Southwest Rail Transit Study

Final Report

Conducted for
Hennepin County Regional Railroad Authority in cooperation with the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis.

October 2003

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1. INTRODUCTION

The Hennepin County Regional Railroad Authority (HCRRA), in partnership with the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park and Minneapolis conducted a rail transit study for a Southwest Rail Transitway between Eden Prairie and downtown Minneapolis.

The purpose of the Southwest Rail Transit Study was to determine if rail transit should be part of the transportation strategy for the southwest metropolitan area.

Study elements included:

- Continuously informing, involving, and engaging the public in discussions regarding rail transit.
- Defining and evaluating rail transit technology and alignment alternatives.
- Estimating ridership and costs (capital and operating).
- Identifying potential environmental and social impacts.
- Determining if rail transit should continue to be studied as a feasible option for a Southwest Rail Transitway.

Study Management

Two committees, the Southwest Policy Advisory Committee (PAC) and the Southwest Technical Advisory Committee (TAC) provided guidance for the Southwest Rail Transit Study.

Policy Advisory Committee (PAC)

A Policy Advisory Committee (PAC) composed of elected officials or their representatives from the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis, Hennepin County, the Metropolitan Council, Metro Transit, Southwest Metro Transit, the Three Rivers Park District, the Twin West Chamber, and the Eden Prairie Chamber was assembled. The Southwest PAC provided policy guidance throughout the study process and developed a recommendation for the HCRRA regarding whether rail transit should continue to be studied as a feasible option for a Southwest Rail Transitway. The Southwest PAC met at key decision points throughout the study process.

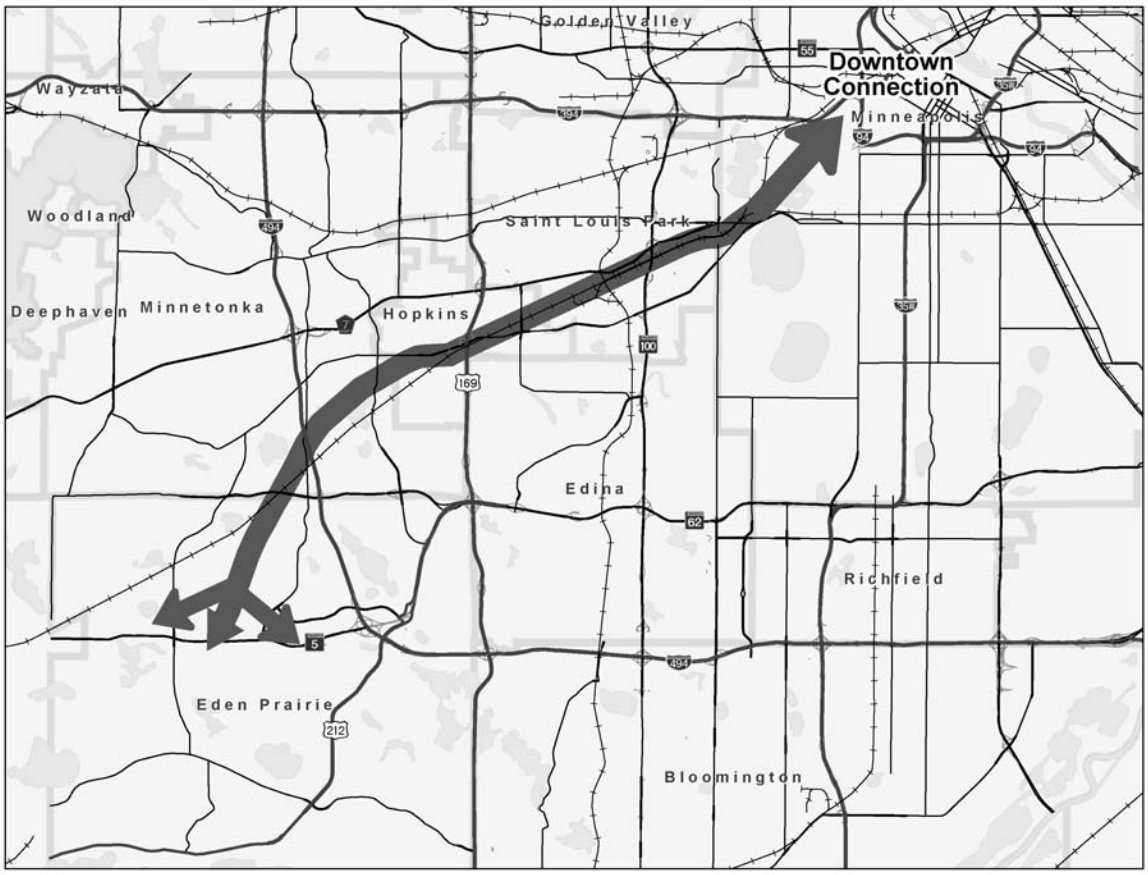
Technical Advisory Committee (TAC)

A Technical Advisory Committee (TAC) composed of technical staff from the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis, Hennepin County, the Metropolitan Council, Metro Transit, Southwest Metro Transit, the Three Rivers Park District, the Minnesota Department of Transportation (Mn/DOT), and Twin City Western Railroad was assembled. The Southwest TAC developed a recommendation for Southwest Policy Advisory Committee (PAC) consideration regarding which rail transit alternatives should be considered in future studies. The Southwest TAC met monthly throughout the study process to provide technical guidance and to review the technical work of the consultant.

Study Area

The study area is defined as the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park and Minneapolis.

Figure 1.1 Study Area Map



History

Hennepin County Regional Railroad Authority (HCRRA)

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.

Southwest Transitway

In recognition of the potential growth in the southwest metro area, a Southwest Transitway has been discussed for this area since the mid-1980s.

The following is a list of the history of planning for a Southwest Transitway:

Comprehensive Light Rail Transit (LRT) System Plan, Hennepin County 1988
In 1988, the HCRRA completed the Comprehensive Light Rail Transit System Plan, which identified the HCRRA's Southwest Corridor from Minneapolis to Hopkins as a future LRT line.

29th Street & Southwest Busway Feasibility Study, Hennepin County February 2000
In 1999, Hennepin County initiated a study to determine the feasibility, defined in terms of ridership forecasts and cost estimates, of constructing and operating a limited-stop, rapid transit busway in the 29th and Southwest (defined as Hopkins to downtown Minneapolis) corridors. The study concluded that based upon ridership forecasts and cost estimates, an exclusive limited-stop busway in the 29th Street and Southwest Corridor is "technically" feasible.

Transit 2020 Master Plan, Metropolitan Council, February 2000
In 2000, the Metropolitan Council published the Transit 2020 Master Plan, the region's long-range plan for improving transit. The Southwest Corridor from Eden Prairie to downtown Minneapolis was identified in Transit 2020 as an exclusive busway for implementation prior to 2010.

Twin Cities Exclusive Busway Study, Mn/DOT August 2000
In 2000, the Commissioner of Transportation directed staff to conducted a study to determine the cost of constructing and operating an exclusive busway system by the Year 2020. 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.

Legislative Appropriation for Exclusive Busway Studies
In 2000, the State Legislature appropriated $6.3 million for the Metropolitan Council to conduct busway studies. The Metropolitan Council decided to divide these funds equally between three busway candidates: the Riverview, Southwest, and Northwest Corridors.

Legislative Ban on the Southwest Busway Study
In 2001, the State Legislature passed a bill banning the Metropolitan Council from studying, planning, designing, constructing and operating a busway in the cities of Minnetonka, Eden Prairie, Chanhassen, and Chaska as well as the Kenilworth and Midtown Corridors in Minneapolis.

Transit 2025 Master Plan for Transit
Late in 2001, the Metropolitan Council changed the designation of the Southwest Corridor from "exclusive busway" to "transitway technology unspecified."

Southwest Rail Transit Study
In early 2002, the HCRRA in partnership with the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park and Minneapolis, initiated the current study to revisit earlier plans to develop light rail transit along this corridor. This study represents an initial step in moving towards development of a rail transit option.

Bicycle and Pedestrian Trails

Currently, 37 miles of bicycle and pedestrian trails are located on land purchased by the Hennepin County Regional Railroad Authority (HCRRA). In 1995 the HCRRA adopted the *HCRRA Land Use Management Plan,* which identified interim bicycle and pedestrian trails as an allowable use on HCRRA property until such a time as the property was required for a transit purpose. While these bicycle and pedestrian trails are identified as "interim" uses, the long-range vision for these corridors are facilities that accommodate both the trails and rail transit.

Within the study area, four trails are located on HCRRA property: the Southwest LRT Trail (north and south), the Kenilworth Trail, the Cedar Lake Trail, and the Midtown Greenway Trail. The Southwest LRT Trail is operated and maintained by the Three Rivers Park District, formerly Suburban Hennepin Parks. The Kenilworth, Cedar Lake, and Midtown Greenway Trails are operated and maintained by the City of Minneapolis.

As stated previously, if a decision is made to locate rail transit along the HCRRA property the intent is for the trail to co-exist with rail transit. The ultimate vision 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 a minimum of 100 feet of right-of-way. In Minneapolis the HCRRA also owns 100 feet of right-of-way with the exception of a small portion of the Kenilworth Corridor where the HCRRA right-of-way narrows to 60 feet. Typically two tracks of LRT require 30 to 35 feet of space and a trail requires 10 to 14 feet of space.

LRT and Trail, Strasbourg, France

According to the *Rails-to-Trails Conservancy*, rail and trails co-exist 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 Corridor, the Cedar Lake Corridor, and the Southwest Corridor through Hopkins and St. Louis Park. Until recently rails and trails also co-existed in the Midtown Greenway 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.

Trail and Freight Rail, Kenilworth Corridor

Freight Rail Lines

Three active freight lines, the Canadian Pacific (CP), the Burlington and Northern Santa Fe (BNSF), and the Twin Cities and Western (TCW), currently operate within the study area. These freight rail companies not only provide freight service to customers within the study area and the Twin Cities region, but also to other regions of the country (Seattle, Washington; Aberdeen, South Dakota; and, Kansas City, Missouri). Currently, these freight rail companies have no plans to abandon service through the study area.

Transit Services

Two transit providers primarily serve the study area cities: Metro Transit and Southwest Metro Transit. 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 to downtown Minneapolis from Eden Prairie, Chanhassen and Chaska as well as local circulator service throughout Eden Prairie, Chanhassen and Chaska.

A total of 42 bus routes, 28 express, two limited stop, and 12 local routes, serve the study area. On an average weekday, nearly 45,000 commuters from the study area cities use transit to travel to downtown Minneapolis. Approximately 43,000 study area commuters are carried on Metro Transit buses and 2,000 are carried on Southwest Metro buses. While numerous park-and-rides are located throughout the study area, the largest single park-and-ride facility with over 1,000 spaces is the Southwest Metro Transit Center located in Eden Prairie.

Roadways

The roadway network in the study area is a comprehensive system of urban interstates, major highways, arterial roadways, collector 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. Due to 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.

Land Use

Within the five study area cities, a vast mixture of development types and intensities exist. The study area not only encompasses downtown Minneapolis, which remains the largest traffic generator in the region, but also 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 also grown quickly in recent years developing employment concentrations in area such as downtown Hopkins, Opus, Golden Triangle.

2. THE PURPOSE AND NEED

Introduction

This chapter documents the changing demographics, travel behavior, and resulting transportation problems in the study area and the region. It also describes the proposed strategy for managing the region's transportation system.

Demographics

Over the past 10 years, the Twin Cities Metropolitan Area has experienced strong growth and is anticipated to continue growing into 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 this region will add 635,000 people, 320,000 households, and 312,000 jobs. The study area cities (i.e., Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis) are projected to add 63,000 residents and 85,000 jobs by 2030. The study area cities will then account for 17 percent of all regional residents and 25 percent of all regional employment.

Study Area Population

While the study area cities increased in population from 1980 to 1990, it was Eden Prairie and Minnetonka that experienced the most substantial growth. Between 1980 and 1990, Eden Prairie more than doubled its population, adding over 23,000 residents, and Minnetonka increased its population by more than a quarter, adding over 9,000 residents.

Between 1990 and 2000, it was again Eden Prairie leading the study area cities in growth by increasing its' population by another 40 percent.

Table 2.1 Study Area Population Trends

	1980	1990	Percent Change (1980-1990)	2000	Percent Change (1990-2000)
Eden Prairie	16,263	39,311	104%	54,901	40%
Minnetonka	38,683	48,370	25%	51,301	6%
Hopkins	15,336	16,534	8%	17,145	4%
Minneapolis	370,951	368,383	-1%	382,618	4%
St. Louis Park	42,931	43,787	2%	44,126	1%
Total	**484,164**	**516,380**	**7%**	**550,091**	**7%**

Source: Minnesota Planning

Between 2000 and 2030, the Metropolitan Council projects the study area cities to increase by nearly 63,000 residents or 11 percent. While in terms of raw numbers, Minneapolis will add the most residents at approximately 43,000; the cities with the strongest percentage growth are expected to be St. Louis Park at 17 percent and Eden Prairie at 15 percent.

Table 2.2 Projected Study Area Population

St. Louis Park	44,126	51,500	17%
Eden Prairie	54,901	63,000	15%
Hopkins	17,145	18,900	10%
Minneapolis	382,618	426,000	11%
Minnetonka	51,301	53,500	4%
Total	**550,091**	**612,900**	**11%**

Sources: Metropolitan Council and Minnesota Planning

Study Area Employment Trends

According to the U.S. Census between 1990 and 2000, the Twin Cities Metropolitan Area added 290,000 new jobs, which equates to an increase in job base of 23 percent. During this same period, the study area cities added over 43,000 new jobs, which increased 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 the highest traffic generator in the region because it is not only home to many corporate headquarters, including the Target Corporation, American Express, Excel Energy, and Wells Fargo, but is also the cultural and entertainment center of the region with the Guthrie Theatre, the Walker Art Center, Orchestra Hall, the HHH Metrodome, and the Target Center Arena.

The remaining study are employment is dispersed throughout the remaining study area cities in concentrations in the Park Commons and Wooddale area of St. Louis Park, downtown Hopkins, the Opus development in Minnetonka, and the Golden Triangle as well as the Eden Prairie Center Mall areas in Eden Prairie.

Table 2.3 Study Area Employment Trends

	1990	**2000**	**Percent Change (1990-2000)**
Eden Prairie	36,095	49,392	37%
Minnetonka	35,536	50,471	42%
Minneapolis-CBD	128,395	139,800	9%
St. Louis Park	36,791	40,714	11%
Hopkins	12,252	11,777	-4%
Total	248,895	292,154	17%

Sources: U.S. Census Bureau and Metropolitan Council

Study Area Employment Projections

The Metropolitan Council projects that the study area cities will continue to experience strong employment growth through 2030. According to those forecasts, the five cities will increase their collective employment base by 30percent to a total of over 370,000 jobs. In terms of raw numbers, again it is downtown Minneapolis that will add the highest number of jobs at 43,600. In terms of percentage growth, Hopkins is expected to lead the study area cities increasing its' job base by 38 percent, followed by St. Louis Park at 30 percent, Eden Prairie at 21 percent, and Minnetonka at 16 percent.

Table 2.4 Study Area Employment Projections

	2000	2030	Percent Change (2000-2030)
Minneapolis -CBD	139,800	183,400	31%
St. Louis Park	40,714	52,500	30%
Minnetonka	50,471	58,600	16%
Eden Prairie	49,392	59,500	21%
Hopkins	11,777	16,300	38%
Total	**285,700**	**370,300**	**30%**

Sources: U.S. Census Bureau and Metropolitan Council

Impact on the Transportation System

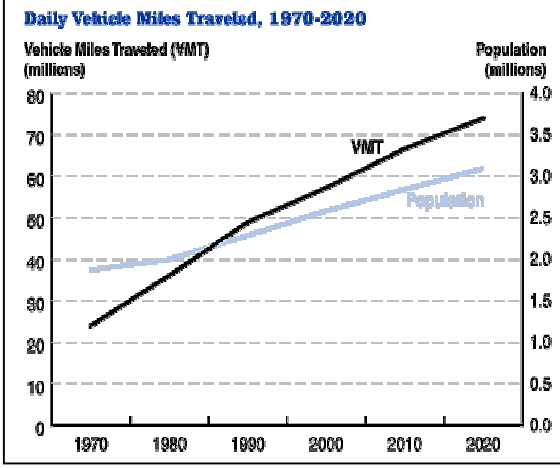
According to the Minnesota Department of Transportation, over the past 30 years changing demographic and development patterns in the region have resulted in increased travel. The excess roadway capacity created in the 1970s to accommodate projected population growth has been quickly depleted as people 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 this region. Due to the lack of transportation funding as well as the social and environmental consequences of roadway expansion, congestion is anticipated to continue to grow.

There are a number of factors that explain the increase in travel demand within this region. These include increases in the average number of vehicles per household, increases in the number of multiple-worker households, and increased dispersion of jobs as well as housing throughout the region.

As shown in Figure 2.2, since the mid-1980s vehicle miles of travel has outpaced population growth in this region. The Metropolitan Council projects this trend to continue through 2020 with vehicle miles of travel increasing by 38percent while population increases by 28percent.

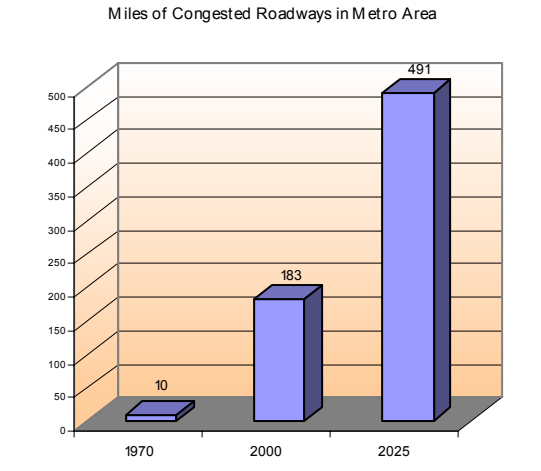
According to data from Mn/DOT the demand for travel in the southwestern metro area has increased substantially since the 1980s and is expected to continue to increase significantly. Specifically, between 1990 and 2000, traffic growth on the major interstates and highways in the southwestern metropolitan area increased by approximately 23percent.

Figure 2.2 Daily Vehicle Miles Traveled, 1970-2020



As daily travel for work, education, shopping, and other purposes continues to outpace the capacity of the transportation system, congestion and delays will result. As shown in Figure 2.3, the number of congested lane miles increased from 10 in 1970 to 183 in 2000. According to Mn/DOT the average person going to work in the Twin Cities wasted 54 hours in congestion in 2000. This contributed to a per commuter loss of $1,000 in time and fuel, which equates to $1.2 billion for the region.

Figure 2.3 Miles of Congested Roadways



Future Conditions

As the region continues to grow and residents continue to make more and longer trips on a relatively fixed roadway system, congestion and delays will increase substantially. According to Mn/DOT the number of congested lane miles will increase from 183 in 2000 to 491 in 2025. According to the Metropolitan Council, even if funds were unlimited, the social and environmental constraints are too great to continue with large highway expansion programs to eliminate congestion.

Figure 2.4 illustrates the regional roadways that are considered congested in 2000 and those projected to be congested in 2025. According to Figure 2.4, congestion is identified as occurring today on the study area roadways of I-394, I-494, I-35W, TH 7, TH 62, TH 100, and TH 169. The majority of these roadways are expected to continue to be congested in the future even with Mn/DOT's planned improvements of adding a lane to I-494, removing the signalized intersections on TH 169, and rebuilding TH100.

As congestion in the region increases the geographic area that can easily be accessed for jobs, education, shopping, and recreation decreases. Figure 2.5 through 2.7 attempt to graphically depict the decline in accessibility between 2000 and 2025 for three of the study area cities, Minneapolis, St. Louis Park, and Eden Prairie. The maps depict the area that can be accessed during the afternoon rush hour within 30 minutes and within 30 to 60 minutes. It is clear from these maps that travel times will greatly increase and accessibility will greatly decline in the southwestern metro area between 2000 and 2025.

According to both the Metropolitan Council and Mn/DOT, the funding for transportation, both roadways and transit, is insufficient. According to Mn/DOT Metro Division an additional $9 billion is required to maintain current mobility on the regional highway system. According to the Metropolitan Council, transit spending in this region is low compared to our peer cities. This low level of funding limits the amount of transit service available, which exacerbates congestion by not providing an attractive alternative to driving alone.

There are serious consequences to failing to provide a higher level of investment in the regional transportation system. These consequences include a significant increase in congestion and delay (measures a an increase in travel times, an increase in traffic on local and neighborhood streets, a higher number of accidents, and a lack of continuity in design of the transportation system. Many of these impacts will increase the costs of goods and services for the public and will reduce the overall quality of life in the metro area.

Figure 2.4 Congested Highways, 2000 and 2020

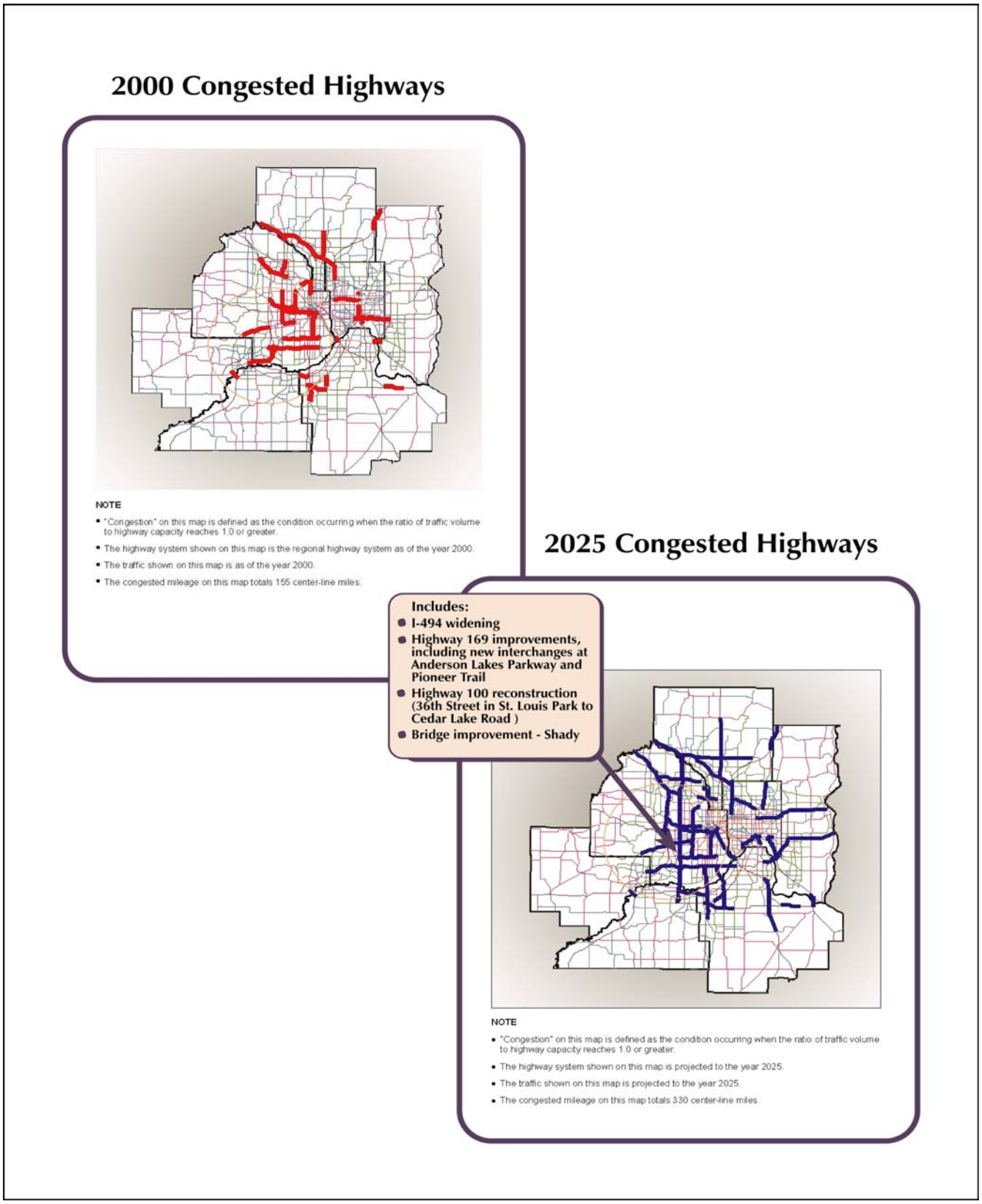


Figure 2.5 Peak Hour Travel Times (2000 vs. 2020) Minneapolis

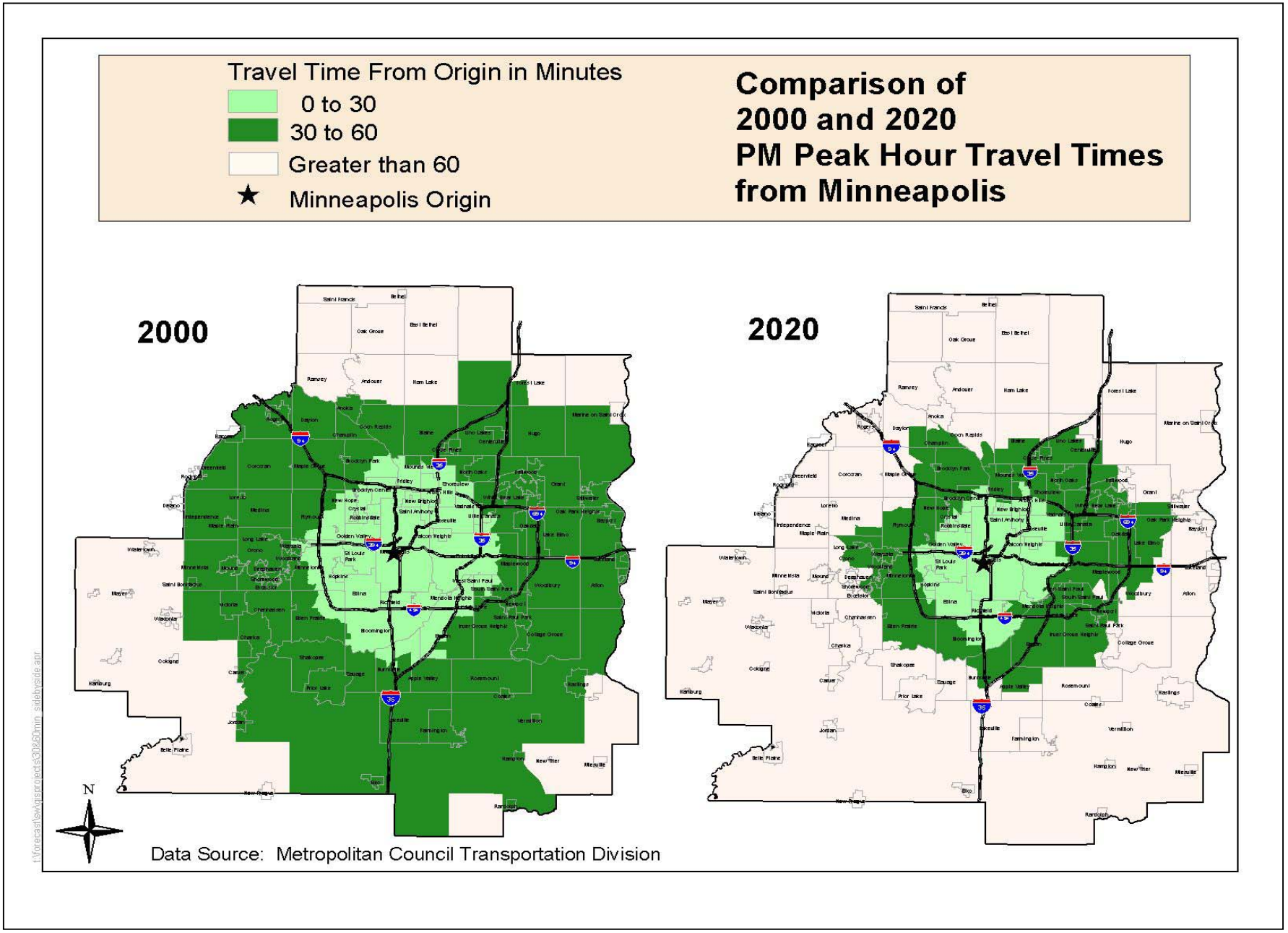


Figure 2.6 Peak Hour Travel Times (2000 vs. 2020) St. Louis Park

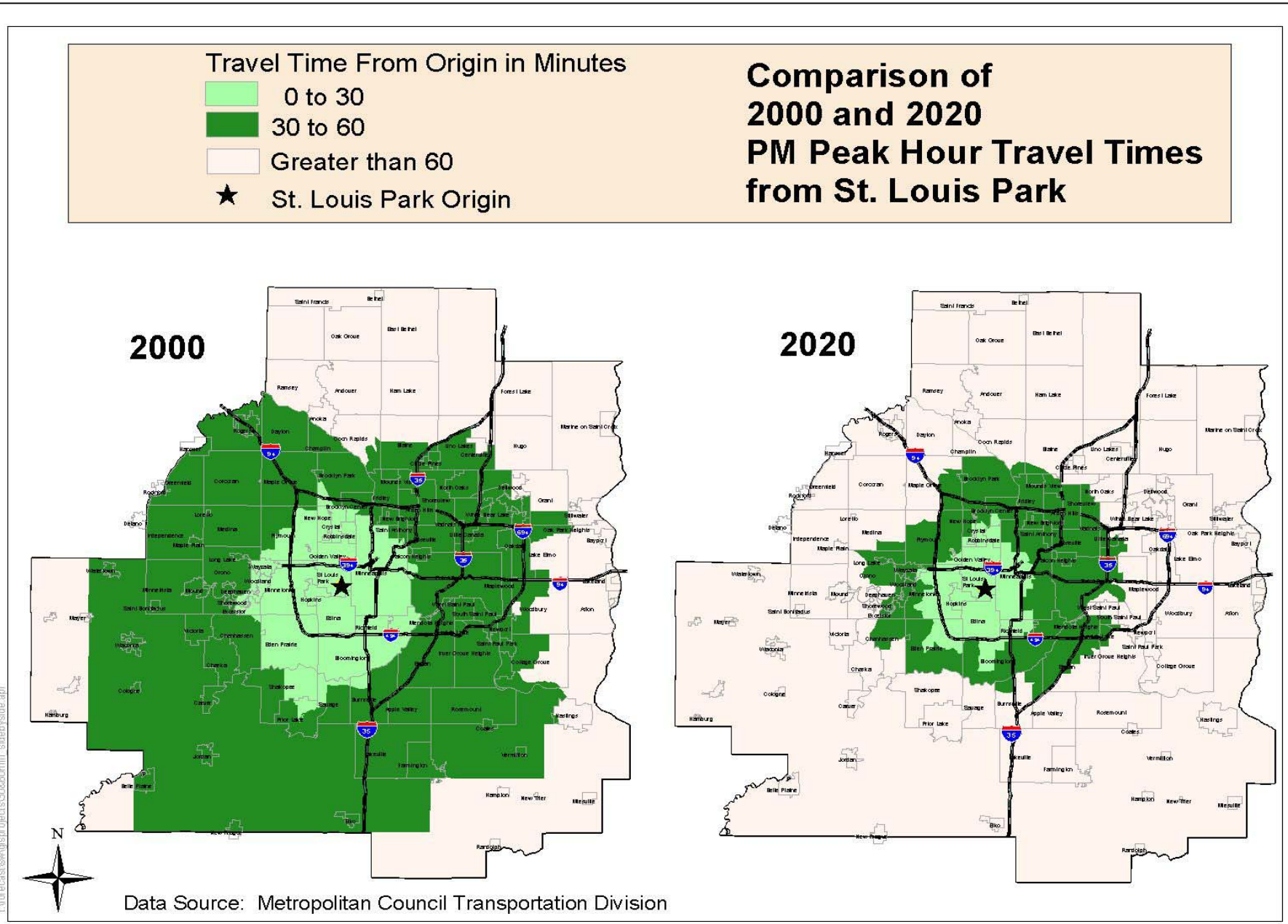
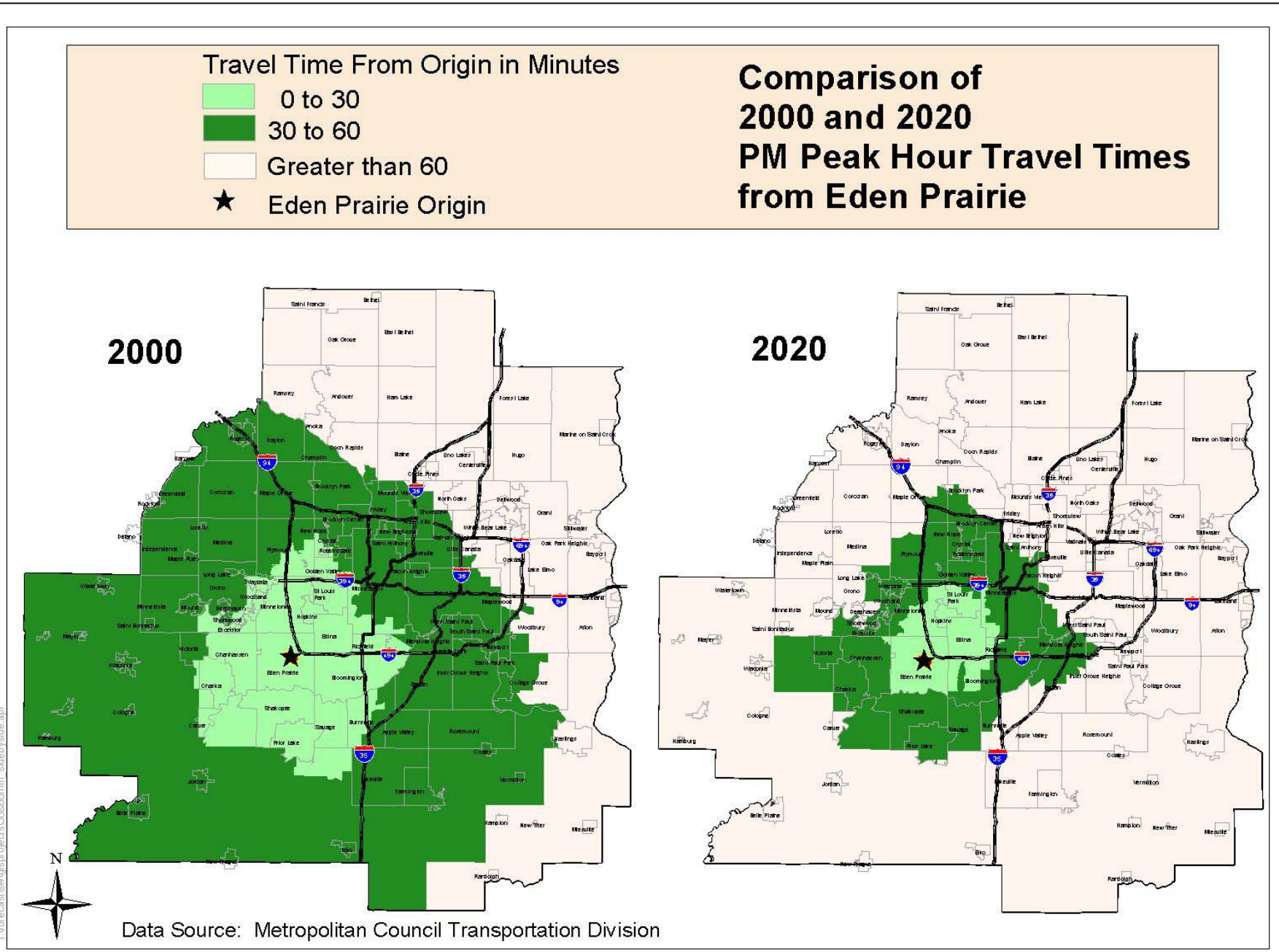


Figure 2.7 Peak Hour Travel Times (2000 vs. 2020) Eden Prairie



The Challenge

The key challenge for the Twin Cities Metropolitan Area will be to accommodate the projected growth while maintaining the region's economic competitiveness and enhancing the region's quality of life. The Metropolitan Council, the Minnesota Department of Transportation, and the metropolitan area counties and cities work cooperatively to develop long-range plans for managing growth and the transportation system in this region.

Regional Plans

Regional Blueprint

The Metropolitan Council's Regional Blueprint provides the policy guidelines, goals, and strategies for how the Metropolitan Council and its regional partners will guide growth in the Twin Cities Metropolitan Area. Though land use and economic development are the main themes of this plan, transportation and transit play a key role in the vitality of these themes.

Transportation Policy Plan (TPP)

The Metropolitan Council's Transportation Policy Plan (TPP), documents the future of transportation in the seven county metropolitan area of the Twin Cities. This plan documents the growing concern of present and future traffic congestion and provides an incentive for transit to provide better access to jobs, promote higher density development, and revitalize the core of the central cities. Increasing and improving the existing transit service to the metropolitan area is one of the trop priorities in this policy plan.

Transportation System Plan (TSP)

The Mn/DOT Metro Division's Transportation System Plan (TSP) is the long-range plan of the Metro Division for maintaining and improving the trunk highway system through 2025. The TSP is a comprehensive planning foundation upon which 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. Mn/DOT anticipates that expansion and improvement projects on the metro area highway system to total more than $2.4 billion between 2001 and 2025. Mn/DOT has also documented that the metropolitan area's unmet transportation needs total $9 billion between 2001 and 2025.

Transit 2025

The Metropolitan Council's Transit 2025 Plan is the region's long-range plan for transit investments. The overall goal of this plan is to double transit ridership by the year 2025 through doubling the region's bus service and implementing a system of transitways (i.e., light rail transit, commuter rail, and exclusive busways).

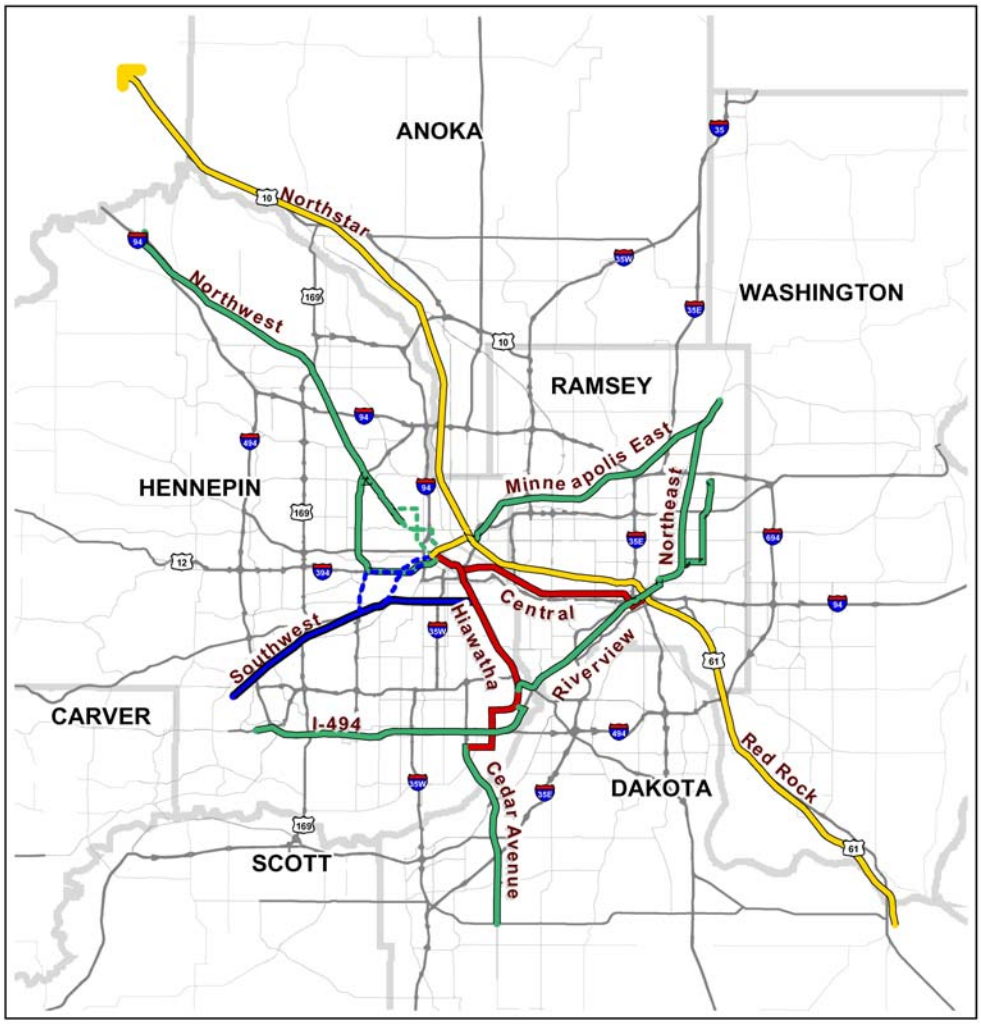
A system of transitways is a key component of this plan because transitways provide a travel-time advantage over single-occupant automobiles, improve transit service reliability, and boost the potential for transit-oriented development. In addition, the implementation of the transitway system is expected to 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 million annually, save 27 million gallons of fuel, and reduce carbon monoxide emissions by 6, 600 tons annually. A Southwest transitway was identified in the Transit 2025 Plan for implementation post-2010 and with an unspecified technology.

Figure 2.8 Transit 2025 Map

Updates to the 2025 Transitways Map

As a result of state legislation and completion of transportation studies, on January 23, 2002, the Metropolitan Council updated its 2025 Transitways map as follows:

- Southwest/Midtown Greenway/Kenilworth Corridor : Shown as a transitway with "technology unspecified."
  Busway prohibited by state law west of TH 169 or in Kenilworth and Midtown corridors.
- Cedar Avenue : changed to busway
- Dan Patch Commuter Rail : removed from 2025 Transitways map
- Riverview Corridor Busway : extended along Phalen Corridor and Maryland Ave. to White Bear Ave. and then north to Maplewood Mall
- I-494 Corridor : added as a busway from the airport to the Eden Prairie Transit Center



Local Comprehensive Plans

The following are excerpts from the comprehensive plans from the study area cities and Hennepin County regarding the proposed Southwest Rail Transitway.

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."[1]

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."[2]

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}."[3]

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."[4]

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."[5]

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."[6]

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[1] The Minneapolis Plan, adopted 3/24/00, pg. 1.8.6.64.

[2] City of St. Louis Park Comprehensive Plan 2000-2020, adopted 5/17/99, pg. I-37.

[3] City of Hopkins Comprehensive Plan, completed 12/21/99, pg. 35.

[4] City of Minnetonka Comprehensive Plan, Draft for Metropolitan Council Review, 10/26/98, pg. 5-10.

[5] City of Eden Prairie Comprehensive Plan Update, adopted 3/19/02 pg. 5-12.

[6] Hennepin County Transportation Systems Plan, adopted by the Hennepin County Board of Commissioners, 7/19/00, pg. 4-24.

Southwest Rail Transitway Goals

The purpose of this study is to determine if a Southwest rail transitway should be part of an overall transportation strategy for the Southwest Metro Area that also includes investments in roads and buses. For overall study guidance, the following goals, which respond to the transportation needs of the Southwest Study Area, were developed:

Improve Mobility

Roadway improvements in the study area have not kept pace with travel demand. The result has been increased congestion, delay, pollution, and business costs. Between 1990 and 2000, major highways in the study area experienced a 23 percent increase in traffic volume. By 2020, volumes on study area roadways are expected to increase an additional 40 percent. This is expected to occur even with the roadway improvement planned for the southwestern metro area, namely the widening of I-494, new interchanges along Highway 169, the reconstruction of Highway 100, and the bridge improvements along Shady Oak Road over the HCRRA Corridor.

A Southwest Rail Transitway needs to improve mobility within the Southwestern Metro Area through providing an alternative to the single-occupant vehicle and through providing additional capacity to the transportation system.

Efficiently and Effectively Move People

Transportation investments are intended to result in the efficient and effective movement of people and goods throughout the region. Increased congestion is severely impacting the roadway system's ability to move people throughout the region.

A Southwest Rail Transitway needs to be efficient and effective in moving people throughout the region.

Provide a Reliable/Competitive Travel Choice

Traffic congestion, vehicular crashes and weather dramatically affect travel time reliability in this region. The time lost due to congestion and delay is estimated to exceed $1.2 billion annually.

A Southwest Rail Transitway needs to provide commuters with predictable travel times that are competitive to driving alone.

Serve Population and Employment Concentrations

The Metropolitan Council projects that by 2030, the study area cities will account for 25percent of all regional employment and 17percent of all regional households.

A Southwest Rail Transitway needs to serve the population and employment concentrations within the study area. This includes both providing transit service for those destined to downtown Minneapolis as well as those destined to suburban job centers in Eden Prairie, Minnetonka, Hopkins and St. Louis Park.

The Capital and Operating Costs Should be Reasonable

Transportation investments must be reasonable in terms of both their one time capital costs as well as their ongoing operating costs.

A Southwest Rail Transitway needs to be reasonable in terms of the initial capital costs required for construction as well as the ongoing costs to operate the system.

Protect the Environment and Enhance the Quality of Life in the Region

Air quality and protection of the natural environment are key to maintaining the high quality of life enjoyed in this region. The current and projected congestion levels will have a negative effect on the air quality, mobility, and the quality of life in this region.

A Southwest Rail Transitway needs to enhance air quality, the natural environment, and the quality of life in the study area as well as the region.

3. PUBLIC INVOLVEMENT

Introduction

This chapter presents an overview of the public involvement process utilized for the Southwest Rail Transit Study. *Appendix B: Public Involvement* contains more details on the public involvement activities.

Public involvement is important for any planning process, and was a critical component of the Southwest Corridor Rail Transit Study. A public involvement plan, developed early in the study process with input from study partners, used concepts from the Systematic Development of Conformed Consent (SDIC) public involvement process. Under this process, key stakeholders and their likely concerns and interests were identified, and outreach strategies were developed based on the analysis of issues. A plan for action was developed that offered multiple opportunities for the public, specifically for affected residents and businesses, to offer input into the study process.

Issues, concerns, questions, and other feedback from the public was sought throughout the study via community meetings and open houses, electronic and regular mail, phone calls, and meetings with neighborhood groups and groups of interested residents, and other outreach techniques. Throughout the study, public involvement efforts were guided by input from the Technical Advisory Committee (TAC) and the Policy Advisory Committee (PAC).

In addition to the public involvement activities, a statistically valid survey of study area residents was conducted to learn more about community attitudes towards traffic congestion, the current transportation system, and rail transit.

Public Involvement Techniques

The public involvement techniques employed during the Southwest Rail Transit Study included public open houses, special meetings and presentations, newsletters, a website, press releases, newspaper articles, city council meetings, a Southwest Policy Advisory Committee (PAC) and a Southwest Technical Advisory Committee (TAC).

Open Houses

Public open houses were held at key milestone points during the study process. The purpose of the public open houses was to provide the general public with study updates and for one-on-one discussions with study team staff. The issues and concerns expressed at the public open houses held to shape the analysis that was conducted as part of the study process.

The public open houses were publicized through distributing newsletters to over 500 interested persons, notification flyers in community newspapers with a circulation in excess of 96,000 residents, and emailing over 300 interested persons.

The Southwest Rail Transit study included three series of public open houses:

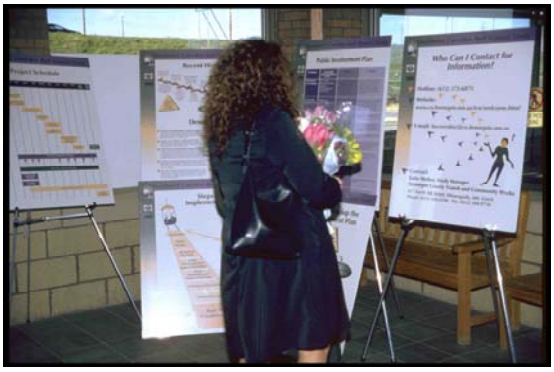
Spring 2002

Seven (7) open houses were held during the spring of 2002. The open houses were structured to allow for informal, one-on-one discussions between project team staff and community residents. Most meetings were held in the evening or on the weekend.

Meeting attendees provided a number of suggestions and ideas that played an important role in helping the Southwest Policy and Technical Advisory Committees refine the study.

Fall 2002

Three (3) open houses were held in the fall of 2002 to provide the public with a study update as well as an opportunity for additional public input on the issues to be addressed during the process.



Spring 2003

Three (3) open houses were held in the spring of 2003 to present study findings. Presentation boards showed the impact of growing traffic congestion on future travel times, results of the resident survey, the regional transit plan, and key study findings.

Approximately 520 individuals attended the 13 public open houses held during the study process. Comments gathered at the public open houses were used to shape the study analysis. While a wide range of opinions were expressed at the public open houses regarding rail transit, the primary issues raised included the following:

- Who will use rail transit, and will there be sufficient ridership?
- Will the rail system be cost-effective?
- Will building a rail system reduce the funding available to build roads?
- What impact will there be on properties adjacent to the rail?
- Can rails and trails successfully co-exist?
- How soon can a rail line be built?
- How often will the trains run? How much will it cost to ride?
- How noisy are the trains?
- How much pollution do the trains emit?
- How safe are the trains?

Special Presentations and Meetings

In order 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 over 30 specially scheduled meetings.

Minneapolis Neighborhood Groups

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. Attending the neighborhood association meetings enabled study team staff to develop a greater understanding of the key issues for Minneapolis residents adjacent to the proposed alignments.

Business Community

In May 2003, the HCRRA hosted a meeting with business leaders to discuss their issues/concerns/questions regarding rail transit. Approximately 30 business leaders and local officials attended the meeting and participated in discussions. The concerns expressed by the business attendees included increasing congestion and delays in the region, recruitment and retention of employees, and the competitiveness of the Twin Cities as a region.
In addition to this early meeting, study team staff attended eight additional meetings with business groups including the Eden Prairie Chamber of Commerce, the Twin West Chamber of Commerce, the Hopkins Rotary, and the Hopkins Business Council. A representative from both the Eden Prairie and Twin West Chambers of Commerce served on the Southwest Policy Advisory Committee (PAC).

Individuals

Study team staff met with individuals who had specific concerns regarding how rail transit plans might affect them.

Newsletters

Five project newsletters were developed and distributed to over 500 interested individuals. The purpose of the newsletters was to provide general information, study results and public open house notifications. The newsletters discussed the study process, reviewed transit technologies, summarized the results of a resident survey and publicized open houses. See Appendix C for copies of the Southwest Newsletters.


Southwest Corridor News

History of the Southwest Corridor

Web Site

An Internet web site was designed and maintained by Hennepin County to provide updated information on the study's progress and information about opportunities for public comment on the study.

The web site address is http://www.co.hennepin.mn.us/tcw/southwest/swhome.htm.

Press Releases

Hennepin County produced five press releases during the course of the study to provide local media with study updates and to publicize the public open houses.

Newspaper Articles

Over 50 news articles appeared in the local community newspapers: the Eden Prairie News, the Sun Current, the Sun Sailor, the Southwest Journal, and the Lakeshore Weekly News. The combined circulation of these local community newspapers is in excess of 96,000 residences. In addition to the community newspapers, three articles appeared in the Minneapolis Star Tribune, which has a circulation of over 400,000. An inventory of these news articles is included in *Appendix B: Public Involvement*.

City Council Briefings

Study team staff met with the potentially affected city councils in the spring of 2002 and fall of 2003. The purpose of the meeting in the spring of 2002 was to inform them that the Hennepin County Regional Railroad Authority (HCRRA) was interested in partnering with them to conduct the Southwest Rail Transit Study and was asking that they appoint representatives to the Southwest Policy and Technical Advisory Committees. The purpose of the meetings in fall of 2003 was to present the study findings and the Southwest Policy Advisory Committee (PAC) recommendation and to receive their feedback.

Southwest Policy Advisory Committee (PAC)

A Policy Advisory Committee (PAC) composed of elected officials or their representatives from the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis, Hennepin County, the Metropolitan Council, Metro Transit, Southwest Metro Transit, the Three Rivers Park District, the Twin West Chamber, and the Eden Prairie Chamber was assembled. The Southwest PAC provided policy guidance throughout the study process and developed a recommendation for the HCRRA regarding whether rail transit should continue to be studied as a feasible option for a Southwest Rail Transitway. The Southwest PAC met seven times during the study process.

Southwest Technical Advisory Committee (TAC)

A Technical Advisory Committee (TAC) composed of technical staff from the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis, Hennepin County, the Metropolitan Council, Metro Transit, Southwest Metro Transit, the Three Rivers Park District, the Minnesota Department of Transportation (Mn/DOT), and Twin City Western Railroad was assembled. The Southwest TAC developed a recommendation for Southwest Policy Advisory Committee (PAC) consideration regarding which rail transit alternatives should be considered in future studies. The Southwest TAC met 12 times during the study process.

Resident Survey

In response to suggestions made by the public, a telephone survey of a random sample of study area residents was conducted. CJ Olson Research Inc., an independent market research firm, conducted a survey of residents in the southwestern study area concerning their perspectives on traffic congestion, the current transportation system, and rail transit. *Appendix D: Resident Survey* contains a copy of the questionnaire for the Southwest Resident Survey.

Methodology

The probability sampling method was used to survey a representative random sample of the general public, which allows for developing projections regarding the general public. Telephone interviews were completed with adults from 650 randomly selected households in the cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, Eden Prairie, Edina, and Chanhassen. Completing 650 interviews resulted in statistical reliability at the 95% confidence level of ± 3.8%.

Survey Respondents

Of the 650 survey respondents, 113 reside in Minneapolis, 113 reside in St. Louis Park, 111 reside in Hopkins, 113 reside in Minnetonka, 125 reside in Eden Prairie, 38 reside in Edina, and 37 reside in Chanhassen. Seventy percent of the survey respondents are employed full-time, part-time or were self-employed. The majority (86%) of respondents worked at locations other than their homes. The roadways used on a daily basis include I-494, Crosstown 62, Excelsior Boulevard, Highway 7, and Highway 100. The majority of survey participants said their usual travel mode is driving alone.

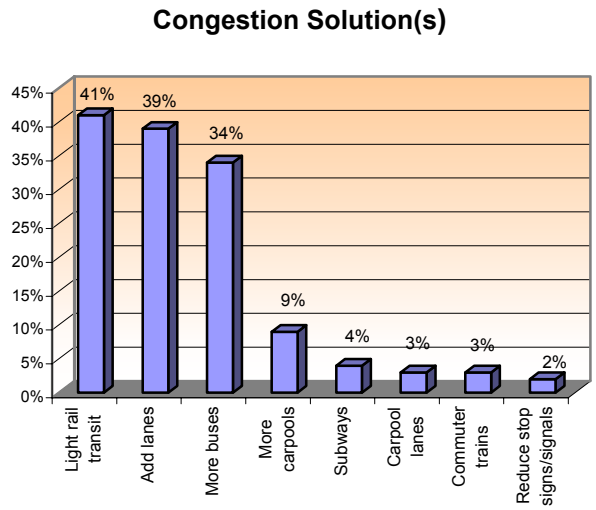
Key Survey Findings

Traffic Congestion

Over 90% of the respondents think that traffic levels on the roads they use will increase over the next five years.

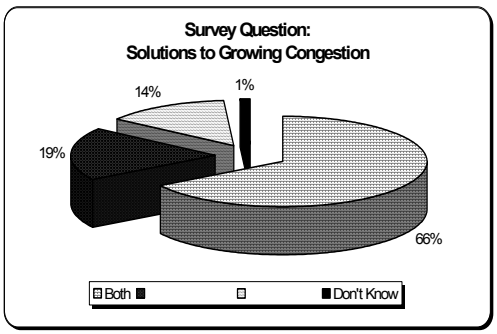
Best Congestion Solution

When survey respondents where asked the open ended question of what they thought would be the best solution to traffic congestion, the most frequent responses were: light rail transit (41%), adding lanes (39%), more buses (34%), more carpools (9%), subways (4%), carpool lanes (3%), commuter trains (3%), and reducing stop signs/signals (2%).



Preferred Improvements (Roads, Transit, or Both)

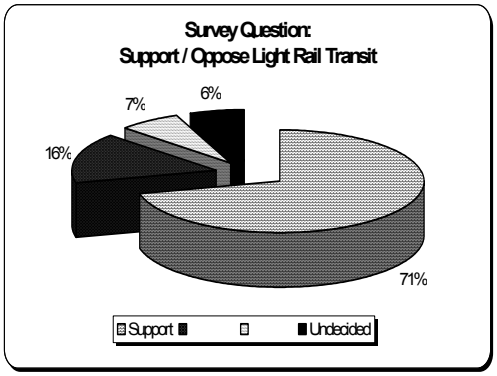
Two-thirds (66%) of the survey respondents said a combination of highway improvements (like adding lanes) and transit improvements (like buses or light rail) would be the best solution to traffic congestion in the southwest metro area.



Support or Opposition to Light Rail Transit (LRT)

71% of survey respondents stated they support a light rail transit option running through Eden Prairie, Minnetonka, Hopkins, and St. Louis Park to downtown Minneapolis; 16% stated they oppose this option; 7% stated they were neutral; and, 6% stated they were undecided.

When separated by city of residence support for LRT is 79 % in Minneapolis, 75% in Hopkins, 73% in both St. Louis Park and in Minnetonka, 66% in both Edina and Eden Prairie, and 57% in Chanhassen. Opposition to LRT is 22% in Chanhassen, 21% in both Eden Prairie and Minnetonka, 16% in Edina, 14% in Hopkins, 11% in St. Louis Park, and 9% in Minneapolis.



Reasons for Supporting LRT

When the 71% of respondents who stated they support LRT were asked why, they stated they believe it will:

- Reduce traffic congestion (63 percent)
- Cut pollution (22 percent)
- Result in a faster commute (17 percent)
- Provide transportation choices (16 percent)
- Eliminate the need to pay for parking downtown (15 percent)

Reasons for Opposing LRT

When the 16% of respondents who stated they oppose LRT were asked why, they stated that they believe:

- It will be too expensive (35 percent)
- People won't use it (32 percent)
- Routes won't take people where they want to go (18 percent)
- Money would be better spent on roads (15 percent)
- They don't want rail transit close to their homes (12 percent)
- They might lose the use of bike trails (6 percent)

4. RAIL TRANSIT TECHNOLOGIES

Introduction

This chapter presents a comparison of the two rail transit technologies being considered for the Southwest rail transit line: light rail transit (LRT) and diesel multiple unit (DMU). Light rail transit (LRT) is included in this analysis because previous studies determined that LRT is a feasible alternative for service between Hopkins and downtown Minneapolis. LRT was also included because it is the chosen technology for the Hiawatha and proposed Central Corridors. The Colorado Rail Car Company's Aero Diesel Multiple Unit (DMU) technology is also included to determine if it is a lower-cost alternative to LRT because it can operate on existing freight rail tracks at the same time as freight trains. In June 2003, the Colorado Rail Car Company received Federal Railroad Administration (FRA) approval to operate the Aero DMU vehicle on freight rail tracks at the same time as freight trains.

Other transit technologies, particularly Bus Rapid Transit (BRT) have been studied for a Southwest Transitway. BRT is not included in this analysis because in 2001 the Minnesota State Legislature enacted legislation that banned the Metropolitan Council from studying, planning, designing, constructing, or operating an exclusive busway in the cities of Minnetonka, Eden Prairie, Chanhassen, and Chaska as well as the Kenilworth and Midtown Corridors in Minneapolis.

Rail Transit Technologies

Light Rail Transit (LRT)

Light rail vehicles (LRV) are electrically powered receiving a current from an overhead wire. They can operate in exclusive rights-of-way or in existing roadways and up to four LRVs can be coupled into trains. Several North American cities currently operate LRT lines including Baltimore, Boston, Calgary, Cleveland, Dallas Denver, Los Angeles, Ottawa, Portland, Sacramento, St. Louis, Salt Lake City and San Diego. The Twin Cities is in the process of constructing it's first LRT line, the Hiawatha Line, which will operate from downtown Minneapolis to the Mall of America and is scheduled to begin operation early in 2004.

Diesel Multiple Units (DMU)

Diesel Multiple Units are self-propelled diesel-powered rail cars designed for regional passenger service. DMUs can operate on active freight railroad tracks at the same time as freight trains. A variety of DMUs currently operate in Canada and Europe; however, these vehicles do not meet FRA standards for U.S. operation. DMU is not a new technology, the Dallas Area Rapid Transit (DART) operates refurbished 1950s era DMUS on its commuter rail line to Fort Worth. The Colorado Rail Car Company's Aero DMU is the first recently constructed DMU that is approved by the FRA for use in the United States.

Technology Characteristics

For purposes of this analysis, the Bombardier light rail vehicle, the vehicle that will be used for the Hiawatha LRT line, and the Colorado Rail Car Company's Aero diesel multiple unit vehicle will be used. The primary similarities between light rail transit (LRT) and diesel multiple unit (DMU) systems include the passenger carrying capacity of the vehicles, the tracks, and the maintenance facility requirement. The primary differences between LRT and DMU systems include the vehicles, their power systems, travel time, track ownership, system connectivity, and their usage in the United States.

Rail Transit Technology Similarities

The primary similarities between light rail transit (LRT) and diesel multiple unit (DMU) systems include the passenger carrying capacity of the vehicles, the tracks, and the maintenance facility requirement.

Vehicle Capacity

The Bombardier LRT vehicle and Aero DMU vehicle can be configured to provide similar passenger carrying capacity of approximately 246 passengers per train set (two cars per train set).

Tracks

For purposes of this study, both LRT and DMU service are assumed to require two tracks to support the service frequency (i.e., 7.5 minutes during peak hours) in both directions. For LRT, two new tracks are assumed to be constructed. For DMU, the existing freight rail track is assumed to reconstructed and a second, parallel track constructed.

Maintenance Facility

For purposes of this study, both LRT and DMU service are assumed to require a new maintenance facility. While the maintenance facility constructed for the Hiawatha LRT line does have some excess capacity, that capacity is assumed to be used by the proposed Central LRT line. It is assumed that DMU vehicles would require a separate maintenance facility with unique equipment.

Rail Transit Technology Differences

The primary differences between LRT and DMU systems include the vehicles, their power systems, travel time, track ownership, system connectivity, and their usage in the United States.

Vehicle Size & Weight

The Aero DMU vehicle is substantially larger (3 feet taller, 1.2 feet wider) and 60% heavier than the Bombardier LRT vehicle. The larger size of the Aero DMU means that it cannot share station platforms with the Hiawatha LRT line currently under construction. The greater weight means that the Aero DMU takes longer to accelerate/decelerate than the Bombardier LRT vehicle thus increasing the travel time for the Aero DMU.

Power Systems

The Bombardier LRT vehicle is electrically powered from an overhead catenary system whereas the Aero DMU vehicle is powered by two on-board diesel engines. Because the Bombardier LRT vehicle is electrically powered it is likely to be quieter and emit less pollutants than the Aero DMU vehicle

Travel Time
The travel time for the Aero DMU vehicle is longer than for the Bombardier LRT vehicle for two primary reasons. First, the Aero DMU has slower acceleration/deceleration rates than the Bombardier LRV, and second, the Aero DMU has fewer boarding doors which means it takes longer to board passengers than does the Bombardier LRV.

Track Ownership
Typically, LRT systems operate on publicly owned right-of-way while DMU or Commuter Rail systems operate on private railroad rights-of-way under lease agreements negotiated with the private railroad companies. In the case of a Southwest DMU line, this lease agreement would be negotiated with three private freight rail companies - the Canadian Pacific, the Burlington Northern & Santa Fe, and the Twin Cities & Western Rail Companies. It is believed that the annual lease payment for a Southwest DMU line would be considerably higher than for those of typical Commuter Rail service because the Southwest DMU operation would utilize the freight rail tracks for approximately 20 hours per day (4:30 AM to 12:30 AM) at frequencies of 7.5 minutes during the peak periods, 10-15 minutes during the mid-day and early evening, and 30 minutes in the late-evening. Most commuter rail systems operate peak only service on weekdays at frequencies of 20 to 60 minutes. Due to the frequency of DMU service it is unlikely that the private freight rail companies would operate freight service at the same time, thus limiting freight rail service to 12:30 AM to 4:30 AM.

System Connectivity
LRT vehicles can be through-routed with the Hiawatha and proposed Central LRT lines. This means that Southwest LRT passengers could have a one-seat ride (i.e., no transfer) to the core of downtown Minneapolis, the University of Minnesota (UMN), the Minneapolis-St. Paul Airport (MSP), the Mall of America (MOA), and downtown St. Paul. Because the Aero DMU vehicle is wider it cannot use the Hiawatha LRT stations and as such cannot be through-routed with the Hiawatha and proposed Central LRT lines. DMU passengers destined for downtown Minneapolis, the UMN, the MSP, the MOA, or downtown St. Paul would be required to transfer at the proposed downtown Multi-Modal Station (North 5th Street and North 3rd Avenue) to either a bus or the Hiawatha/Central LRT lines.

Existing Systems
LRT is in use in many cities throughout North America, Europe, Asia, and South America. Since the Aero DMU only recently received FRA approval for operation in the U.S., it is not currently in operation. However, older forms of DMUs are in existence in Europe, Canada, and in Dallas, Texas. The European and Canadian DMUs could not operate in the U.S. due to different safety standards. In the case of the Dallas Trinity Railway Express system, the DMU vehicles are refurbished vehicles from the 1940s, which are compliant with FRA safety standards. Currently, the Dallas Trinity Railway system owns the freight rail tracks and allows the Union Pacific and Burlington Northern Santa Fe railroads access.

Table 4.1
Summary of Technology Characteristics – Light Rail Transit and Diesel Multiple Unit[1, 2]

	LRT	DMU
Track Alignment		
Track gauge	4'-8½"	4'-8½"
Horizontal Alignment		
Minimum radius	100 feet	250 feet
Vertical Alignment		
Grades		
Maximum sustained grade, unlimited length	4.0%	4.2%
Maximum sustained grade with up to 2,500 ft between PVI's of vertical curves	6.0%	TBD[3, 4]
Maximum short sustained grade with no more than 500 ft between PVI's of vertical curves	7.0%	TBD[3, 4]
Curves		
Minimum radius – Crest curve	820 ft	2,000 ft
Minimum radius – Sag curve	1,150 ft	2,000 ft
Vehicle		
Length over body ends	92 ft	83'-6½"
Width, maximum	8.8 ft	10 ft
Height above top of rail	11.4 ft, excluding pantograph[5]	14.4 ft
Weight, empty	105,000 lbs	164,000 lbs
Step height above top of rail	14 in	18 in
Floor height above top of rail Number of stairs	14 in 3	18 in 4
ADA access	Level boarding	Lifts, add low-floor trailer car or high platform with bridge plates
Number of seats	66	90 to 98
Maximum passengers with standees (AW3 load)	246	228 to 246
Operations		
Acceleration		
Maximum operating speed	55 mph	90 mph
Time to accelerate to 55 mph	40 sec, variable rate	48 sec, variable rate
Deceleration		
Service braking	2.0 to 3.0 mphps[6]	1.5 mphps[6]
Emergency braking	5.0 mphps[6, 7]	1.8 mphps[6]
Noise (Sound Exposure Level, in dBa)[8]	82 dBa	85 dBa
Propulsion power	Via 750V DC overhead contact electrical system	2 on-board diesel engines
Potential for Joint Track Use[9]		
Rail Mode	*LRT*	*DMU*
Freight Rail	No	Yes
Passenger/Commuter Rail	No	Yes
High-Speed Rail	No	No
LRT	Yes	No
Other Considerations		
Vehicle cost[10]	$2.5 million	$2.9 million[11]
Annual vehicle maintenance cost per vehicle[7]	$655,000[12]	To be determined
Annual lease payment for joint track use	Not required because tracks are in publicly owned.	An annual lease payment is required and would be negotiated with the private freight rail company. Preliminary estimates are $1 to 7.5 million/year.

Notes

1 Vehicle characteristics based on Bombardier LRV to be used in Hiawatha LRT and Colorado Rail Car's prototype of their Aero DMU.
2 Source: *Hiawatha LRT Light Rail Transit Project, Phase 2 RFP, Part 5 – Design Criteria/Performance Specifications*, 7 April 2000.
3 Source: *Colorado Rail Car, New DMU, 2002 Edition*. Data provided are for single-level powered car.
4 At this time, only theoretical values are available from Colorado Rail Car
5 Height of pantograph ranges from 1.6 feet (low) to 10.5 feet (working range).
6 Miles per hour per second.
7 Without track brake.
8 Typical bus noise is 84 to 88 dBa. Typical automobile noise is 73 dBa.
9 Source: *Joint Operation of Light Rail Transit or Diesel Multiple Unit Vehicles with Railroads*, TCRP Report #52, 1999..
10 In Year 2002 dollars.
11 Does not include cab modifications, wheelchair lifts, additional doors, signal and communication system, on-board diagnostics or provisions for other vendors to furnish and install the above.
12 Source: Metro Transit 2003 Light Rail Operations and Maintenance Cost Model (Hiawatha LRT). Includes labor and non-labor costs.

5. EVALUATION

Introduction

This chapter present an overview of the evaluation methodology developed for the Southwest Rail Transit Study. The methodology and results are described in more detail in the *Technical Memorandum 4.0 Evaluation.*

Methodology

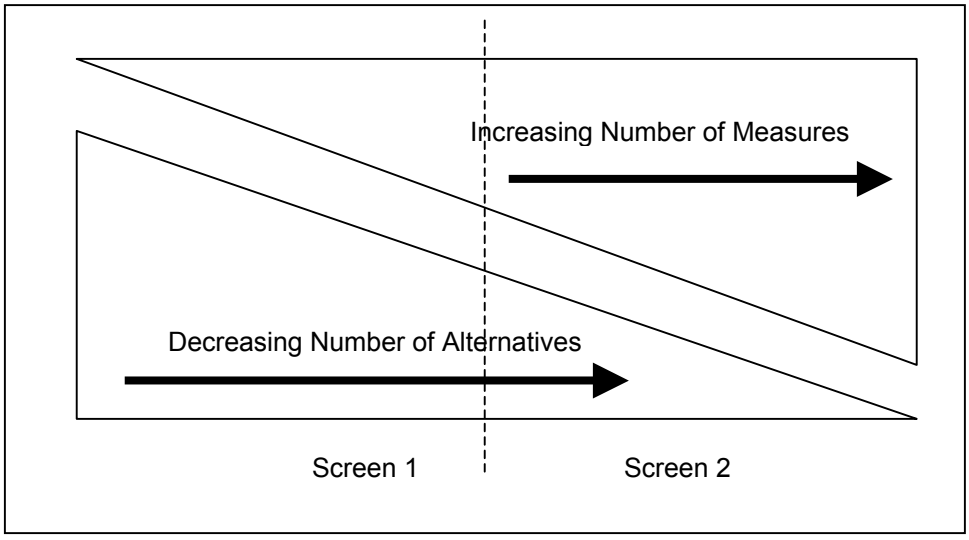
The evaluation process for the Southwest Corridor Rail Study was conducted in two phases, which applied increasingly detailed and comprehensive evaluation measures to a decreasing number of alternatives. The alternatives advanced or carried forward for further evaluation at the end of each phase are those that best meet the Southwest Rail Transitway goals documented in *Chapter 2. Purpose and Need.*

During the initial evaluation phase, Screen 1, several alignment segments were evaluated based on broadly defined, qualitative measures of the potential transportation, economic, and environmental impacts of rail transit. As a result of this analysis, the Southwest Technical Advisory Committee (TAC) recommended a number of alignment segments be evaluated in more detail during the next evaluation phase, Screen 2.

During Screen 2 the remaining alignment segments were combined into alignment options, which were then evaluated based upon more detailed quantitative measures of the potential transportation, economic, environmental and social impacts of rail transit.

The evaluation measures were based on various sources, including those used by the Federal Transit Administration for their New Starts rail transit program and those used in the Twin Cities for the Cedar Avenue Transitway and Red Rock Commuter Rail Feasibility Studies.

Figure 5.1 Evaluation Process



Initial Alignment Segments

The initial set of alignment segments were developed through discussions with local elected officials, the Southwest Technical Advisory Committee (TAC), and suggestions from the general public. The first phase, Screen 1, evaluated all segments on a relatively broad, qualitative level to determine which were the most promising. The segments considered most promising were then compiled into alignment alternatives for evaluation during Screen 2.

For the Screen 1 evaluation, the alignments were segmented into those west of Highway 169, between Highway 169 and Highway 100, and east of Highway 100.

Alignment Segments West of Highway 169

Segment W1 is defined as light rail transit between Highway 312/5 and Highway 169 via the HCRRA property.

Segment W2 is defined as light rail transit between Highway 62 and Highway 169 via the HCRRA property.

Segment W3 is defined as light rail transit from the Southwest Metro Transit Station to Highway 169 via Highway 212 (east side), Shady Oak Road (center) and the HCRRA property.

Segment W4 is defined as light rail transit extending from the Southwest Metro Transit Station to Highway 169 via I-494 and the HCRRA property.

Segment W5 is defined as light rail transit extending from the Southwest Metro Transit Station to Highway 169 via Baker Road and the HCRRA property.

Segment W6 is defined as diesel multiple unit extending from Highway 62 to Highway 169 via the Canadian Pacific Railroad property.

Segment W7 is defined as diesel multiple unit extending from Dell Road to Highway 169 via the Canadian Pacific Railroad property.

Segment W8 is defined as light rail transit from the Southwest Metro Station to Highway 169 via Highway 212 and Highway 169 (west side).

Alignment Segments Between Highway 169 and Highway 100

Segment C1 is defined as light rail transit from Highway 169 to Highway 100 via the HCRRA property.

Segment C2 is defined as diesel multiple unit from Highway 169 to Highway 100 via the Canadian Pacific Railroad property.

Alignment Segments East of Highway 100

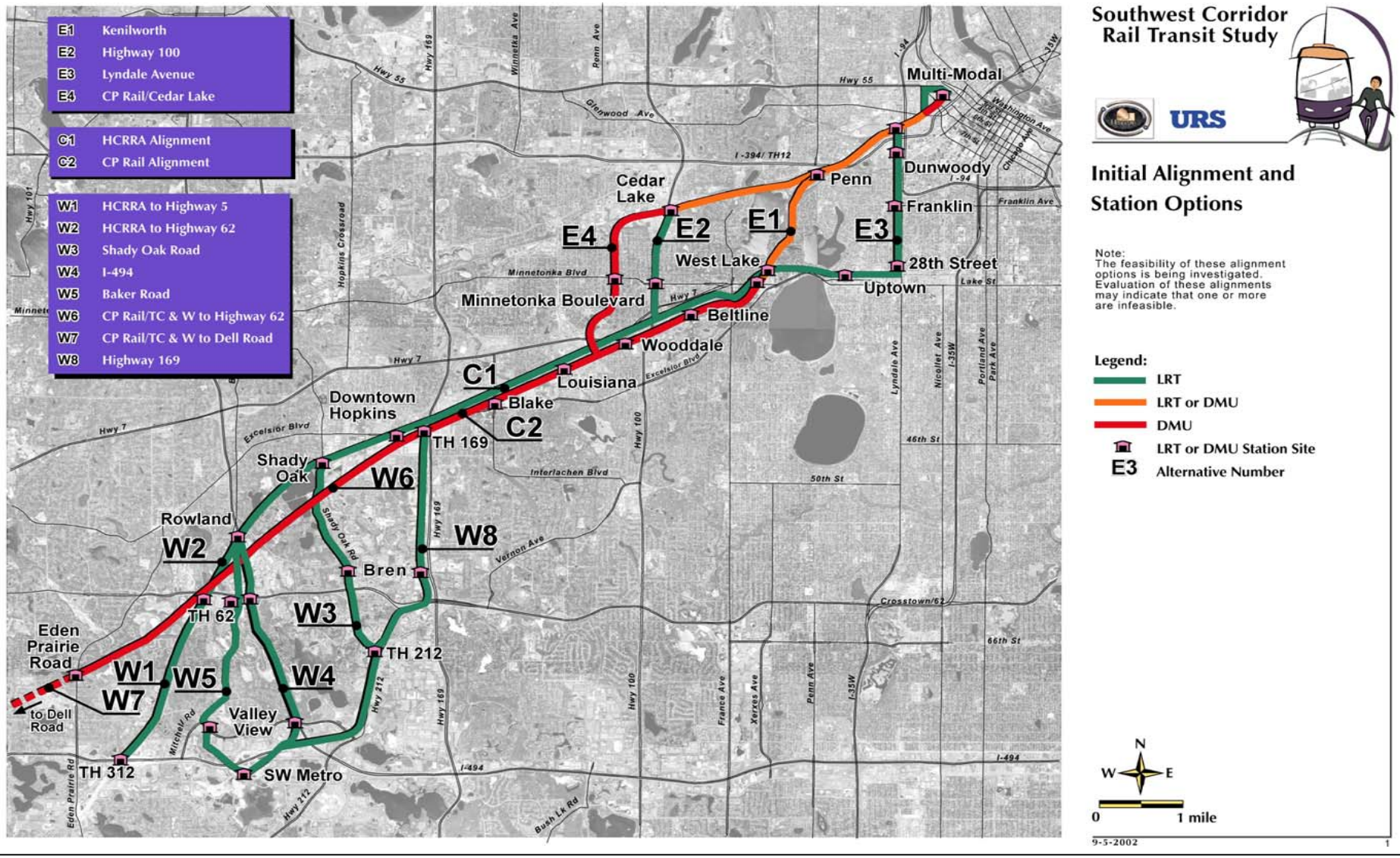
Segment E1 is defined as light rail transit or diesel multiple unit from Highway 100 to downtown Minneapolis via the HCRRA property in St. Louis Park and the Kenilworth Corridor in Minneapolis.

Segment E2 is defined as light rail transit from Highway 100 to downtown Minneapolis via Highway 100 (center) and the Cedar Lake Corridor.

Segment E3 is defined as light rail transit from Highway 100 to downtown Minneapolis via the HCRRA property in St. Louis Park, the Midtown Corridor in Minneapolis and Lyndale Avenue.

Segment E4 is defined as diesel multiple unit from Highway 100 to downtown Minneapolis via the Canadian Pacific Railroad property through St. Louis Park. This option would require the construction of the northern interconnect in St. Louis Park.

Figure 5.2 Initial Alignment Segments



Screen 1 Evaluation

The intent of the Screen 1 evaluation was to analyze a large number of alternatives using relatively broad qualitative measures to indicate which alternatives are likely to be most effective in meeting the Southwest Transitway goals. Those that were considered most effective were retained for further analysis during the Screen 2 evaluation. The detailed results of the Screen 1 evaluation are contained in *Technical Memorandum 4.0: Evaluation.*

Screen 1 Evaluation Measures

Transportation

The transportation evaluation measures are intended to gauge how well an alternative improves transit ridership, provides a competitive travel time, serves population and employment concentrations, connects to other rail transit lines, and impacts traffic.

- **Potential Ridership** defined as the expected transit ridership impact of the new rail transit service.
- **Travel Time** defined as the estimated rail transit travel time.
- **Service Area** defined as service to concentrations of population and employment centers according to the 2000 U.S. Census.
- **Transit Connectivity** defined as the potential to connect to other rail transit lines (applies to all segments except the central segments, C1 and C2).
- **Traffic Impacts** defined as potential impact to traffic patterns and parking.

Economic

The economic evaluation measures are intended to estimate the relative costs and right-of-way availability for each segment.

- **Relative Capital Cost (estimated)** defined as the relative cost (per mile) of building the system.
- **Relative Operating and Maintenance Cost (estimated)** defined as the relative annual cost (per hour) to operate and maintain the system.
- **Right-of-Way** defined as the anticipated cost and difficulty in acquiring and/or leasing right-of-way required to construct and operate the system.

Environmental

The environmental evaluation measures are intended to identify areas where there may be environmental impacts caused by rail transit.

- **Potentially Impacted Natural Environment** defined as wetlands, water bodies, floodplains, and parks located within 50 feet either side of the alignment segment.
- **Potentially Impacted Dwelling Units** defined as dwelling units (single and multi-family) located within 50 feet either side of the alignment segment.

Table 5.1 Screen 1 Evaluation Results

Eastern Segments (E1, E2, E3, and E4)

	E1 - HCRRA (LRT)	E1 - HCRRA (DMU)	E2 - TH 100 (LRT)	E3 - Lyndale (LRT)	E4 - CP Rail (DMU)
Southwest TAC Recommendation	Retain	Retain	Not Retain	Retain	Not Retain

Transportation

	E1 - HCRRA (LRT)	E1 - HCRRA (DMU)	E2 - TH 100 (LRT)	E3 - Lyndale (LRT)	E4 - CP Rail (DMU)
Potential Ridership	Improved transit service should increase ridership.	Required transfer for downtown core & slower travel time than LRT should result in smaller ridership increase compared to LRT.	Improved transit service should increase ridership.	Improved transit service and direct access to Uptown should increase ridership.	Required transfer for downtown core & slower travel time than LRT should result in smaller ridership increase compared to LRT.
Travel Time[1]	15.5 minutes	20.5 minutes	14.5 minutes	18.0 minutes	22.5 minutes
Service Area	Direct service to downtown core. Good service to population & employment concentrations in St. Louis Park (Wooddale & Beltline). No direct service to Uptown/South Minneapolis.	Indirect (transfer required) service to downtown core. Good service to population & employment concentrations in St. Louis Park (Wooddale & Beltline). No direct service to Uptown/South Minneapolis.	Direct service to downtown core. Does not serve population & employment concentrations in St. Louis Park (Wooddale & Beltline). No direct service to Uptown/South Minneapolis.	Direct service to downtown core. Good service to population & employment concentrations in St. Louis Park (Wooddale & Beltline). Direct service to Uptown/South Minneapolis.	Indirect (transfer required) service to downtown core. Does not serve population & employment concentrations in St. Louis Park (Wooddale & Beltline). No direct service to Uptown/South Minneapolis.
Transit Connectivity	Direct connection to Hiawatha/Central LRT lines. Transfer required for Uptown/South Minneapolis service.	Transfer required at multi-modal station to connect with Hiawatha/Central LRT lines. Transfer required for Uptown/South Minneapolis service.	Direct connection to Hiawatha/Central LRT lines. Transfer required for Uptown/South Minneapolis service.	Direct connection to Hiawatha/Central LRT lines. Direct service to Uptown/South Minneapolis.	Transfer required at multi-modal station to connect with Hiawatha/Central LRT lines. Transfer required for Uptown/South Minneapolis service.
Traffic & Parking Impacts	No significant impacts.	No significant impacts.	Traffic impacts TH 100 west frontage road.	Eliminates two traffic lanes & some access (right in/right out) limitations on Lyndale Avenue. Loss of 250 to 350 on-street Lyndale Ave. parking spaces.	No significant impacts.

[1] Travel time between TH 100 and Nicollet Mall Station in downtown Minneapolis.

Economic

	E1 - HCRRA (LRT)	E1 - HCRRA (DMU)	E2 - TH 100 (LRT)	E3 - Lyndale (LRT)	E4 - CP Rail (DMU)
Relative Capital Cost (per unit)	Least expensive of LRT options. More expensive than DMU options.	Least expensive DMU options. Less expensive than LRT options.	Most expensive LRT option due to structures and right-of-way required. More expensive than DMU options.	More expensive than E1 (LRT) due to structures (Loring Park & Midtown Greenway) & embedded track (Lyndale) More expensive than DMU options.	More expensive than E1 (DMU) due to required northern & southern interconnects. Less expensive than LRT options.
Relative Operating & Maintenance Cost (per unit)	Average for LRT options. Less than DMU options.	More than LRT options due to annual lease payments to private rail companies. Slightly lower than E4 DMU option.	Average for LRT options. Less than DMU options.	Average for LRT options. Less than DMU options.	More than LRT options due to annual lease payments to private rail companies. Slightly higher than E1 DMU option.
Right-of-Way	Majority of right-of-way in public ownership (HCRRA).	Agreement to use railroad right-of-way needs to be negotiated.	No right-of-way available in the TH 100 Corridor. Acquisition would have significant impacts for St. Louis Park. Requires additional right-of-way at stations.	Majority of right-of-way in public ownership (HCRRA & Minneapolis) Requires additional right-of-way at stations.	Agreement to use railroad right-of-way needs to be negotiated. Requires additional right-of-way at stations.

Environmental

	E1 - HCRRA (LRT)	E1 - HCRRA (DMU)	E2 - TH 100 (LRT)	E3 - Lyndale (LRT)	E4 - CP Rail (DMU)
Potentially Impacted Natural Environment					
Wetlands	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.	East of Dakota Park in St. Louis Park.
Water Bodies	Cedar Lake Lagoon (between Cedar Lake and Lake of the Isles).	Cedar Lake Lagoon (between Cedar Lake and Lake of the Isles).	No significant impacts.	Lake of the Isles Lagoon (between Lake Calhoun and Lake of the Isles).	No significant impacts.
Floodplains	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.
Parks	No significant impacts.	No significant impacts.	No significant impacts.	Loring Park.	No significant impacts.
Potentially Impacted Dwelling Units (w/in 50 feet)	near Lake Street in Minneapolis.	near Lake Street in Minneapolis.	Between 28th Street and Wooddale Avenue.	Lyndale Avenue and 29th Street Greenway near Lake Street.	28th Street and Wooddale Avenue.

Central Segments (C1 and C2)

	C1 - HCRRA (LRT)	C2 - CP Rail (DMU)
Southwest TAC Recommendation	Retain	Retain

Transportation

	C1 - HCRRA (LRT)	C2 - CP Rail (DMU)
Potential Ridership	Improved transit service should increase ridership.	Improved transit service should increase ridership.
Travel Time[2]	7.0 minutes	8.5 minutes
Service Area	Good service to population & employment concentrations in Hopkins & St. Louis Park.	Good service to population & employment concentrations in Hopkins & St. Louis Park.
Transit Connectivity	N/A	N/A
Traffic & Parking Impacts	No significant impacts.	No significant impacts.

Economic

	C1 - HCRRA (LRT)	C2 - CP Rail (DMU)
Relative Capital Cost (per unit)	Slightly higher than DMU option.	Slightly lower than LRT option.
Relative Operating & Maintenance Cost (per unit)	Slightly lower than DMU option.	More than LRT option due to annual lease payments to private rail companies.
Right-of-Way	Majority of right-of-way in public ownership (HCRRA).	Agreement to use railroad right-of-way needs to be negotiated. Requires additional right-of-way for stations.

Environmental

	C1 - HCRRA (LRT)	C2 - CP Rail (DMU)
Potentially Impacted Natural Environment		
Wetlands	No significant impacts.	No significant impacts.
Water Bodies	Minnehaha Creek.	Minnehaha Creek.
Floodplains	Minnehaha Creek.	Minnehaha Creek.
Parks	No significant impacts.	No significant impacts.
Potentially Impacted Dwelling Units (w/in 50 feet)	West of TH 100.	West of TH 100.

[2] Travel time between TH 100 and TH 169.

WESTERN SEGMENTS (W1- W8)

	W1- HCRRA/TH312 (LRT)	W2-HCRRA/TH62 (LRT)	W3-Shady Oak (LRT)	W4-I-494 (LRT)	W5- Baker Rd. (LRT)	W6- TH 62 (DMU)	W7- Dell Rd. (DMU)	W8 - TH169 (LRT)
Southwest TAC Recommendation	Retain	Combine with W1	Not Retain	Retain	Not retain	Combine with W7	Retain	Retain

Transportation

	W1- HCRRA/TH312 (LRT)	W2-HCRRA/TH62 (LRT)	W3-Shady Oak (LRT)	W4-I-494 (LRT)	W5- Baker Rd. (LRT)	W6- TH 62 (DMU)	W7- Dell Rd. (DMU)	W8 - TH169 (LRT)
Potential Ridership	Improved transit service should increase ridership.	Improved transit service should increase ridership	Improved transit service should increase ridership.	Improved transit service should increase ridership.	Improved transit service should increase ridership.	Improved transit service should increase ridership.	Improved transit service should increase ridership.	Improved transit service should increase ridership .
Travel Time[3]	14.0 minutes	10.5 minutes	14.5 minutes	15.0 minutes	15.0 minutes	8.5 minutes	13.0 minutes	12.5 minutes
Service Area	Serves employment concentrations in Hopkins & Minnetonka (SuperValu, Minnetonka Business Park)	Serves employment concentrations in Hopkins & Minnetonka (SuperValu, Minnetonka Business Park)	Serves employment & population concentrations in Hopkins, Minnetonka and Eden Prairie (Opus Business Park, Golden Triangle).	Due to freeway right-of-way location provides indirect service to population and employment concentrations in Minnetonka & Eden Prairie.	Serves employment & population concentrations in Hopkins, Minnetonka and Eden Prairie (e.g. Minnetonka Business Park).	Serves employment & population concentrations in Hopkins, Minnetonka and part of Eden Prairie.	Serves employment & population concentrations in Hopkins, Minnetonka, Eden Prairie and potentially Chanhassen.	Serves employment concentration, particularly the Minnetonka Corporate Center on Bren Road.
Transit Connectivity	Requires new transit station at TH 312. Able to extend to Southwest via the HCRRA property.	Requires new transit station at TH 62. Able to extend to Southwest via the HCRRA property.	Connects to SW Metro Station. Unknown extension beyond SW Metro Station.	Connects to SW Metro Station. Unknown extension beyond SW Metro Station.	Connects to SW Metro Station. Unknown extension beyond SW Metro Station.	Requires new transit station at TH 62. Able to extend to Southwest via the CP rail line.	Requires new transit station at Dell Road. Able to extend to Southwest via the CP rail line.	Connects to SW Metro Station. Unknown extension beyond SW Metro Station.
Traffic & Parking Impacts	No significant impacts.	No significant impacts.	Driveway and minor cross-streets on Shady Oak Road would be limited to right-in/right-out access.	No significant impacts.	Driveway and minor cross-streets on Baker Road could be limited to right-in/right-out access.	No significant impacts.	No significant impacts.	No significant impacts.

[3] Travel time between TH 100 and TH 169.

Economic

	W1- HCRRA/TH312 (LRT)	W2-HCRRA/TH62 (LRT)	W3-Shady Oak (LRT)	W4-I-494 (LRT)	W5- Baker Rd. (LRT)	W6- TH 62 (DMU)	W7- Dell Rd. (DMU)	W8 - TH169 (LRT)
Relative Capital Cost (per unit)	Average for LRT options. More expensive than DMU options.	Average for LRT options. More expensive than DMU options.	More expensive than other LRT options due to Shady Oak Rd. reconstruction, embedded tracks & structures. More expensive than DMU options.	Average for LRT options. More expensive than DMU options.	More expensive than other LRT options due to Baker Rd. reconstruction, embedded tracks & structures. More expensive than DMU options	Less expensive than LRT options. Average for DMU options.	Less expensive than LRT options. Average for DMU options.	More expensive than other LRT options due to structures required. More expensive than the DMU options.
Relative Operating & Maintenance Cost (per unit)	Average for LRT options. Less than DMU options.	Average for LRT options. Less than DMU options.	Average for LRT options. Less than DMU options.	Average for LRT options. Less than DMU options.	Average for LRT options. Less than DMU options.	More than LRT options due to annual lease payments. Slightly higher than E1 DMU option.	More than LRT options due to annual lease payments. Slightly higher than E1 DMU option.	Average for LRT options. Less than DMU options.
Right-of-Way	Majority of right-of-way in public ownership (HCRRA).	Majority of right-of-way in public ownership (HCRRA).	Requires additional right-of-way along Shady Oak Road. Requires right-of-way at stations.	Assumes use of Mn/DOT right-of-way along I-494. Requires right-of-way at stations.	Requires additional right-of-way along Baker Road. Requires right-of-way at stations.	Agreement to use railroad right-of-way needs to be negotiated. Requires right-of-way at stations.	Agreement to use railroad right-of-way needs to be negotiated. Requires right-of-way at stations.	Requires additional right-of-way required along TH 169. Requires right-of-way at stations.

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Environmental

	W1- HCRRA/TH312 (LRT)	W2-HCRRA/TH62 (LRT)	W3-Shady Oak (LRT)	W4-I-494 (LRT)	W5- Baker Rd. (LRT)	W6- TH 62 (DMU)	W7- Dell Rd. (DMU)	W8 - TH169 (LRT)
Potentially Impacted Natural Environment								
Wetlands	Shady Oak Lake and east of Glen lake.	Shady Oak Lake and east of Glen lake.	south of TH 62.	Shady Oak Lake	Shady Oak Lake, Forest Hills School Park and along Bent Creek.	No significant impacts.	No significant impacts.	Valley park.
Other Water Bodies	Shady Oak Lake & three small creeks.	Shady Oak Lake & two small creeks.	Shady Oak Lake & two small creeks.	Shady Oak Lake & three small creeks.	Shady Oak Lake & Bent Creek.	Shady Oak Lake, Birch Island Lake & Purgatory Creek	Shady Oak Lake, Birch Island Lake, Duck Lake & Purgatory Creek	Valley Park.
Floodplains	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.	No significant impacts.	Valley Park.
Parks	No significant impacts.	No significant impacts.	Shady Oak Beach Park.	No significant impacts.	Forest Hills School Park.	Birch Island Lake Park.	Birch Island Lake Park.	Valley Park.
Potentially Impacted Dwelling Units (w/in 50 feet)	Edenvale Boulevard and Valley View Road.	Northwest of Shady Oak Lake.	East side of Shady Oak Road between Bren Road and TCWRR R/W.	HCRRA right-of-way.	Baker Road between CSAH 62 and Valley View Road.	Railroad right-of-way south of Birch Island Lake Park.	between Duck Lake & Dell Road Along R/W south of Valley View Road.	East of Highway 169 between Highway 62 and Valley View Road.

Screen 1 Recommendations

The Southwest Technical Advisory Committee (TAC) reviewed the Screen 1 evaluation and recommended that the most promising segments be considered for further study.

Segments Recommended for Continued Study

Segment W1: LRT from Highway 312/5 to Highway 169 via the HCRRA property

Segment W4: LRT from the Southwest Metro Station to Highway 169 via I-494 & the HCRRA property

Segment W7: DMU from Dell Road to Highway 169 via the CP rail line

Segment W8: LRT from the Southwest Metro Station to Highway 169 via Highways 212 and 169

Segment C1: LRT from Highway 169 to Highway 100 via the HCRRA property

Segment C2: DMU from Highway 169 to Highway 100 via the CP rail line

Segment E1: LRT or DMU from Highway 100 to downtown Minneapolis via the Kenilworth Corridor

Segment E3: LRT from Highway 100 to downtown Minneapolis via the Midtown Greenway and Lyndale Avenue

Segments NOT Recommended for Continued Study

Segment W3: LRT between the Southwest Metro Station and Highway 169 via Shady Oak Road
This segment was not recommended for further study due to relatively high capital and right-of-way costs; additional right-of-way requirements along Shady Oak Road; and, significant traffic impacts on Shady Oak Road due to lane use for LRT and access modifications (right in/right out).

Segment W5: LRT between the Southwest Metro Station and Highway 169 via Baker Road
This segment was not recommended for further study due to relatively high capital and right-of-way costs; additional right-of-way requirements along Baker Road; and, significant traffic impacts on Baker Road due to lane use for LRT and access modifications (right in/right out).

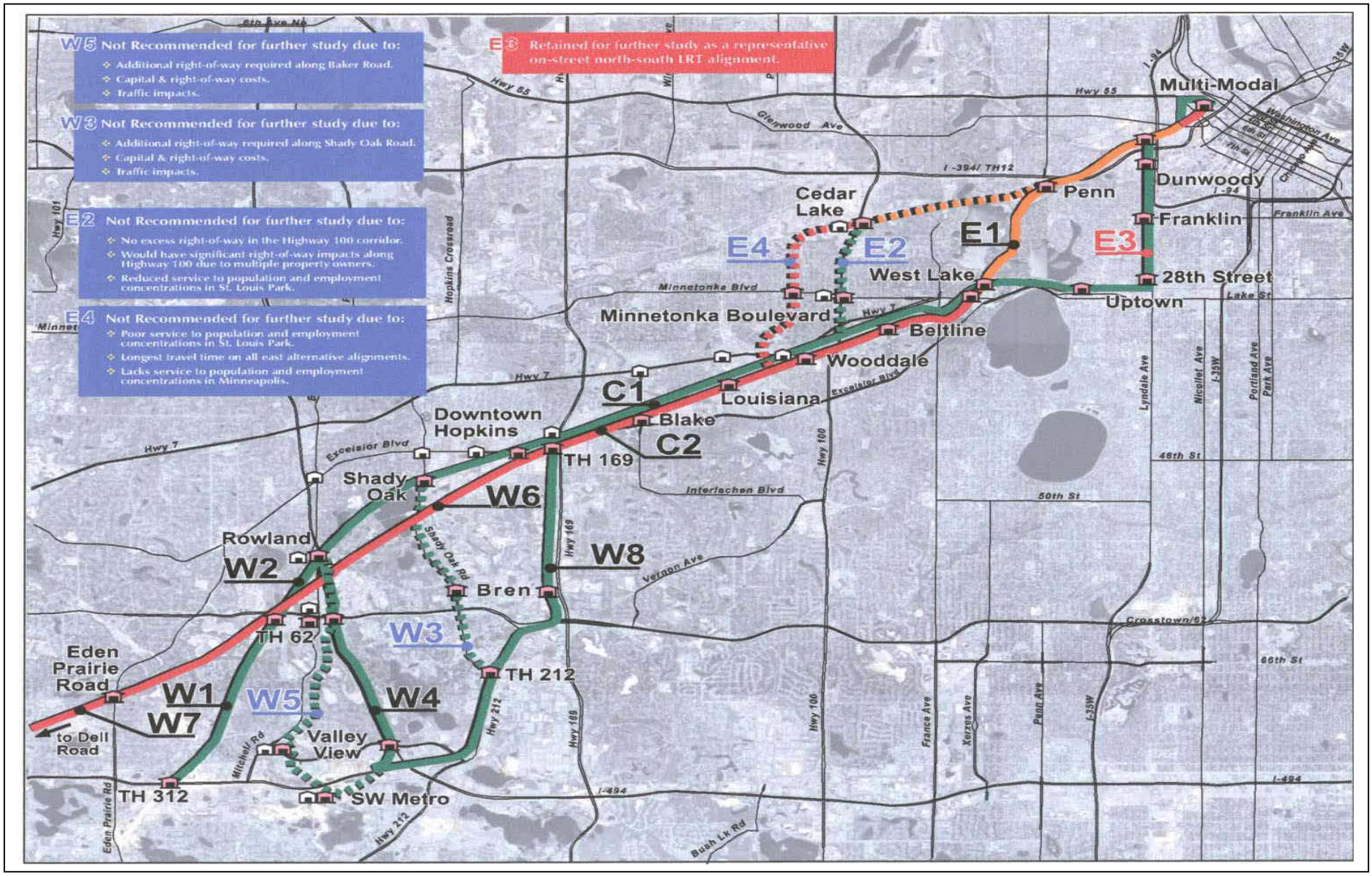
Segment W2: LRT from Highway 62 to Highway 169 via the HCRRA property
This segment was recommended to be combined with segment W1, which terminates at Highway 312/5.

Segment W6: DMU from Highway 62 to Highway 169 via the CP rail line
This segment was recommended to be combined with segment W7, which terminates at Dell Road.

Segment E2: LRT from Highway 100 to downtown Minneapolis via Highway 100
This segment was not recommended for further study due to the lack of available right-of way within the Highway 100 Corridor; the potential difficulty and negative community impacts of acquiring the necessary right-of-way on the west side of Highway 100; and, the lack of rail transit service to population and employment concentrations in St. Louis Park, especially around Wooddale Avenue and Beltline Boulevard.

Segment E4: DMU from Highway 100 to downtown Minneapolis via the CP & BNSF Rail lines
This segment was not recommended for further study due to the lack of service to population and employment concentrations in St. Louis Park, significantly longer travel time, and less potential to improve ridership.

Figure 5.3 Screen 1 Recommendation



Screen 2 Evaluation

For the Screen 2 evaluation, the segment options from the Screen 1 evaluation were compiled into routing alignments. In addition, an Express Bus Baseline alternative (Route 650) was defined in order to compare the rail options to a bus option.

Screen 2 Alignment Alternatives

Express Bus Baseline Alternative (Route 650)

The Route 650 Express Bus Baseline Alternative was defined as a limited-stop bus route mimicking the rail transit options. The Route 650 alternative extends from the Southwest Metro Transit Station in Eden Prairie to downtown Minneapolis via Highway 5, Mitchell Road, Baker Road, Excelsior Boulevard, Highway 169, Highway 7, Highway 25 to Beltline Boulevard (to access a park-and-ride lot), to Highway 100 (shoulders) and I-394 High Occupancy Vehicle (HOV) lane. The purpose of the Route 650 is to compare the results of a bus only system with that of a bus-rail system.

LRT 1A (combines segments W1 + C1 + E1)
This alternative is defined as light rail transit from Highway 312/5 to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor.

LRT 1B (combines segments W1 + C1 + E3)
This alternative is defined as light rail transit from Highway 312/5 to downtown Minneapolis via the HCRRA property, the Midtown Greenway Corridor, and Lyndale Avenue.

LRT 2A (combines segments W4 + C1 + E1)
This alternative is defined as light rail transit from the Southwest Metro Transit Station to downtown Minneapolis via the I-494 Corridor, the HCRRA property, and the Kenilworth Corridor.

LRT 2B (combines segments W4 + C1 + E3)
This alternative is defined as light rail transit from the Southwest Metro Transit Station to downtown Minneapolis via the I-494 Corridor, the HCRRA property, the Midtown Greenway Corridor, and Lyndale Avenue.

LRT 3A (combines segments W8 + C1 + E1)
This alternative is defined as light rail transit from the Southwest Metro Transit Station to downtown Minneapolis via Highways 212 and 169, the HCRRA property, and the Kenilworth Corridor.

LRT 3B (combines segments W8 + C1 + E3)
This alternative is defined as light rail transit from the Southwest Metro Transit Station to downtown Minneapolis via Highways 212 and 169, the HCRRA property, the Midtown Greenway Corridor, and Lyndale Avenue.

LRT 4A (combines segments C1 + E1)
This alternative is defined as light rail transit from downtown Hopkins to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor.

LRT 4B (combines segments C1 + E3)
This alternative is defined as light rail transit from downtown Hopkins to downtown Minneapolis via the HCRRA property, the Midtown Greenway Corridor, and Lyndale Avenue.

DMU 5 (combines segments W7 + C2 + E1)
This alternative is defined as diesel multiple unit from Dell Road to downtown Minneapolis via the Canadian Pacific, Kenilworth, and Burlington Northern Santa Fe freight rail lines. This alternative assumes that both freight rail and DMU operate in the Kenilworth Corridor.

Screen 2 Evaluation Measures

The Screen 2 Evaluation applied more quantitative measure to determine how well the alternatives address the Southwest Rail Transitway goals. *Technical Memorandum 4.0 Evaluation* contains a detailed description of the Screen 2 evaluation.

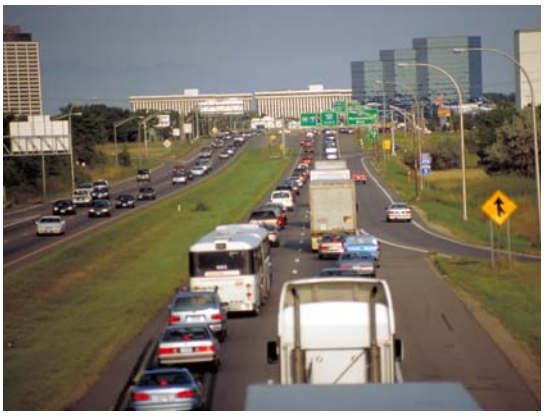
For purposes of the Screen 2 Evaluation, the measures were grouped into four categories: transportation, economic, environmental, and social.

Screen 2 Evaluation Measures

Transportation

These evaluation measures are intended to gauge how well each alternative attract riders, improves mobility through reducing travel time and attracting riders, serve population and employment concentrations, and provide travel choices.

- **Forecasted Ridership** defined as the estimated 2020 weekday transit ridership using the Metropolitan Council's travel demand model.
- **Travel Time Savings** defined as the year 2020 change in annual vehicle hours traveled (VHT) relative to the Route 650 Express Bus Baseline Alternative using the Metropolitan Council's regional model. This applies to automobile trips only.
- **Transit Connectivity** defined as a qualitative assessment of an alternative's ability to connect to the Hiawatha and proposed Central light rail transit lines.
- **Travel Time Reliability** defined as a qualitative assessment of an alternative's susceptibility to fluctuations in travel time due to traffic congestion, roadway accidents and inclement weather.
- **Travel Time Comparison** (Rail Transit vs. Single Occupant Vehicles): defined as the estimated afternoon rush hour travel time via rail transit versus single occupant vehicles for a number of origin/destination pairs.
- **Service Area** defined as an estimate of the number of jobs and households within one-half mile of transit stations using 2000 U.S. Census data. The purpose of this measure is to identify concentrations of households and employment along or proximate to an alternative.
- **Traffic & Parking Impacts** defined as where existing traffic lanes would be affected by the construction of an alternative, identifies where at-grade crossings would exist, elimination of parking, park & ride demand, and access/circulation issues at stations.



Economic

These measures are intended to examine the costs and the cost-effectiveness of each alternative**.**

- **Estimated Capital Cost** defined as the one-time costs to construct a rail system, namely the guideway, stations, structures, right-of-way, cost of engineering (design), administration and contingencies.
- **Estimated Operating and Maintenance (O&M) Cost** defined as the on-going annual costs to operate and maintain the rail system.

Environmental

These measures are intended to indicate the potential environmental impacts and benefits of each alternative.

- **Impact to Air Quality** defined as an estimate of the annual reduction of carbon dioxide (CO_2) emissions in metric tons relative to the Route 650 Express Bus Baseline Alternative in year 2020.
- **Potentially Impacted Natural Environment** defined as an inventory of all wetlands, water bodies, floodplains, and parklands located within 50 feet either side of each proposed alignment option.
- **Potential Proximity Impacts** defined as the estimated sound exposure level, generalized ground surface vibration, and the number of dwelling units within 50 and 100 feet of proposed alignment.

Social

These measures are intended to gauge the potential impacts and /or benefits to the study area and the region of each alternative.

- **Potential for Transit-Oriented Land Use Development** defined as a qualitative assessment of the potential for transit-oriented development at stations, consistency with regional plans, and consistency with local comprehensive plans.
- **Environmental Justice** defined as an estimate of the number of minority and low-income households within one-half mile of stations as a percent of county totals, using 2000 U.S. Census data.
- **Consistency with Federal/Regional Policies** (Access to Jobs) defined as an estimate of the number of low-income households and jobs within one-half mile of stations, using 2000 U.S. Census data and the Metropolitan Council's 2020 forecast. The intent of this measure is to indicate the degree to which an alternative provides access to jobs for low-income persons.
- **Neighborhood/Community Cohesion** defined as a qualitative assessment of an alternative's potential impacts on access to and from neighborhoods or communities. Access is defined to include the transit system or station as a focus of the community.
- **Impact on Property Values** defined as a qualitative assessment of an alternative's potential impact on adjacent residential and commercial properties. This assessment is based on information from other regions across the country with rail transit.

Figure 5.2 Screen 2 Evaluation Results

	Bus Base	1a	1b	2a	2b	3a (modified)	3b	4a	4b	5
SW TAC Recommendation	Retain	Retain	Not Retain	Retain	Not Retain	Retain	Not Retain	Retain	Not Retain	Not Retain

Transportation

	Bus Base	1a	1b	2a	2b	3a (modified)	3b	4a	4b	5
2020 Forecasted Rail Transit Ridership	7,000	17,450	19,925	18,500	20,975	17,800	19,375	16,500[4]	18,275	16,975
Travel Time Savings (Vehicle hours of Travel)	N/A	330,000	300,000	330,000	270,000	300,000	285,000	150,000	90,000	240,000
System Connectivity • Connections to 2010 transitways • Future extensions	Indirect On roadways	Direct HCRRA	Direct HCRRA	Direct undetermi ned	Direct undetermi ned	Direct undetermin ed	Direct undetermined	Direct HCRRA	Direct HCRRA	Indirect CP Rail
Travel Time Reliability Travel time fluctuations	Moderately Reliable	Highly Reliable	Highly Reliable	Highly Reliable	Highly Reliable	Highly Reliable	Highly Reliable	Highly Reliable	Highly Reliable	Highly Reliable
Rail Transit versus SOV Travel Time										
Minneapolis CBD to SW Metro Transit Station		NA/NA	NA/NA	31/34	35/34	29/34	33/34	NA/NA	NA/NA	NA/NA
UMN to Southwest Metro Transit Station		NA/NA	NA/NA	40/38	44/38	40/38	44/38	NA/NA	NA/NA	NA/NA
Minneapolis CBD to Hopkins		18/26	22/26	18/26	22/26	18/26	22/26	22/26	22/26	30/26
St. Louis Louis Park to MSP		33/31	37/31	33/31	37/31	33/31	37/31	37/31	37/31	45/31
Hopkins to Uptown (Hennepin & Lake)		NA/NA	12/19	NA/NA	12/19	NA/NA	12/19	12/19	12/19	NA/NA
Service Area *(2000 U.S. Census)* • Employment within 1/2 mile of stations • Households within 1/2 mile of stations	221, 870 15,614	198,000 16,084	206,069 31,573	195,307 16,213	203,376 31,702	209,267 14,684	217,336 30,174	187,878 13,465	194,177 26,522	195,066 15,349
Traffic/Parking Impacts • Disruption/elimination of general traffic lanes • At-grade crossings • Elimination/consolidation of parking • Park & Ride demand • Access/circulation issues at stations	N/A 0 None 2,500 None	None 28 None 4,560 TH312	Lyndale (2 lanes) 44 Lyndale* 4,110 TH312	None 28 None 4,795 TH62	Lyndale (2 lanes) 37 Lyndale* 4,345 TH62	TH 169 23 None 4,560 TH 212 Shady Oak	Lyndale (2 lanes) 39 Lyndale* 3,905 TH 212 Shady Oak	None 16 None 3,635 None	Lyndale (2 lanes) 28 Lyndale* 3,175 None	None 29 None

** requires the elimination of 300 on-street parking spaces and their consolidation into structured parking

[4] Source: 29th Street & Southwest Busway Feasibility Study, Hennepin County, 2000.

	Bus Base	1a	1b	2a	2b	3a (modified)	3b	4a	4b	5
SW TAC Recommendation	Retain	Retain	Not Retain	Retain	Not Retain	Retain	Not Retain	Retain	Not Retain	Not Retain

Economic

	Bus Base	1a	1b	2a	2b	3a	3b	4a	4b	5
Capital Costs In Millions (2003 & 2010) • 2003 (current year) • 2010 (anticipated construction year)	$72.2 $87.3	$503.0 $606.1	$614.8 $740.9	$582.0 $701.4	$691.4 $833.1	$663.4 $799.4*	$769.1 $926.8*	$358.0 $431.3	$468.7 $564.8	$425.5 $512.7
Operating & Maintenance Costs in Millions (2003)	$9.9	$15.7	$16.8	$16.0	$17.1	$14.9	$16.2	$6.4	$7.8	$19.2 - 25.7*

* Includes Hopkins Spur at an estimated cost of $45.2 million (2003) and $54.5 million (2010)
** Includes the estimated annual lease payment of $1 to 7.5 million.

Environmental

	Bus Base	1a	1b	2a	2b	3a	3b	4a	4b	5
Air Quality										
• Reduction in HCVOC in metric tons annually	N/A	33.1	31.2	32.8	18.2	22.1	20.2	13.9	13.3	27.0
• Reduction in NOX in metric tons annually	N/A	12.7	11.9	12.6	7.0	8.5	7.7	5.3	5.1	10.4
• Reduction in CO in metric tons annually	N/A	179.7	168.9	178.0	98.5	120.1	109.3	75.3	72.0	146.6
Noise and Vibration										
• Noise (for vehicle)	N/A	82 dBA	82 dBA	82 dBA	82 dBA	82 dBA	82 dBA	82 dBA	82 dBA	90dBA
• Vibration (for vehicle)	N/A	73VdB	73VdB	73VdB	73VdB	73VdB	73VdB	73VdB	73VdB	84VdB
• Potential # of impacted dwelling units	N/A									
(within 100 feet single-family/multi-family)		35/155	65/485	125/145	42/475	7/145	37/475	5/145	35/400	20/180
(within 200 feet single-family/multi-family)		100/290	110/555	40/255	50/520	60/255	70/520	30/255	40/250	130/310
Potentially Affected Natural Environment										
Wetland Impact	N/A	7	7	8	8	9	9	4	0	4
Water Bodies *(Lakes, Rivers, Creeks, etc.)*	N/A	10	10	9	9	8	8	9	2	9
Parklands	N/A	6	6	5	5	5	5	7	2	7
Floodplains	N/A	2	2	2	2	2	2	2	0	2

	Bus Base	1a	1b	2a	2b	3a (modified)	3b	4a	4b	5
SW TAC Recommendation	Retain	Retain	Not Retain	Retain	Not Retain	Retain	Not Retain	Retain	Not Retain	Not Retain

Social

	Bus Base	1a	1b	2a	2b	3a	3b	4a	4b	5
Potential for TOD at stations										
• TOD potential at station locations	Low	High	High	High	High	High	High	High	High	Moderate
• Consistency with regional growth plan (i.e., Blueprint/Transit 2020)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
• Consistency with local comprehensive plans	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Environmental Justice										
• Percentage of minority households within ½ mile of stations (relative to county totals)	13.6%	11.1%	15.1%	11.4%	15.3%	11.9%	15.7%	12.2%	16.6%	11.3%
• Percentage of low income households within ½ mile of stations (relative to county totals)	8.7%	8%	10.3%	8%	10.3%	8.2%	10.5%	8.7%	11.1%	8%
Consistency with Access to Jobs Program										
• Employment within ½ mile of stations	81,870	58,000	66,069	55,307	63,376	69,267	77,336	47,878	54,177	55,066
• Low-income households within 1/2 mile of stations	1,362	1,284	3,232	1,301	3,249	1,203	3,151	1,167	2,941	1,244
Promote Neighborhood/Community Cohesion										
• Barrier for access to/from community	No	No	No	No	No	No	No	No	No	No
Protect Property Values										
• Potential impact to residential/commercial properties within 1/2 mile of stations	None	None or Positive	None or Positive	None or Positive	None or Positive	None or Positive	None or Positive	None or Positive	None or Positive	None or Positive

Southwest Technical Advisory Committee (TAC) Recommendation

The Southwest Technical Advisory Committee (TAC) developed the following recommendation regarding which rail transit alternatives should be included in future studies.

The Southwest TAC's recommendation was presented to the public at a series of open houses in May 2003 prior to being presented to the Southwest Policy Advisory Committee (PAC) for their consideration.

Southwest Technical Advisory Committee (TAC) Recommendation

Based upon the results of the Screen 2 Evaluation, the Southwest TAC recommended that alternatives LRT 1A, LRT 2A, LRT 4A, and a modified LRT 3A continue to be considered in future studies. The Southwest TAC also recommended that the diesel multiple unit (DMU) technology (DMU 5) and the Lyndale Avenue alternatives (LRT 1B, LRT 2B, LRT 3B, and LRT 4B) no longer be considered in future studies.

Alternatives Recommended for Further Study

LRT 1A: Highway 312/5 to downtown Minneapolis via the HCRRA property & Kenilworth
This alternative is projected to carry 17,450 trips per day, cost $606 million in year 2010 dollars to construct, cost $15.7 million in year 2010 dollars annually to operate, serve 16,000 households and 198,000 jobs, and provide a travel time from TH 312/5 to Nicollet Mall Street of 35 minutes.

LRT 2A: SW Metro to downtown Minneapolis via I-494, the HCRRA property, & Kenilworth
This alternative is projected to carry 18,500 trips per day, cost $701 million in year 2010 dollars to construct, cost $16 million in year 2010 dollars annually to operate, serve 16,200 households and 195,300 jobs, and provide a travel time from the Southwest Metro Transit Station to Nicollet Mall of 30 minutes.

LRT 4A: downtown Hopkins to downtown Minneapolis via the HCRRA property
This alternative is projected to carry 16,500 trips per day, cost $431 million in year 2010 dollars to construct, cost $6.4 million in year 2010 dollars annually to operate, serve 13,500 households and 187,900 jobs, and provide a travel time from downtown Hopkins to Nicollet Mall of 25 minutes.

Modified LRT 3A: SW Metro to downtown Minneapolis via Eden Prairie Center, Golden Triangle, Opus, & Hopkins
Originally, the Southwest TAC decided to recommend that LRT 3A be removed from future consideration due to the high capital costs and relatively low ridership from the stations in Eden Prairie and Minnetonka. The relatively high capital costs resulted from the structures that are required to cross through the wetland adjacent to Highway 169 south of Hopkins and to access the Southwest Metro Transit Station in Eden Prairie. Southwest TAC members theorized that the relatively low ridership from the stations in Eden Prairie and Minnetonka was due to their location within the highway right-of-way which made them relatively inaccessible for employees working in the Golden Triangle, Opus, and downtown Hopkins.

Rather than recommending that LRT 3A be removed from consideration, the Southwest TAC decided to recommend to the Southwest Policy Advisory Committee (PAC) that LRT 3A be modified to reroute it to more directly serve the employment concentrations located near the Eden Prairie Center Mall, the Golden Triangle, Opus, and downtown Hopkins. The Southwest TAC recommended that this modified alignment be included in future studies along with LRT 1A, LRT 2A, and LRT 4A.

Alternatives NOT Recommended for Further Study

Diesel Multiple Unit (DMU) Technology (Alternative 5)

The Southwest TAC rationale for excluding the Diesel Multiple Unit (DMU) technology from further consideration because they determined that the DMU alternative did not provide a lower-cost alternative to LRT when both capital and operating/maintenance costs were considered. The Southwest TAC also found that due to the annual lease agreement requirements with three private freight rail companies, DMU service might not be able to be implemented more quickly than LRT. Other issues related to DMU service include the lack of a seamless connection to downtown Minneapolis, the University of Minneapolis, the Minneapolis-St. Paul Airport, the Mall of America, and downtown St. Paul; the slower travel times; the additional wear and tear on the Aero DMU vehicle which is not designed to stop every 1/2 to 1 mile; and, finally that the Aero DMU vehicle is still in the demonstration phase and is not in operation anywhere in the world.

Lyndale Avenue options (LRT Alternatives 1B, 2B, 3B, and 3B)

The Southwest TAC rationale for excluding the Lyndale Avenue LRT alternatives (i.e., LRT 1B, LRT 2B, LRT 3B, and LRT 4B) included traffic, business, visual/aesthetic, and cost impacts.

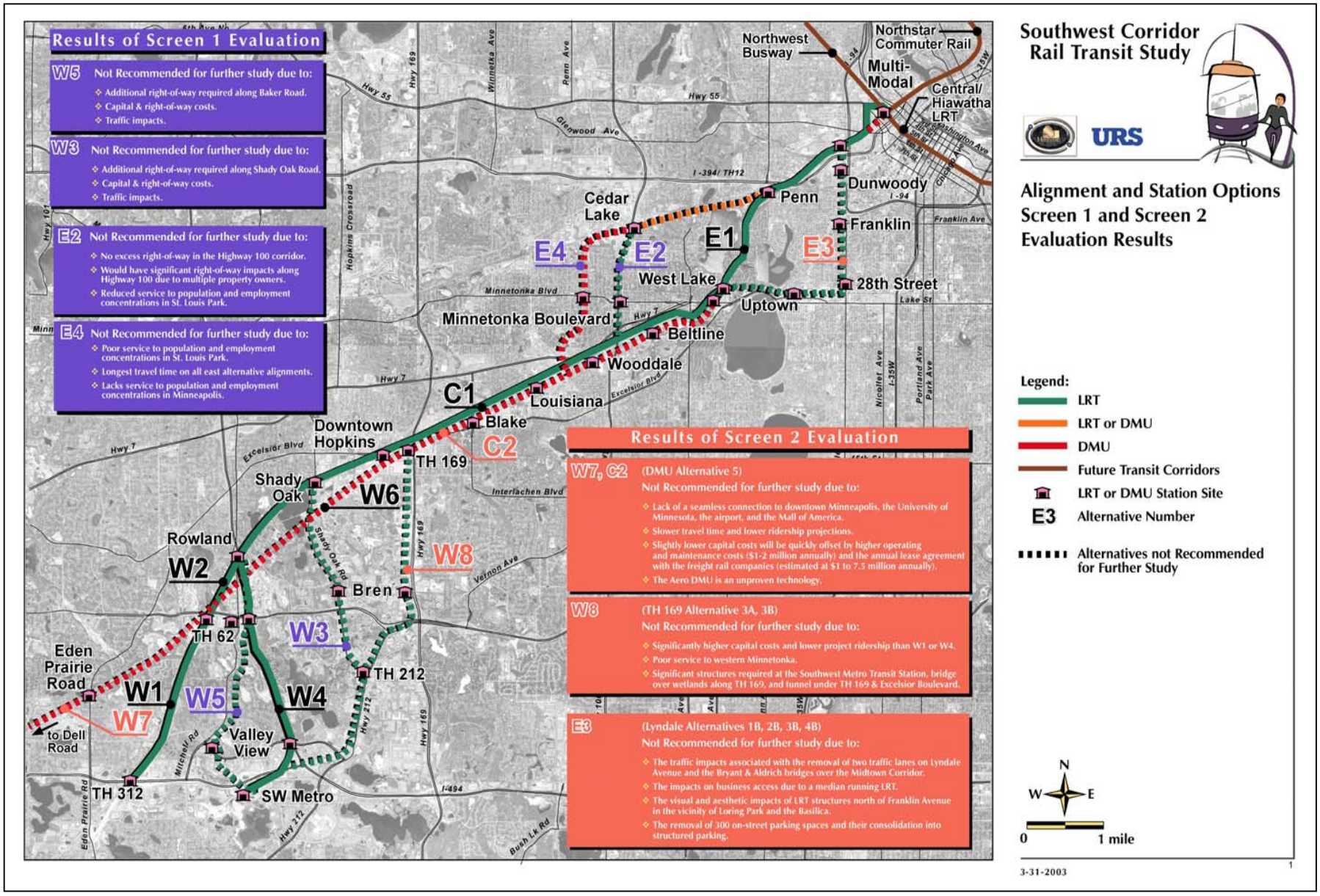
In terms of traffic impacts, a median running Lyndale Avenue LRT line will mean the elimination of the center two lanes of traffic on Lyndale Avenue. In addition, the Bryant and Aldrich bridges over the Midtown Greenway Corridor would be removed in order to allow the light rail vehicles sufficient space to accomplish the grade change that exists between the Midtown Greenway Corridor and Lyndale Avenue.

In terms of business impacts, the 300 on-street parking spaces on Lyndale Avenue would be removed and consolidated into one to two parking structures along Lyndale Avenue from 28th Street to Franklin Avenue. In addition, due to the required structure for the LRT to climb over the Hennepin/Lyndale Avenue exit ramps from I-94 there will be access restrictions to Lyndale Avenue businesses in the vicinity of Franklin Avenue.

In terms of visual/aesthetic impacts, an LRT structure would be required from south of Franklin Avenue to the Basilica. This structure would be elevated to carry the LRT over the Hennepin/Lyndale Avenue exit ramps from I-94 and the Harriet Irene Huxley pedestrian bridge between Loring Park and the Walker Sculpture Gardens.

In terms of capital costs, the Lyndale Avenue LRT option is estimated to cost approximately $100 million more than the Kenilworth option.

Figure 5.4 Screen 2 Evaluation Results



6. Key Study Findings

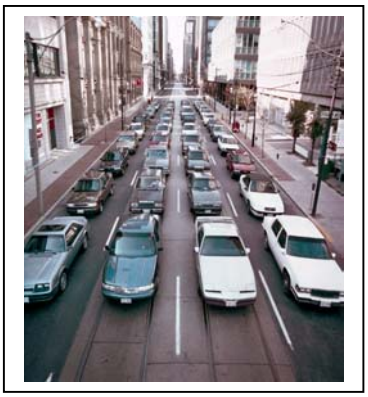
Introduction

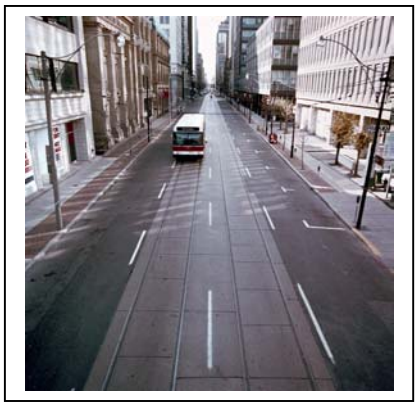
This chapter presents the key study findings for the Southwest Rail Transit Study. These findings are based upon the technical information that was generated as part of this study. A Southwest Rail Transitway was found to improve mobility, provide a competitive travel time to the private automobile, be reasonable in terms of costs, move passengers efficiently and effectively, provide service to population and employment concentrations, promote economic development and redevelopment at station locations, enhance the environment and improve the quality of life in the region, and be compatible with trails.

Improve Mobility

A Southwest Rail Transitway is estimated to carry between 16,500 and 19,500 trips per day. During the peak hour (rush hour), this line is expected to carry between 1,600 and 2,000 passengers, which equates to about one lane of roadway capacity (assumes 2,000 vehicles per lane and one person per vehicle).

In terms of the capacity provided, a Southwest Rail Transitway would occupy less space than private automobiles. The photographs below graphically depict the space occupied by a single driver in an automobile versus those same drivers in a light rail vehicle. The passenger capacity of a two-car light rail vehicle is in excess of 250 passengers.





Competitive Travel Time

A Southwest Rail Transitway is estimated to provide afternoon rush hour travel times that are competitive with the private automobile. Rail transitway passengers would also benefit from a travel choice not subject to delays caused by weather, congestion, and accidents.

Figure 6.1 Travel Time Comparisons

Origin/Destination Pair	LRT	DMU	SOV*
Nicollet Mall to SW Metro Transit Station	29-35	N/A	39
UMN (east bank) to SW Metro Transit Station	40	N/A	43
Nicollet Mall to downtown Hopkins	18-22	25	31
St. Louis Park to Minneapolis/St. Paul Airport	39-47	45	36
Downtown Hopkins to Uptown (Lake/Hennepin)	12	N/A	19

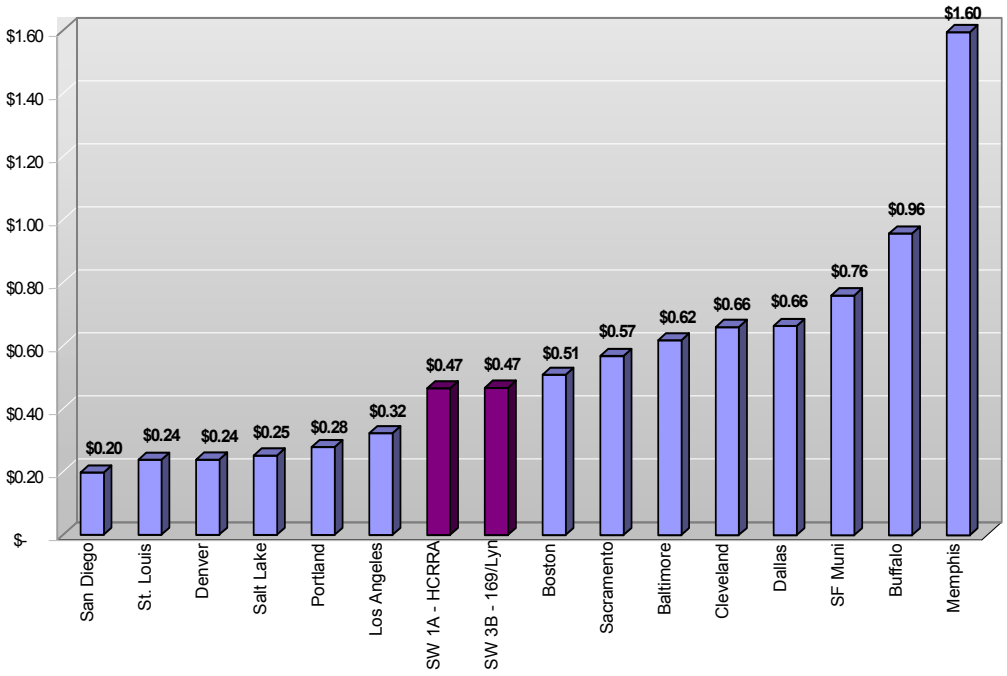
**The single-occupant vehicle (SOV) travel times were calculated assuming an average travel speed of 35 mph and a wait time of 5-minutes/ramp meter.*

Reasonable Cost

The cost to construct a Southwest Rail Transitway is estimated to range from $431 million to $926 million in 2010 dollars. In terms of capital cost per mile, a Southwest Rail Transitway is within the range of federally funded light rail transit (LRT) systems throughout the country. On a per mile capital cost basis, a Southwest Rail Transitway would range from $28 to $52 million per mile depending upon alignment, which is slightly higher than Denver ($30 million) and St. Louis ($39 million), but lower than Dallas ($54 million), Portland ($63 million), San Diego ($68 million), San Francisco ($98 million), and New Jersey ($113 million).

Cost-Effectiveness

Operating cost per passenger mile measures the cost and average distance traveled by each boarding passenger. Figure 6.2 indicates that the operating cost per passenger mile for a Southwest Rail Transitway is expected to be $ 0.47, which is higher than Denver and Portland, but lower than Baltimore and Dallas.



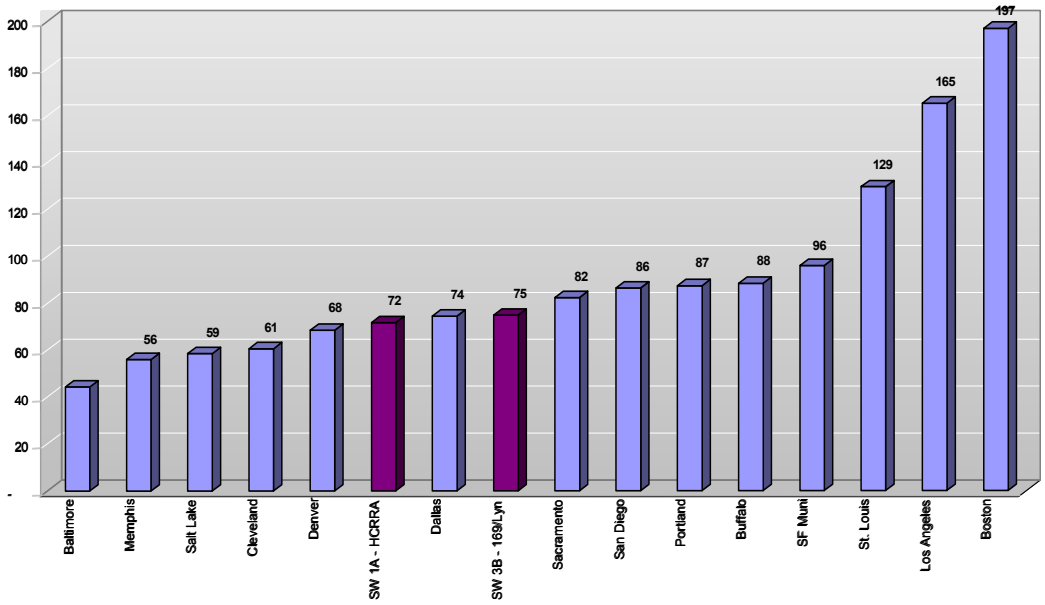
Effectively and Efficiently Moves People

In terms of service effectiveness and efficiency, a Southwest Rail Transitway is within the range of federally funded light rail transit (LRT) systems throughout the country.

Service Effectiveness

The number of passengers carried per hour of revenue service is a commonly used indicator of the effectiveness of transit service. A Southwest Rail Transitway is projected to carry between 72 and 75 passengers per revenue hour, which is similar to Denver and Dallas systems.

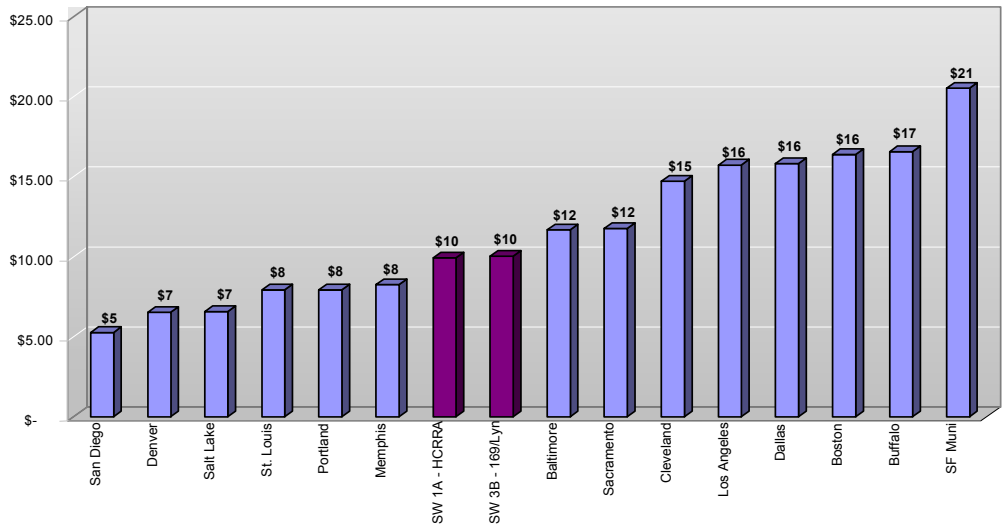
Figure 6.3 Passengers-per-Revenue Hour



Service Efficiency

The operating cost per vehicle mile of revenue service is a commonly used measure of transit service efficiency. A Southwest Rail Transitway's operating cost per revenue vehicle mile is expected to be $10, which is close to that of St. Louis, Portland, Memphis, Baltimore, and Sacramento.

Figure 6.3 Operating Cost Per Revenue Vehicle Mile ($2002/3)



Service to Population and Employment

According to the 2000 U.S. Census, the study area encompassed over 233,200 households and over 454,000 jobs. By 2030, the study area households are expected to increase to over 270,500 and the jobs to over 553,400.

A Southwest Rail Transitway is expected to serve over 31,000 households and over 200,000 jobs, which are currently located within a 1/2 mile radius of proposed stations.

Economic Development/Redevelopment

Opportunities exist at the proposed stations for development and redevelopment that is compatible with rail transit service. Examples include the Elmwood area of St. Louis Park, downtown Hopkins, the Golden Triangle in Minnetonka, and the Opus area of Minnetonka.

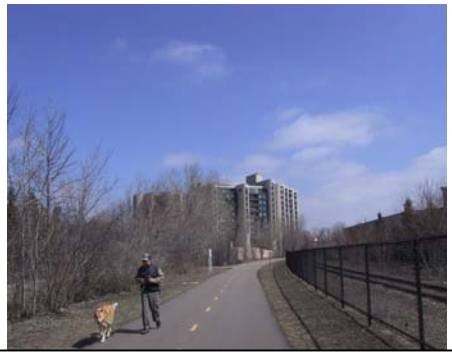
Proposed Wooddale Station

Enhance the Environment

A Southwest Rail Transitway is projected to reduce carbon monoxide emissions by 72,000 to 180,000 tons annually and to reduce hours of automobile travel by 90,000 to 330,000 hours annually.

Trails & Rails Co-Existence

According to the Rails-to-Trails Conservancy, rails and trails co-exist in over 60 locations in the United States, including the Southwest Study Area. Within the study area, freight rail and trails currently co-exist in the Kenilworth Corridor, the Cedar Lake Corridor, and in the portions of the Southwest Corridor in through St. Louis Park and Hopkins. Until recently, freight rail and a trail co-existed in the Midtown Greenway Corridor. Pictured below are the existing Kenilworth Corridor and an example of light rail transit co-existing with a trail in Strasbourg, France.



Kenilworth Trail and Rail

Strasbourg Trail and LRT

7. STUDY RECOMMENDATIONS

Introduction

This chapter presents the Southwest Policy Advisory Committee's (PAC) recommendation regarding the future of rail transit in the Southwest Metro Area. In developing their recommendation, the Southwest Policy Advisory Committee (PAC) considered the Southwest Technical Advisory Committee's (TAC) recommendation and comments from the public.

The Southwest PAC recommendation will be forwarded to the Hennepin County Regional Railroad Authority (HCRRA) in late 2003 for their consideration.

Southwest Policy Advisory Committee (PAC) Recommendations

The Southwest Policy Advisory Committee (PAC), a group composed of elected officials or their representatives from Hennepin County, the study area cities, the Metropolitan Council, Metro Transit, Southwest Metro Transit, the Three Rivers Park District, and the Twin West and Eden Prairie Chambers of Commerce, provided policy direction to the study and developed the following recommendation for consideration by the Hennepin County Regional Railroad Authority (HCRRA).

The Southwest PAC recommended that study continue on four light rail transit (LRT) alignment alternatives because they are the most likely to achieve the Southwest Transitway goals of improving mobility, providing a reliable travel choice, serving population and employment concentrations, providing for a seamless/integrated transit system, reasonable costs, enhancing the environment, enhancing the study area and region's quality of life, and promoting economic development and redevelopment.

The light rail transit (LRT) alternatives recommended for further study include:

LRT 1A: LRT from Highway 312/5 to downtown Minneapolis via the HCRRA property & Kenilworth.

LRT 2A: LRT from the Southwest Metro Station to downtown Minneapolis via I-494, the HCRRA property, & the Kenilworth Corridor.

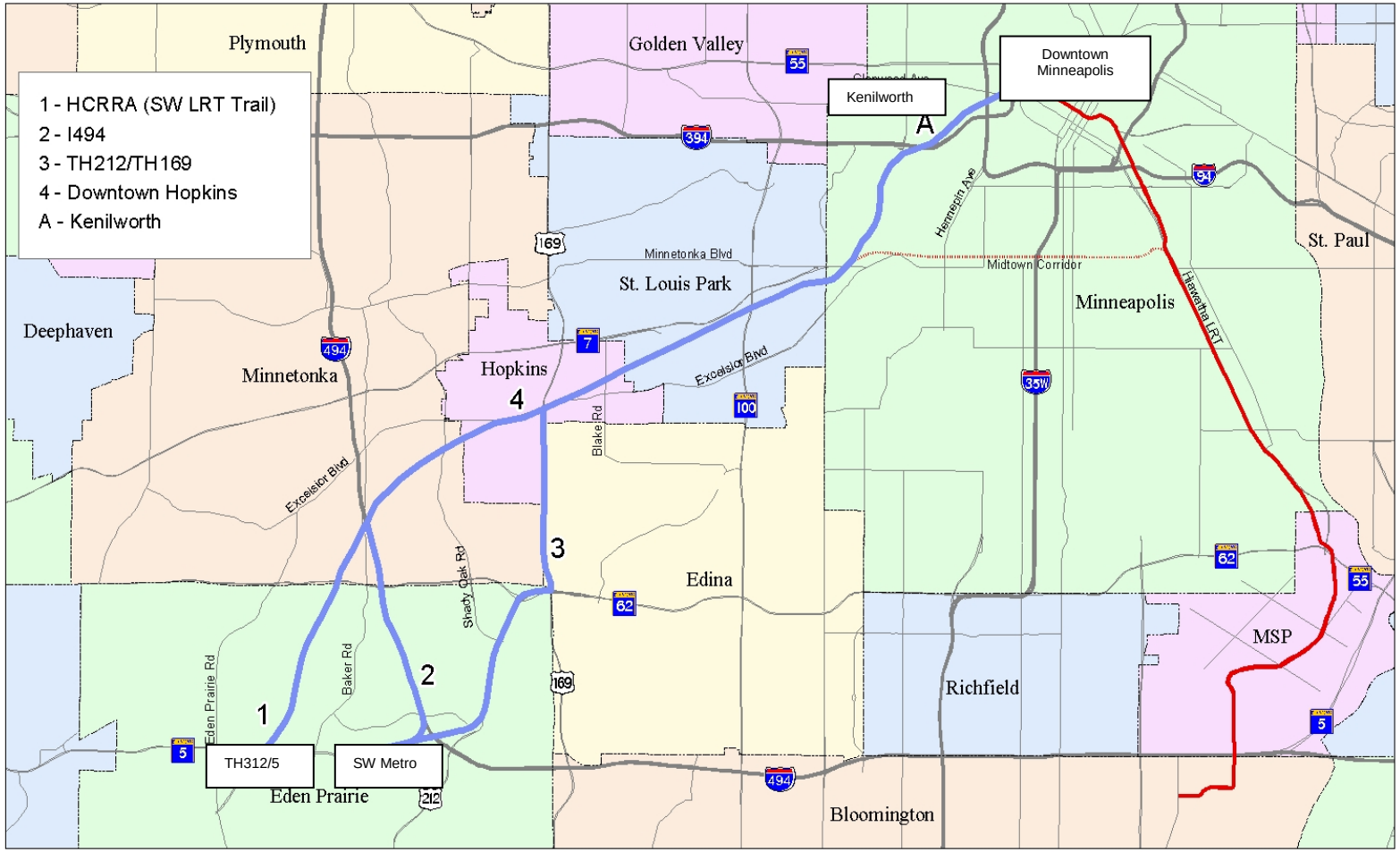
LRT 4A: LRT from downtown Hopkins to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor.

LRT 3A(modified): LRT from the Southwest Metro Station to downtown Minneapolis *modified* via the Eden Prairie Center Mall, the Golden Triangle, Opus, downtown Hopkins, the HCRRA property, and the Kenilworth Corridor.

In addition, future studies should include an analysis of a rail transit connection along the Midtown Greenway Corridor, environmental impacts and mitigation measures, public involvement, and retention of the trails.

The Southwest PAC also recommended that study not be continued for the Diesel multiple unit (DMU) technology (DMU 5) and for Light rail transit (LRT) options on Lyndale Avenue (LRT 1B, LRT 2B, LRT 3B, and LRT 4B).

Figure 7.1 Southwest Policy Advisory Committee (PAC) Recommendation



The Southwest Policy Advisory Committee (PAC) concurred with the Southwest Technical Advisory Committee's (TAC) rationale for recommending that study be discontinued for the Diesel multiple unit (DMU) technology, discontinued for light rail transit (LRT) on Lyndale Avenue, and that alternative 3A be modified.

Diesel Multiple Unit (DMU) Technology

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 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.

Lyndale Avenue Light Rail Transit (LRT) Alternatives

The Southwest PAC rationale for excluding the Lyndale Avenue LRT alternatives (i.e., LRT 1B, LRT 2B, LRT 3B, and LRT 4B) included traffic, business, visual/aesthetic, and cost impacts.
In terms of traffic impacts, a median running Lyndale Avenue LRT line will mean the elimination of the center two lanes of traffic on Lyndale Avenue. In addition, the Bryant and Aldrich bridges over the Midtown Greenway Corridor would be removed in order to allow the light rail vehicles sufficient space to accomplish the grade change that exists between the Midtown Greenway Corridor and Lyndale Avenue.

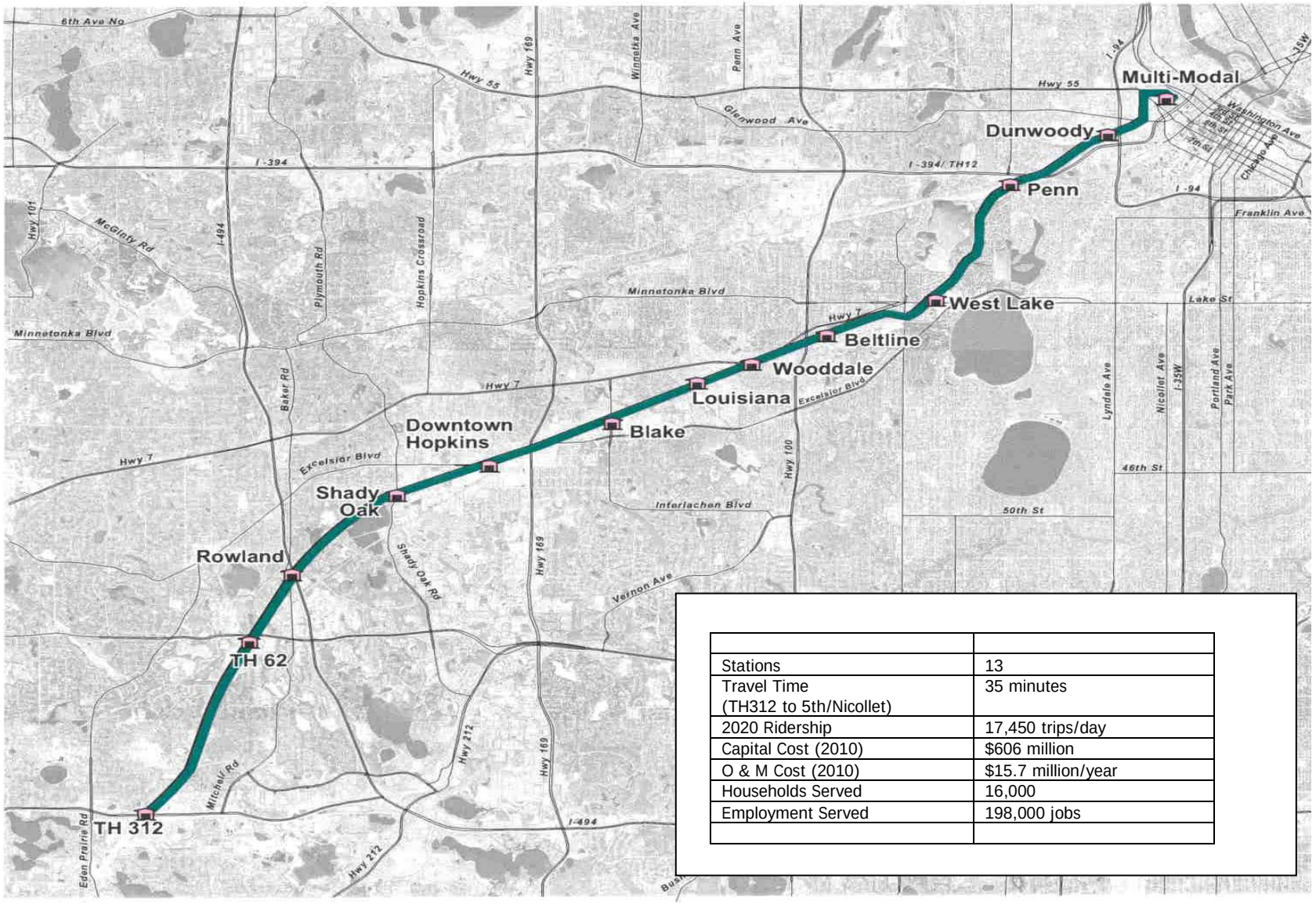
In terms of business impacts, the 300 on-street parking spaces on Lyndale Avenue would be removed and consolidated into one to two parking structures along Lyndale Avenue. In addition, due to the required structure for the LRT to climb over the Hennepin/Lyndale Avenue exit ramps from I-94 there will be access restrictions to Lyndale Avenue businesses in the vicinity of Franklin Avenue.

In terms of visual/aesthetic impacts, an LRT structure would be required from south of Franklin Avenue to the Basilica. This structure would be elevated to carry the LRT over the Hennepin/Lyndale Avenue exit ramps from I-94 and the Harriet Irene Huxley pedestrian bridge between Loring Park and the Walker Sculpture Gardens.
In terms of capital costs, the Lyndale Avenue LRT option is estimated to cost approximately $100 million more than the Kenilworth option.

Modified 3A: LRT from Southwest Metro to downtown Minneapolis

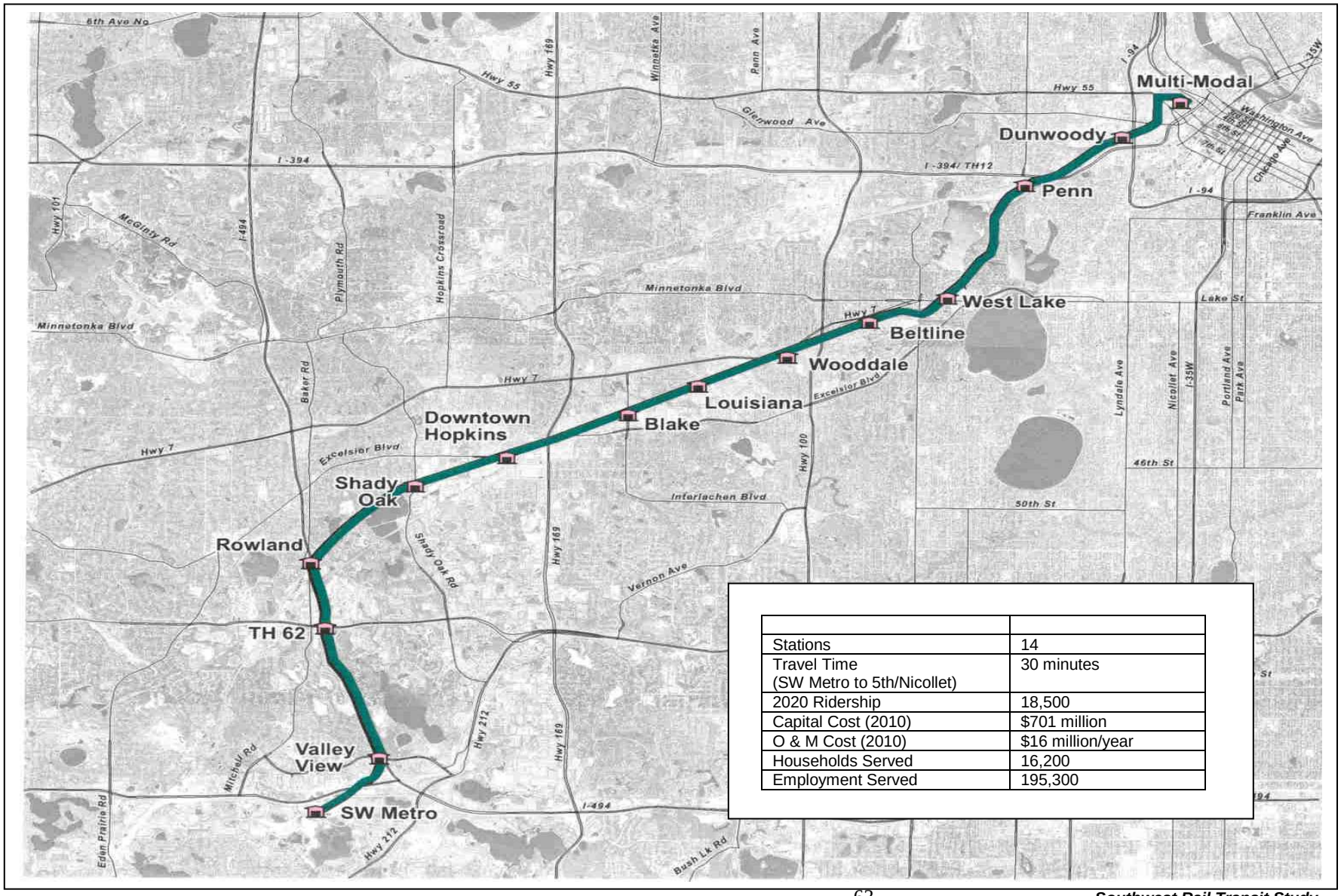
The Southwest PAC recommended that additional study be conducted to reroute LRT 3A in order to better serve employment generators including the Eden Prairie Center Mall, the Golden Triangle, Opus, and downtown Hopkins. The current 3A alignment does not provide direct service to these employment sites because it remains within the existing Highway 169 and 212 rights-of-way. Once a revised alignment is developed, new ridership forecasts and cost estimates should be conducted. The modified 3A alternative should be included in future study phases for a Southwest Transitway.

Figure 7.2 LRT 1A: TH312 to downtown Minneapolis via the HCRRA property and the Kenilworth Corridor



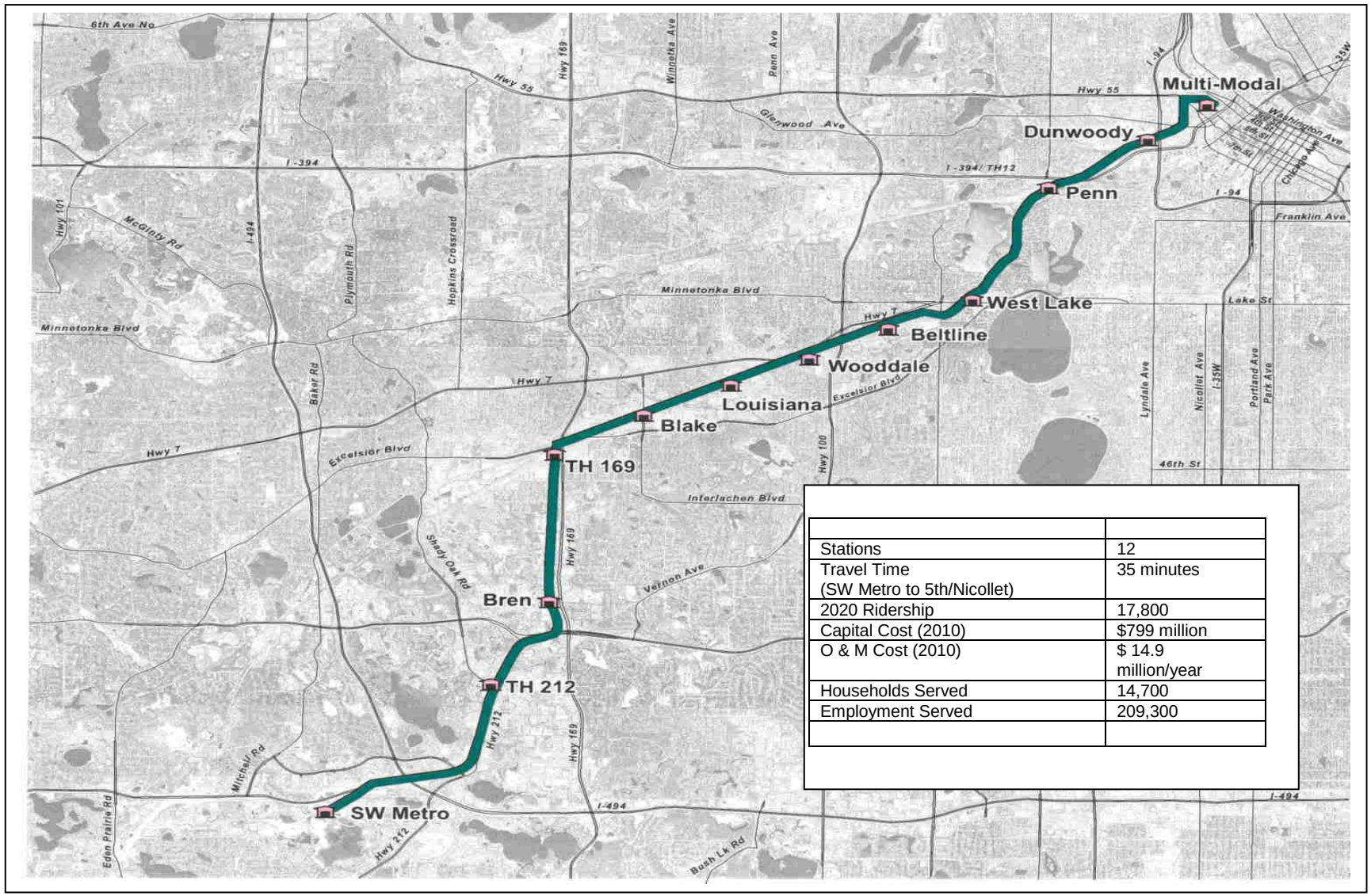
Stations	13
Travel Time (TH312 to 5th/Nicollet)	35 minutes
2020 Ridership	17,450 trips/day
Capital Cost (2010)	$606 million
O & M Cost (2010)	$15.7 million/year
Households Served	16,000
Employment Served	198,000 jobs

Figure 7.3 LRT 2A: SW Metro to downtown Minneapolis via I-494, HCRRA property & Kenilworth Corridor



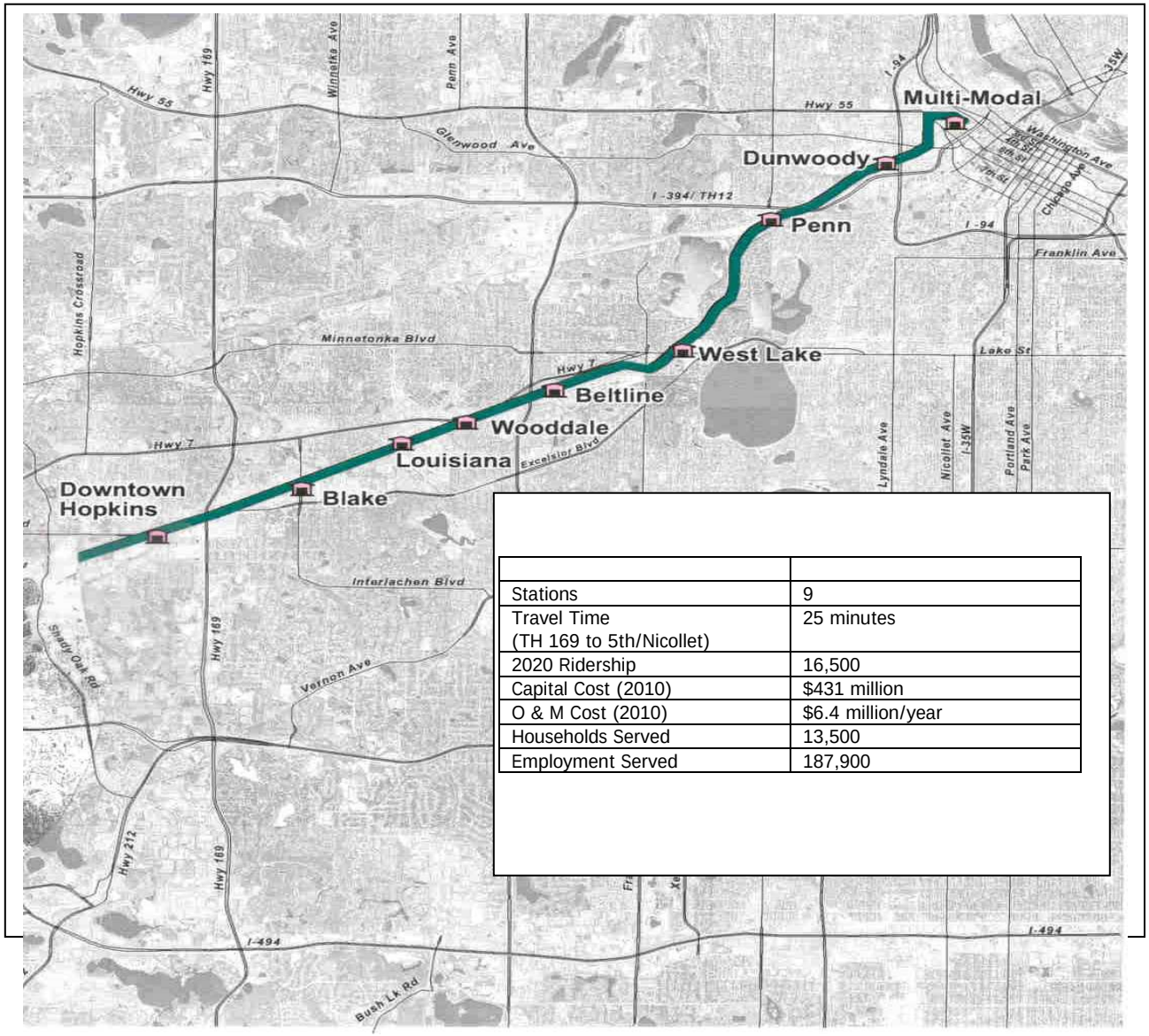
Stations	14
Travel Time (SW Metro to 5th/Nicollet)	30 minutes
2020 Ridership	18,500
Capital Cost (2010)	$701 million
O & M Cost (2010)	$16 million/year
Households Served	16,200
Employment Served	195,300

Figure 7.4 LRT 3A: SW Metro to downtown Minneapolis via Eden Prairie Center Mall, the Golden Triangle, Opus, downtown Hopkins, HCRRA property & Kenilworth Corridor



Stations	12
Travel Time (SW Metro to 5th/Nicollet)	35 minutes
2020 Ridership	17,800
Capital Cost (2010)	$799 million
O & M Cost (2010)	$ 14.9 million/year
Households Served	14,700
Employment Served	209,300

Figure 7.5 LRT 4A: downtown Hopkins to downtown Minneapolis via HCRRA property & Kenilworth Corridor



Stations	9
Travel Time (TH 169 to 5th/Nicollet)	25 minutes
2020 Ridership	16,500
Capital Cost (2010)	$431 million
O & M Cost (2010)	$6.4 million/year
Households Served	13,500
Employment Served	187,900

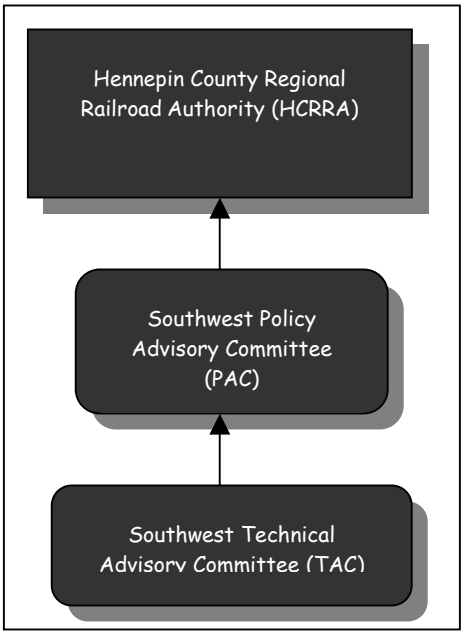
8. NEXT STEPS

Introduction

This chapter presents an overview of the potential next steps in the development of a Southwest Transitway. Those next steps include presentation of the Southwest Policy Advisory Committee (PAC) recommendation to the Hennepin County Regional Railroad Authority (HCRRA), an alternatives analysis (AA)/draft environmental impact statement (DEIS) study, preliminary engineering (PE), and final design.

Southwest Rail Transit Study Process

Two committees, a Southwest Technical and Southwest Policy Advisory Committee, guided this Study. The role of the Southwest Technical Advisory Committee (TAC) was to review technical information and develop a technical recommendation regarding which rail transit alternatives to include in future studies. The Southwest TAC recommendation was forwarded to the Southwest Policy Advisory Committee (PAC) for their consideration in developing their recommendation for the Hennepin County Regional Railroad Authority (HCRRA).



The role of the Southwest Policy Advisory Committee (PAC) was to provide policy guidance and develop a recommendation regarding future study of rail transit. The Southwest PAC recommendation will be presented to the HCRRA for action in late 2003.

The Hennepin County Regional Railroad Authority (HCRRA) is composed of the Hennepin County Board of Commissioners and is charged with rail transit planning for Hennepin County. The HCRRA provided funding for the current Study in order to investigate the potential for rail transit development in the Southwest Metro Area. The Southwest PAC recommendations will be presented to the HCRRA in late 2003. At that the HCRRA will decide whether to partner with the study area cities to continue study of a Southwest Rail Transitway.

Rail Transitway Development Process

Assuming that the HCRRA acts to continue study for a Southwest Rail Transitway the following are the likely next steps in the transitway planning process.

There are three key phases in the planning process for projects seeking Federal funding from the New Starts program:

- Alternatives Analysis (AA) / Draft Environmental Impact Statement (DEIS).
- Preliminary Engineering (PE).
- Final Design.

Alternatives Analysis (AA)/ Draft Environmental Impact Statement (DEIS)

The next logical study phase for a Southwest Rail Transitway is an alternatives analysis(AA)/draft environmental impact statement (DEIS). The AA/DEIS study phase is required in order to be eligible for Federal Funding from the Federal Transit Administration's Section 5309 New Starts Program. Typically an AA/DEIS evaluates appropriate modal and alignment options for addressing mobility needs in a given area. The AA/DEIS study is intended to provide information to local officials on the benefits, costs and impacts of various transportation alternatives in a given area. Potential local funding sources for implementing and operating the proposed rail transitway are also identified.

The AA/DEIS study phase is considered complete when a locally preferred alternative (LPA) is selected by local and regional decision-makers, adopted by the Metropolitan Council, and included in the financially constrained Transportation Policy Plan (TPP). Once this is completed, the local project sponsor may request the Federal Transit Administration's (FTA) approval to enter into the preliminary engineering phase of project development.

Preliminary Engineering (PE)

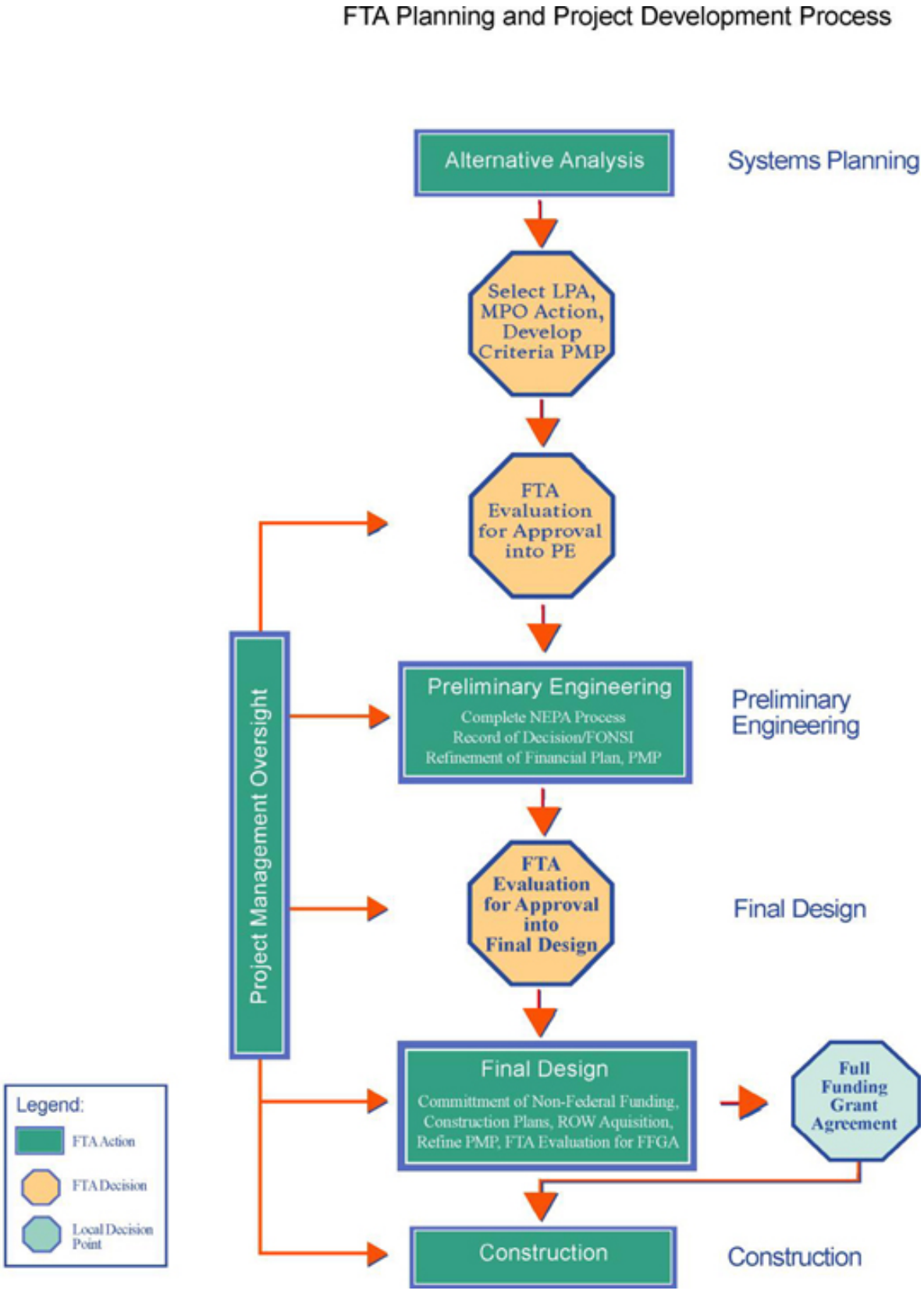
During the preliminary engineering (PE) phase of project development, the design of the proposal is refined, taking into consideration all reasonable design alternatives. PE results in estimates of project costs, benefits and impacts at a level of detail necessary to complete the Federally-mandated National Environmental Policy Act (NEPA) process and local funding sources are committed to the project.

Typically, preliminary engineering (PE) is considered complete when FTA issues either a Record of Decision (ROD) or a Finding of No Significant Impact (FONSI). Once this occurs, the local project sponsor requests FTA approval to enter final design.

Final Design

Final design includes right-of-way acquisition, utility relocation, and 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. Once this is completed, the local project sponsor requests that FTA enter into a full funding grant agreement (FFGA). After the FFGA is signed, construction of the project may commence.

Figure 8.1 Planning and Project Development Process



TECHNICAL MEMORANDUM

The following technical memoranda were produced as part of the this study and are available upon request from Hennepin County (612.348.9260):

1.0 Study Area Inventory

3.0 Transit Technology

4.0 Evaluation

6.0 Ridership Forecast

7.1 Capital Cost Estimate

7.2 Operating & Maintenance Cost Estimate

Appendix B: Public Involvement

Southwest Corridor Rail Transit Study Public Involvement Plan

Purpose

The purpose of this public involvement plan is to outline the techniques used during the Southwest Corridor Rail Transit Study to involve Potentially Affected Interests (PAIs) in the study process. The public involvement techniques chosen are targeted to encourage involvement of the PAIs throughout the study process.

Development

Staff from the cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie, Hennepin County, and the consulting firm, Richardson/Richter & Associates, developed this public involvement plan utilizing the principles contained in the Systematic Development of Informed Consent (SDIC) process. This process includes identify those individuals or groups most likely to be affected by the proposed action and then ensuring the public involvement techniques employed provide them with opportunities to participate in the decision making process.

Potentially Affected Interests (PAIs)

The following groups were identified as those that are potentially affected by the proposed Southwest Rail Transit line.

- Future Generations
- Area (five cities) Residents
- Residents adjacent to potential routes
- City Council Members (five cities)
- The Hennepin County Regional Railroad Authority (HCRRA)
- State Legislators
- The Governor
- Local Chambers of Commerce
- Businesses adjacent to potential routes
- Transit users
- Metro Transit
- Southwest Metro Transit
- Other Transit Providers
- Neighborhood Associations
- Trail users
- Three Rivers Park District
- Midtown Greenway Coalition
- Freight Rail Companies (CP, BNSF, & TCW)
- Potential employees (reverse commute to five cities)
- Agencies/Associations/Organizations (Mn/DOT, LRT JPB, Hennepin County, Golden Triangle TMA, Minneapolis TMO, Downtown Council, I-494 Corridor Commission, Citizens League, Metropolitan Council)

Appendix B: Public Involvement

Public Involvement Techniques

Technique	Potentially Affected Interest (PAI)	Timing	Description
Newsletters	City Councils Planning Commissions Legislators Neighborhood groups General public	Project Initiation (April 2002) Purpose and Need, Alternatives (July 2002) Ridership, costs, evaluation (Sept 2002) (April 2003) Recommendations, next steps (August 2003)	4-color multi-page newsletters distributed to PAC, TAC, councils, legislators, agencies, local media, and other interested parties (mailing list in excess of 500) and posted on website.
Press Releases	Local Media	At key milestones	One-page
Web Site	General public	Ongoing	www.co.hennepin.mn.us/tcw/southwest/swhome.htm Provide study information and announcement of open houses. Developed and maintained by Hennepin County.
E-mail	General Public	Ongoing	Swcorridor@co.hennepin.mn.us Collection of comments and questions. Responses to questions. Broadcast emails announcing open houses, press releases, and newsletters.
Hot Line	General Public	Ongoing	Established and monitored by URS
Open Houses	General public Adjacent property owners Transit users	Study Initiation (Spring 2002) Key Findings (Fall 2002) Recommendation (Spring 2003)	
Special Presentations	Neighborhood groups Chambers of Commerce Other Business Groups Resident Groups	Ongoing	Request time on regular meeting agendas
City Council Meetings	City Councils (five cities)	Project Initiation (Spring 2002) Recommendation (Fall 2003)	Presentations to City Councils
HCRRA	Hennepin County Commissioners	Study Initiation Key Findings (July 2003) Recommendation/Next Steps (Dec. 2003)	Presentations to update HCRRA on study process and recommendations. Aired on cable television.
Technical Advisory Committee (TAC)	Cities (5) Hennepin County Three Rivers Park District Mn/DOT Metropolitan Council/Metro Transit SW Metro Transit TCW Rail	Monthly meetings	TAC composed of technical staff charged with providing technical guidance to and review of the consultant's work. TAC study recommendation forwarded to PAC for their consideration.
Policy Advisory Committee (PAC)	Cities (5) Hennepin County Three Rivers Park District Metropolitan Council/Metro Transit SW Metro Transit Twin West Chamber Eden Prairie Chamber	Quarterly meetings	PAC composed of elected officials or representatives from member groups charged with providing policy guidance to and review of the consultant's work. PAC study recommendation forwarded to HCRRA for consideration.

Appendix B: Public Involvement

PUBLIC INVOLVEMENT RESULTS

Table B1: Open Houses

Date	Location	Attendees
April 24, 2002	Walker Library - Minneapolis	12
April 25, 2002	Southwest Metro Transit Station	25
April 27, 2002	Eden Prairie Center	32
April 30, 2002	Minnetonka Community Center	15
May 2, 2002	St. Louis Park Recreational Center	26
May 7, 2002	Walker Library - Minneapolis	15
May 9, 2002	Hopkins Depot	5
October 9, 2002	Southwest Metro Transit Station	91
October 16, 2002	Hopkins Depot Coffee House	107
October 17, 2003	Walker Library - Minneapolis	45
May 19, 2003	Kenwood Recreation Center	41
May 21, 2003	Hopkins Depot Coffee House	65
Mary 22, 2003	Southwest Metro Transit Station	41

Table B2: City Council Meetings

Meeting	Date
Eden Prairie City Council	April 16, 2002
Minnetonka City Council	April 22, 2002
Hopkins City Council	April 30, 2002
St. Louis Park City Council	April 22, 2002
Minneapolis City Council members (Lilligren, Goodman, Zimmerman, Niziolek, and Shift)	April 29, 2002
Eden Prairie City Council	August 19, 2003
Minnetonka City Council	August 25, 2003
Hopkins City Council	September 2, 2003
St. Louis Park City Council	September 8, 2003
Minneapolis Transportation/Public Works Committee	November 17, 2003

Appendix B: Public Involvement

Table B3: Special Meetings & Presentations

Organization	Date
Southwest Metro Transit Commission	April 25, 2002
Cedar Isles Dean Neighborhood Association	September 3, 2002
Kenwood Isles Neighborhood Association	September 9, 2002
Eden Prairie Chamber of Commerce Executive Committee	September 10, 2002
CARAG Neighborhood Association	September 17, 2002
Minnetonka - City Open House (Southwest Study booth)	October 8, 2002
Minneapolis Kenilworth Condo/Townhome Group Representatives	October 23, 2002
Kenilworth Rail Issues Community Meeting	October 23, 2002
Southwest Area Candidate Meeting at Depot Coffee House	October 23, 2003
Hopkins Rotary Club	October 31, 2002
John Erickson	November 13, 2002
Lyndale Neighborhood Association	November 25, 2002
Bryn Mawr Neighborhood Association	December 11, 2002
Twin West Chamber Committee	January 28, 2003
Cedar Isles Dean Neighborhood Association	February 4, 2003
Lyndale Avenue Business Assocation	February 26, 2003
Cedar Isles Dean Neighborhood Association	April 1, 2003
Bryn Mahr Neighborhood Association	April 9, 2003
Twin West Chamber of Commerce	April 11, 2003
Cedar Isles Dean Neighborhood Association	May 6, 2003
Minneapolis Chamber of Commerce Staff	May 15, 2003
Minneapolis Councilmember Nzielock	May 19, 2003
Cedar Isles Dean Neighborhood Association	June 3, 2003
Midtown Greenway Coalition	June 5, 2003
Trails Without Rails Group	June 18, 2003
Hiawatha Community Advisory Committee	July 23, 2003
St. Louis Park Community Development Staff	September 17, 2003
Twin West Chamber of Commerce	September 23, 2003
Hopkins School District Staff	October 9, 2003
Hopkins Business Council	October 21, 2003
Kenwood Isles Neighborhood Association	November 3, 2003
Eden Prairie Chamber of Commerce	November 20, 2003

Appendix B: Public Involvement

Table B4: Summary of News Articles

Date	Newspaper	Article
05/15/03	Southwest Journal	Public meeting on SW rail corridor is May 19
05/15/03	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	Southwest rail system open houses scheduled
05/15/03 05/08/03	Eden Prairie News	Southwest Rail Study open houses next week
04/23/03	Eden Prairie News	Bad news, then good on LRT option
04/10/03	Eden Prairie News	For light rail
04/08/03	Lakeshore Weekly	Don't stifle transit debate
03/26/03	Eden Prairie News	Bill aims to stop light-rail study for southwest area in its tracks
03/21/03	Southwest Journal	Bill threatens SW transit plans
03/20/03	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	Bill would ban trains on SW Corridor
02/26/03	Southwest Journal	Kenilworth or Lyndale Avenue? Southwest rail study delayed
02/20/03	Eden Prairie News	Light-rail study completion date is pushed back
01/28/03	Lakeshore Weekly News	Letters to the Editor
01/02/03	Southwest Journal	Rich 'hoods, poorer 'hoods toss LRT hot potato
12/30/02	Lakeshore Weekly News	Group organizes to oppose Southwest Corridor light rail line
12/19/02	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	Survey released on light rail option in SW Corridor
12/12/02	Eden Prairie News	Survey: Support high in southwest area for LRT
12/11/02	Star Tribune	Southwest LRT - Pawlenty voters favor new line
12/8/02	Star Tribune	Survey finds support for southwest light-rail line
11/07/02	Eden Prairie News	Letters to the Editor - Against light-rail
11/06/02	Eden Prairie News	Study likely to keep LRT reality a far-off dream
10/31/02	Eden Prairie News	Case/Davis/Douglas/Young/Seymour-Position's on the LRT trail
10/31/02	Sun Current - Eden Prairie	Web site collects opinion on LRT
10/31/02	Sun Current - Eden Prairie	Council opposes light rail on trail
10/24/02	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	Residents discuss transit proposal for SW Corridor
10/16/02	Eden Prairie News	City weighs in on light-rail transit study
10/15/02	Lakeshore Weekly News	Community Calendar - Open House Announcement
10/03/02	Eden Prairie News	LRT study open house in EP on Wednesday
10/01/02	Lakeshore Weekly	Rail study open houses slated
09/11/02	Eden Prairie News	This Minnetonkan wants light rail in suburbs
08/28/02	Lakeshore Weekly News	County agency identifies eight route options for light rail
08/28/02	Sun Current - Eden Prairie	EP Golden Triangle redevelopment recommended
08/22/02	Eden Prairie News	Group hits trail to raise awareness of study
08/21/02	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	Hiking trails can carry rail too, McLaughlin says
08/21/02	Sun Current - Eden Prairie	Opponents meet on Southwest Corridor trail
08/14/02	Eden Prairie News	Activists call Saturday 'Celebrate Our Trail Day'
08/14/02	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	EP group publishes guide to embattled trail
08/13/02	Lakeshore Weekly News	Trails and rails can co-exist

Appendix B: Public Involvement

Date	Newspaper	Article
05/15/03	Southwest Journal	Public meeting on SW rail corridor is May 19
08/07/02	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	Residents speak out against trains on hiking trail
08/07/02	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	Southwest rail system could follow highways
08/06/02	Lakeshore Weekly News	Group organizes to oppose Southwest Corridor light rail line
07/02/02	Eden Prairie News	Residents gear up to fight light-rail plan
07/11/02	Eden Prairie News	Letters from the July 11 Eden Prairie News
06/14/02	Southwest Journal	County studies diesel-powered cars for Kenilworth track
06/11/02		Residents object to newest light rail plans
06/06/02	Eden Prairie News	Letters from the June 6 Eden Prairie News
06/02/02	Star Tribune	Will light rail get a southwestern flavor?
05/29/02	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	EP, Minnetonka residents rally against rail
05/15/02	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	Eden Prairie to Minneapolis rail system is a possibility
05/01/02	Sun Current - Eden Prairie	Light rail plans draw opposition
05/01/02	Southwest Journal	Meetings to consider SW rail
04/24/02	Sun Current - Eden Prairie Sun Sailor - Hopkins, Minnetonka, St. Louis Park	Eden Prairie-Minneapolis transit route meetings set

Table B5: Southwest Policy Advisory Committee Meetings

Regular Meetings	Special Meetings
September 9, 2002	October 25, 2003 - Alignment Tour (west end)
November 20, 2002	November 15, 2003 - Alignment Tour (east end)
December 18, 2002	June 20, 2003 - Hiawatha LRT Tour
February 12, 2003	
April 9, 2003	
May 14, 2003	
July 9, 2003	

Table B6: Southwest Technical Advisory Committee (TAC) Meetings

Meetings
May 22, 2002
July 24, 2002
August 26, 2002
October 2, 2002
November 6, 2002
December 11, 2002
January 31, 2003
March 21, 2003
June 5, 2002
June 26, 2003
August 6, 2003

SOUTHWEST NEWSLETTERS

RESIDENT SURVEY

Introduction

In response to suggestions made by the public at open houses and other venues, a telephone survey of a random sample of study area residents was conducted. CJ Olson Research Inc., an independent market research firm, conducted a survey of residents in the cities of Eden Prairie, Minnetonka, Hopkins, St. Louis Park, and Minneapolis concerning their perspectives on traffic congestion, the current transportation system, and rail transit. Appendix C contains a copy of the questionnaire for the Southwest Resident Survey

Methodology

The probability sampling method was used to survey a representative sample of the general public, which allows for projecting the views of the population at large. Telephone interviews were completed with adults from 650 randomly selected households in the southwest metro area cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, Eden Prairie, Edina, and Chanhassen. Completing 650 interviews resulted in overall statistical reliability at the 95% confidence level of $\pm$ 3.8%.

Survey Respondents

Of the 650 survey respondents, 113 reside in Minneapolis, 113 reside in St. Louis Park, 111 reside in Hopkins, 113 reside in Minnetonka, 125 reside in Eden Prairie, 38 reside in Edina, and 37 reside in Chanhassen. Seventy percent of the survey respondents were employed full-time, part-time or were self-employed. The majority (86%) of respondents worked at locations other than their homes. The roadways most often used on a daily basis include I-494, Crosstown 62, Excelsior Boulevard, Highway 7, and Highway 100. The majority of survey participants said their usual travel mode was driving alone.

Employment Status (Q13)

Of all respondents, 52% classify themselves as employed full-time, 14% as retired, 9% as self-employed, 8% as homemaker, 4% as unemployed, 2% as student, 1% as disabled, and 1% refused to answer. Male respondents were more likely than female respondents to be employed full-time (64% vs. 43%). Respondents from Eden Prairie (55%), St. Louis Park (59%) and Hopkins (61%) were more likely to be employed full-time than were respondents from Edina (26%).

Primary Workplace (Q14)

Of those respondents who worked full-time, part-time or were self-employed 86% stated that they work at a location other than their home, 9% from their home and 5% both from home and away from home equally.

Location Of Work Or School (Q15)

Of those who identified themselves as students or working away from home at least part of the time 25% percent travel to Minneapolis, 10% travel to Eden Prairie, 9% travel to Minnetonka, 8% travel to Edina, 8% travel to St. Louis Park, 7% travel to Bloomington, and the remaining 34% travel to various other locations.

Major Southwest Roadways Used (Q1)

Of all 650 survey participants, 70% stated these use I-494, 70% TH 62, 69% Excelsior Boulevard, 63% TH 7, 55% TH 100, 39% TH 5, 31% Eden Prairie Road, 29% Baker Road, 27% TH 169, 20% I-394 on a regular basis.

Mode Of Transportation (Q2)

Of all survey respondents, 86% drive alone, 7% van or carpool, 5% use the bus, 1% bike, and 1% use another transportation mode for their daily travel. Residents of Eden Prairie (94%), St. Louis

Park (90%) and Minnetonka (88%) were more likely than were Minneapolis (71%) residents to drive alone.

Traffic Congestion (Q3)

Of all survey respondents, 92% expect traffic congestion to increase either greatly or somewhat over the next five years. Only 2% stated that they believe traffic congestion will decrease either somewhat or a lot over the next five years.

Best Solutions For Congestion (Q4)

When survey respondents were asked the open ended question of what they thought would be the best solution to traffic congestion in the southwest metro area:

41% said light rail transit
39% said add more lanes/widen highways/build roads
34% said operate more buses more often
9% said more carpooling
4% said build subways
3% said more carpool lanes
3% said operate commuter trains, and
2% said reduce stop signs and signals.

Preferred Improvements (Q5)

When respondents were asked what they believed was the best solution to traffic congestion: highway improvements (adding lanes), transit improvements (buses and light rail transit), or a combination of both:

66% stated both
19% stated highways only, and
14% stated transit only.

The following table documents the results segmented by city of residence.

CITY	BOTH	HIGHWAYS ONLY	TRANSIT ONLY	DON'T KNOW
Chanhassen	73%	24%	3%	0%
Eden Prairie	61%	30%	8%	2%
Edina	68%	24%	8%	0%
Hopkins	71%	16%	13%	0%
St. Louis Park	66%	17%	14%	3%
Minneapolis	59%	12%	28%	1%
Minnetonka	68%	19%	12%	1%

SUPPORT OR OPPOSE LIGHT RAIL (Q9)

When respondents were asked if they supported or opposed a light rail transit option running through Eden Prairie, Minnetonka, Hopkins, and St. Louis Park to downtown Minneapolis:

71% support LRT
16% oppose LRT
7% neutral/ no feelings regarding LRT
6% don't know/ can't decide/ depends

APPENDIX D: RESIDENT SURVEY

The following table documents the results segmented by city of residence.

CITY	SUPPORT	OPPOSE	NEUTRAL	CAN'T DECIDE	REFUSED
Chanhassen	57%	22%	8%	14%	0%
Eden Prairie	66%	21%	6%	6%	1%
Edina	66%	16%	10%	5%	3%
Hopkins	75%	14%	5%	6%	0%
St. Louis Park	73%	11%	10%	7%	0%
Minneapolis	79%	9%	6%	6%	0%
Minnetonka	73%	21%	4%	2%	0%

Reasons For Support of LRT (Q10)

Those respondents (71%) who indicated support a light rail transit option in the southwest metro area were asked their reasons. A wide variety of responses were given, and those mentioned most often are in the table below.

REASON	PERCENT
BASE FOR PERCENT	464
Roads are congested/ would lessen traffic	63%
Environmentally-friendly/ would cut pollution	22%
Faster commute/ faster than driving/ than bus	17%
Good alternative/ another option	16%
Don't have to find parking/ don't have to pay	15%
Wouldn't have to drive/ could avoid traffic	8%
It's needed/ something has to be done	8%
More would take advantage of shopping/ activities/ events/ would make downtown more accessible	8%
Good for people who don't drive/ can't/ seniors	6%
Run on time/ timeliness	6%
Cheaper than driving/ save on gas, insurance, maintenance	5%
Works well elsewhere	5%
Fuel savings/ fuel efficiency	5%
Efficient/ good way to move a lot of people	4%
I'd feel safer than in a car/ less risky	4%

APPENDIX D: RESIDENT SURVEY

Reasons For Opposition to LRT (Q10)

Those respondents (16%) who indicated opposition to a light rail transit option in the southwest metro area were asked their reasons. A wide variety of responses were given, and those mentioned most often are in the table below.

REASON	PERCENT
BASE FOR PERCENT	101
Cost/ too expensive/ costs taxpayers	35%
People won't use it/ not enough will use it	32%
Doesn't go to all the places people go/ prefer it on another route	18%
Money better spent on roads	15%
Don't want it in my backyard/ goes through residential neighborhoods/ noisy	12%
Would lose bike trails/ reduce use of trails	6%
Other*	59%

APPENDIX D: RESIDENT SURVEY

CJ OLSON MARKET RESEARCH, INC. 22095
MINNEAPOLIS, MN 55413 SW CORRIDOR

FINAL

START:		END:		STATION:		SAMPLE PAGE:	
FIRST NAME:				PHONE:			
GENDER:	1...FEMALE	2...MALE					
INTERVIEWER:			SUP:			DATE:	

(ASK FOR MALE/ FEMALE HEAD OF HOUSEHOLD)

Hello, this is _____ calling from CJ Olson Market Research in Minneapolis. We are conducting a short study regarding transportation options in your area for the Hennepin County Rail Authority and would like to include your opinions. Your name will not be attached to your answers and this will only take about 10 minutes of your time, depending on how much you have to say.

A. First of all, we're talking with people in certain cities today. Do you live in...? (READ LIST. CIRCLE CODE)

Chanhassen	1	
Eden Prairie	2	
Edina	3	
Hopkins	4	
St. Louis Park	5	
Minneapolis, or	6	
Minnetonka	7	
OTHER	97	(THANK, TALLY AS QA, TERM)
DK/ REFUSED	99	(THANK, TALLY AS QA, TERM)

1. Thinking about your usual travel patterns in the southwest part of the metro area that we define as Eden Prairie, Minnetonka, Hopkins and St. Louis Park, which of the following roadways do you use on a regular basis? (READ LIST AND CIRCLE CODES)

	YES	NO	DK/REF
Highway 100	1	2	9
Highway 7	1	2	9
Excelsior Boulevard	1	2	9
Crosstown Highway 62	1	2	9
Highway 5	1	2	9
Eden Prairie Road	1	2	9
494	1	2	9
Baker Road	1	2	9
Or another main road (WRITE IN)			
_____	1	2	9

APPENDIX D: RESIDENT SURVEY

2. What is your usual mode of transportation for daily travel? (READ LIST AND CIRCLE CODE)

Drive alone	1
Vanpool or carpool	2
Bus	3
Bike	4
OTHER (WRITE IN) _____	7
DK/ REFUSED	9

3. Over the next five years, do you expect that traffic levels on the roadways you use will..... (ROTATE ORDER OF RESPONSE CHOICES)

Decrease a lot	1
Decrease somewhat	2
Stay the same	3
Increase somewhat	4
Greatly increase	5
DK/ REFUSED	9

4. In your opinion, what is the best solution to traffic congestion in the southwest metro area? (RECORD WORD FOR WORD, PROBE AND CLARIFY)

5. In the next questions we'll be talking about transit options like buses and light rail transit, and about highway changes like adding lanes.

   In general, what do you believe is the best solution to traffic congestion in the Southwest part of the Metro area--highway improvements, transit improvements or a combination of both? (CIRCLE CODE)

HIGHWAYS ONLY	1	(SKIP TO Q6)
TRANSIT ONLY	2	(CONTINUE)
BOTH	3	(CONTINUE)
OTHER (WRITE IN) _____	7	(CONTINUE)
DK/ REFUSED	9	(CONTINUE)

5a. Thinking about a 5-point scale, where 1 means not at all important and 5 means very important, please tell me how important each of the following features are for improving transit in the southwest metro area. (READ EACH, ROTATING ORDER, CIRCLE CODE)

	NOT AT ALL IMPT				VERY IMPT	DK/REF
a. More frequent service	1	2	3	4	5	9
b. Evening and weekend service	1	2	3	4	5	9

c. Heated, lighted transit stations ..... 1 ..... 2 ..... 3 ..... 4 ..... 5 9
d. Depart and arrive on time ..... 1 ..... 2 ..... 3 ..... 4 ..... 5 9
e. More Park & Ride lots ..... 1 ..... 2 ..... 3 ..... 4 ..... 5 9
f. Direct ride to destinations, like the Mall of America, airport, and U of M ..... 1 ..... 2 ..... 3 ..... 4 ..... 5 9
g. Carpool lanes ..... 1 ..... 2 ..... 3 ..... 4 ..... 5 9

6. As you may have heard, there currently is a study being conducted that looks at the possibility of a light rail transit option running diagonally from downtown Minneapolis through St. Louis Park, Hopkins, and Minnetonka to Eden Prairie. Have you heard or read anything about this idea? (CIRCLE CODE)

YES	1	(CONTINUE)
NO	2	(SKIP TO Q8)
DON'T KNOW/ REFUSED	9	(SKIP TO Q8)

7. What, specifically, have you heard or read before this interview? (DO NOT READ LIST. CIRCLE CODES. PROBE. CLARIFY OTHERS)

NOTHING SPECIFIC/ CAN'T RECALL/ DON'T KNOW	1
OLD/ ABANDONED RAIL LINES/ TRACKS PURCHASED/ USED	2
THREE RIVERS PARK INVOVLED/ COLLABORATION	3
GETTING RID OF THE HIKING/ BIKING TRAILS/ WILL REPLACE THE TRAILS	4
WILL HAVE BOTH TRAILS AND TRANSIT/ TRAINS/ RAILS	5
WILL RUN TO DOWNTOWN MINNEAPOLIS/ U OF M	6
IT'S UNSAFE TO HAVE TRAILS NEXT TO RAILS	7
BEING DONE BY HENNEPIN COUNTY	8
THEY'RE ADDING RAIL TRANSIT/ LIGHT RAIL THROUGH EDEN PRAIRIE/ MINNETONKA/ ST. LOUIS PARK/ HOPKINS/ TO MPLS	9
WILL BE ABLE TO GO TO MALL OF AMERICA	10
WILL BE ABLE TO GO TO THE AIRPORT	11
OTHER (WRITE IN & CLARIFY)	
_____	97
REFUSED	99

8. If a light rail line were developed with service in the southwest metro to downtown Minneapolis, with stations in each city along the way, how <u>likely</u> would you be to take the train for each of the following occasions? Please use a 5-point scale where 1 means you definitely would not take the train and 5 means you definitely would take the train. (READ EACH, ROTATING ORDER, CIRCLE CODE)

	DEFINITELY WOULD NOT				DEFINITELY WOULD	DK/REF
a. To commute to work or school during nice weather	1	2	3	4	5	9
b. To commute to work or school during inclement weather	1	2	3	4	5	9
c. To go shopping, to a movie or out to eat	1	2	3	4	5	9

d. To go to University of Minnesota	1		2	3	4	5		9
e. To go to sports events or entertainment in downtown Minneapolis	1		2	3	4	5		9
f. For fun, just to try it or to see what it's like	1		2	3	4	5		9
g. To go to the airport	1		2	3	4	5		9

9. Overall, do you support or oppose a light rail transit option running through Eden Prairie, Minnetonka, Hopkins, and St. Louis Park to downtown Minneapolis? (DO NOT READ LIST. CIRCLE CODE)

SUPPORT	1	(CONTINUE)
OPPOSE	2	(CONTINUE)
NEUTRAL/ NO FEELINGS	3	(SKIP TO Q11)
REFUSED	8	(SKIP TO Q11)
DON'T KNOW/ CAN'T DECIDE/ DEPENDS	9	(SKIP TO Q11)

10. Why do you (SUPPORT/ OPPOSE) this option? (RECORD WORD FOR WORD, PROBE AND CLARIFY)

11. What information would you like to receive about the proposed Southwest Corridor rail line? (DO NOT READ LIST. CIRCLE CODES)

CONSTRUCTION COST / OPERATION COST/ TAX ISSUES	1	
FARES / COST TO RIDE	2	
NOISE EXPECTATIONS / ENVIRONMENTAL ISSUES	3	
OVERALL PLANS/ WHAT'S GOING TO HAPPEN	4	
ROUTES/ LOCATION OF STOPS/ STATIONS	5	
SAFETY PLANS	6	
SCHEDULE/ WHEN TRAINS WILL RUN/ COMMUTE TIME	7	
STATUS REPORTS/ PROGRESS	8	
TIMELINE FOR CONSTRUCTION	9	
NOTHING/ CAN'T THINK OF ANYTHING	96	(SKIP TO Q13)
OTHER **(WRITE IN + CLARIFY)** _____	97	
REFUSED	99	(SKIP TO Q13)

12. From which of the following sources would you most prefer to receive additional information on the proposed Southwest Corridor rail line? (READ LIST. ROTATE ORDER. CIRCLE CODES)

Newsletters	1
Local community newspapers	2
The Minneapolis StarTribune	3
Direct mail to your home	4
Internet/website/e-mail	5

Public meetings	6
Displays at malls, city halls and other public places	7
OTHER (WRITE IN AND CLARIFY) _____	8
DON'T KNOW/ REFUSED	9

Finally, I have just a few questions to group your answers...

13. Which of the following best describes your current employment status? (READ LIST. CIRCLE CODE)

Employed full-time	1 (CONTINUE)
Employed part-time	2 (CONTINUE)
Self-employed	3 (CONTINUE)
Student	4 (SKIP TO Q15)
Homemaker	5 (SKIP TO Q16)
Retired	6 (SKIP TO Q16)
Unemployed	7 (SKIP TO Q16)
OTHER (WRITE IN) _____	97 (SKIP TO Q16)
DK/ REFUSED	99 (SKIP TO Q16)

14. Do you work primarily...? (READ LIST. CIRCLE CODE)

At a location other than your home	1
From your home	2 (SKIP TO Q16)
BOTH EQUALLY	3
DON'T KNOW / REFUSED	9 (SKIP TO Q16)

15. In what city is your (WORK/SCHOOL) located? (READ LIST. CIRCLE CODE)

CHANHASSEN	1
EDEN PRAIRIE	2
EDINA	3
HOPKINS	4
MINNEAPOLIS	5
MINNETONKA	6
ST. LOUIS PARK	7
ST. PAUL	8
OTHER (WRITE IN) _____	97
VARIES	98
REFUSED	99

APPENDIX D: RESIDENT SURVEY

16. Which of the following categories contains your age? (READ LIST. CIRCLE CODE)

18 – 24	1
25 – 34	2
35 – 44	3
45 – 54	4
55 – 64	5
65 – 74	6
75 or older	7
REFUSED	9

17. Which of the following categories best describes your household makeup? (READ LIST. CIRCLE CODE)

One income, no children under 18	1
One income, with children under 18	2
More than one income, no children under 18	3
More than one income, with children under 18	4
REFUSED	9

18. How many working vehicles, such as cars, trucks, vans or motorcycles, are there in your household? (WRITE IN)

_____	VEHICLES
REFUSED	99

19. Which of the following categories includes your total household income for last year, before taxes? (READ LIST. CIRCLE CODE)

Under $25,000	1
$25,000 - $49,999	2
$50,000 - $74,999	3
$75,000 - $99,999	4
$100,000 or higher	5
REFUSED	9

THANK RESPONDENT. RECORD ALL FRONT BOX INFORMATION.

RIDERSHIP FORECAST

Introduction

The purpose of ridership forecasting is to estimate for a future year the number of trips per day that would use a particular mode of transportation. In this case, the ridership forecast is intended to estimate the number of daily trips in the year 2020 that would use a Southwest rail transit line.

Many cities with recently opened light rail transit lines found that they underestimated their ridership because they did not account for special event ridership (i.e. sporting events, state fairs, conventions) and for a rail preference factor. Part of the reason these systems did not account for these factors in their ridership forecast is because the Federal Transit Administration (FTA) does not allow cities to count special event ridership and also does not allow cities without an operational light rail transit line to factor in a rail preference. The "rail attractiveness" factor is defined as those riders who are specifically attracted by the rail element of the system (i.e., the higher level of amenities, the level of certainty/permanence, the service frequency, etc.). The FTA is now working to develop a methodology to account for rail attractiveness and will likely allow its use in the future.

Methodology

The Twin Cities regional model, which was developed and is maintained by the Metropolitan Council, was used to generate a ridership forecast for the Southwest rail transit line options. The Twin Cities regional model is a traditional four-step model that includes a series of mathematical equations that simulate human travel behavior.

The Twin Cities regional model contains the following four-steps:

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 study 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.

APPENDIX E: RIDERSHIP FORECAST

Key Model Assumptions

Socioeconomic Data

The Metropolitan Council's forecast for year 2020 population, households, and employment was used.

Transportation System Improvements

The transportation (roadway and transit) system is assumed to include all improvements contained in the Metropolitan Council's Transportation Policy Plan (TPP) for year 2020. For the roadway system this includes improvements to I-494, TH 100, TH 169, TH 212, and TH 62. For the transit system, this includes both the Hiawatha and the proposed Central LRT lines.

Service Plan

The following assumptions were made for a Southwest rail transit line:

Hours of Service - The hours of service are assumed to be the same as for the Hiawatha LRT line, which is planned to operate from 4:30 AM to 12:30 AM.

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

Peak Period	6:30 AM - 9:00 AM 3:30 PM - 6:00 PM	7.5 minutes
Base Period	6:00 AM - 6:30 AM 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

Park/Ride Lots - Park and ride lots are assumed to exist at all stations outside the city of Minneapolis. The city of Minneapolis currently has a policy that does not allow for park and ride lots within the city limits therefore stations within the city of Minneapolis will not include park/ride spaces, but will include space for feeder bus service.

Feeder Bus Routes - All rail stations will be served by feeder buses that will circulate throughout the study area cities to provide access to/from the rail stations. Transfers between the feeder buses and the rail line are assumed to be free.

Fares - The transit fare for LRT or DMU service is assumed to be the same as for the regular route bus service, which is currently $1.50 during the peak periods and $1.25 during the off-peak periods. Transfers between the buses and the rail line are assumed to be free.

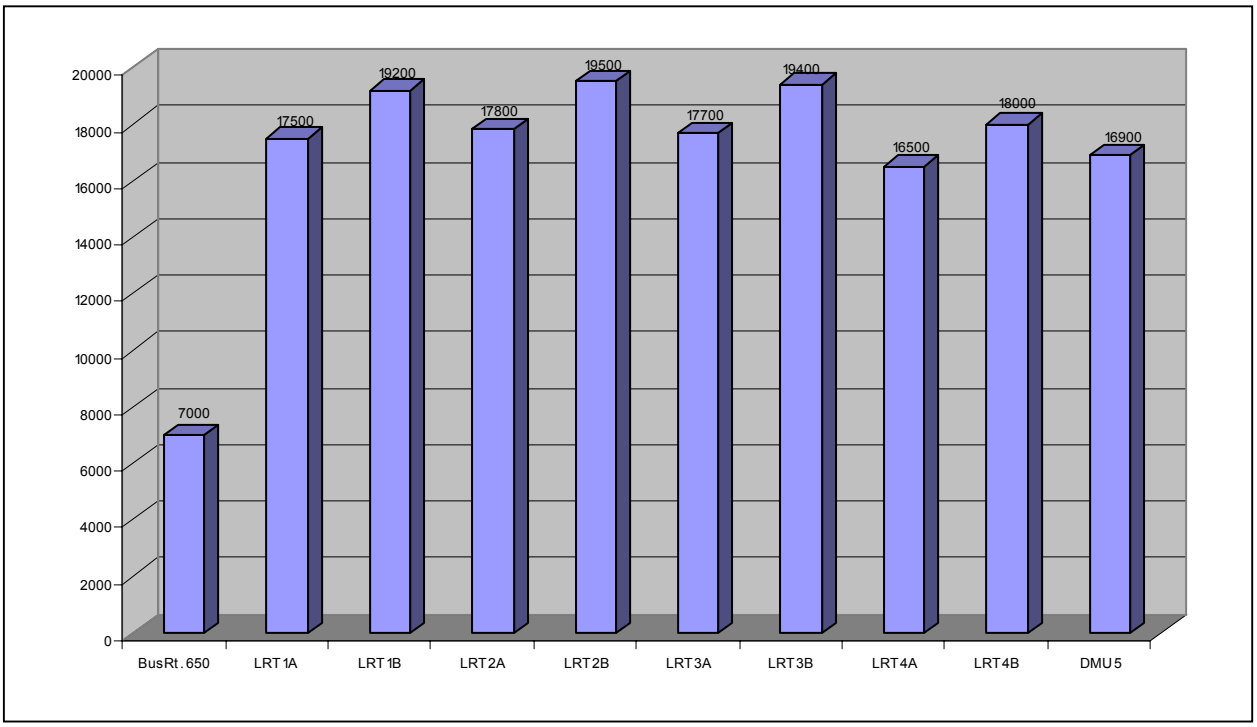
Southwest Metro Express Bus Service - For purposes of this analysis, the Southwest Metro Express Bus service to downtown Minneapolis is assumed to remain in operation. It is also assumed that some Metro Transit Express Bus service from the study area cities to downtown Minneapolis via I-394's High Occupancy Vehicle (HOV) lane will also remain in operation.

Hiawatha/Central LRT Connection - The LRT options for a Southwest rail transit line are assumed to be "interlined" (i.e., to operate on the same tracks and as part of the Hiawatha and Central LRT lines through downtown Minneapolis, the UMN, the MSP, the MOA, and downtown St. Paul). The DMU options for a Southwest rail transit line are assumed to terminate at the proposed Multi-modal Station at North 5th Street and North 3rd Avenue. This would require passengers destined for downtown Minneapolis and beyond to either walk or transfer to the Hiawatha LRT line or a bus.

APPENDIX E: RIDERSHIP FORECAST

Summary

A Southwest light rail transit line (LRT) from Eden Prairie to downtown Minneapolis is projected to carry from 17, 450 to 20,975 passengers per day, a Southwest light rail line (LRT) from Hopkins to downtown Minneapolis is projected to carry 16,500 passengers per day, and a Southwest diesel multiple unit (DMU) line from Eden Prairie to downtown Minneapolis is projected to carry 16, 975 passengers per day.



CAPITAL COST ESTIMATE

INTRODUCTION

There are two types of costs involved in building a new rail line: capital costs and operating/maintenance costs. Capital costs are the one-time expenditures to build the system and typically include tracks, stations, structures, signals, barriers, the maintenance facility, vehicles, fare collection system, and environmental mitigation. Operating/maintenance costs are the annual costs associated with operation of the system and typically include labor, administration, vehicle maintenance, fuel, and insurance.

At this early study stage, the cost estimates are developed on a per unit basis. Assuming analysis of rail transit continues into future study phases the cost estimates contained here will be refined through more detailed engineering.

It should also be noted that the cost estimates contained in this study are intentionally conservative. The estimates are conservative because they contain generous contingencies and do not factor in the economies of scale that are generally realized by the second and third rail lines.

Capital Costs

As stated previously, capital costs are the one-time expenses to construct the rail transit system. For purposes of this study, the order-of-magnitude capital costs were estimated in year 2003, current year, dollars and then escalated to year 2010, the anticipated year of construction. An escalation rate of 2.7 percent per year was used, which is consistent with the escalation rate used in *Central Corridor 2002 Draft Environmental Impact Statement (DEIS).*

Elements and Unit Costs

Table A presents the unit costs used in developing the capital cost estimates. Data sources for the unit costs included: the *Central Corridor Draft Environmental Impact Statement (DEIS), April 2002*, the *Hiawatha Corridor Light Rail Transit Capital Cost Estimate Report, November 1999*, the *29th Street and Southwest Corridors Busway Feasibility Study, February 2000*, data from the Colorado Rail Car Company, and data from both the Minnesota Department of Transportation (Mn/DOT) and Metro Transit.

The following elements were included in the capital cost estimate:

Guideway

This element includes the tracks and site preparation required to operate the system. For purpose of this study the following four categories were developed for the guideway: (1) at-grade ballasted track which is generally used in areas such as former rail beds, (2) paved track which is generally used at intersections with roadways or on streets such as Lyndale Avenue, (3) tunneled track which is used in tunnels, and (4) elevated direct fixation track which is generally used in grade-separated areas.

For purposes of the capital cost estimate, it is assumed that LRT service requires two new tracks and that DMU service requires the upgrading of the existing freight rail track and the construction of a second track. These assumptions are conservative because it may be possible to single-track the LRT service through narrow areas and it may also be possible to use sidings and passing tracks rather than a second track for the DMU service.

Streetwork

This element refers to modifications to existing roadways, and construction of new roadways intersecting the guideway and serving transit stations. This component includes roadway, intersection and traffic signal work.

Structures

This element refers to modifications to existing or construction of new roadway bridges.

Utility Relocation Allowance

APPENDIX F: CAPITAL COST ESTIMATE

This element includes an allowance for relocation of existing public utilities. For this cost estimate the utility relocations were classified as light, medium, or heavy. A light allowance was applied to areas where utilities are known to exist, for example a railroad corridor. A medium allowance was applied to suburban roadways and freeway corridors. A heavy allowance was applied to urban roadways such as Lyndale Avenue, where it is likely to require more extensive work to relocate. Utility allowances were applied based upon field surveys, plans provided by HCRRA staff, and input from the Southwest Technical Advisory Committee (TAC).

Stations
This element includes the costs of transit stations (i.e., site work, access facilities- handicap ramps, platforms, ticket vending machines, information boards, benches, lighting, shelters and minor facilities for feeder bus access).

Parking
This element includes the costs associated with providing park-and-ride facilities at stations.

Trail Reconstruction
This element includes the cost to reconstruct trails that would coexist with the transit line.

Maintenance Facility
This element includes the costs associated with a new operations and maintenance facility, which is assumed to be required for either LRT or DMU service. The location of a new operations and maintenance facility has not been determined.

Right-of-Way Allowance
This element includes the cost of right of way required at transit stations, park-and-ride facilities and specific areas such as freeway corridors (i.e. TH 169, TH 212 and I-494). This allowance does not apply to areas where HCRRA owns property.

Systems
This element includes the cost of providing signals, communications, and traction power.

Vehicles
This element includes the cost for an LRV and DMU vehicle including the cost of spare parts and the cost of modifying the DMU vehicles to include dual cabs and wheelchair lifts. This cost estimate also includes the required fleet size, which is based on route length (two vehicles per route mile). This is a conservative approach and yields a higher fleet size than the operational plan.

APPENDIX F: CAPITAL COST ESTIMATE

Table A: Unit Costs

Description	Unit[2]	Unit Cost (Year 2003 Dollars)[1] Bus	LRT	DMU	Notes
Guideway					
At-grade ballasted track	RF	-	$400	$400	Includes site preparation and trackwork.
Paved track	RF	-	$600	$600	LRT: For construction of two new tracks.
Tunneled track	RF	-	$12,000	$12,000	DMU: Upgrade of one existing track and construction
Elevated direct fixation track[3]	RF	-	$5,500	$6,000	of one new track.
Shoulder widening	LF	$20	-	-	
Ramp meter bypass	LS	$300,000	-	-	
Streetwork					
Minor intersection rebuild	EA	$250,000	$250,000	$250,000	Includes roadway, intersection and traffic signal
Major intersection rebuild	EA	$450,000	$450,000	$450,000	allowances.
2-lane reconstruction	LF	$350	$350	$350	
4-lane reconstruction	LF	$675	$675	$675	For 32-foot wide pavement, including curb and gutter. For 52-foot wide pavement, including curb and gutter.
Structures					
Roadway bridge reconstruction	SF	$85	$85	$85	For simple, precast bridge (e.g. over 29th Street).
Retaining wall (to 4ft/to20ft)	SF	$20/$35	-	-	Includes excavation, construction, & landscaping
Utility Relocation Allowances	RF	$100	$100	$100	Depending on corridor, for example: Railroad corridor
Light	RF	$350	$350	$350	Suburban roadway and freeway corridors.
Medium	RF	$600	$600	$600	Urban roadway corridor.
Heavy					
Stations					
At-grade station	EA	$250,000	$1,000,000	$1,000,000	For rail includes site work/access facilities, canopy,
Elevated station	EA	-	$4,000,000	$4,000,000	sidewalk, lighting, drainage. For rail more bus
Bus berthing	LS	$125,000	$500,000	$500,000	berthing space is required.
Parking					
Surface	STALL	$3,000	$3,000	$3,000	No park-and-ride facilities at stations in Minneapolis.
Structure	STALL	$13,000	$13,000	$13,000	
Trail Reconstruction					For 12-foot wide trail with 2 feet of clear zone on
Asphalt[4]	LF		$50	$50	either side, including earthwork and grading.
Trail bridge	SF		$60	$60	Wooden trail bridge
Maintenance Facility	EA		$40,000,000	$38,000,000	Includes midday storage and maintenance/operations facility.
Right-of-Way Allowance[5]	EA		$1,000,000	$1,000,000	For all stations expect areas owned by HCRRA.
Systems					
Signals	RF		$300	$300	
Communications	RF		$140	$140	
Traction Power	RM		$2,000,000	-	Applies only to LRT.
Vehicles[6]					LRT and DMU spare parts included. DMU assumes all
Rail	EA	-	$3,200,000	$3,800,000	power cars with dual cabs and wheelchair lifts.
Bus - standard	EA	$325,000	-	-	
Bus - articulated	EA	$500,000	-	-	
Engineering & Administration					
Infrastructure		30%	30%	30%	
Right-of-way		-	30%	30%	
Vehicle		5%	5%	5%	
Contingency					
Infrastructure		30%	30%	30%	
Right-of-way		-	100%	100%	
Vehicle		5%	5%	10%	

[1] References: Hiawatha LRT, Phase 2 RFP, Part 5 - Design Criteria/Performance Specifications, 7 April 2000; Central Corridor Draft Environmental Impact Statement, Order-of-Magnitude Cost Estimate, April 2002; and Colorado Railcar specifications as of September 2002. Year 2003 capital cost will be escalated to Year 2010 using a 2.7 percent escalation rate. This rate is consistent with the 2002 Central Corridor DEIS.

[2] RF = Route Foot (double track foot) LF = Linear Foot RM = Route Mile EA = Each SF = Square Foot LS = Lump Sum

[3] DMU elevated direct fixation track costs more than LRT because the vehicle weights more than an LRV and requires greater structural support.

[4] Existing crushed limestone trail west of TH 169 to be reconstructed with asphalt.

[5] Includes area for station platforms and park-and-ride facility.

[6] Vehicles base price is $2.5 million for LRV (based on Hiawatha Corridor project for Bombardier vehicle) and $2.9 million is the projected cost for Colorado Railcar's Aero DMU powered car. For this study, DMU trains are assumed to consist of all-powered cars. The number of vehicles is based on two (2) vehicles per route mile.

APPENDIX F: CAPITAL COST ESTIMATE

Table B: Capital Cost Estimates (Year 2003 and Year 2010)

Alignment	Year 2003		Year 2010	
	Total	Per Mile	Total	Per Mile
LRT 1A	$ 503.0	$ 36.5	$ 606.1	$ 44.0
LRT 1B	$ 614.8	$ 42.0	$ 740.9	$ 50.6
LRT 2A	$ 582.0	$ 41.8	$ 701.4	$ 50.4
LRT 2B	$ 691.4	$ 46.8	$ 833.1	$ 56.4
LRT 3A	$ 663.4	$ 47.0	$ 799.4	$ 56.7
LRT 3B	$ 769.1	$ 51.4	$ 926.8	$ 62.0
LRT 4A	$ 358.0	$ 46.1	$ 431.3	$ 55.6
LRT 4B	$ 468.7	$ 54.5	$ 564.8	$ 65.7
DMU 5	$ 425.5	$ 29.1	$ 512.7	$ 35.0
Bus Baseline	$ 72.2	$ 4.0	$ 87.3	$ 4.9

Notes

Year 2010 cost estimate derived by escalating year 2003 costs by 2.7 percent per year, which is consistent with the 2002 Central Corridor DEIS. Cost for LRT 3A and 3B includes an option spur to 8th Avenue in downtown Hopkins ($45.2 million in year 2003 dollars).

OPERATING AND MAINTENANCE COSTS

Introduction

Annual operating and maintenance costs include the ongoing costs to operate and maintain the transit system. These costs typically include administration, labor (operations and maintenance), vehicle maintenance, fuel, and insurance. For purposes of this study, the annual operating and maintenance costs were estimated in year 2003, current year, dollars and then escalated to year 2010, the anticipated year of expenditure. An escalation rate of 4.0 percent per year was used, which is consistent with the escalation rate used in *Central Corridor 2002 Draft Environmental Impact Statement (DEIS).*

The total estimated annual operating and maintenance cost is the sum of the feeder bus costs, rail costs and, in the case of DMU the lease payment to the private railroad companies.

Feeder Bus

The operating and maintenance cost estimate for the feeder bus system is a calculation of the estimated change in platform hours (i.e., revenue hours, deadhead hours, and vehicle preparation hours) over the existing service provided by the existing bus system. A unit cost of $89.96 (year 2003) per platform hour is the regional standard for estimating the cost per platform hour. This $89.96 figure includes the cost of labor, materials, fuel, utilities, insurance, taxes and benefits.

Light Rail Transit

The model used to estimate LRT operating and maintenance costs for the Southwest rail transit line was originally developed for the Hiawatha LRT line. It is based on actual financial and operating data for the following eight LRT systems: Baltimore, Dallas, Denver, Portland, Sacramento, San Jose, San Diego, and St. Louis.

The model includes the following categories:

Rail Transportation – This applies to operations personnel such as the director, assistant manager, clerk, train operators, fare inspector, police officers, materials and supplies, and propulsion power.

Rail Vehicle Maintenance – This applies to vehicle maintenance personnel such as the director, clerks, mechanics, materials and supplies, and fuel and lubrication.

Rail Facilities Maintenance – This applies to facility maintenance personnel such as the director, manager, technicians as well as the costs for maintenance of the tracks, power, signals, station platforms and yards and shop.

Rail Administration and Support – This applies to administrative personnel such as the assistant general manager of rail operations, director of bus/rail safety, budget analysts, engineers, marketing, customer service, taxes, insurance and utilities.

In addition, the model also factors in the operating characteristics (i.e., the number of vehicles, the service frequency, the system miles, the number of maintenance facilities and stations) to calculate the annual operating and maintenance costs.

To reflect potential LRT costs in this region, the model uses Metro Transit's current annual average earnings for comparable job positions and fringe benefit rates. The model also reflects Metro Transit's allocation of labor overhead, as reported in the National Transit Database. The

overhead allocation is intended to represent functions not directly associated with operations, such as marketing and customer service.

Diesel Multiple Unit

Since the Colorado Rail Car Company's Aero DMU vehicle is not currently in operation there is no system data upon which to base an annual operating and maintenance cost estimate. To develop an operations and maintenance cost estimate, the LRT model was modified slightly for application to the Diesel Multiple Unit system.

Information provided by DMU manufacturers and from European experience indicates that DMU costs are likely to differ from LRT costs in the following areas:

Vehicle Maintenance – Operating and maintenance costs for DMUs are similar to LRV costs for items such as axles, wheels, body and paint. However, the cost to maintain the power train is comparable to a transit bus. Each powered DMU typically contains two diesel engines, each with the power output (horsepower) similar to a diesel engine of one standard transit coach. This results in the need for a greater number of diesel engine mechanics than the number of electro mechanics required for LRT. The cost to maintain power-related elements of DMUs will also be higher. Based on prior research conducted for Denver's Regional Transit District, vehicle maintenance labor and material costs for two diesel engines[1] are expected to be approximately 20 percent higher than comparable LRT costs, on a vehicle-mile basis.

Facility Maintenance – Costs for overhead catenary maintenance are not required by DMUs. The cost of labor, materials and contracted services for the catenary expense category in the LRT cost model have been removed from the DMU cost model.

Fuel – Another major area of difference is fuel cost. The Colorado Rail Car Company provided an average fuel consumption rate of 1.2 miles per gallon per car for their Aero DMU vehicle. This information is used in the DMU cost model.

Track Maintenance – Track maintenance costs have been assumed to be 20 percent higher than those identified in the LRT cost model. This is based on the assumption that shared use with freight trains will result in higher maintenance costs.

Annual Lease Payment

In addition to the annual operating and maintenance costs, the DMU option also requires an annual lease payment to the private freight rail companies for use of their tracks.

Typically, the transit agency would purchase rights to operate passenger rail transit service on the private railroads tracks. In return, the private rail companies generally require capital improvements to the existing rail tracks and a long-term lease agreement that includes payment for access fees, real estate taxes, track retention, special or extra train service fees, incentives (e.g. to maintain passenger rail service reliability/on-time performance) and contingencies.

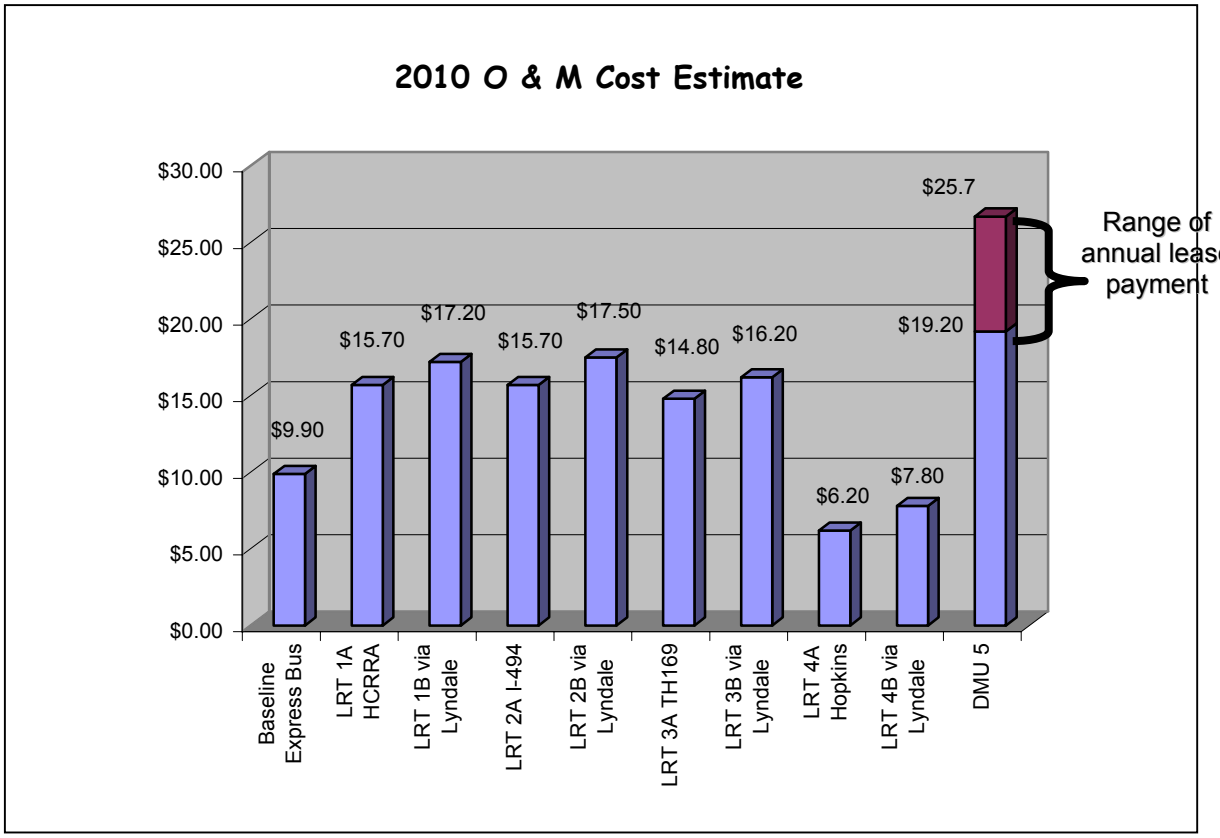
For purposes of this study, the following two methods of estimating the annual lease agreement costs were used:

Method 1: Payments to railroads based on cost per Directional Route Mile (DRM = the number of route miles of revenue track, excluding yard and tail track). One route-mile of double track equals two directional route-miles.

[1] Each Colorado Railcar DMU powered car includes two Detroit Diesel Series 60 engines.

Method 2: Payments to railroads based on Daily Hours of Track Use. This method is based on what portion of the service day the agency intends to utilize the track, and what portion of the day remains for the railroad to utilize the track. These costs can be low or high depending on how active existing freight service is on the host railroad.

Historically, existing railroads have been used (track lease agreement) to operate commuter rail type service versus a more frequent passenger rail service, like LRT or DMU. Because commuter rail service typically operates less frequently (peak hours only or very limited midday service), railroads have been willing to sell or lease use (time) of their tracks, provided they can still maintain their existing and planned use of the railroad line.



PEER CITY COMPARISON

Introduction

This chapter presents a comparison of the performance of a Southwest Rail Transitway to light rail transit (LRT) lines in peer cities across the country. The Southwest Policy Advisory Committee (PAC) requested that this information be prepared for their use in determining the future of rail transit in the Southwest Metro Area.

Peer City Comparison

The performance of the proposed Southwest Rail Transitway was compared to that of operating light rail lines in the following cities: Baltimore, Boston (Green Line), Buffalo, Cleveland (Shaker Line), Dallas, Denver, Los Angeles (Blue Line), Memphis, Portland, Sacramento, Saint Louis, Salt Lake City, San Diego, San Francisco MUNI. Peer cities for the Minneapolis/St. Paul area exhibit similar characteristics in regard to transit fleet size, population, and urbanization pattern.

Table A
Peer Cities – Light Rail

Newer Systems	Year	Older Systems	Year
Baltimore	1992	Boston – Green	1897
Buffalo	1992	Cleveland – Shaker	1927
Dallas	1996	San Francisco MUNI	1912/1980[b]
Denver	1994		
Los Angeles – Blue	1991		
Memphis[a]	1993		
Portland	1986		
Sacramento	1987		
Saint Louis	1993		
Salt Lake	1999		
San Diego	1981		

[a] *Downtown trolley*

[b] *Restructured to downtown subway*

Light rail currently operates in all peer cities, except Memphis, which is a trolley line. The majority of light rail lines operate along exclusive right-of-way, at-grade or grade separated. Other than Boston and certain routes in San Francisco, few lines operate within mixed-flow traffic. Light rail is primarily grade separated in Buffalo and Los Angeles; significant sections of grade-separated right-of-way can be noted for Boston, San Diego, and San Francisco. While light rail has operated for many years in Boston, Cleveland, and San Francisco, light rail in other peer cities has opened within the last 25 years.

APPENDIX H: PEER CITY COMPARISON

Performance Measures

Transit systems across the country report their performance on an annual basis to the Federal Transit Administration (FTA). The FTA then compiles this information into the National Transit Database. The National Transit Database information for year 2001 was used to prepare this peer city comparison. Performance measures were calculated to reflect service effectiveness, cost effectiveness and service efficiency. For the proposed Southwest Rail Transitway, alternatives LRT 1A and LRT 3B were used for this comparison to show the range of performance.

It should be noted that the performance for the Southwest Rail Transitway is likely to improve as the operating plan and related costs are refined to maximize system performance. The service plan and related operating and maintenance costs used to calculate the performance for the Southwest Rail Transitway have not been evaluated to identify areas where cost savings may be realized. This is typically done as the next step in the transitway development process.

Service Effectiveness
- Passenger Trips/Vehicle Revenue Hour

Cost-Effectiveness
- Operating Cost/Passenger Mile
- Operating Cost/Passenger Trip

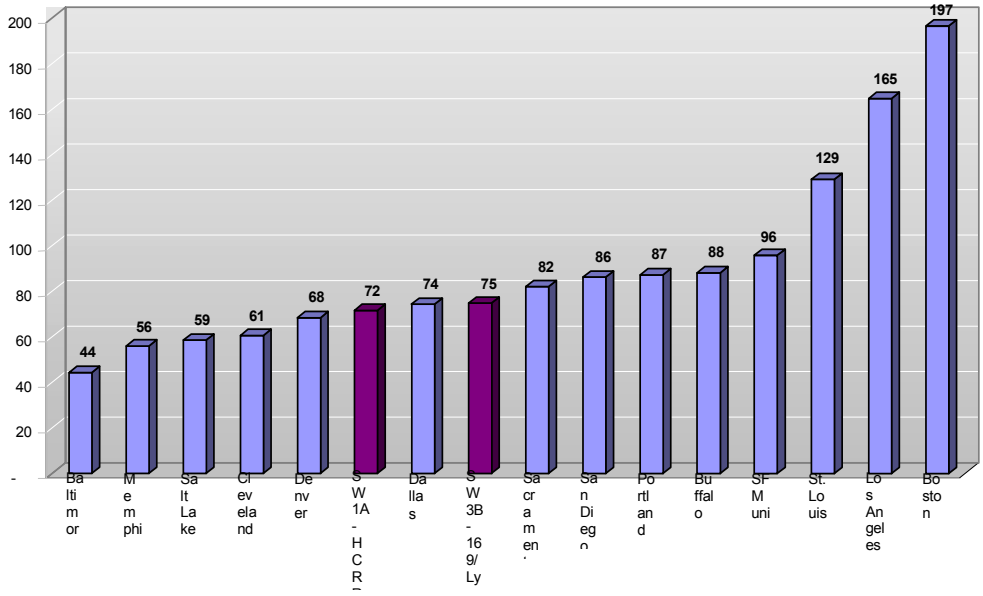
Service Efficiency
- Operating Cost/Vehicle Revenue Hour
- Operating Cost/Vehicle Revenue Mile

Figures A through E display performance data for Southwest Corridor Alternatives 1A and 3B as well as for peer cities. In general, values noted for the Southwest Corridor alternatives are in the mid-range of those noted for peer cities.

Service Effectiveness

Passenger Trips/Vehicle Revenue Hour. This measure reflects effectiveness in moving passengers within a corridor. Figure A indicates that the number of passenger trips/vehicle revenue hour for a Southwest Rail Transitway lies in the mid-range of peer cities and similar to those for Denver and Dallas.

Figure A Passenger Trips per Revenue Vehicle Hour

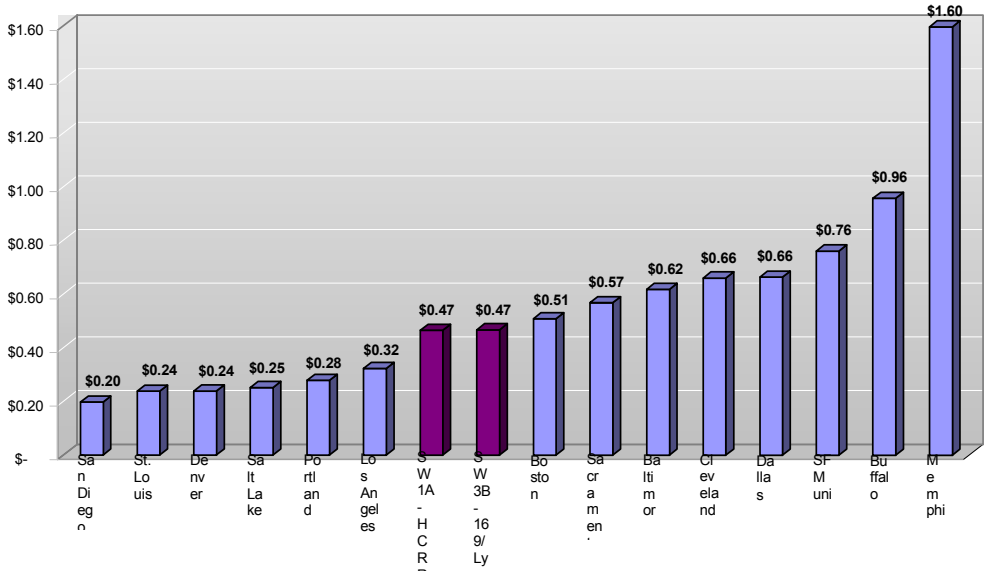


APPENDIX H: PEER CITY COMPARISON

Cost-Effectiveness

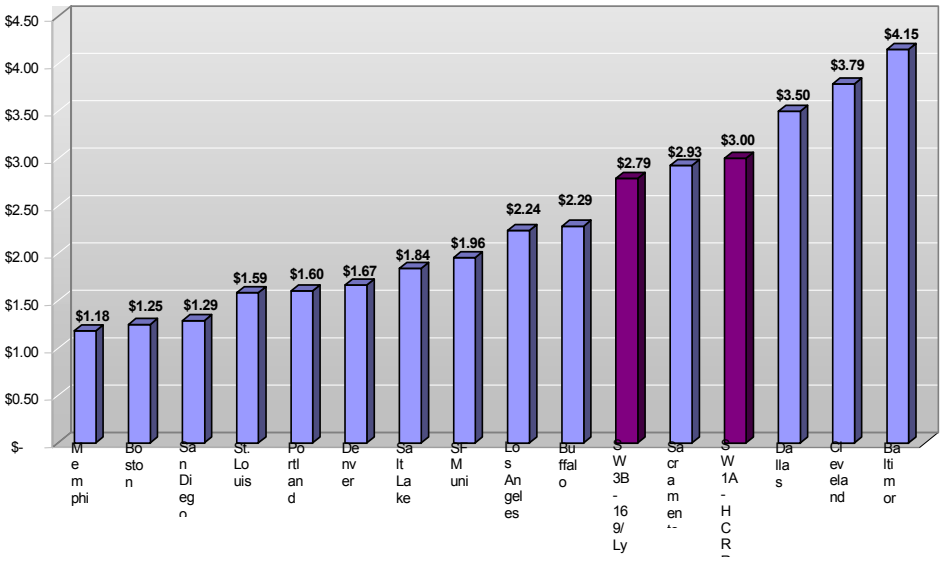
Operating Cost per Passenger Mile. This measure reflects the cost and average distance traveled by each boarding passenger. Figure B indicates that the operating cost per passenger mile for a Southwest Rail Transitway is in the mid-range of the peer cities.

Figure B Operating Cost per Passenger Mile
[$2002/3]



Operating Cost per Passenger Trip. This measure reflects operating cost for each passenger trip. Recurring annual costs for administration, vehicle and maintenance labor are included, but the amortized capital costs are not. Figure C indicates that a Southwest Rail Transitway is slightly higher than the mid-range for operating costs per passenger trip. While this is true if the subsidy per trip is calculated by deducting the average fare ($1.25) from the operating cost per passenger trip of $2.79 to $3.00, the subsidy per passenger trip for a Southwest Rail Transitway is between $1.75 and $1.54, which is lower than the average for this region of $1.88 for Metro Transit.

Figure C Operating Cost per Passenger Trip
[$2002/3]

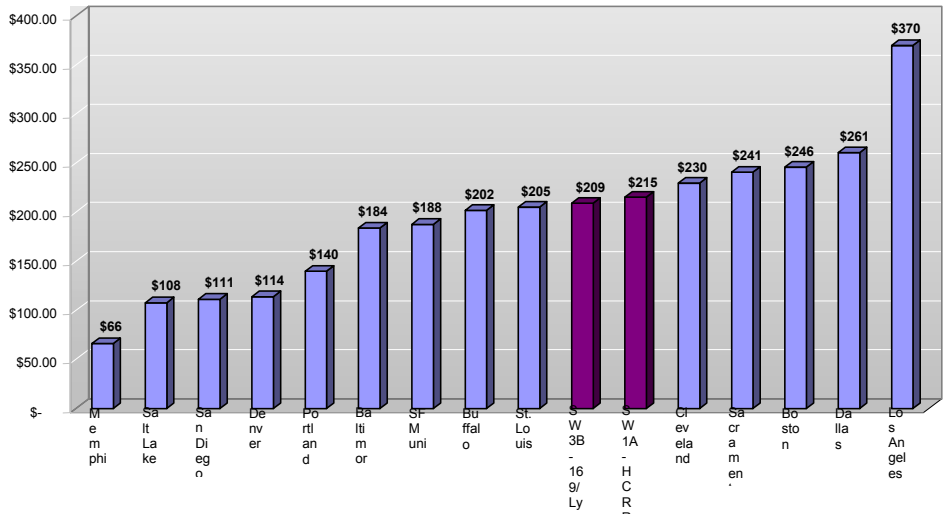


APPENDIX H: PEER CITY COMPARISON

Service Efficiency

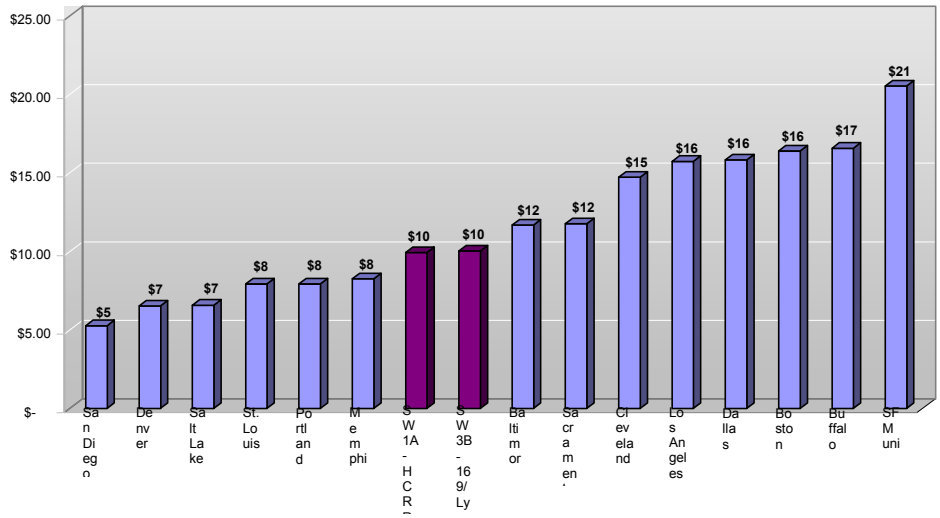
Operating Cost per Revenue Vehicle-Hour. This measure reflects the cost of operating rail vehicles in the corridor. This measure takes into account the number of cars per train in order to reflect the total vehicles in service. Figure D indicates that a Southwest Rail Transitway lies in the mid-range of the peer cities.

Figure D Operating Cost per Revenue Vehicle Hour
[$2002/3]



Operating Cost per Revenue Vehicle-Mile. This measure reflects operating cost for all rail vehicles operated in service, considering multi-car trains. The number of revenue vehicle, or car, miles will be higher for systems that operate a significant share of multi-car trains. Figure E indicates that a Southwest Rail Transitway's operating cost per revenue vehicle mile lies within the mid-range of the peer cities.

Figure E Operating Cost per Revenue Vehicle Mile
[$2002/3]



RAILS-AND-TRAILS RESEARCH

The Rails-to-Trails Conservancy recently reported that there are over 60 cases of trails coexisting with rail operations in 30 states nationwide. These "rails-with-trails", defined as bicycle/pedestrian paths located directly adjacent to active railroad corridors, vary in characteristics from a few slow-moving short-haul freight trains weekly to high-frequency Amtrak trains traveling as fast as 150 miles per hour.

In the Southwest Study area there are three rails-with -trails segments. These include the Cedar Lakes Trail in Minneapolis that is adjacent to the BNSF freight rail line, the Kenilworth Trail in Minneapolis that is adjacent to the CP freight rail line, and the Southwest Trail in St. Louis Park and Hopkins that is adjacent to the CP freight rail line.

RAILS-TO-TRAILS CONSERVANCY SURVEY RESULTS

The Rails-to-Trails Conservancy is a nonprofit organization with more than 100,000 members whose purpose is create a nationwide network of public trails from former rail lines and connecting corridors. In 1999, the Rails-to-Trails Conservancy compiled information regarding the design, management and operating characteristics of 61 rails-with-trails corridors. The following section summarizes the results of this survey.

Overall Statistics

- From 1996 to 2000, the number of rails-with-trails increased from 37 to 61. The resulting mileage increase was from 151 miles in 1996 to 239 miles in 2000.
- Of all rails-with-trails nearly 40% pass through suburban areas, over 60 percent pass through residential areas, and nearly 10 percent passed through nature preserves.
- Typically, trails adjacent to rail lines are 10 feet wide with the average distance between the active rail track and the trail (as measured from the centerline to the nearest edge of the trail) of 33 feet.
- In approximately 71% of rails-with-trails a barrier separates the tracks and trails. Barriers most often used include vegetation, grade separation, a chain link fence and a ditch.

Rail Operation

- Rail operations adjacent to trails included freight rail service as well as transit (light rail, trolley, heavy rail)
- The number of freight trains operating within the rails-with-trails ranged from one to 9 trains per hour.
- The range of train speeds ranged from five to 150 miles per hour with the average speed of 32 miles per hour.

APPENDIX I: RAILS AND TRAILS

Trail Use

- The average number of trail users in 2000 was 240,409— ranging from 16,000-1.5 million users per year.
- One accident occurred as a direct result of a trail being adjacent to a rail line. This accident occurred at an at-grade crossing on the Illinois Prairie Path when a bicyclist ignored warning bells and flashing red lights and rode around a lowered crossing gate and was injured in a collision with a train.

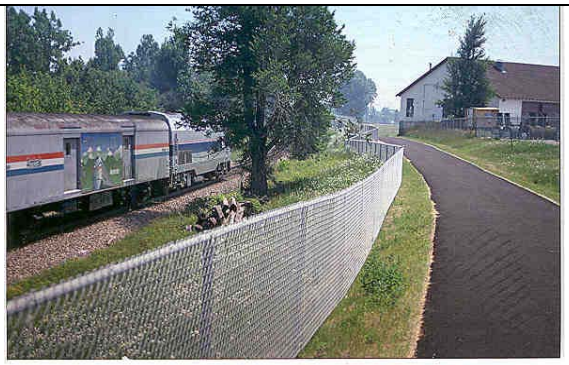
LOCAL EXAMPLES

There are three examples of Rails-with-Trails corridors in Hennepin County. The Cedar Lakes Trails is located in Minneapolis, the Kenilworth Trail is also located in Minneapolis, and the Southwest Trail where rails coexist with trails occurs in the cities of St. Louis Park and Hopkins. All three of these Rails-with-Trails corridors have active freight rail service adjacent to the biking/pedestrian trail.

APPENDIX I: RAILS AND TRAILS

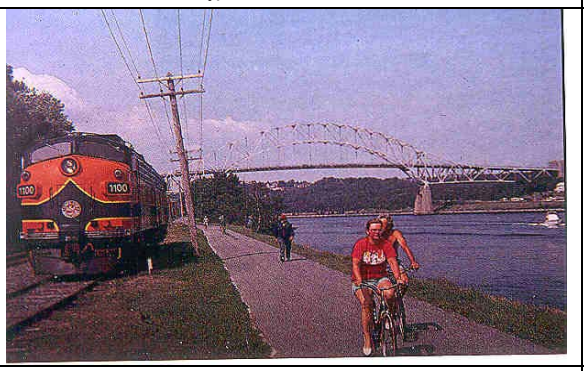
Photos of Rails-and-Trails

Kenilworth Trail, Minneapolis



Amtrak in Platt

Baltimore, Maryland

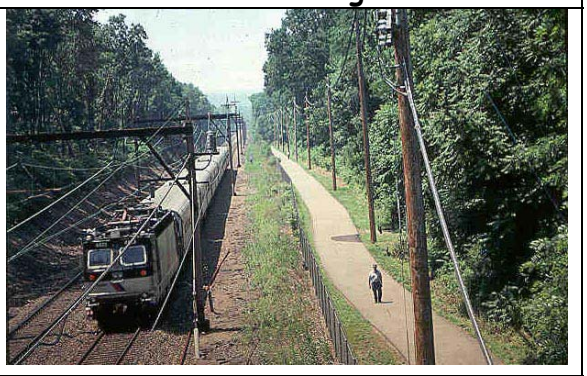


Cape Cod, Rhode Island

Newport, RI

Strasbourg

Kenilworth Trail, Minneapolis



Traction Line

APPENDIX I: RAILS AND TRAILS