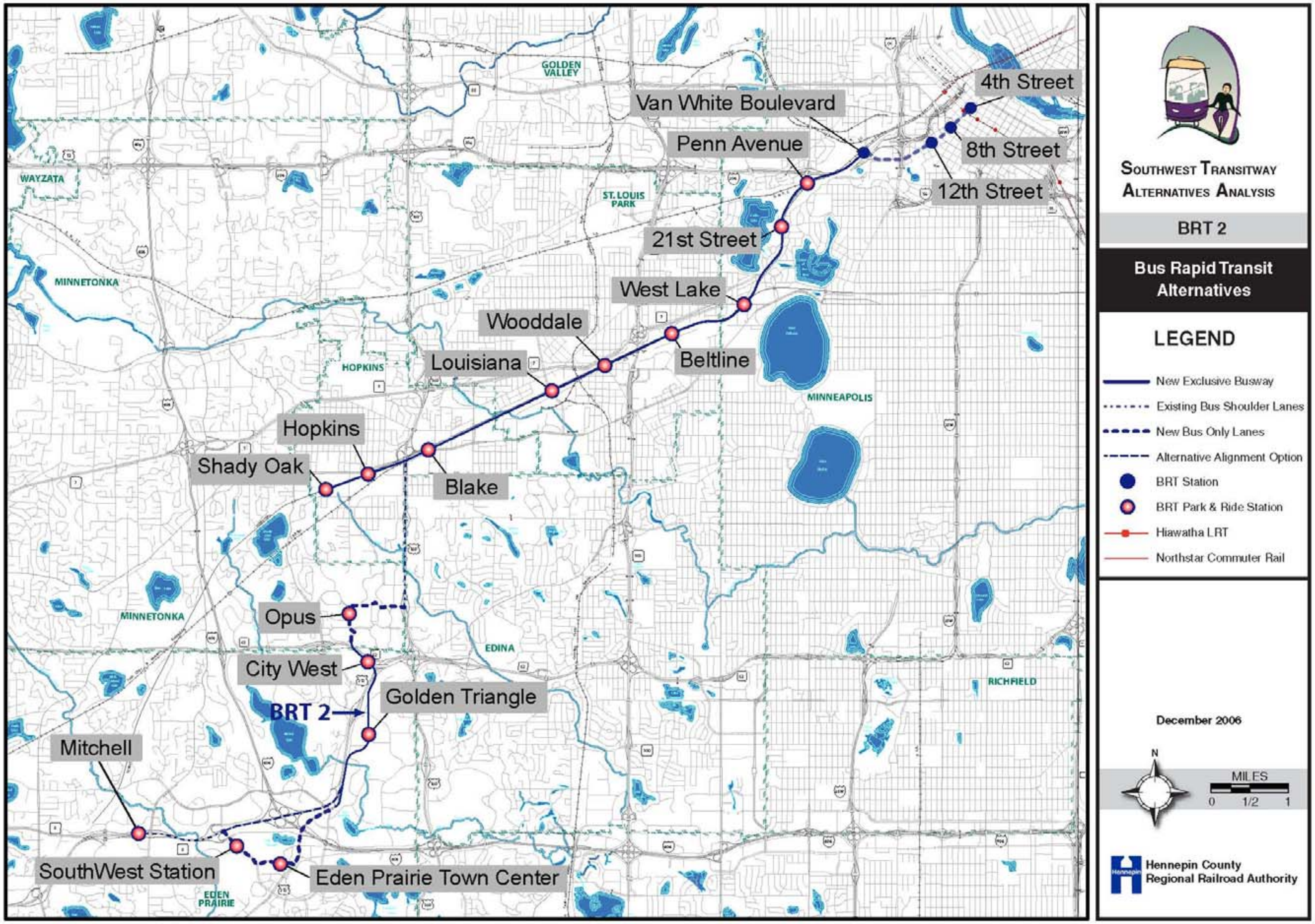
Eight initial LRT alternatives were defined to serve the travel needs of the study area. The eight LRT alternatives are identified using a combination of a numeric (1, 2, 3, or 4) and alphabetic (A or C) designations. The numbers designate the four possible routings west of Louisiana Avenue in St. Louis Park. The letters designate the two possible routes east of Louisiana Avenue.

In developing the initial LRT alternatives, the HCRRA's *Southwest Rail Transit Study, 2003* was reviewed. The four LRT alternatives recommended for continued study in the 2003 study were included in the Southwest AA's initial set of alternatives. These alternatives are identified as LRT 1A, LRT 2A, LRT 3A, and LRT 4A, and are described in more detail later in this chapter.

An additional four LRT alternatives were added to the initial set of alternatives. These alternatives were defined to use the same routings as LRT 1A, LRT 2A, LRT 3A, and LRT 4A west of West Lake Street in Minneapolis. East of West Lake Street these alternatives, labeled LRT 1C, LRT 2C, LRT 3C and LRT 4C use the HCRRA's Midtown Corridor and Nicollet Avenue. This LRT routing, labeled as "C", is similar to an LRT routing recommended for the Southwest Transitway in the 1988 Draft Environmental Impact Statement (DEIS).

Alternatives numbered "1" designate routes that use the HCRRA's Southwest right-of-way through Eden Prairie, Minnetonka, Hopkins, to Louisiana Avenue in St. Louis Park. Alternatives numbered "2" designate routes that use TH 5 and I-494 rights-of-way through Eden Prairie and Minnetonka and HCRRA's Southwest right-of-way through Hopkins to Louisiana Avenue in St. Louis Park. Alternatives numbered "3" use a combination of new exclusive rights-of-way through Eden Prairie, Minnetonka and part of Hopkins, in addition to the HCRRA's Southwest right-of-way through Hopkins to Louisiana Avenue in St. Louis Park. Alternatives numbered "4" designate shortened routes using the HCRRA's Southwest right-of-way from Shady Oak Road in Minnetonka to

## Figure 5.3 BRT 2



Louisiana Avenue in St. Louis Park. These alternatives do not provide direct LRT service to areas of Minnetonka west of Shady Oak Road and Eden Prairie. LRT alternatives 1 through 4 mirror those resulting from the HCRRA's *Southwest Rail Transit Study, 2003*.

Alternatives with the letter "A" designate routes that use the HCRRA's Southwest right-of-way through St. Louis Park, and the HCRRA's Kenilworth and Cedar Lake Park Corridors in Minneapolis. Alternatives with the letter "C" designate routes that use the HCRRA's Southwest Corridor in St. Louis Park, the HCRRA's Midtown Corridor in Minneapolis, and a shallow tunnel under Nicollet Avenue in Minneapolis. In general, the A and C routings are similar to those contained in the HCRRA's *Draft Environmental Impact Statement (DEIS) Hennepin County LRT System, 1988.*

The alternatives also include potential route variations for some of the LRT alternatives. For all A alternatives, one variation uses Dunwoody Boulevard and Hennepin Avenue rather than Royalston Avenue to access downtown Minneapolis. This route variation cannot "interline" or operate with the Hiawatha LRT line westbound to access the Warehouse and proposed Intermodal stations.
The service frequency and span (hours of service) for the Southwest LRT alternatives is assumed to be the same as the existing operating plan for the Hiawatha Light Rail line. Table 5.5 summarizes this service plan. All LRT alternatives include feeder bus service which provides local bus service to and from LRT stations. More information about the LRT alternative operating plans and feeder bus service can be found in *Technical Memorandum No.5, Operating Plans*.

**Table 5.5 LRT Service Plan – Frequency (Minutes between Trains) and Hours**

| | **Morning** (4:00 - 6:00 AM) | **AM Peak** (6:00- 9:00 AM) | **Mid-Day** (9:00 AM - 3:00 PM) | **PM Peak** (3:00- 6:00 PM) | **Evening** (6:00 PM - 2:00 AM) |
|---|---|---|---|---|---|
| **Weekday** | 15-30 minutes | 7.5 minutes | 10 minutes | 7.5 minutes | 15-30 minutes |
| **Saturday** | 15-30 minutes | 15-30 minutes | 10 minutes | 10 minutes (to 7:30 PM) | 15-30 minutes |
| **Sunday/ Holiday** | 15-30 minutes | 15-30 minutes (to 10:00 AM) | 10 minutes | 10 minutes | 15-30 minutes |

Each LRT alternative is described below.

## LRT 1A – Initial Alternative

LRT 1A operates from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Routing*

The LRT route begins near the intersection of TH 5 and the HCRRA's Southwest right-of-way. From that point the route enters a new exclusive light rail transit (LRT) guideway in the HCRRA's Southwest right-of-way to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At

Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lake Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lake Corridor to street level, where it enters Royalston Avenue. In Royalston Avenue the route operates on semi-exclusive LRT guideway in the median of Royalston Avenue to 7th Street. At 7th Street the route enters a shallow tunnel under 7th Street to 5th Street. At 5th Street the route continues through downtown Minneapolis on the Hiawatha LRT tracks.

***Potential Route Variations***

Two route variations are included in the LRT 1A alternative, one in Eden Prairie and the other in downtown Minneapolis.

Under the LRT 1A alternative as described above, the LRT route must cross the TC&W Railroad tracks near TH 62. The TH 62 overpass and the existing grades in that area make the crossing difficult. To avoid this potentially difficult and costly crossing, a short route variation that uses the TC&W and Canadian Pacific right-of-way may be evaluated in future engineering studies. Under this variation the route turns into the railroad right-of-way after passing beneath TH 62, and runs next to the railroad tracks to a location approximately ¼ mile west of the Minnetonka-Hopkins city limits. At that point the route crosses beneath the freight tracks and turns north, following new right-of-way until it reaches the HCRRA's Southwest right-of-way. The route then enters the HCRRA's Southwest right-of-way and proceeds towards Minneapolis.

The second route variation uses Dunwoody Boulevard and Hennepin Avenue rather than Royalston Avenue to access downtown Minneapolis. Under this variation the route leaves the HCRRA's Cedar Lake Corridor at the new Van White Boulevard and enters Dunwoody Boulevard and Hennepin Avenue to 5th Street in downtown Minneapolis. While this route variation can interline with the Hiawatha LRT line eastbound it cannot interline with the Hiawatha LRT line westbound to access the Warehouse and proposed Intermodal stations.

***Stations***

LRT 1A provides service to the following stations: TH 5, TH 62, Rowland Road, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, and Royalston.

Because this route operates on the Hiawatha LRT tracks through downtown Minneapolis it also provides direct service to the proposed Intermodal, as well as existing Warehouse, Nicollet, Government Plaza and Metrodome LRT stations.

The Hennepin Avenue variation of this alternative does not include service to the proposed Royalston, the proposed Intermodal, and the Warehouse stations. However, it does provide service to new stations at 14th Street and 10th Street as well as to the existing LRT stations at Nicollet, Government Plaza, and the Metrodome in downtown Minneapolis.

### LRT 1A – Refined Alternative

Based upon comments received, the initial LRT 1A alternative was modified as follows:

- The initial alternative did not include a Penn Avenue Station. In response to comments from the Bryn Mawr neighborhood, a station was added at Penn Avenue.
- To provide better access to the bus network, the stations along the Hennepin Avenue option were moved from 14th and 10th Streets to 12th and 8th Streets.
- Because of freight railroad grade constraints, the potential route deviation that shares the TCW-

CP right-of-way turns north following the Minnetonka-Hopkins jurisdiction boundary rather than ¼ mile west.

Figure 5.4 illustrates refined alternative LRT 1A.

### LRT 2A – Initial Alternative

LRT 2A operates from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

#### *Routing*

The LRT route begins near the intersection of TH 5 and the HCRRA's Southwest right-of-way in Eden Prairie. From that point the route enters an exclusive LRT guideway along the south side of TH 5, crossing under Prairie Center Drive. As it approaches the I-494/TH 5 interchange, the route climbs and crosses over TH 5, descending along the west side of the I-494 exit ramp to TH 5. It continues north along the west side of I-494 right-of-way to the HCRRA's Southwest right-of-way, where it turns east and crosses under the freeway.

After entering the HCRRA's Southwest right-of-way, the route continues on an exclusive LRT guideway to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lake Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lake Corridor to street level where it enters Royalston Avenue. In Royalston Avenue the route operates on semi-exclusive LRT guideway in the median of Royalston Avenue to 7th Street. At 7th Street the route enters a shallow tunnel under 7th Street to 5th Street. At 5th Street the route continues through downtown Minneapolis on the Hiawatha LRT tracks.

#### *Potential Route Variation*

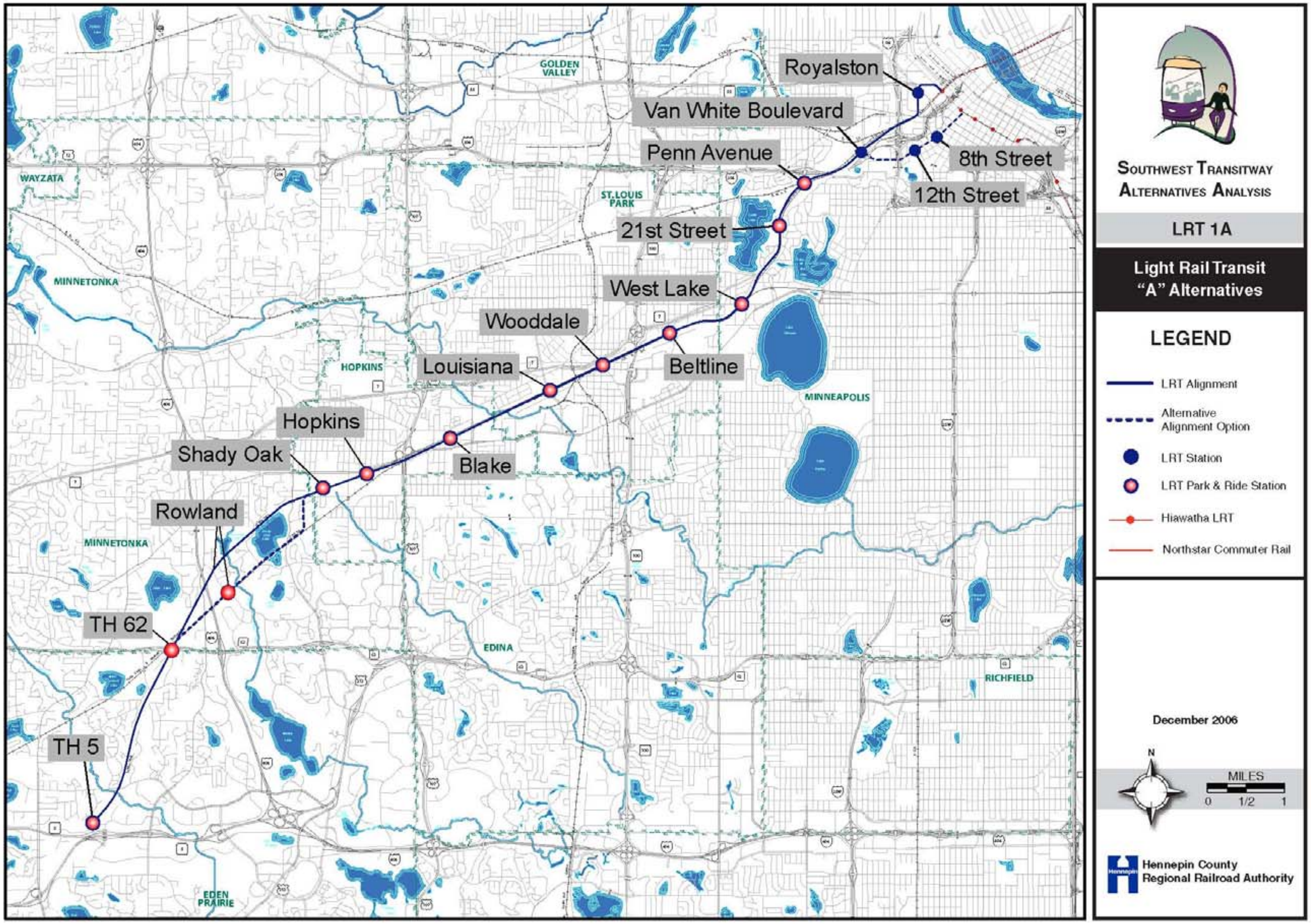
This alternative includes the potential Hennepin Avenue route variation described under LRT 1A.

#### *Stations*

LRT 2A provides service to the following stations: TH 5, SouthWest Station, Valley View, TH 62, Rowland Road, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, and Royalston.

Because this route can operate on the Hiawatha LRT tracks through downtown Minneapolis it also provides direct service to the proposed Intermodal, as well as existing Warehouse, Nicollet, Government Center and Metrodome LRT stations.

**Figure 5.4 LRT 1A**



### LRT 2A – Refined Alternative

Based upon comments received, the initial LRT 2A alternative was modified as follows:

- The initial alternative did not include a Penn Avenue Station. In response to comments from the Bryn Mawr neighborhood, a station was added at Penn Avenue.
- To provide better access to the bus network, the stations along the Hennepin Avenue option were moved from 14th and 10$^{th}$ Streets to 12$^{th}$ and 8$^{th}$ Streets.
- To avoid an additional freeway crossing, the terminal station was moved from TH 5 to Mitchell Road.
- Because of existing terrain and access issues, the Valley View Station was moved south approximately ¼ mile.
- The TH 62 Station was moved approximately ¼ mile south, adjacent to the athletic club's south parking lot.

Figure 5.5 illustrates refined alternative LRT 2A.

### LRT 3A – Initial Alternative

LRT 3A operates from Mitchell Road in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

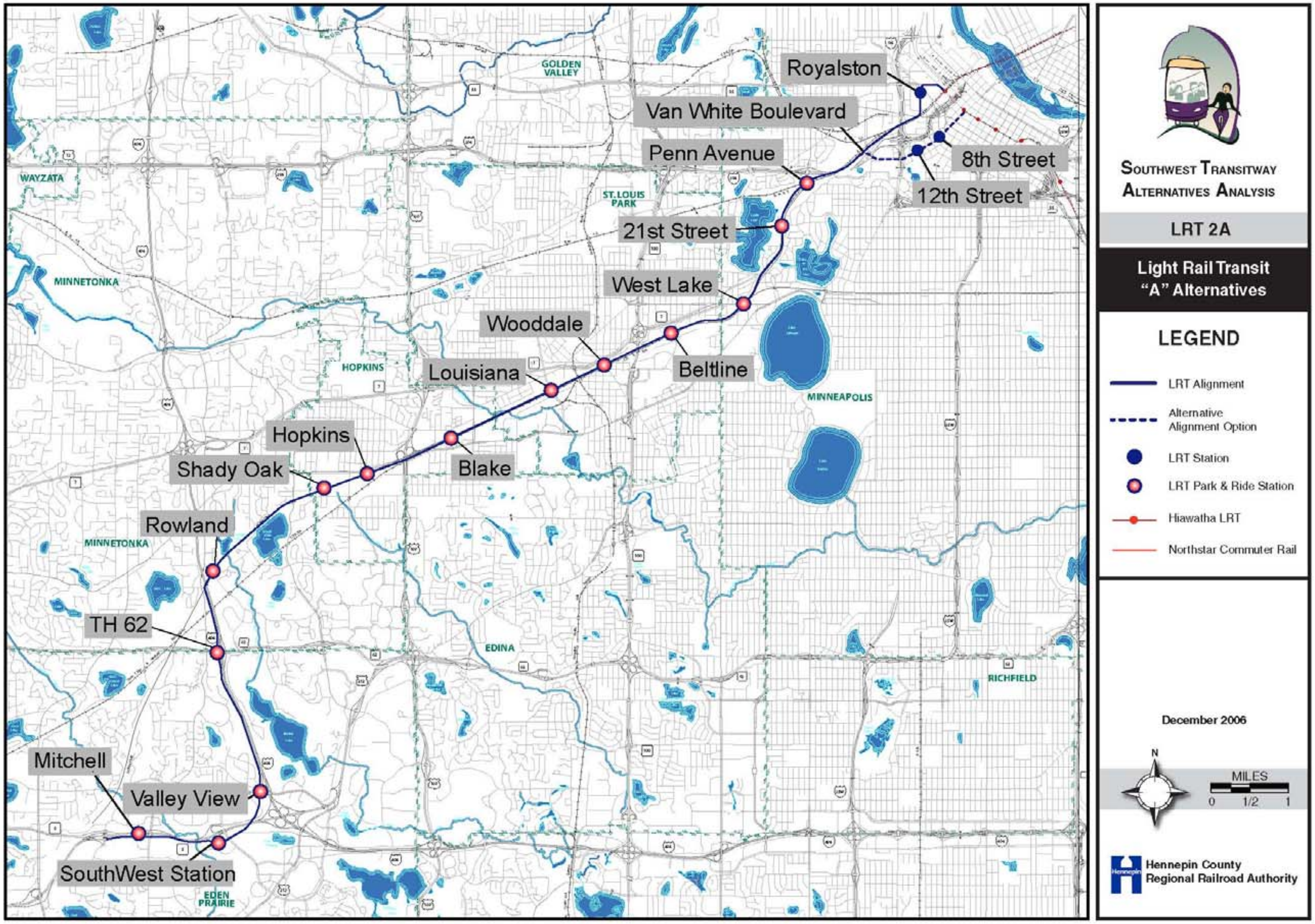
#### *Routing*

The route begins near the intersection of TH 5 and the HCRRA's Southwest right-of-way in Eden Prairie. From that point the route enters an exclusive (LRT) guideway along the south side of TH 5, crossing under Prairie Center Drive. It turns south along the east side of Prairie Center Drive, then turns east into new right-of-way located behind the existing properties on the north side of Singletree Lane. The route continues along the south side of Leona Road to Prairie Center Drive, where it turns north. It runs along the east side of Prairie Center Drive, over I-494 and into the east side of the TH 212 right-of-way.

The route then swings east and north along new right-of-way through the Golden Triangle area. After crossing Shady Oak Road, the route crosses over TH 212 into the City West area, then it crosses over TH 62 into the Opus area of Minnetonka. The route follows new right-of-way through Opus, crossing under Smetana Road and continuing north paralleling the Minnetonka-Hopkins city limits. After reaching the HCRRA's Southwest right-of-way, the route turns east and enters an exclusive LRT guideway to West Lake Street in Minneapolis.

Just north of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lake Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lake Corridor to street level where it enters Royalston Avenue. In Royalston Avenue the route operates on semi-exclusive LRT guideway in the median of Royalston Avenue to 7$^{th}$ Street. At 7$^{th}$ Street the route enters a shallow tunnel under 7$^{th}$ Street to 5$^{th}$ Street. At 5$^{th}$ Street the route continues through downtown Minneapolis on the Hiawatha LRT tracks.

## Figure 5.5 LRT 2A



***Potential Route Variation***

This alternative includes a route variation in Eden Prairie. After serving the SouthWest Metro station, the route would cross under Prairie Center Drive and continue along the north side of Technology Drive. It then turns northeast, crossing over I-494 and intersecting Flying Cloud Drive. The route follows along the east side of Flying Cloud Drive and into the east side of the TH 212 right-of-way. The variation does not include an Eden Prairie Center area station.

This alternative also includes the potential Hennepin Avenue route variation described under LRT 1A.

***Stations***

LRT 3A provides service to the following stations: TH 5, SouthWest Station, Eden Prairie Center, Golden Triangle, City West, Opus, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21st Street, Van White Boulevard, and Royalston.

Because this route can operate on the Hiawatha LRT tracks through downtown Minneapolis it also provides direct service to the proposed Intermodal, as well as existing Warehouse, Nicollet, Government Center and Metrodome LRT stations.

### LRT 3A – Refined Alternative

Based upon comments received, the initial LRT 3A alternative was modified as follows:

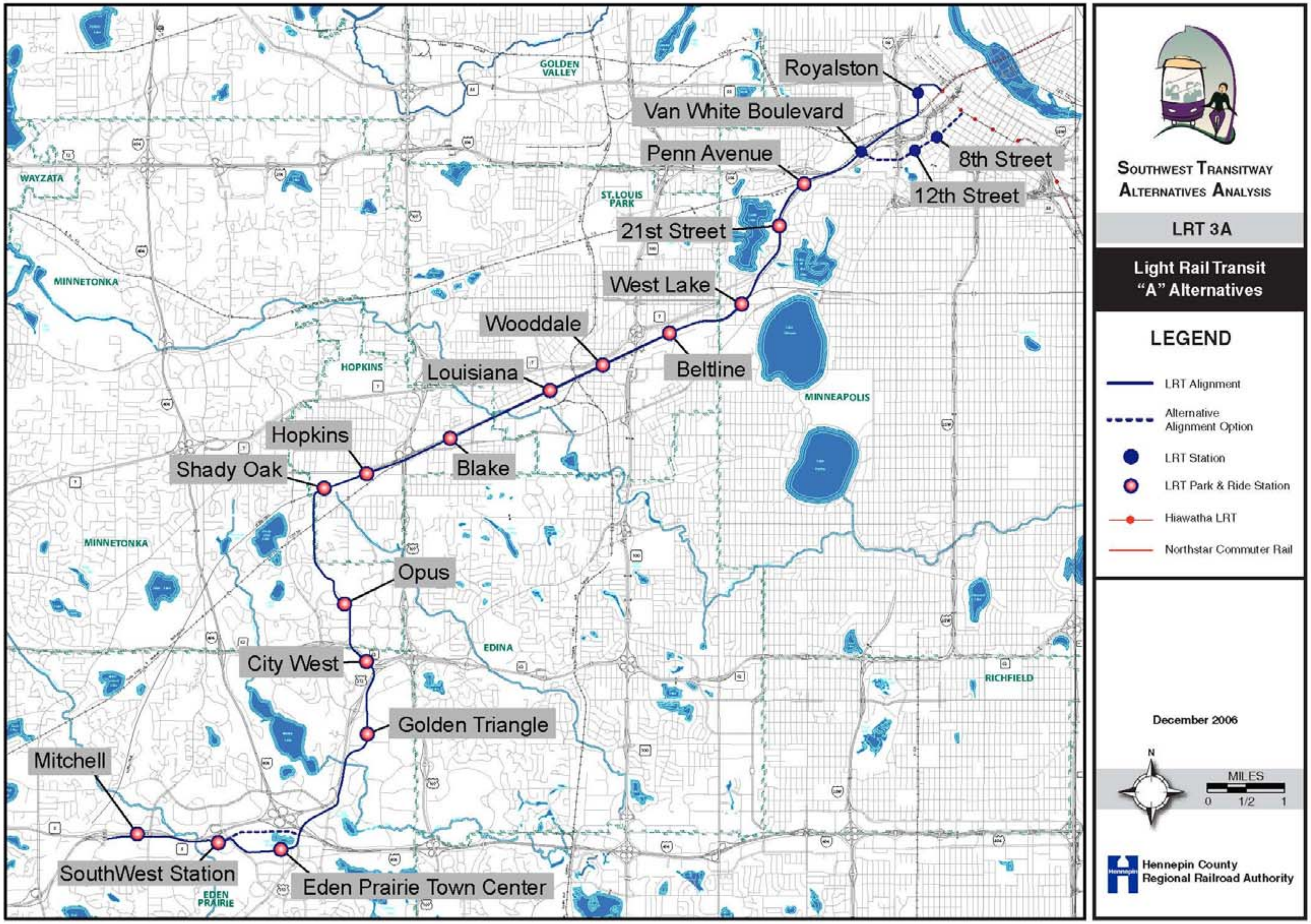
- The initial alternative did not include a Penn Avenue Station. In response to comments from the Bryn Mawr neighborhood, a station was added at Penn Avenue.
- To provide better access to the bus network, the stations along the Hennepin Avenue option were moved from 14th and 10th Streets to 12th and 8th Streets.
- To avoid an additional freeway crossing, the terminal station was moved from TH 5 to Mitchell Road.
- The routing is now proposed to cross I-494 at Flying Cloud Drive rather than Prairie Center Drive.
- To provide better integration with Eden Prairie's plan for the Major Center Area, the Eden Prairie Center Station was moved west approximately 1/3 mile and re-named Eden Prairie Town Center Station.
- Because of existing terrain, the routing through the north end of the Opus development was modified.

Figure 5.6 illustrates refined alternative LRT 3A.

### LRT 4A – Initial Alternative

LRT 4A operates from Shady Oak Road in Minnetonka to downtown Minneapolis, providing service to Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

## Figure 5.6 LRT 3A



### *Routing*

The LRT route begins near the intersection of Shady Oak Road and the HCRRA's Southwest right-of-way. From Shady Oak Road the route enters an exclusive LRT guideway in the HCRRA's Southwest right-of-way to West Lake Street in Minneapolis. Just north of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Kenilworth Corridor to Penn Avenue. At Penn Avenue the route enters an exclusive LRT guideway in the HCRRA's Cedar Lake Corridor to Glenwood Avenue in Minneapolis. At Glenwood Avenue the route climbs from the Cedar Lake Corridor to street level where it enters Royalston Avenue. In Royalston Avenue the route operates on semi-exclusive LRT guideway in the median of Royalston Avenue to 7$^{th}$ Street. At 7$^{th}$ Street the route enters a shallow tunnel under 7$^{th}$ Street to 5$^{th}$ Street. At 5$^{th}$ Street the route continues through downtown Minneapolis on the Hiawatha LRT tracks.

### *Potential Route Variation*

This alternative includes the potential Hennepin Avenue route variation described under LRT 1A.

### *Stations*

LRT 4A provides service to the following stations: Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, 21$^{st}$ Street, Van White Boulevard, and Royalston.

Because this route can operate on the Hiawatha LRT tracks through downtown Minneapolis it also provides direct service to the proposed Intermodal, as well as existing Warehouse, Nicollet, Government Center and Metrodome LRT stations.

## LRT 4A – Refined Alternative

Based upon comments received, the initial LRT 4A alternative was modified as follows:

- The initial alternative did not include a Penn Avenue Station. In response to comments from the Bryn Mawr neighborhood, a station was added at Penn Avenue.
- To provide better access to the bus network, the stations along the Hennepin Avenue option were moved from 14th and 10$^{th}$ Streets to 12$^{th}$ and 8$^{th}$ Streets.

Figure 5.7 illustrates refined alternative LRT 4A.

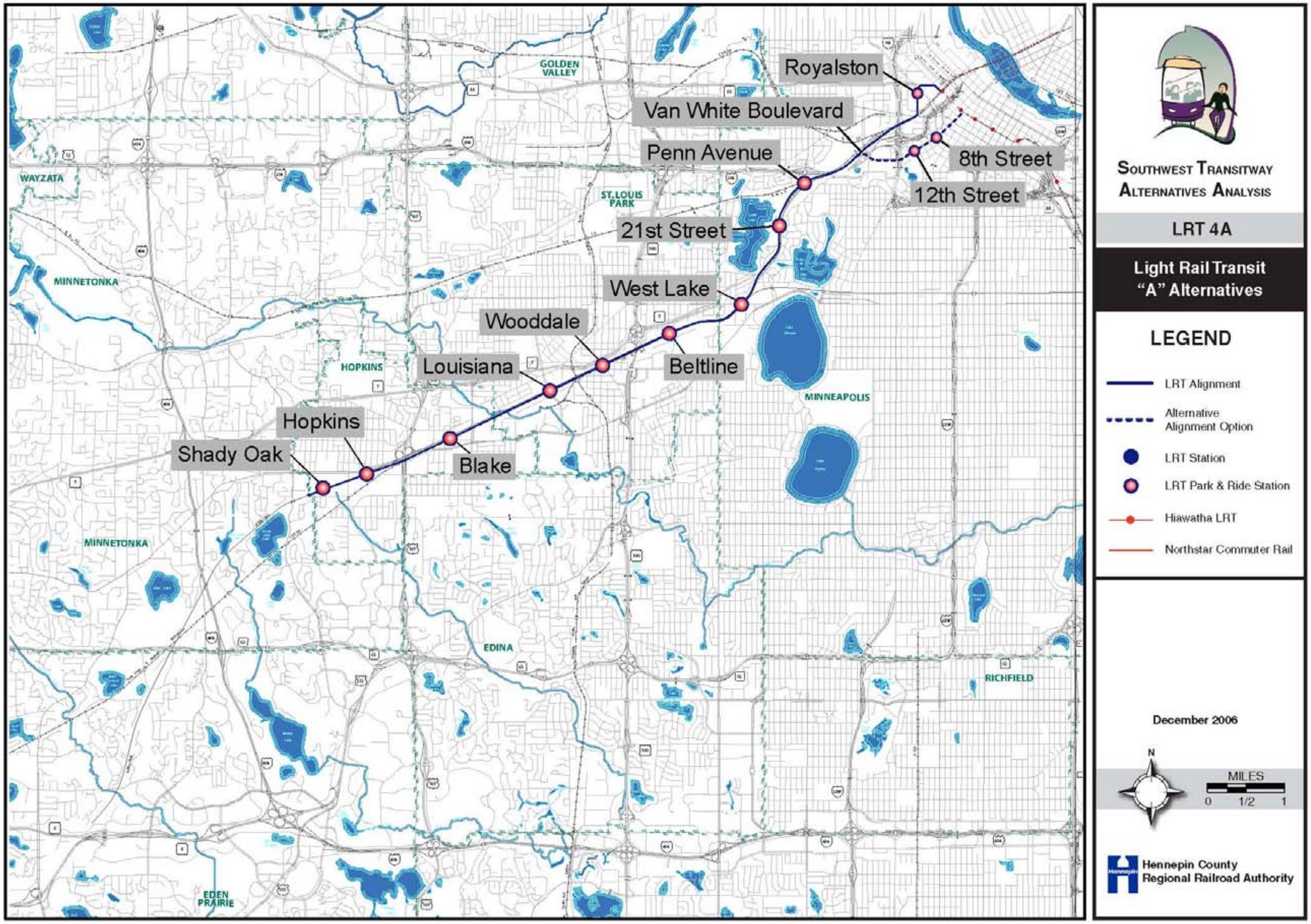
## LRT 1C – Initial Alternative

LRT 1C operates from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

### *Routing*

The LRT route begins near the intersection of TH 5 and the HCRRA's Southwest right-of-way. From that point the route enters an exclusive LRT guideway in the HCRRA's Southwest right-of-way to West Lake Street in Minneapolis. Just east of West Lake Street the route enters an

## Figure 5.7 LRT 4A



exclusive LRT guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive LRT guideway in a shallow tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2nd and Marquette Avenues to 4th Street.

***Potential Route Variation***

This alternative includes the potential shared railroad right-of-way route variation described under LRT 1A.

***Stations***

LRT 1C provides service to the following stations: TH 5, TH 62, Rowland Road, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, Uptown, Lyndale Avenue, 28th Street, Franklin Avenue, 12th Street, 8th Street (Nicollet routing), 8th Street (2nd/Marquette routing), and 4th Street.

### LRT 1C – Refined Alternative

Based upon comments received, the initial LRT 1A alternative was modified as follows:

- Because of freight railroad grade constraints, the potential route deviation that shares the TCW-CP right-of-way turns north following the Minnetonka-Hopkins jurisdiction boundary rather than ¼ mile west.
- Because of transit operating issues, the LRT C alternatives under the 2nd/Marquette one-way pair option would operate on a loop via 4th Street.
- Because of parking ramp access issues and to facilitate better pedestrian flow, stations on the 2nd/Marquette one-way pair option were moved to 7th Street rather than 8th Street.

Figure 5.8 illustrates refined alternative LRT 1C.

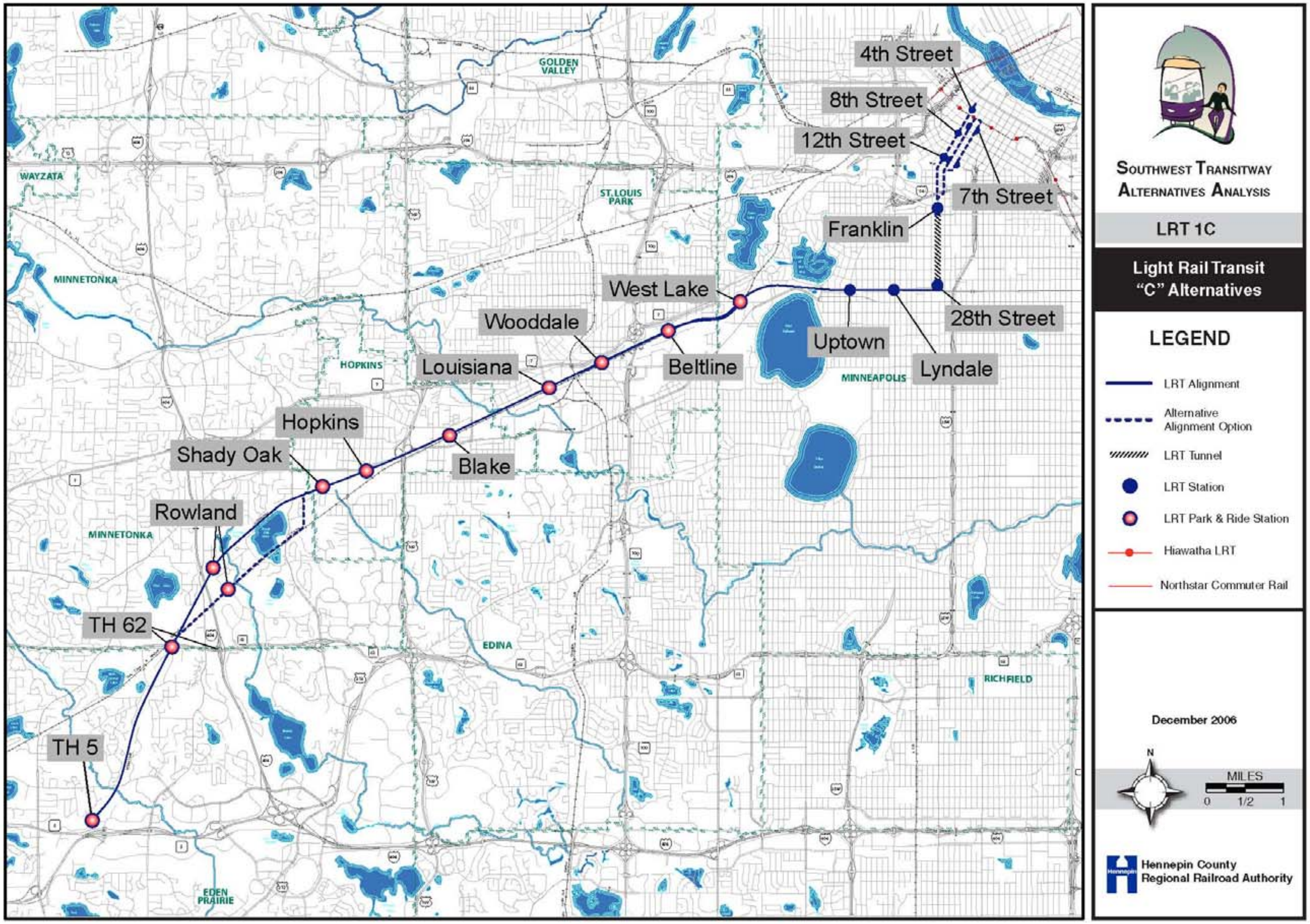
### LRT 2C – Initial Alternative

LRT 2C operates from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

***Routing***

The route begins near the intersection of TH 5 and HCRRA's Southwest right-of-way in Eden Prairie. From that point the route follows along the south side of TH 5, crossing under Prairie Center Drive. As it approaches the I-494/TH 5 interchange, the route climbs and crosses over TH 5, descending along the west side of the I-494 exit ramp to TH 5. It continues north along the west

## Figure 5.8 LRT 1C



side of I-494 to the HCRRA's Southwest right-of-way, where it turns east and crosses under the freeway.

After entering the HCRRA's Southwest right-of-way, the route continues in an exclusive LRT guideway to West Lake Street in Minneapolis. Just east of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive LRT guideway in a shallow tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant Street, the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2nd and Marquette Avenues to 4th Street.

#### *Stations*

LRT 2C includes service to the following stations: TH 5, SouthWest Station, Valley View, TH 62, Rowland Road, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, Uptown, Lyndale Avenue, 28th Street, Franklin Avenue, 12th Street, 8th Street (Nicollet routing), 8th Street (2nd/Marquette routing), and 4th Street.

### LRT 2C – Refined Alternative

- To avoid an additional freeway crossing, the terminal station was moved from TH 5 to Mitchell Road.
- Because of existing terrain and access issues, the Valley View Station was moved south approximately ¼ mile.
- The TH 62 Station was moved approximately ¼ mile south, adjacent to the athletic club's south parking lot.
- Because of transit operating issues, the LRT C alternatives under the 2nd/Marquette one-way pair option would operate on a loop via 4th Street.
- Because of parking ramp access issues and to facilitate better pedestrian flow, stations on 2nd/Marquette one-way pair option were moved to 7th Street rather than 8th Street.

Figure 5.9 illustrates refined alternative LRT 2C.

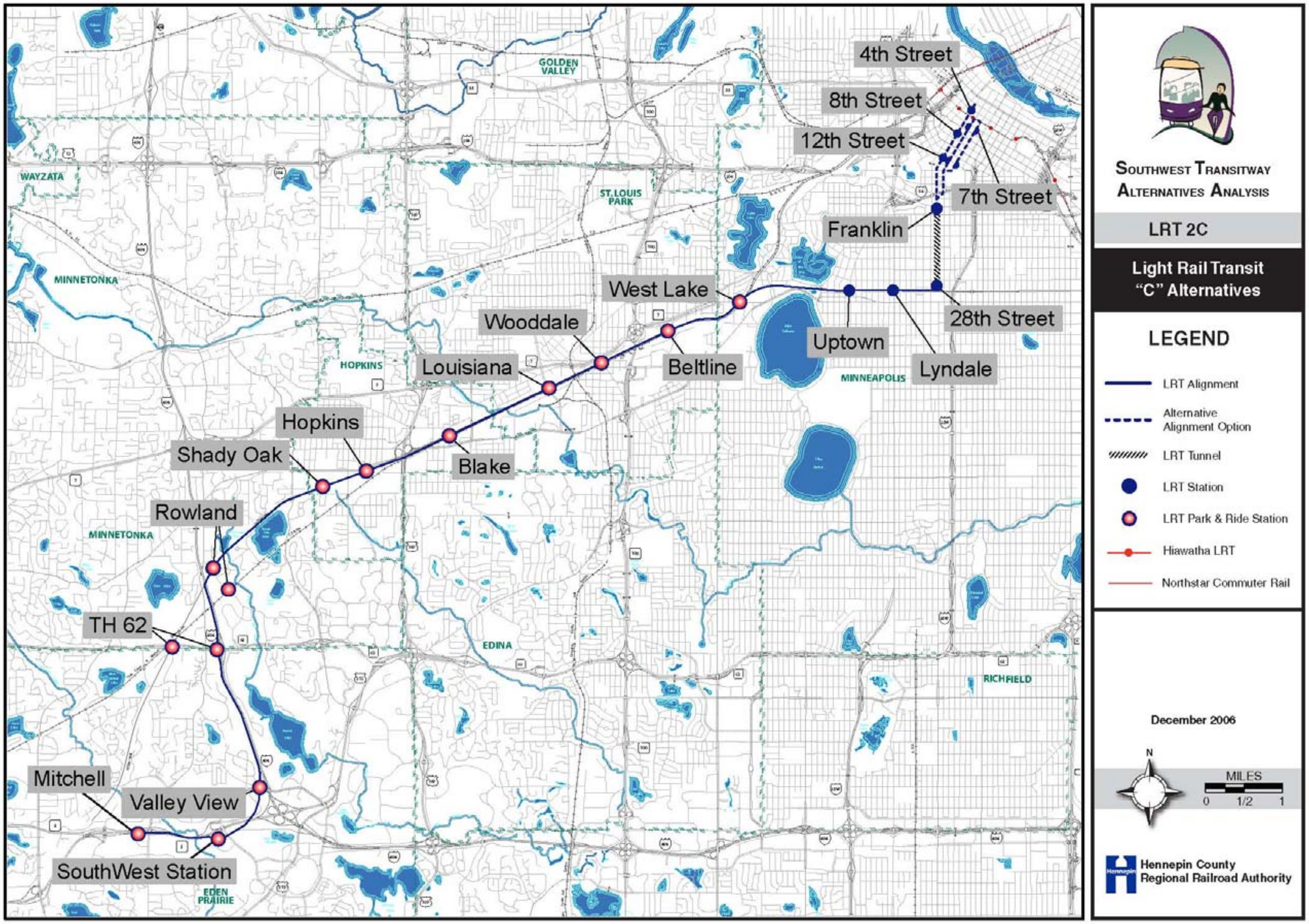
### LRT 3C – Initial Alternative

LRT 3C operates from TH 5 in Eden Prairie to downtown Minneapolis, providing service to Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

#### *Routing*

The LRT route begins near the intersection of TH 5 and HCRRA's Southwest right-of-way in Eden Prairie. From that point the route follows along the south side of TH 5, crossing under Prairie Center Drive. It turns south along the east side of Prairie Center Drive, then turns east into new right-of-way located behind the existing properties on the north side of Singletree Lane. The route continues along the south side of Leona Road to Prairie Center Drive, where it turns north. It runs

## Figure 5.9  LRT 2C



along the east side of Prairie Center Drive, over I-494 and into the east side of the TH 212 right-of-way. The route then swings east and north along new right-of-way through the Golden Triangle area.

After crossing Shady Oak Road, the route crosses over TH 212 into the City West area, then crosses over TH 62 into the Opus area of Minnetonka. The route follows new right-of-way through Opus, crossing under Smetana Road and continuing north paralleling the Minnetonka-Hopkins city limits. After reaching the HCRRA's Southwest right-of-way, the route turns east and follows an exclusive LRT guideway to West Lake Street in Minneapolis.

Just east of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive LRT guideway in a shallow tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route either operates two-way on Nicollet Mall or as a one-way paired loop on 2nd and Marquette Avenues.

***Potential Route Variation***

This alternative includes the potential Eden Prairie route variation described under LRT 3A.

***Stations***

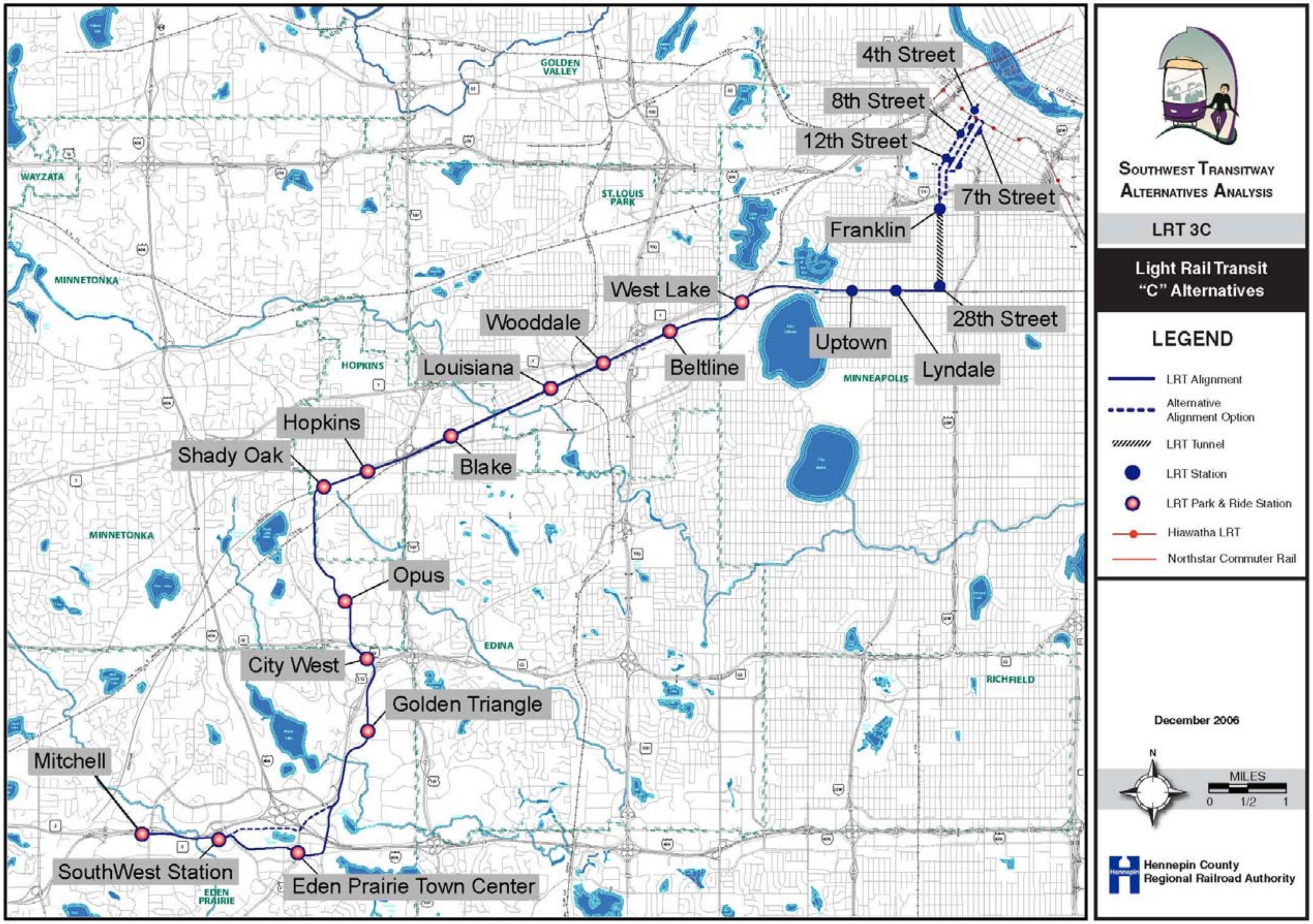
LRT 3C provides service to the following stations: TH 5, SouthWest Station, Eden Prairie Center, Golden Triangle, City West, Opus, Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, Uptown, Lyndale Avenue, 28th Street, Franklin Avenue, 12th Street, 8th Street (Nicollet routing), 8th Street (2nd/Marquette routing), and 4th Street.

### LRT 3C – Refined Alternative

- To avoid an additional freeway crossing, the terminal station was moved from TH 5 to Mitchell Road.
- The routing is now proposed to cross I-494 at Flying Cloud Drive rather than Prairie Center Drive.
- To provide better integration with Eden Prairie's plan for the Major Center Area, the Eden Prairie Center Station was moved west approximately 1/3 mile and re-named Eden Prairie Town Center Station.
- Because of existing terrain, the routing through the north end of the Opus development was modified.
- Because of transit operating issues, the LRT C alternatives under the 2nd/Marquette one-way pair option would operate on a loop via 4th Street.
- Because of parking ramp access issues and to facilitate better pedestrian flow, stations on the 2nd/Marquette one-way pair option were moved to 7th Street rather than 8th Street.

Figure 5.10 illustrates refined alternative LRT 3C.

## Figure 5.10  LRT 3C



### LRT 4C – Initial Alternative

LRT 4C operates from Shady Oak Road in Minnetonka to downtown Minneapolis, providing service to Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

#### *Routing*

The LRT route begins near the intersection of Shady Oak Road and the HCRRA's Southwest right-of-way. From Shady Oak Road the route enters an exclusive LRT guideway in the HCRRA's Southwest right-of-way to West Lake Street in Minneapolis. Just east of West Lake Street the route enters an exclusive LRT guideway in the HCRRA's Midtown Corridor to Nicollet Avenue. At Nicollet Avenue the route turns northward entering a new exclusive LRT guideway in a shallow tunnel under Nicollet Avenue to Franklin Avenue. At Franklin Avenue the route exits the shallow tunnel and operates at-grade on Nicollet Avenue to Grant Street. At Grant the route will either operate two-way on Nicollet Mall or as a one-way paired loop on 2$^{nd}$ and Marquette Avenues.

#### *Stations*

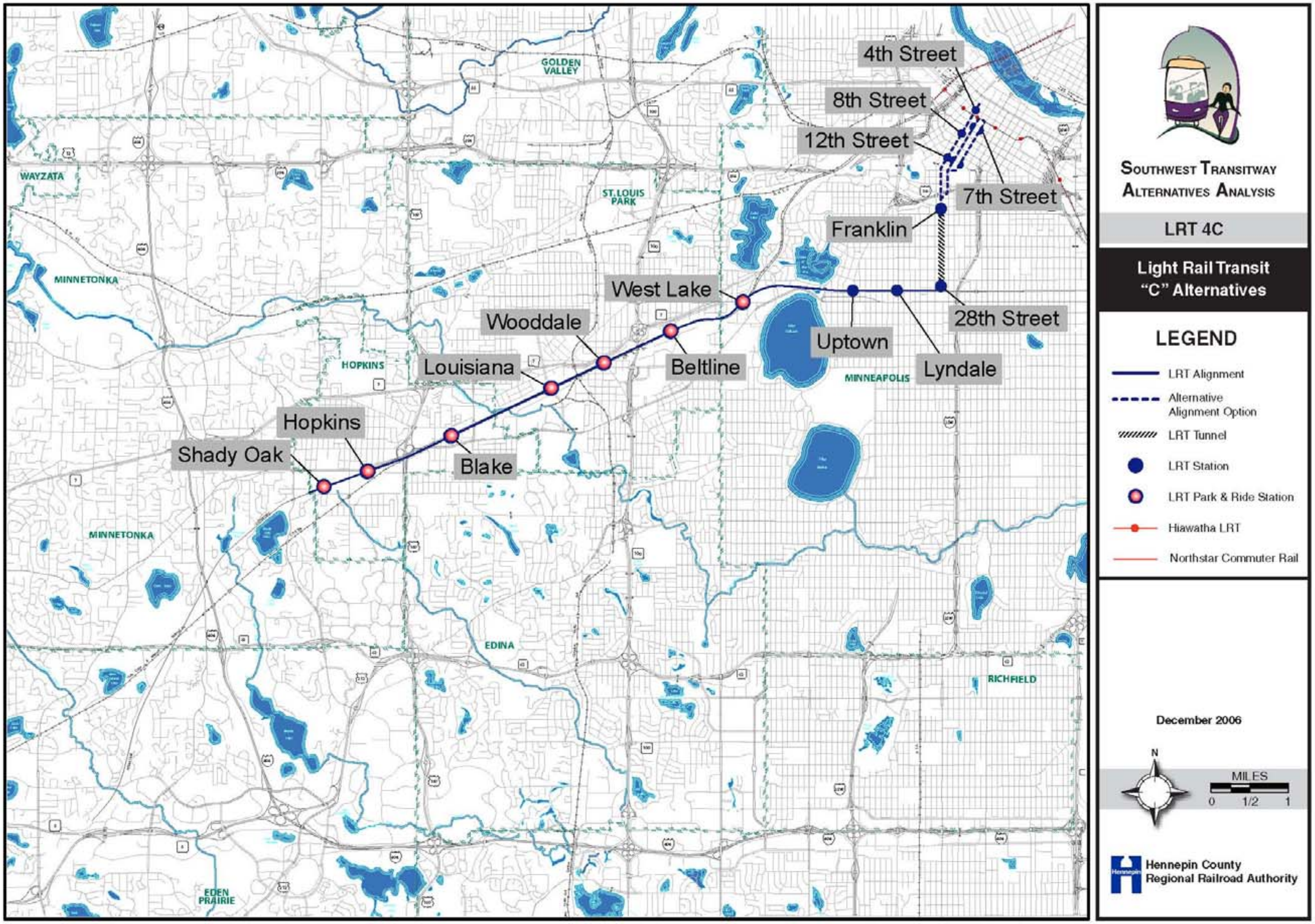
LRT 4C provides service to the following stations: Shady Oak Road, Hopkins, Blake Road, Louisiana Avenue, Wooddale Avenue, Beltline Boulevard, West Lake Street, Uptown, Lyndale Avenue, 28$^{th}$ Street, Franklin Avenue, 12$^{th}$ Street, 8$^{th}$ Street(Nicollet routing), 8$^{th}$ Street (2$^{nd}$/Marquette routing), and 4$^{th}$ Street.

### LRT 4C – Refined Alternative

- Because of transit operating issues, the LRT C alternatives under the 2$^{nd}$/Marquette one-way pair option would operate on a loop via 4$^{th}$ Street.
- Because of parking ramp access issues and to facilitate better pedestrian flow, stations on the 2$^{nd}$/Marquette one-way pair option were moved to 7$^{th}$ Street rather than 8$^{th}$ Street.

Figure 5.11 illustrates refined alternative LRT 4C.

## Figure 5.11  LRT 4C



# 4.0 Goals and Objectives

## 4.1 Overview

This chapter identifies the Southwest Transitway Goals and Objectives developed by the Southwest Technical Advisory Committee (TAC) and adopted by the Southwest Policy Advisory Committee (PAC) for a Southwest Transitway. These goals and objectives are based upon the identified study area transportation needs as described in Chapter 3, Purpose and Need. The Southwest Transitway Goals were used to guide the definition of transitway alternatives and the evaluation process, which resulted in the selection of a preferred course of action.

## 4.2 Background and Assumptions

In February 2005, the Southwest Technical Advisory Committee (TAC) developed a set of goals and objectives and sent them to the Southwest Policy Advisory Committee (PAC) for their consideration. In March 2005, the Southwest Transitway PAC unanimously approved the goals and objectives sent to them by the Southwest TAC.

The approved Southwest Transitway goals are to:

1. Improve Mobility
2. Provide a Cost-Effective, Efficient Travel Option
3. Protect the Environment
4. Preserve the Quality of Life in the Study Area and the Region
5. Support Economic Development

For purposes of evaluating the alternatives, the Southwest Transitway PAC prioritized the goals into two tiers. Tier One goals are those that must be achieved in order for a viable project to exist. Tier Two goals are those that should be achieved assuming a viable project exists. Tier One goals are (1) Improve Mobility and (2) Provide a Cost-Effective, Efficient Travel Option. Tier Two goals are (3) Protect the Environment, (4) Preserve the Quality of Life in the Study Area and the Region, and (5) Support Economic Development.

## 4.3 Southwest Transitway Goals and Objectives

### 4.3.1 Tier 1 Goals

Tier 1 goals are defined as those that must be achieved in order for a viable project to exist.

#### GOAL 1: Improve mobility

*Objectives:*

- Provide a travel option competitive with other modes in terms of travel time
- Provide a reliable travel option that improves mobility throughout the day
- Provide a travel option that serves population and employment concentrations
- Provide a travel option that adds capacity and access to the regional and local transportation system
- Provide a travel option that serves people who depend on transit
- Provide a travel option that enhances pedestrian and bicycle activity and access to community nodes

### GOAL 2: Provide a cost-effective, efficient travel option

*Objectives:*

- Provide a travel option with acceptable capital and operating costs
- Provide a travel option that efficiently and effectively moves people
- Provide a travel option that integrates efficiently with other modes and avoids substantial negative impacts to the existing roadway system
- Provide a travel option that supports regional system efficiency

### 4.3.2 Tier 2 Goals

Tier 2 goals are those that should be achieved assuming a viable project exists.

### GOAL 3: Protect the environment

*Objectives:*

- Provide a travel option beneficial to the region's air quality
- Provide a travel option that avoids or minimizes alterations to environmentally sensitive areas
- Provide a travel option that supports efficient, compact land use that facilitates accessibility
- Provide a travel option that avoids major environmental impacts on adjacent properties, such as noise and vibration

### GOAL 4: Preserve and protect the quality of life in the study area and the region

*Objectives:*

- Provide a travel option that contributes to the economic health of the study area and region through improving mobility and access
- Provide a travel option that is sensitively designed with respect to existing neighborhoods and property values
- Provide a travel option that protects and enhances access to public service and recreational facilities
- Provide a travel option that supports sound planning and design of transit stations and park and ride lots
- Provide a travel option that enhances the image and use of transit services in the region

### GOAL 5: Support economic development

*Objectives:*

- Provide a travel option that supports economic development and redevelopment with improved access to transit stations
- Provide a travel option that supports local sustainable development/redevelopment goals
- Provide a transportation system element that facilitates more efficient land development patterns and saves infrastructure costs
- Provide a travel option that accommodates future regional growth in locations consistent with local plans and the potential for increased transit ridership

# 3.0 Purpose and Need

## 3.1 Overview

This chapter documents the purpose and need for improved transit service in the southwest metropolitan area of the Twin Cities

## 3.2 Background and Assumptions

The Southwest transitway is a proposed 14-mile line in the Minneapolis/St. Paul region, connecting the downtown Minneapolis to the high growth areas to the southwest. A Southwest transitway will add system capacity in an area of high demand, respond to travel demand created by existing and planned residential and employment growth, provides a competitive travel option that will attract choice riders and serve transit dependent populations. This line will also be an expansion of the region's transitway system (Hiawatha LRT line, Northstar Commuter Rail (under construction), Central LRT line (proposed)).

### 2. Purpose of the Project

A Southwest transitway will improve access and mobility to the jobs and activity centers both to/from the Minneapolis CBD for the traditional work trip as well as along the entire 14-mile line for reverse-commute trips to the expanding suburban employment centers, most notably the Opus/Golden Triangle area with over 50,000 jobs.

A Southwest transitway will also provide a competitive, cost-effective travel option that will attract choice riders to the transit system. The competitive travel time for the Southwest Transitway is attributed to the diagonal nature of the line compared to the north-south/east-west orientation of the roadway network and the increasing levels of congestion of the roadway network.

A Southwest transitway will be part of the region's system of transitways integrated to support regional transportation efficiency. The Southwest transitway has been identified by the Metropolitan Council since the late 1990s as warranting a high-level of transit investment to respond to increasing travel demand in a highly congested area of the region. Due to congestion levels on the roadway network, the speed/use limitations of the shoulder bus operations and capacity constraints in downtown Minneapolis, a bus option is limited in its ability to adequately serve the travel demand.

## 3.3 Transportation Planning Context

The Southwest Transitway has been included in various transportation plans and studies conducted by local and regional planning agencies. As described in detail in *Technical Memorandum No. 1, Purpose and Need Statement* and summarized in Chapter 1 of this report, the Hennepin County Regional Railroad Authority (HCRRA) has studied the Southwest Transitway since the mid-1980s. In addition, the Metropolitan Council, the region's Metropolitan Planning Organization (MPO), has also included the Southwest Transitway in the *Transportation Policy Plan* (TPP), 2004. Figure 3.1 illustrates the Metropolitan Council's planned 2030 Transitway System.

## 3.4 Existing and Future Conditions

### 3.4.1 Demographics

Between 1990 and 2000, the Twin Cities region experienced strong growth, which is anticipated to continue in the future. According to the 2000 US Census and the Metropolitan Council, the region added 430,000 new residents and 290,000 new jobs between 1990 and 2000. This equates to a 17 percent increase in population and a 23 percent increase in jobs.

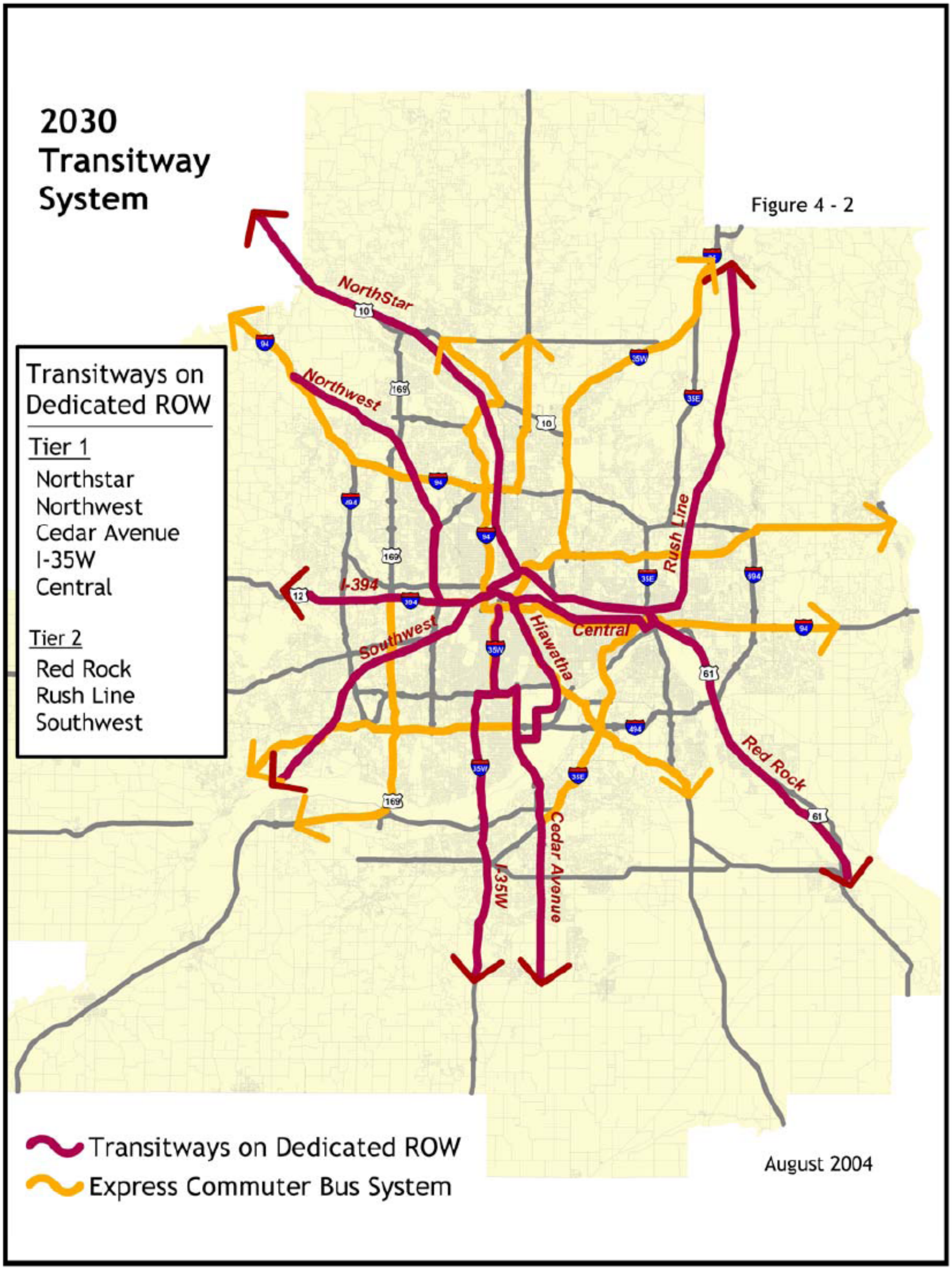
By 2030, the Metropolitan Council projects another 37 percent increase in population and 36 percent increase in jobs for the region. In raw numbers, during the 30 year period between 2000 and 2030, the region anticipates adding nearly one million people and over half a million jobs. This sustained growth will continue to have a major impact on the region's transportation system.

#### 3.4.1.1 Study Area Population

*1980-1990*

With the exception of Minneapolis, all study area communities increased in population from 1980 to 1990. Eden Prairie and Minnetonka experienced the most substantial growth in percentage terms.

Figure 3.1 Metropolitan Council 2030 Transitway System




Source: Metropolitan Council, 2004

From 1980 to 1990, Eden Prairie nearly tripled its population. During that same decade, Minnetonka's population increased by 25 percent.

*1990-2000*
All study area communities experienced additional population growth between 1990 and 2000, as shown in Table 3.1. Eden Prairie again experienced the highest percentage gain, with a 40 percent increase in population.

*2000-2030*
Between 2000 and 2030, the population for all study area communities is projected to increase, as shown in Table 3.2. St. Louis Park and Eden Prairie are expected to have the largest percent growth with 17 percent and 15 percent, respectively.

**Table 3.1 Study Area Population Trends (1980 – 2030)**

| Locality | 1980 | 1990 | Percent Change | 2000 | Percent Change | 2030 | Percent Change |
|---|---|---|---|---|---|---|---|
| Eden Prairie | 16,300 | 39,300 | 141% | 54,900 | 40% | 63,000 | 15% |
| Minnetonka | 38,700 | 48,400 | 25% | 51,000 | 5% | 53,500 | 5% |
| Hopkins | 15,300 | 16,500 | 8% | 17,000 | 3% | 18,900 | 11% |
| St. Louis Park | 42,900 | 43,800 | 2% | 44,100 | 1% | 51,500 | 17% |
| Minneapolis | 371,000 | 368,400 | -1% | 383,000 | 4% | 435,000 | 14% |
| Total | 484,200 | 516,400 | 7% | 550,000 | 7% | 621,900 | 13% |

Source: U.S. Census and Metropolitan Council

### 3.4.1.2 Study Area Employment

*1990-2000*
According to the Metropolitan Council, between 1990 and 2000 the Twin Cities Metropolitan Area added approximately 290,000 new jobs, which increased the job base by 23 percent. During this same period, the Southwest Transitway study area cities' share of the added jobs was over 43,000 new jobs, increasing their job base by 17 percent.

Nearly half of all jobs in the study area are located in downtown Minneapolis, which is currently the highest traffic generator in the region. Downtown Minneapolis is home to many corporate headquarters, including Target Corporation, American Express, Wells Fargo and Excel Energy. It is also the cultural and entertainment center of the region, with the Convention Center, Guthrie Theatre, Walker Art Center, Orchestra Hall, the HHH Metrodome, and the Target Center Arena.

The remaining study area employment is dispersed throughout the other study area cities. Concentrations are located in the Park Commons and Wooddale areas of St. Louis Park, downtown Hopkins, the Opus development in Minnetonka, and the Golden Triangle and Eden Prairie Center Mall areas of Eden Prairie.

Study area employment trends by community are shown in Table 3.3.

### Table 3.2 Study Area Employment Trends (1990 – 2030)

| Locality | 1990 | 2000 | Percent Change | 2030 | Percent Change |
|---|---|---|---|---|---|
| Eden Prairie | 36,100 | 49,400 | 37% | 65,000 | 32% |
| Minnetonka | 35,500 | 50,500 | 42% | 58,600 | 16% |
| Hopkins | 12,300 | 11,800 | -4% | 16,300 | 38% |
| St. Louis Park | 36,800 | 40,700 | 11% | 52,500 | 29% |
| Minneapolis - CBD | 128,400 | 139,800 | 9% | 346,500 | 15% |
| Total | 249,100 | 292,200 | 17% | 538,900 | 19% |

Source: Metropolitan Council

*2000-2030*
Employment growth is expected to continue. By 2030, the Metropolitan Council projects that the region will add over 500,000 jobs, which is a 36 percent increase.

All study area communities are projected to experience job growth during the next two decades. As shown in Table 3.4, a 38 percent increase is projected for Hopkins, with substantial gains projected for other study area communities as well. The City of Minneapolis estimates that downtown currently has 140,000 jobs. The Metropolitan Council estimates that downtown Minneapolis alone will add nearly 20,000 new jobs during the next two decades.

### 3.4.3 Community Resources

The Southwest Transitway study area encompasses many features of Minnesota's famed quality of life. Community resources in the study area include recreational features such as the lakes, parks and trails found throughout the five study area cities. The study area also includes the major medical facilities of Hennepin County Medical Center in downtown Minneapolis and Methodist Hospital in St. Louis Park, and individual community amenities including schools, libraries, service centers, and other unique features such as the student-run Hopkins Depot coffee shop.

### 3.4.4 Transportation System

#### 3.4.4.1 Roadways

Growth in population and employment over the past 20 years has resulted in increased travel. Additional roadway capacity created in the 1970s to accommodate projected population growth has been depleted as people travel more than had been forecasted. The result has been increased congestion, increased delays, more pollution, and an increase in the economic costs of operating a business in the region. With constraints on transportation funding, and the social and environmental consequences of roadway expansion, congestion is anticipated to continue to grow and mobility to decline.

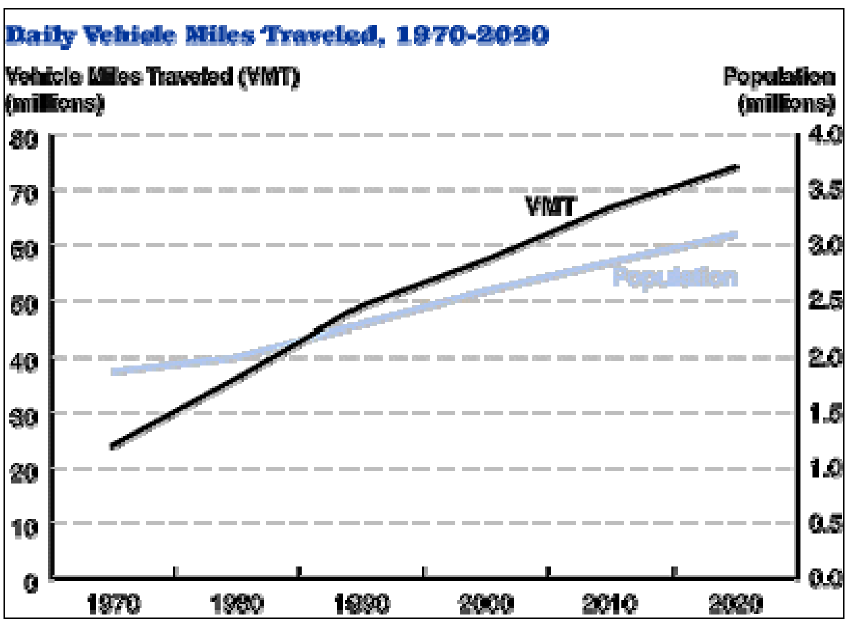
Since the mid-1980s, the number of vehicle miles of travel (VMT) has outpaced population growth in this region. In 1970, Twin Cities residents made an average of 2.7 daily trips per capita, with an average trip length of just less than 5 miles. By 2000, the average had increased to 4.2 daily trips per capita and the average trip length had increased to 6.5 miles. In 2000, the total number of trips taken ("daily person-trips") using all means of transportation ("all modes") totaled 11,670,000, of which 10,800,000 were motorized trips. This was an increase of 16% from 1990.

A number of factors explain the increase in travel demand within this region. These include increases in the number of households, average number of vehicles per household, and number of multiple-worker households; and the increased dispersion of jobs and housing throughout the region.

The Metropolitan Council projects this trend to continue through 2030, with travel increasing faster than population growth. Total VMT is expected to increase from 57 million in 2000 to 86 million in 2030, a 51% increase, while population is expected to grow by 17 percent. Daily person-trips are expected to increase to 15 million by 2030. Figures 3.3 and 3.4 illustrate these statistics.

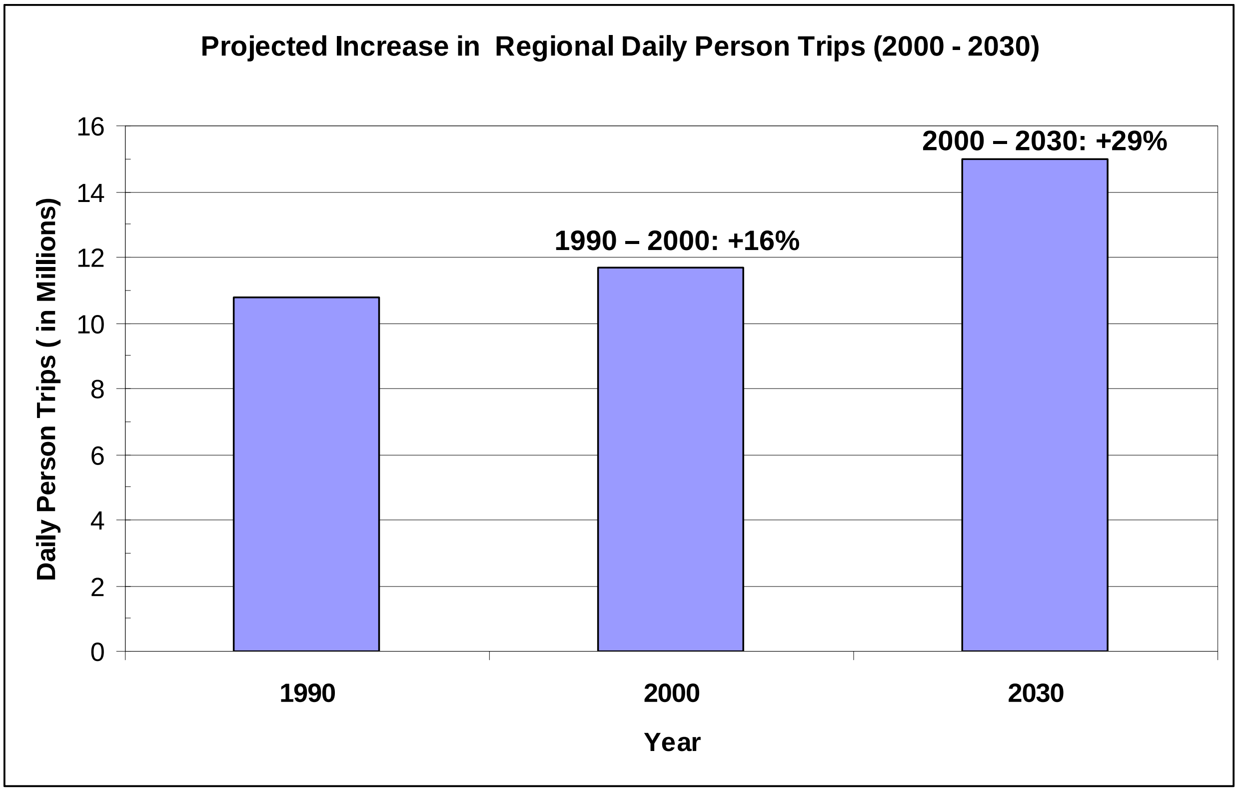
According to data from the Minnesota Department of Transportation (Mn/DOT) the demand for travel in the southwestern metropolitan area has increased substantially since the 1980s and is expected to continue increasing significantly. Specifically, between 1990 and 2000, traffic on the major interstates and highways in the southwestern metropolitan area increased by approximately 23 percent. Congestion is growing region-wide as well. In 1970, the regional road system experienced 10 congested lane miles; by 2000 that number rose to 183 congested lane miles. Mn/DOT projects that by 2025 that number will more than double, to 491 congested lane miles (Figure 3.5).

**Figure 3.2 Daily Vehicle Miles Traveled**



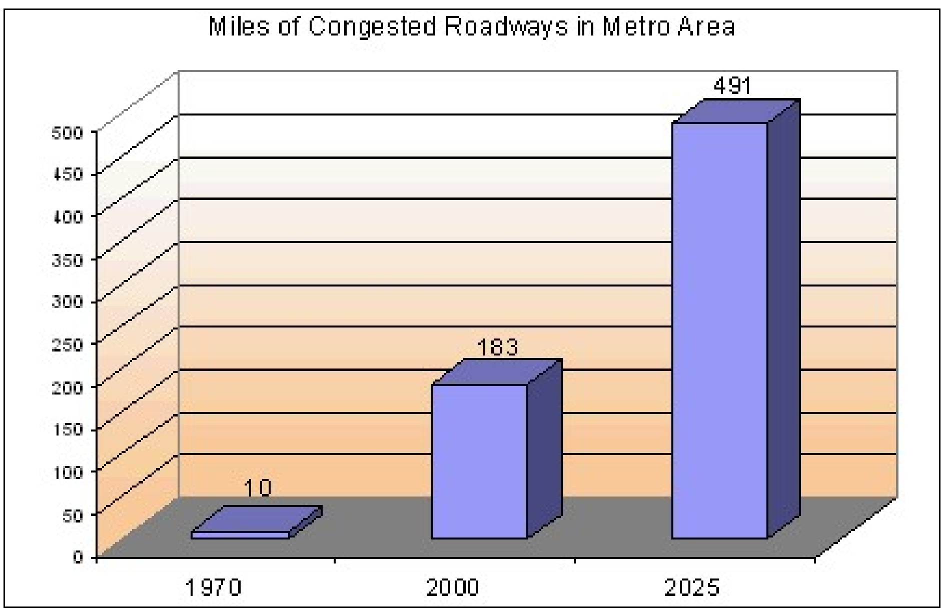

Source: Metropolitan Council

## Figure 3.3 Regional Daily Person Trips (2000-2030)




Source: Metropolitan Council

## Figure 3.5 Miles of Congested Roadway




Source: Minnesota Department of Transportation

The Texas Transportation Institute regularly conducts and reports research on the nation's transportation conditions. The Institute's findings are widely reported and tracked by transportation agencies throughout the country. Among the Institute's findings on increased congestion in U.S. cities, its 2004 Urban Mobility Report lists Minneapolis as experiencing a faster increase in delay than its population group average from 1982 to 2002. The Institute's finding confirms not only the region's increased congestion over that 20-year period, but also indicates congestion is increasing faster in the Twin Cities than in comparable cities. Figure 3.6 illustrates the expected increase in congestion on Twin Cities highways based on Metropolitan Council projections.

The Southwest Transitway study area experiences a major share of this increased traffic. Between 1980 and 2000, traffic on the major interstates and highways in the Southwest Transitway study area increased by 79 to 150 percent. Average annual daily traffic on these major roadway segments is forecasted to grow by 49 percent between 2000 and 2020.

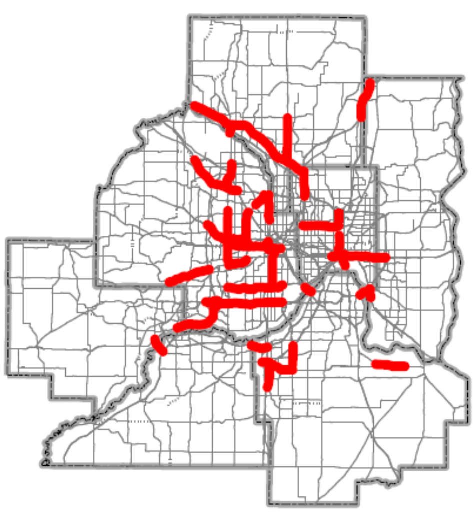
### 3.4.4.2 Travel Time

As congestion in the region increases, the geographic area that can easily be accessed for jobs, education, shopping and recreation decreases. In 2000, travelers from study area communities could reach many destinations within the metro area within 30 to 60 minutes. By 2030, travel times greater than 60 minutes are anticipated to substantially increase. Figures 3.7 through 3.9 illustrate the projected decline in accessibility by 2030 for travel from Eden Prairie, Minneapolis and St. Louis Park.

The increase in travel demand also has economic impacts on the region's residents. According to the Metropolitan Council, Twin Cities residents spent a total of 54.6 million hours in roadway congestion in 2002, which is the equivalent of approximately 6,200 years or $740 million in lost time. When including fuel consumed for each traveler in the peak period, this amounts to an overall cost to the region of $970 million.

**Figure 3.6 Congested Highways, 2000 and 2020**

**2000 Congested Highway Corridors**



NOTE

- "Congestion" on this map is defined as the condition occurring when the ratio of traffic volume to highway capacity reaches 1.0 or greater.

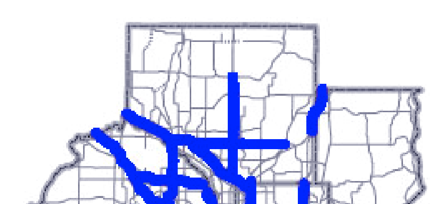
- The highway system shown on this map is the regional highway system as of the year 2000.

- The traffic shown on this map is as of the year 2000.

- The congested mileage on this map totals 155 center-line miles.

(source: Metropolitan Council Transportation Policy Plan; adopted 1/24/2001)

**2025 Congested Highway Corridors**



**2025 Highway Network Assumes:**
- **I-494 widening**
- **TH 169 improvements,**

## Figure 3.7 PM Peak Hour Travel Times from Eden Prairie in 2000 & 2030

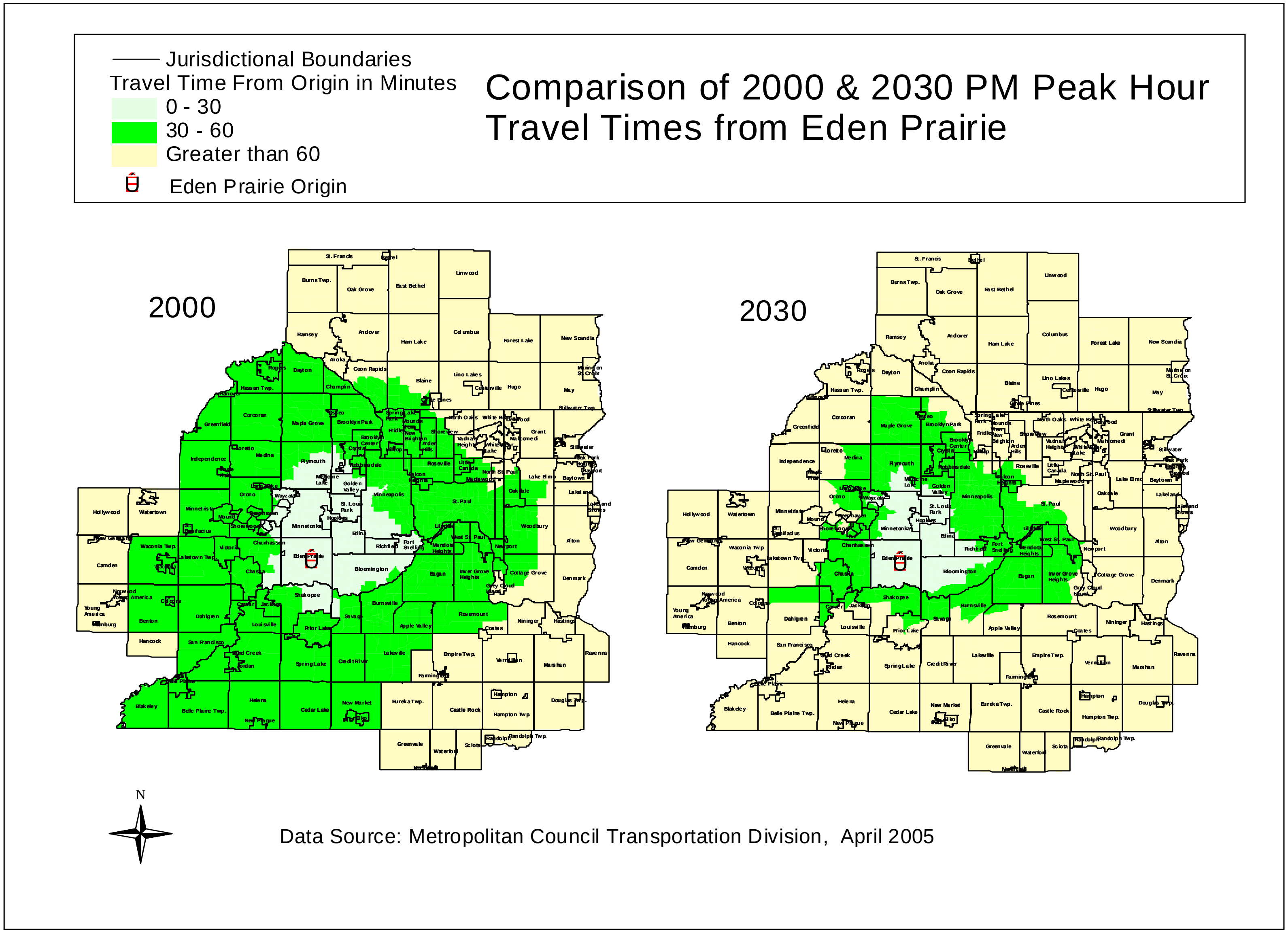
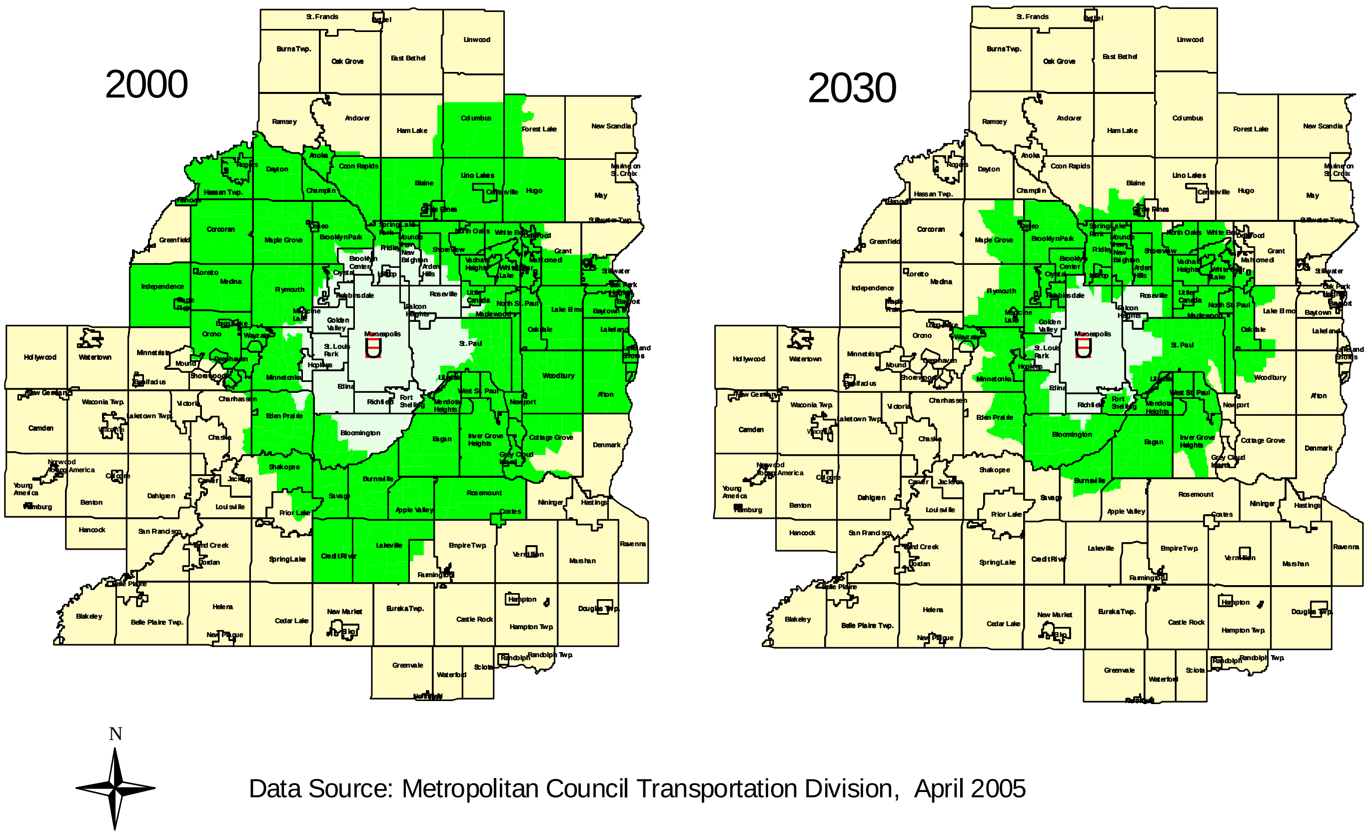


**Figure 3.8 PM Peak Hour Travel Times from Minneapolis in 2000 & 2030**

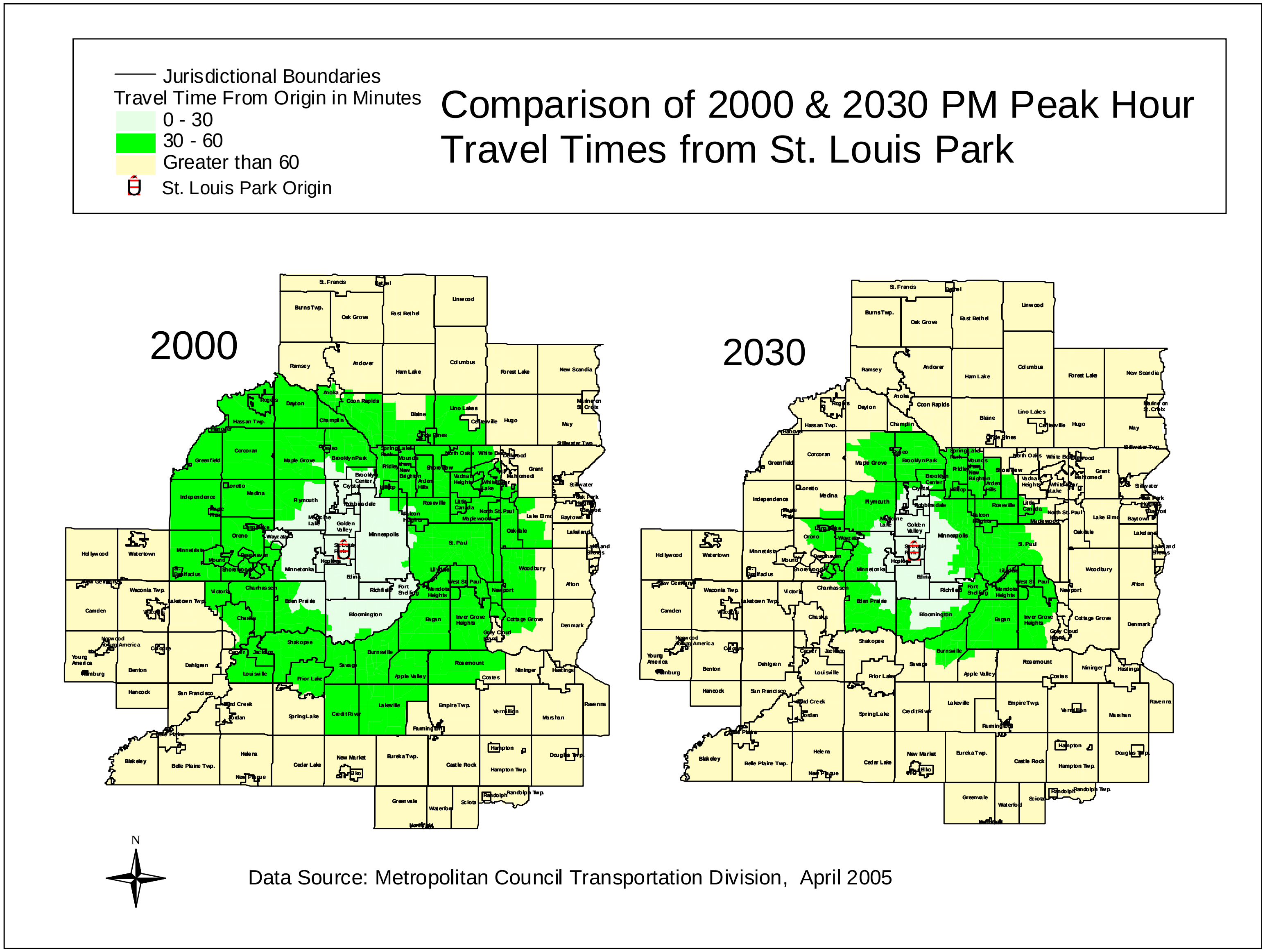
—— Jurisdictional Boundaries
Travel Time From Origin in Minutes
0 - 30
30 - 60
Greater than 60
Minneapolis Origin

## Comparison of 2000 & 2030 PM Peak Hour Travel Times from Minneapolis




Data Source: Metropolitan Council Transportation Division, April 2005

## Figure 3.9 PM Peak Hour Travel Times from St. Louis Park in 2000 & 2030



#### 3.4.4.3 Transit

Facing rapid population growth, growing congestion and limited prospects for new major freeways, the Twin Cities will need a strong transit system to ensure its continued economic vitality. The Metropolitan Council has set a goal of doubling current transit ridership by 2030, through a variety of transit programs.

Two of the area's transit providers primarily serve Southwest study area cities: Metro Transit and SouthWest Metro Transit. Metro Transit, the transit operating agency of the Metropolitan Council, provides express, limited-stop and local bus service to the study area cities of Minneapolis, St. Louis Park, Hopkins and Minnetonka. SouthWest Metro Transit provides express bus service to downtown Minneapolis from Eden Prairie, Chanhassen and Chaska as well as local circulator service throughout Eden Prairie, Chanhassen and Chaska.

A total of 49 bus routes, including 27 express, three limited stop, and 18 local routes, serve the study area. On an average weekday, nearly 28,000 commuters from the study area cities use transit to travel to downtown Minneapolis. Approximately 24,000 weekday study area commuters are carried on Metro Transit buses and 3,600 are carried on SouthWest Metro buses. While numerous park-and-ride facilities are located throughout the study area, the largest single park-and-ride facility, with over 1,000 spaces, is the SouthWest Metro Transit Station located in Eden Prairie.

### 3.4.5 Travel Demand Patterns

The Southwest Transitway study area accounts for a large portion of travel demand within the region. According to an analysis of the Metropolitan Council's 2005 Travel Demand Model, approximately one-quarter of all trips (one-way) in the Twin Cities metropolitan area currently begin or end within the Southwest Transitway's demand area. The demand area, illustrated in Figure 3.10, produced and attracted a combined total of 3.4 million daily trips in 2005; this represents just over 27% of the approximately 12.9 million daily trips in the 7-county Twin Cities metropolitan area. In the 2030 Metropolitan Council Travel Demand Model, the demand area continues to capture approximately a quarter of all metropolitan area trips. Roughly 24% (or 3.9 million) of the 16.3 million daily regional trips in the 2030 model either begin or end within the Southwest Transitway demand area.

This analysis also showed that more than half the trips that begin within the demand area also end in the demand area. In both the 2005 and 2030 models, 65% of all trips originating in the demand area have destinations within the corridor. In 2005, of the 2.2 million trips which begin in the demand area (trip productions), 1.45 million have attractions (endings) within the corridor. In 2030, the number of trips with both productions and attractions within the demand corridor increases to over 1.6 million.

High concentrations of work attractions form a radial pattern from downtown Minneapolis to the southwest. Much of this concentration lies within three areas which represent large centers of employment: Opus, the Golden Triangle, and downtown Minneapolis. To further distinguish trip making patterns within the corridor, the analysis examined the travel demand for these three districts, also identified in Figure 3.10.

The Downtown Minneapolis district accounts for a substantial portion of trips with both beginnings and endings within the demand area. In both the 2005 and 2030 models, roughly 40% of all Downtown Minneapolis-destined trips also originate within the demand corridor.

The majority of trips attracted to the Golden Triangle and Opus also originate within the demand area. In the 2005 and 2030 models, over half of all trips attracted to the Golden Triangle and to Opus are also produced within the demand corridor.

## 3.5 Needs Analysis

### 3.5.1 Proposed Development and Redevelopment

Land use goals supportive of transit are a significant factor in the evaluation of a prospective New Starts project by the Federal Transit Administration (FTA). The Southwest Transitway AA process was guided by FTA land use and development criteria in identifying station area concept plans that are consistent with local comprehensive plans, and that reflect local community goals regarding the environment, quality of life, and economic development.

All five study area cities recognize the need to improve mobility and access for their resident and employee populations. Recognition of the need to coordinate land use decisions with transportation access is reflected in the Comprehensive Plans of each of the cities. Each Southwest study area city's adopted Comprehensive Plan, the enforceable policy instrument that guides land use, includes transit-supportive policies.

In Minneapolis, St. Louis Park and Hopkins, redevelopment planning has been underway for several years as planning for a Southwest Transitway has progressed since the late 1980s. The cities of Minnetonka and Eden Prairie, two of the region's newer high employment growth areas, have focused recent development and redevelopment efforts on transit-supportive development at several proposed Southwest Transitway station areas. Development planning currently underway will be reflected in the next regional comprehensive plan update as Southwest study area communities along with all Twin City municipalities submit their updated plans to the Metropolitan Council in 2008.

**Declining Mobility (Growth Outpacing Supply)**

The Southwest area is experiencing significant declining mobility resulting from high residential and employment growth and limited infrastructure improvements. The area is home to downtown Minneapolis, the region's largest employment center with over 140,000 jobs (78 jobs/acre) and the Golden Triangle, the region's sixth largest employment with over 50,000 jobs (10 jobs/acre) The area is also home to many major employers listed above. In addition to the high employment growth, this area has also experienced high residential growth with over xx residences. An illustrative example is the city of Eden Prairie which grew from 16,000 persons in 1980 to over 50,000 persons by 2000. In terms of travel, currently 27 % of all regional trips begin or end in the corridor, and 65 % of all trips originating within the study area stay within the study area.

As a result of this strong residential and employment growth travel on area roadways has increased by 80% to 150% in the past 25 years. A number of study area roadways, TH 100, TH 169, TH 62, I-494, I-394, and TH 7, have been identified by the Mn/DOT as having a high mobility deficiency rating. According to Mn/DOT's long-range transportation plan, the Transportation System Plan (TSP) there are no plans for major expansions or improvements to roadways in the study area.

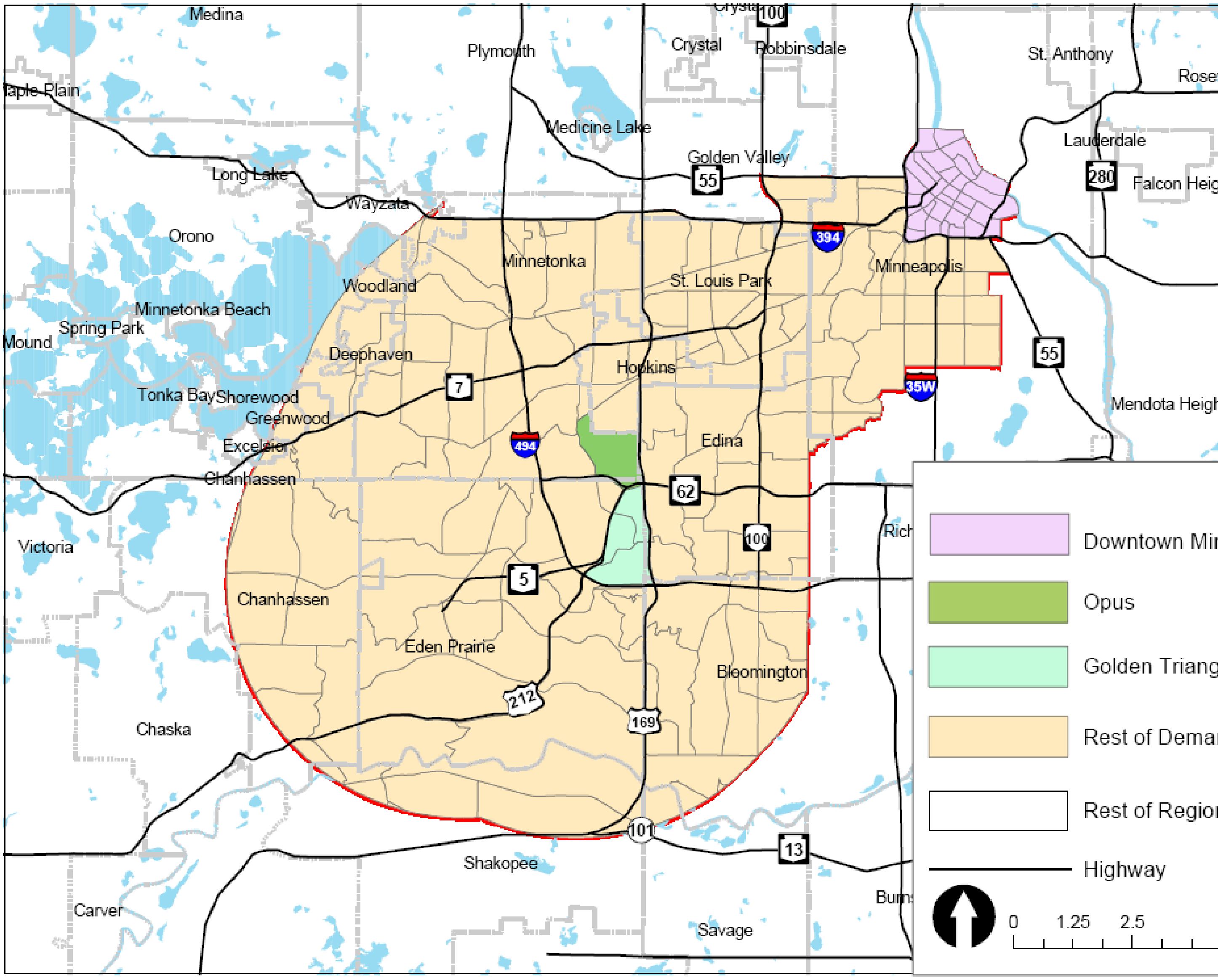
Suburban express bus ridership in the area provided by SouthWest Transit and Metro Transit has more than doubled in the past 10 years and surpassed 1 million annual riders for the first time in 2007. SouthWest Transit operates 12 express routes from Eden Prairie to downtown Minneapolis and Metro Transit operates 15 limited-stop/high frequency routes in and between Minnetonka, Hopkins, St. Louis Park and downtown Minneapolis. Transit advantages, including bus shoulder-lanes, park/ride lots, ramp meter bypasses, have been implemented throughout the area, but bus speeds remain limited, even on shoulder-lanes, to a maximum of 35mph under congested conditions.

Due to lack of planned highway capacity additions, and transit facility capacity limitations in downtown Minneapolis, future demand increases will not be adequately met by capacity enhancements for either auto or bus.  Demand increases will be fueled by increasing population within the corridor (12% increase to 2030) and by increasing job concentrations – a 16% overall increase and increases in job concentrations from 78 to 113 jobs/acre in downtown Minneapolis and from 10 to 17 jobs/acre in the Golden Triangle.  Travel times from Eden Prairie for auto are expected to increase by about 10%, from 30 min in 2000 to 34 minutes in 2030 during peak periods.  Current express bus time may increase, as it is already using shoulder lanes with no plans for expansion.

**Lack of Competitive, Reliable Transit Options for Choice Riders and Transit Dependents**
Due to congested roadways and the geography of the roadway network used by the bus system it is difficult to provide significant travel time advantages to attract choice riders to the system and to adequately serve transit dependent concentrations, especially those in and around downtown Minneapolis.  The study area roadway network is oriented north-south/east-west where development patterns have radiated outward from downtown Minneapolis on a diagonal.  Additional travel time is added to vehicle and transit trips due to the geography of the roadway system.  The Twin Cities is a leader across the nation in the use of bus shoulder lanes. Currently, the Twin Cities has over 250 miles of operating bus shoulder lanes.  These facilities provide buses with a travel time advantage over the auto during congested periods, but due to state law their use is limited to situations where the mainline is operating at 35 mph or lower and the bus cannot travel more than 15 mph above the speed of the mainline.  As stated previously all major roadways in the study area are identified by Mn/DOT as experiencing mobility deficiencies during peak periods.  This negatively affects the ability of the bus transit system to provide a travel time advantage to attract choice riders from suburban locations to the transit system.
The geography of the roadway network near downtown Minneapolis also makes it difficult to provide competitive transit travel times.  Two neighborhoods of note are the Harrison and Bryn Mawr, neighborhoods lying just outside of the downtown core of Minneapolis.  In many cases these residents live within a mile or two of downtown Minneapolis yet due to the roadway network used by the bus system their transit travel times range from 9 minutes to 13 minutes.  The roadway network through these neighborhoods is circuitous with many one-way street operations.

**Lack of Reverse Commute Transit Service**
Transit dependent concentrations are growing in the study area, primarily in and around downtown Minneapolis.  These areas include the North Loop Neighborhood, Harrison, and Bryn Mawr neighborhoods.  In addition to the strong job growth in downtown Minneapolis, the other cities have experienced and area projected to continue to experience substantial job growth into the future. This is evidenced by the 65percent of the trips generated in the study area remaining within the study.  Many of these trips are reverse commute trips from these near downtown neighborhoods to job centers in suburban locations.  Currently these jobs are largely inaccessible by transit.

**Figure 3.10 Southwest Demand Area and Attraction Districts**



# 2.0 Public Involvement

## 2.1 Overview

This chapter documents the public involvement efforts that were employed over the course of the Southwest Transitway Alternatives Analysis (AA), and includes a summary of the public outreach strategy, public outreach activities and media coverage of the study.

## 2.2 Background and Assumptions

Public involvement is important for any planning process, and was a critical component of the Southwest Transitway AA. Meaningful public involvement increases community and public trust in the study process and reduces the risk of making less than optimal decisions. With a comprehensive public outreach process, it is possible to work collaboratively to make a lasting contribution to quality of life. Public involvement is more than an agency requirement and more than a means of fulfilling a statutory obligation. The Hennepin County Regional Railroad Authority (HCRRA) and its partners demonstrated a strong commitment to public involvement throughout the Southwest AA as central to good decision-making.

## 2.3 Strategy

A public outreach plan was developed in January 2005 at the outset of the Southwest Transitway AA with input and direction from study partners on the Southwest Policy Advisory Committee (PAC) and Technical Advisory Committee (TAC). It includes strategies that built upon successful outreach work conducted as part of the 2003 *Southwest Rail Transit Study.* Consistent with the Systematic Development of Informed Consent (SDIC) public involvement process,[1] the HCRRA and its partners built upon established relationships with community and business groups, and the knowledge of community issues. In addition, efforts were made to reach out to a broader range of stakeholders to further strengthen the outreach effort.

Implementation of the *Public Outreach Plan* ensured that study information was provided to the public in a timely manner, and that multiple opportunities were provided for input from the public, particularly residents and businesses that would be most affected by a transitway. Information was provided through presentations at a wide range of venues, and through distribution of newsletters, a study web site, and newspaper articles. Input, feedback, concerns, and questions from the public were sought throughout the study at community and neighborhood meetings, business meetings, open houses, and city council meetings. Also, the interactivity of the study website allowed for electronic submittal of comments throughout the study.

Ongoing input from the public was critical to the development of study goals, the range of alternatives studied, and the study recommendations. All comments received from the wide range of outreach activities were recorded and made available to Southwest PAC and TAC members and to the Hennepin County Regional Railroad Authority (see Appendix B for a summary of comments received).

## 2.4 Key Stakeholder Groups

The *Public Outreach Plan* identified key stakeholder groups for continuous, two-way communication. Key stakeholder groups included study area residents, neighborhoods and

[1] The Bleiker SDIC process identifies key stakeholders and their likely concerns and interests, and outreach strategies are developed based on the analysis of local issues.

neighborhood organizations, business owners and state legislators. Representatives from each study area municipality and from agency partners participated on the study's two advisory committees, and assisted the project team in communicating with local organizations within their respective communities.

Activities undertaken with stakeholder groups are documented in the following section.

## 2.5 Public Outreach Activities and Results

### 2.5.1 Presentations and Meetings

A key strategy was to connect with citizens at places and times when groups gathered to discuss a range of community issues, for example, at neighborhood meetings, business associations, and other such venues. To expand outreach efforts beyond traditional open houses, and to respond to issues, concerns, and questions of groups of interested individuals, the study team staff attended, made presentations, and heard input at more than 40 community and business meetings. At these meetings, the presentation approach and materials were tailored to meet the specific needs and interests of each group. In all cases, handouts and presentation materials including fact sheets and route maps were distributed, and in some cases, more formal PowerPoint presentations were made.

#### Neighborhood and Special Interest Group Meetings

Meeting with existing community groups allowed for presentations to be tailored to the needs and interests of each group, and the settings encouraged dialogue and frank discussion of issues and possible ways to address concerns.

In the City of Minneapolis, neighborhood associations serve as a key point for discussing important public policy issues prior to their discussion with the Minneapolis City Council. Study team staff met with the potentially affected Minneapolis neighborhood associations throughout the study process to provide information to community leaders and residents about the study and to provide additional opportunities for feedback.

The study team also attended meetings with residents of the study area's suburban cities, including city-wide events and special meetings to discuss possible impacts of a Southwest Transitway. In addition, special interest groups such as the Uptown Business Association, the Midtown Greenway Coalition, the Cedar Lake Park Association, the League of Women Voters and the Riley-Purgatory Watershed District requested presentations.

**Table 2.1 Meetings with Neighborhood and Special Interest Groups**

| Date | Group |
|---|---|
| April 26, 2005 | Opus Condo Residents Group |
| May 9, 2005 | Midtown Greenway Land Use/Transportation Committee |
| May 18, 2005 | Bryn Mawr Neighborhood Association |
| June 6, 2005 | Kenwood Isles Neighborhood Association |
| June 8, 2005 | I-494 Corridor Commission |
| June 13, 2005 | Whittier Alliance |
| June 21, 2005 | Bassett Creek community |

| | |
|---|---|
| September 12, 2005 | Cedar Lake Park Association |
| October 11, 2005 | West Calhoun Neighborhood Association |
| November 12, 2005 | League of Women Voters |
| November 17, 2005 | St. Louis Park neighborhoods |
| November 22, 2005 | Citizens for a Loring Park Community |
| January 12, 2006 | West Tonka League of Women Voters |
| February 1, 2006 | Riley-Purgatory Watershed District |
| February 13, 2006 | Cedar Lake Park Association |
| February 23, 2006 | SouthWest Metro Transit Commission |
| September 5, 2006 | Cedar Isles Dean Neighborhood Association (CIDNA) |
| September 10, 2006 | CIDNA Fall Festival |
| September 11, 2006 | Kenwood Isles Neighborhood Association |
| September 27, 2006 | Minneapolis Neighborhoods along Alternative C |
| October 10, 2006 | Minnetonka City-wide Open House |
| October 12, 2006 | St. Louis Park Neighborhoods |
| October 19, 2006 | American Society of Civil Engineers – Mn Chapter |
| October 26, 2006 | Minneapolis Transportation Mgmt Organization |
| October 28, 2006 | Stevens Square Citizen Group |
| November 21, 2006 | East Isles Residents Association |

### Business Meetings

Business groups represent an important constituency. Businesses have a vital interest in transportation issues for a variety of reasons. Many rely upon the ability to move goods throughout our region and can be severely impacted by congestion. In addition, their operations are affected by the ability of their employees to get to and from their jobs. The overall economic competitiveness of a region is greatly affected by the quality of the transportation system serving that region.

The *Southwest Transitway AA Public Outreach Plan* included the business community as a major stakeholder. To ensure that the business community was engaged in the Southwest Transitway AA, the HCRRA hosted a meeting with study area business leaders in March 2005 to discuss their issues, concerns, and questions regarding the proposed Southwest Transitway. Approximately 35 business leaders and local elected officials attended the meeting. In addition, the Eden Prairie, Twin West, and Minneapolis Regional Chambers of Commerce were invited to participate as members of the Southwest PAC. Members of these chambers also participated in the Southwest PAC Funding Subcommittee. Study team staff also attended 11 other meetings with business groups at key intervals throughout the Southwest Transitway AA.

### Table 2.2 Meetings with the Business Community

| Date | Business Group |
|---|---|
| February 15, 2005 | Eden Prairie Rotary Club |
| March 15, 2005 | Uptown Business Association |
| April 8, 2005 | Breakfast Meeting with Interested Businesses |
| August 16, 2005 | Hopkins Business Council |
| September 1, 2005 | Hopkins Rotary Club |
| September 2, 2005 | St. Louis Park Sunrise Rotary Club |
| August 22, 2006 | Twin West Business Council |
| September 21, 2006 | Lake Street Business Council |
| October 10, 2006 | Eden Prairie Chamber Government Committee |
| November 28, 2006 | Edina Realty |
| December 5, 2006 | Edina Chamber – Government Relations Committee |
| November 9, 2006 | Minneapolis Regional Chamber |

## Open Houses and Public Hearing

The *S*outhwest Transitway AA included two series of public open houses, held at key points during the study process to provide the general public with study updates and an opportunity for interaction with study team staff.

The open houses were publicized through distributing newsletters, sending news releases to local newspapers and television stations, posting notices on the Southwest Transitway study website (www.southwesttransitway.org) and study partner websites, and emailing more than 300 interested persons. More than 125 individuals attended the 6 public open houses. Those attending were offered the opportunity to comment in several ways: with one-on-one conversations with study team staff, through a flip chart display of comments at each open house, and through comment cards. The comment cards could either be submitted at the open houses or sent in at a later time (comment cards were designed to be used as postcards, with the Hennepin County address written on the back). Another option offered to was to add their mail and email address to study mailing lists. This information was added to a study database that was used for public notices and distribution of study information.

*Initiation of the Southwest Transitway AA (non-NEPA scoping) Open Houses*
Three open houses were held during the spring of 2005. These open houses were intended to announce the initiation of the Southwest Transitway AA and to act as informal, non-National Environmental Policy Act (NEPA) scoping meetings. Information at these open houses included the intended scope of the Southwest Transitway AA, the history of the Southwest Transitway, the purpose and need for a Southwest Transitway, the Southwest Transitway goals and objectives, and the initial set of Southwest Transitway alternatives. including documentation of transitway options that had been considered during previous studies and dismissed from further consideration.

*Presentation of the Preliminary Southwest TAC Recommendation Open Houses*
Three open houses were held in the fall of 2006 to present the preliminary Southwest Technical Advisory Committee (TAC) recommendations and to solicit input from the public. The public input received at the open houses was shared with the Southwest Policy Advisory Committee (PAC) prior

to the formation of the final Southwest Policy Advisory Committee (PAC) recommendation in November 2006.

### Table 2.3 Open House Dates and Locations

| Date | Location |
|---|---|
| *Initiation of Southwest Transitway AA* | |
| May 10, 2005 | Eden Prairie – SouthWest Metro Station |
| May 11, 2005 | Hopkins – Hopkins Depot |
| May 12, 2005 | Minneapolis – Kenwood Recreation Center |
| *Presentation of Preliminary Southwest TAC Recommendation* | |
| October 24, 2006 | Minneapolis – Bryant Square Park |
| October 26, 2006 | Hopkins – Eisenhower Community Center |
| November 2, 2006 | Eden Prairie – SouthWest Metro Station |

*Hennepin County Regional Railroad Authority (HCRRA) Public Hearing*
The HCRRA held a formal public hearing on January 23, 2007 for the purpose of soliciting public comment on the final Southwest Policy Advisory Committee (PAC) recommendation on a preferred course of action for the Southwest Transitway (Appendix C). The public was notified of the public hearing through the required public announcement in Finance and Commerce on January 9, 2007. Notice was also published in the Southwest Journal, Downtown Journal, Hill and Lake Press, Eden Prairie News, and Sun Current. In addition, information on the public hearing was distributed to Southwest PAC and TAC members and to the study email distribution list.

### 2.5.2 Legislative Breakfast

The *Public Outreach Plan* called for communications with various constituencies that have or will in the future have a particular stake in the outcome of the Southwest Transitway AA. State legislators are such a group, given that state funding will be an important element of total project funding should a transitway project move forward. A breakfast meeting to present information about the Southwest Transitway AA and to solicit input from State legislators representing the study area was convened on August 21, 2006 at the Hopkins Depot Coffee House. Hennepin County Commissioner Gail Dorfman, Chair of the Southwest Policy Advisory Committee, co-hosted the meeting with Representative Frank Hornstein. Seven key legislators representing areas along the corridor attended, as well as nine Southwest PAC members and three local officials. In addition, Hennepin County Commissioner Dorfman and members of the study team met with individual legislators at various intervals throughout the study to provide study updates and to solicit input.

### 2.5.3 Meetings with City and Agency Partners

Study team members met with city councils, council committees, and city staff at intervals throughout the study to provide study overviews and updates, to determine route and station options, and to invite input. It is critically important to connect with city councils and staff, given that they are in close touch with the interests and concerns of their residents, and are key to ensuring that the project reflects those interests and concerns. The following table shows dates when meetings occurred.

### Table 2.4 Meetings with City Staff and Council Members

| Date | Group |
|---|---|
| March 15, 2005 | Eden Prairie City Council |
| August 17, 2005 | St. Louis Park Staff |
| August 18, 2005 | Hopkins Staff |
| September 15, 2005 | Edina Transportation Commission |
| September 22, 2005 | Minnetonka Staff |
| September 27, 2005 | Eden Prairie Staff |
| November 1, 2005 | Minneapolis Staff |
| September 19, 2006 | Eden Prairie City Council |
| September 25, 2006 | Minnetonka City Council |
| October 17, 2006 | Minneapolis Staff |
| October 19, 2006 | Edina Transportation Commission |
| October 24, 2006 | Hopkins City Council |
| November 14, 2006 | Eden Prairie City Council |

### 2.5.4 Advisory Committees

A key public involvement strategy was to connect with key constituencies or study partners through the creation of a policy oversight group, the Southwest Policy Advisory Committee (PAC), composed of representatives of cities, agencies, and business leaders. A staff advisory group, the Southwest Technical Advisory Committee (TAC) was also formed to provide oversight and guidance to the study team and to advise on public outreach efforts. Members of both of these groups were instrumental in communicating issues on behalf of the public constituencies they represent, and in ensuring that the study addressed public concerns.

#### Southwest Policy Advisory Committee (PAC)

The Southwest PAC was composed of elected officials or their representatives from Hennepin County, the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, Edina and Minneapolis, the Metropolitan Council, Metro Transit, SouthWest Metro Transit, the Three Rivers Park District, the Twin West Chamber of Commerce, the Minneapolis Regional Chamber of Commerce, and the Eden Prairie Chamber of Commerce. It was assembled to provide policy guidance and develop the final study recommendation on a preferred course of action for the Southwest Transitway. The Southwest PAC met eleven times during the study process. One of those meetings included a tour of the Hiawatha LRT line.

### Table 2.5 Southwest PAC Meetings

| Date | Agenda / Topics Covered |
|---|---|
| March 2, 2005 | Study overview; Discussion of study goals and objectives; Presentation of *Public Outreach Plan* |
| May 20, 2005 | Tour of the Hiawatha light rail line |
| July 27, 2005 | Public outreach update and website demonstration; Presentation of initial alignment alternatives and proposed evaluation criteria |
| August 24, 2005 | Presentation of and comment on proposed evaluation measures |

| | |
|---|---|
| September 14, 2005 | Public outreach update; Response to questions raised about evaluation measures; Presentation of enhanced bus, BRT, and LRT technologies; Formation of Funding Subcommittee |
| January 11, 2006 | Public outreach update; Update on Funding subcommittee work |
| February 24, 2006 (Funding Subcommittee) | Presentation and discussion of federal transportation funding; review of draft report to the full PAC |
| April 12, 2006 | Review of Definition of Alternatives; Presentation of Funding Subcommittee findings |
| June 14, 2006 | Legislative update; Presentation of preliminary capital cost estimates; Presentation on land use issues |
| September 13, 2006 | Joint PAC and TAC Workshop to review preliminary study findings |
| September 27, 2006 | Review of TAC recommendations; Public outreach update |
| December 13, 2006 | Final PAC meeting to prepare recommendation to the Hennepin County Regional Railroad Authority |

In addition to the primary work of the PAC, a subcommittee of the PAC explored transitway funding issues. Three meetings were convened in late 2005 and early 2006 to hear input from experts on regional, state, and federal funding, and to discuss funding issues as they relate to a Southwest Transitway project. The subcommittee presented a report to the full PAC on April 12, 2006, including recommendations for action. Among those was a recommendation to support an important transit ballot amendment, the Motor Vehicle Sales Tax (MVST) amendment. In response, the PAC adopted a resolution supporting this ballot amendment to increase dedicated state funds for roads and transit.

#### Table 2.6 Southwest Funding Subcommittee Meetings

| Date | Agenda / Topics Covered |
|---|---|
| October 27, 2005 | Presentation and discussion of regional transportation funding |
| December 16, 2005 | Presentation and discussion of state transportation funding |
| February 24, 2006 | Presentation and discussion of federal transportation funding; review of draft report to the full PAC |

### Southwest Technical Advisory Committee (TAC)

The Southwest TAC was led by the Hennepin County Study Manager, and included technical staff from the Metropolitan Council, Metro Transit, SouthWest Metro Transit, the Three Rivers Park District, the Minnesota Department of Transportation (Mn/DOT), Twin City & Western Railroad , and the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, Minneapolis, and Edina. It was assembled to provide technical guidance during the Southwest Transitway AA. The Southwest TAC met 16 times throughout the study period.

### 2.5.5 Newsletters

Four project newsletters were developed and more than 5,000 were distributed throughout the study area. The newsletters discussed the study process and study results, reviewed transit technologies and routes, described the regional transit plan, and publicized open houses. See Appendix D for copies of the Southwest Newsletters.

In addition, study partners from four suburban cities published articles about the Southwest Transitway AA in their city newsletters. These articles described the alternatives being studied and encouraged citizens to attend upcoming meetings.

### 2.5.6 Website

An Internet website was designed and maintained on behalf of the HCRRA to provide updated information on the study's progress, study maps and reports, and information about opportunities for public comment on the study. The website address is www.southwesttransitway.org. In addition to providing study information, the website was structured to allow for submission of comments and to accept requests for email addresses to be added to the study e-mailing list.

### 2.5.7 Press Releases

Hennepin County produced press releases during the course of the study to provide local media with study updates and to publicize the public open houses.

### 2.5.8 Television and Newspaper Articles

The Southwest Transitway AA received coverage in the local community newspapers including the Sun Current, the Sun Sailor, the Eden Prairie News, the Southwest Journal, and in newsletters of local groups and cities. This coverage helped raise public awareness since the combined circulation of local community newspapers is in excess of 100,000 residences. In addition to the community newspapers, 7 articles appeared in the Minneapolis Star Tribune, which has a circulation of over 400,000.

Local TV stations began to track the Southwest Transitway AA in the fall of 2006. Three local TV stations and at least one radio station ran stories on the study in conjunction with the second series of public open houses.

**Table 2.7 Media Coverage**

| Date | Media Source | Article |
|---|---|---|
| March 3, 2005 | Minnesota Bike Trails | SW Regional LRT Trail Log |
| April 4, 2005 | Star Tribune | Hiawatha's Early Success Provides Momentum |
| April 24, 2005 | Star Tribune | Public Forum Set for Proposed Rail Line in West Metro |
| April 2005 | Sun Current / Sun Newspapers | Local News: Getting Around |
| May 17, 2005 | Star Tribune | Residents Weigh in on Transit |
| May 19, 2005 | Sun Current / Sun Newspapers | Shedding Light on Rail, Bus Transit |
| May 2005 | Hopkins City Newsletter | Ad for Community Open Houses in May |
| September 26, 2005 | Eden Prairie News | Planned Prairie |
| January 2 - 15, 2006 | Southwest Journal | Potential LRT Lines Explained |
| August 21, 2006 | Star Tribune | Announcement: Southwest Transit Study on Twin West Chamber Minnetonka/Plymouth Business Council agenda |
| May 2006 | Uptown Neighborhood News | LRT Line Could Connect Uptown with Downtown and Eden Prairie<br>Opinion Article: LRT in Uptown? |

| | | |
|---|---|---|
| June 28, 2006 | Minnetonka City Newsletter | Southwest Transitway Study to Result in Preferred Alternative |
| July 12, 2006 | Eden Prairie News | Still Chugging Along |
| August/September 2006 | St. Louis Park Perspective | Interested in Transit? Here's your chance to get on board |
| August 2006 | Metro Transit Newsletter: Takeout | Transit Options Being Studied in Southwestern Metro |
| September 14, 2006 | Star Tribune | Study: 2 Light-Rail Routes Could Land Federal Funds |
| September 14, 2006 | Pajamas Media web site | Study: 2 Light-Rail Routes Could Land Federal Funds (Star Tribune article) |
| September 14, 2006 | KSTP TV Channel 5 | Possible Light Rail Line for West Metro |
| September 26, 2006 | Twin West Newsletter | Ongoing: Southwest Transitway AA |
| September 26, 2006 | Star Tribune | West cities plan possible routes for light rail into Minneapolis |
| October 10, 2006 | Star Tribune | Want to get onboard light-rail planning? Here's how |
| October 11, 2006 | Sun Newspapers | Light rail could come to southwest suburbs by 2015, officials estimate |
| October 18, 2006 | Sun Newspapers | Light-rail plans described |
| October 25, 2006 | WCCO TV Channel 4 | En Route Toward A New Southwest LRT Line |
| November 2006 | Ralph's Reader (Minneapolis Councilmember Ralph Remington) | Transitway Alternatives Narrowed Down |
| December 1, 2006 | Southwest Journal | On track for rail |

### 2.5.9 Animated Presentation

An animated presentation was prepared and shown at the Fall 2006 open houses, on the local cable access channel, and at the HCRRA's public hearing in January 2007. The nine-minute video presents an overview of the AA process, describes the alternatives evaluated, and provides the rationale for the preliminary Southwest TAC recommendation. The video was created in a fashion to be easily shared and revised for future use in continuing to communicate with the public regarding the proposed Southwest Transitway.

### 2.5.10 Study Displays

In response to a request from city study partners, a mobile bi-fold display board was prepared to show study results and preliminary recommendations. The display was used at city meetings and was also prominently displayed at the Eden Prairie Center Mall for several weeks during the November/December 2006 public input period