Highway Transitway Corridor Study

Technical Memorandum 3: Corridor Concepts and Evaluation

Prepared for: Metropolitan Council

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Introduction

The purpose of the Highway Transitway Corridor Study (HTCS) is to examine the potential for highway bus rapid transit (BRT) implementation along eight Twin Cities highway corridors. Figure 1 shows the eight corridors that are under analysis. They include:

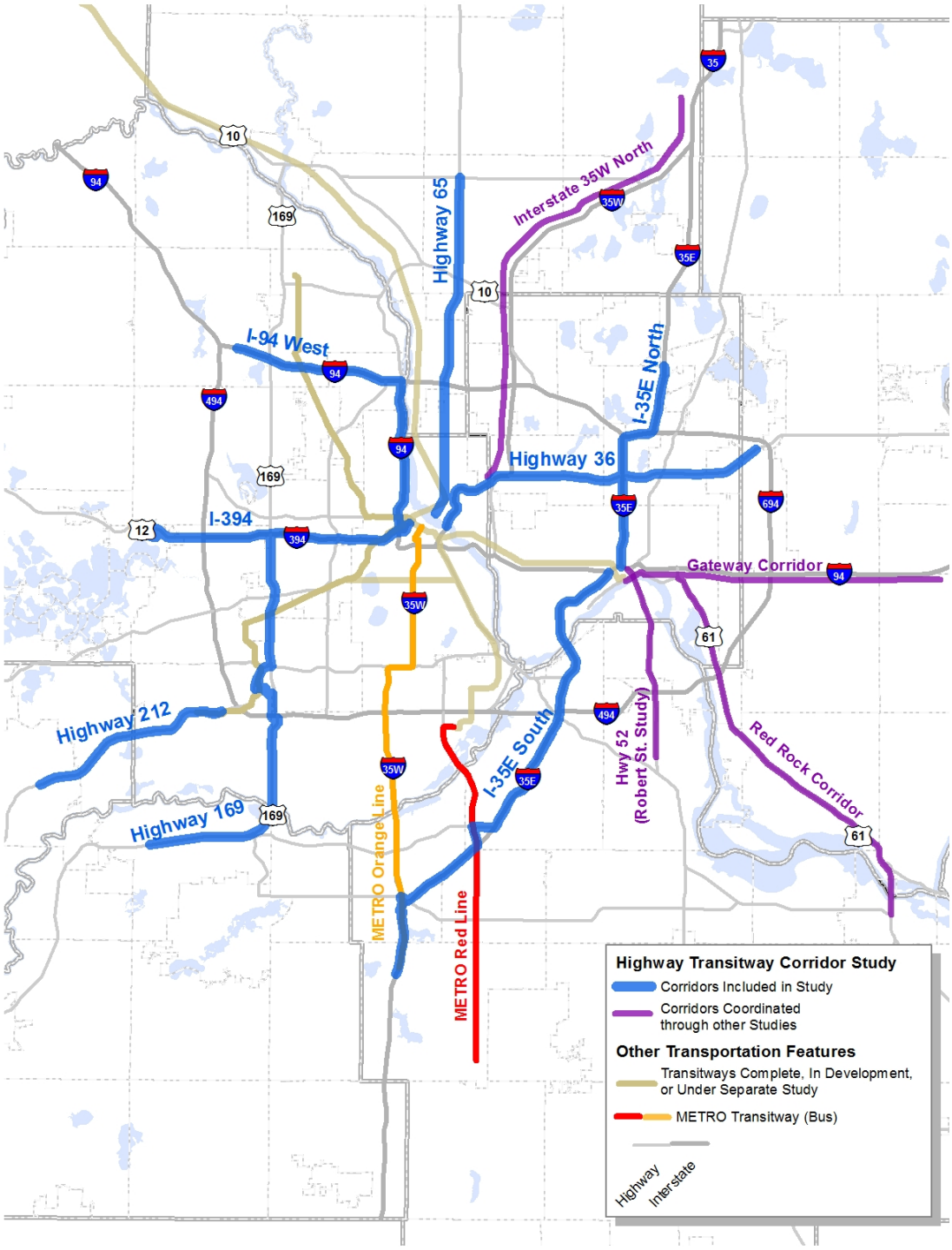
- I-94
- Trunk Highway (TH) 65
- I-35E North
- TH 36
- I-35E South
- TH 169
- TH 212
- I-394

This memorandum documents the following areas of analysis:

- Concept development
- Operating plans
- Capital costs
- Operating and maintenance costs
- Ridership forecasts

The report first discusses the parameters and assumptions for each area of analysis. Then a summary of each corridor is presented. Following the corridor summary is a section that summarizes the evaluation factors and results for the eight corridors studied. The final section of the report presents the results of ridership sensitivity tests that were completed on the corridors.

Figure 1: HTCS Study Corridors



Concept Development

This section details the HTCS concept development assumptions. Corridor concepts are presented in the following five categories:

- Runningways
- Stations
- Fare Collection
- Signals
- Vehicles

These assumptions are consistent across all eight corridors.

Runningways

This study assumes that Highway BRT vehicles would travel in mixed traffic on the highways. Buses would travel in the outside lanes to provide smooth transitions to and from station locations. For highways that currently have bus-only shoulders[1], BRT buses would use these shoulders during congested times of day under MnDOT, Metro Transit, and suburban transit provider operational requirements. The operational requirements are as follows:

- Buses may only use bus-only shoulders when mainline speeds are 35 miles per hour or less
- Buses may only exceed the speed of mainline traffic by 15 miles per hour
- The maximum allowable travel speed on the bus-only shoulder is 35 miles per hour
- Buses traveling on the shoulder must yield to vehicles entering the shoulder as well as any vehicles merging or exiting at an interchange ramp or intersection

The study assumed BRT vehicles would not use managed lanes. Existing and planned managed lanes in the Twin Cities region run adjacent to the center median, farthest from entering and exiting traffic. The study assumed BRT vehicles would not use these lanes because the majority of stations identified for the corridors are assumed to be inline (station definitions can be found in the Station Types section), requiring BRT vehicles to exit the mainline highway to access them. This would make using the managed lanes difficult, especially during congested times, due to having to merge across all lanes of the highway to access a station. The existing or planned managed lanes would still allow for a substantial transit advantage for express buses in the corridors. The study is also not intended to preclude the use of managed lanes or online stations for any corridor if demand is warranted and conditions allow for it. However, the transit operations of managed lanes and online stations would require consecutive stations in the corridor to operate in the same way or allow for substantial distance and time to cross lanes of mixed traffic (generally about 2 miles or more). The operating characteristics of shoulder operations and managed lane operations were assumed to be very similar at this level of study and additional study would be required for corridors where

[1] As part of Technical Memorandum 1: Existing Conditions, an inventory of existing bus-only shoulders was completed. A thorough analysis identifying gaps in the continuity of bus-only shoulders was not completed as part of this study.

managed lane operation may be a possibility. The assumption of shoulder operations for this study allowed for a relatively consistent analysis across all corridors.

Stations

Station Types

BRT station types operating in a highway include online, inline, and offline stations as shown in Figure 2 through Figure 4. The differences between these types of stations are:

- **Online stations** are located within the highway runningway and BRT vehicles can access a station without leaving the runningway. In most cases, the station is located in the median of the highway; however, it can also be located on the side of the highway in unique circumstances.
- **Inline stations** are located adjacent to the runningway and usually require BRT vehicles to exit the runningway to access a station. Few or no turns are required for inline stations as they are typically located on the access ramps of the highway. Inline stations offer a significant time savings over offline stations but do not require the significant cost of online stations.
- **Offline stations** require BRT vehicles to leave the runningway to access a station. This is often to access a nearby park-and-ride facility that is not directly adjacent to the runningway or a transit center with many connecting transit routes.

Figure 2: Online Station, 46th Street Station on I-35W South in Minneapolis, MN

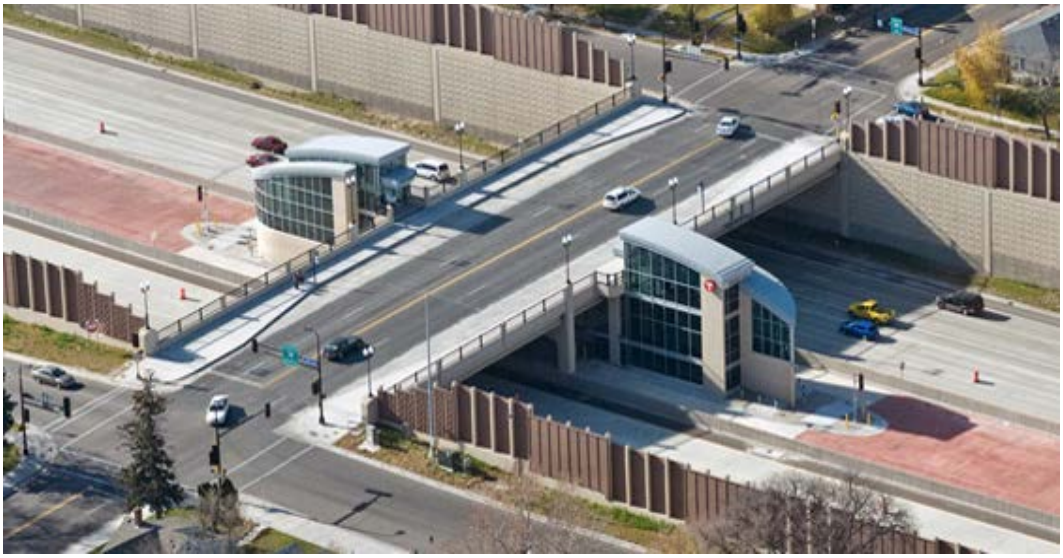


Figure 3: Inline Station, Bothell Everett Highway and I-405 in Bothell, Washington

Figure 4: Offline Station, I-394 & CR 73 Park-and-Ride in Minnetonka, MN

Station Platforms

The study assumes station platforms will be designed with 11-inch platforms to accommodate level-boarding, similar to existing METRO Red Line BRT platforms. In a level-boarding environment, station platforms are built up to the same level as the floor of a transit vehicle. Level boarding, when coupled with now standard low-floor buses, eliminates the need to step up onto the bus. An example of level boarding can be found at light rail stations in the Twin Cities. Level boarding enables faster boarding and alighting of all passengers, especially passengers with limited mobility.

Station Amenities

Highway BRT stations would have the premium amenities included at other transitway stations in the region. Station shelters are assumed to be structured buildings similar in concept to those developed as part of the METRO Red Line BRT project, but scaled slightly smaller. These shelters are anticipated to be enclosed and provide on-demand heating for waiting customers. It is assumed that all station shelters would be the same size.

Highway BRT stations would include off-board fare collection. Passengers would purchase a ticket at a ticket vending machine (TVM) on the station platform rather than pay a farebox on the bus. This allows passengers to board through any vehicle door and speeds up the boarding process. The study assumes one TVM at each Highway BRT station in each direction. Passengers with Go-To Cards could also pay using an on-board validator affixed inside each vehicle door.

Other station amenities include:

- Litter receptacles
- Static signage for stop/route/system and way-finding information
- Real-time vehicle arrival and departure information signage
- Security cameras
- Emergency telephones
- Station lighting
- Push-button radiant heating
- Bicycle racks

Signals

Specific transit signal priority (TSP) assumptions were not identified as part of concept development for this project. However the assumptions made for this study do not preclude the use of TSP in future phases. Transit signal priority would generally only be needed in at signalized intersections near inline or offline stations where the bus is traveling on local streets.

Vehicles

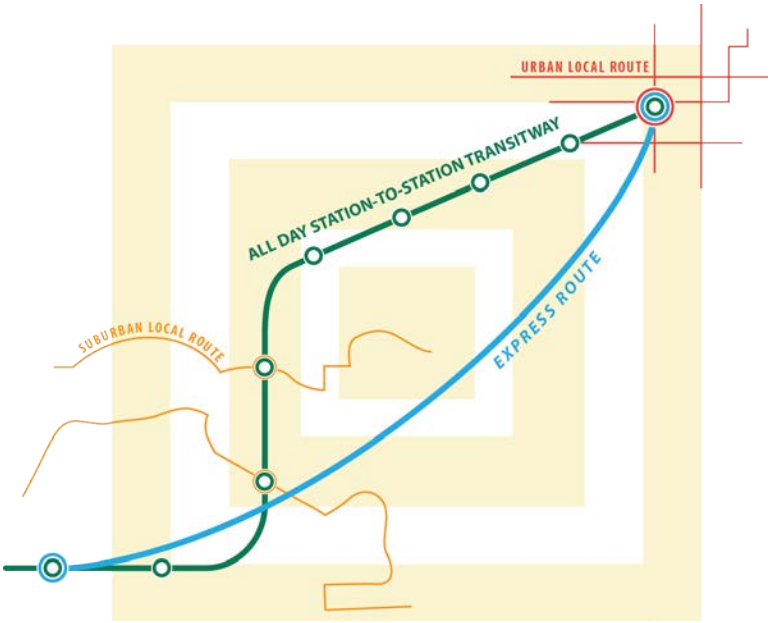
Highway BRT vehicles would have a unique look distinct from regular local and express service, similar to those used on the METRO Red Line, and would be designed to allow for faster boarding and alighting. The study assumes 40-foot premium vehicles with low-floors and two doors. An on-board Go-To Card validator would be provided at each vehicle door to allow passengers to board and alight through both doors at once. Future study phases may determine added features on these buses such as enhanced customer information or other features.

Operating Plans

Consistent assumptions were used in the development of transit operating plans for each potential highway transitway corridor in the study. In all corridors, a variety of transit service is needed to meet different needs. The different transit services in the corridors include:

- **Station-to-Station Service:** Provides frequent, all-day access to proposed Highway BRT station locations, generally spaced every 1-2 miles
- **Express Service:** Provides direct service, typically during peak hours, from suburban locations to the downtown Minneapolis and St. Paul and the University of Minnesota and makes few stops in between.
- **Local Routes:** Provides access to local neighborhoods and makes frequent stops. Local routes serve both urban and suburban areas.

Figure 5: Family of Transit



The operating plans developed as part of this study focused on the Highway BRT station-to-station service, along with some minor modifications to local and express routes to provide better connectivity to potential stations and eliminate redundancy. Operating plans for each corridor are documented in detail in Appendix A.

Span of Service, Frequency and Station Stops

Span of service and frequency assumptions for Highway BRT station-to-station service are generally consistent with Service Operations guidelines presented in the *Regional Transitway Guidelines* (February 2012, Metropolitan Council).

Table 1: Service Span and Frequency

	Weekday	Saturday	Sunday
Span	16 hours	16 hours	13 hours
Frequency	15 minutes	15 minutes 30 minutes evenings	30 minutes

This study assumes that service would be operated seven days a week with a 16-hour span of service (e.g., 6 a.m. – 10 p.m.) on weekdays and Saturdays and 13 hours (e.g., 7 a.m. – 8 p.m.) on Sundays. It is assumed that service frequency would be every 15 minutes on weekdays and during the day on Saturdays, and every 30 minutes on Saturday evenings and Sundays. Existing express routes are generally assumed to remain in place in each corridor, which results in a combined frequency that exceeds the 10-minute peak period frequency guideline proposed in the *Regional Transitways Guidelines*. Highway BRT routes are assumed to stop at each proposed BRT station at all times throughout the day.

Travel Time Calculations Methodology

A consistent approach was used to develop travel time estimates for all eight study corridors with high-level assumptions. More detailed travel time estimation techniques should be used in future project phases. Both peak and off-peak travel time estimates were calculated for each corridor. These estimates consist of two components – the amount of time needed to travel between stations and the amount of time needed at each station for passengers to board and alight, also known as dwell time.

Between Station Travel Time Estimate Assumptions: Station-to-station travel times were determined by assuming an average peak and off-peak speed between each corridor BRT station. Peak-period average speed assumptions ranged from 25 to 35 miles per hour (mph) depending on congestion and travel characteristics; an average speed of 45 mph was assumed in the off-peak. BRT service is assumed to use bus shoulder lanes in the peak periods as a means to minimize general traffic congestion impacts.

Station Dwell Time Assumptions: One minute of dwell time (including time for deceleration/acceleration) was added for each inline and online stop on a corridor. For offline station locations, five minutes of time was assumed to account for dwell time as well as travel time to and from an offline station.

Estimated Highway BRT travel times were then compared to current express route times to verify reasonableness. Highway BRT time estimates are typically 5 to 15 minutes longer than existing express route times, depending on the corridor. This occurs because corridor express routes operate non-stop from a park-and-ride lot to either downtown Minneapolis or St. Paul, whereas Highway BRT routes are assumed to stop at each proposed BRT station. Should any corridors advance beyond this feasibility study, alternative operating plans that include multiple skip stop and/or express route BRT service patterns may be considered.

Operating plans for each corridor were developed using the running time estimates and service frequency assumptions described above. Round-trip cycle times include layover/recovery time of at least 15 percent of the estimated running time. It should be noted that specific routing through downtown Minneapolis or St. Paul was not identified for any of the study corridors. Instead, downtown travel times were estimated based on current downtown transit travel times. Downtown routing would need to be explored in future project phases.

Background Local and Express Bus Service Adjustments

Existing local and express bus service was reviewed in each study corridor to assess how existing routes could be optimized to support Highway BRT for purposed of this study. Modest changes to existing express and local routes were assumed for study testing (for a full list of assumed changes please see Appendix C). Background bus service plans also assume previously proposed Arterial BRT routes and proposed Green Line (Central and Southwest Light Rail) supporting bus changes. These changes are considered to be part of a "No Build" condition. Proposed background bus routing changes were formulated in cooperation with Metro Transit and other transit service providers operating in each corridor.

For purposes of study testing, a few test local bus routes were assumed, so connections could be made from the station-to-station service to activity centers outside the corridor. These connecting routes were typically only assumed if an activity center was within approximately two miles of the station to station service – a reasonable distance for a local bus to travel. For example, a local route was assumed between the TH 65 125th Avenue NE station and to downtown Anoka. Some services were extended short distances to provide connections to Highway BRT station-to-station service. Local routes that operated similarly to Highway BRT station-to-station service bus were eliminated to minimize redundant and competing services for purposes of study testing.

Express services were generally maintained with current routes and levels of service. Express services that operate throughout the midday were generally adjusted to peak-period operation only.

Capital Cost Estimate Methodology

Capital cost estimates include the initial expenditure to build the system and typically include corridor improvements, stations and technology systems, operations and maintenance facilities, vehicles, and right-of-way acquisition. Also included are "soft costs" for items such as engineering, construction services, insurance, and owner's costs, as well as contingencies for uncertainty in both the estimating process and the limited scope of this study.

At this early study stage, there is not sufficient definition or detail to prepare detailed construction cost estimates for the various alternatives under consideration. Therefore, capital cost estimates were developed using representative typical unit costs or allowances on a per-unit basis that is consistent with this level of analysis. The capital cost assumptions are consistent for each alternative, meaning a relative comparison of the alternatives from a capital costs perspective is reasonable. If any of the corridors are selected for implementation in the future, the capital cost estimates developed at this stage will need to be refined based upon additional design and engineering work. It should be noted that capital costs for transit improvements within downtown Minneapolis or St. Paul were not included in the cost estimates. A plan for how Highway BRT routes would operate in conjunction with other downtown transit service would need to be studied. Detailed capital cost estimates for each corridor are included in Appendix B.

Separate capital cost estimates were developed for each of the eight corridors and were broken into six categories:

- Corridor improvements
- BRT stations
- BRT maintenance facilities
- Rapid bus vehicles
- Right-of-way acquisition
- Professional service fees

This section first presents the capital cost parameters that were assumed for all estimates and then provides a summary of the various costs that are included in each cost category.

Capital Cost Parameters

Capital cost parameters are necessary assumptions that are not related to the specific location or design features of the corridor or the alternatives under consideration. The HTCS capital cost estimates are based upon the following parameters:

- **Base Year –** Year 2013 is used as the base year for definition of the unit prices and development of the capital cost estimates.
- **Unit Prices –** Base year unit prices for the various capital cost elements were developed using several references and resources that are similar to the proposed transit corridor improvements.

- **Unallocated Contingency –** An unallocated contingency of 25 percent is included in the capital cost estimates. This contingency is applied to the total estimated capital cost for each corridor, in addition to any specific estimating contingencies that are added to the various cost categories.
- **Allocated Contingencies –** Allocated contingencies are contingencies that are associated with individual cost estimate categories. These contingencies are intended to compensate for unforeseen items of work, quantity fluctuations, and variances in unit costs that develop as the project progresses through the various stages of design development. The level of allocated contingency applied to each cost category reflects the relative potential variability of those estimates. This project assumes a 20 percent allocated contingency is applied to the following cost categories:
    - Corridor Improvements
    - BRT Stations
    - BRT Maintenance Facility
    - Right of way
    - Vehicles

Cost Category Assumptions

This section summarizes the general assumptions used to estimate costs for each cost category.

Corridor Improvements

The study assumes that in most corridors the Highway BRT vehicles run in mixed-traffic lanes or existing bus shoulders; therefore no additional costs are included for guideway improvements in those corridors. A thorough analysis identifying gaps in bus-only shoulders was not conducted as part of this study. There may be some corridors that have gaps in bus-only shoulders. In future studies, a more detailed analysis of the continuity and condition of bus-only shoulders should be completed to determine if corridor improvements are needed.

In some corridors, there are locations that require transit-only slip ramps to allow BRT vehicles to access station platforms. These are located at stations that would not otherwise be practical to access efficiently due to the configuration of the highway interchanges. Transit signal priority (TSP) has not been assumed for any of the Highway BRT corridors, and therefore TSP costs have not been included in the estimates. Further study of the application of TSP to the Highway BRT corridors will need to be completed in future project phases.

BRT Stations

The following elements are included as part of the Highway BRT station costs.

Shelters

Station shelters are assumed to be enclosed structures with an additional covered waiting area. Shelters would have a recognizable branding style for the BRT corridor. Shelter costs include the installation of on-demand heating, lighting, amenities, and a standard park-style bench.

Station Platforms and Associated Roadway Improvements

Different cost assumptions were incorporated based on the three different station types (online, inline, offline); however, all station platforms are assumed to be 80-feet long and 12-feet wide and will be constructed of special concrete pavement. The costs of roadway improvements needed to accommodate the various station types are also included under this category. Platforms are assumed to be 11-inches high to accommodate level boarding. A 2-foot detectable warning strip that runs the entire length of the platform is also assumed for all station types.

Pedestrian Improvements

Pedestrian improvements costs at stations were categorized as either major or minor improvements based on the existing pedestrian facilities near the proposed stations. These costs assume the removal and/or construction of concrete sidewalks and pedestrian ramps. Additional pedestrian improvements were also estimated for the Highway 65 and 93rd Lane station, based on the lack of existing sidewalk and ramps at that location.

Additional pedestrian improvements with bridge modifications were assumed for locations that do not have pedestrian access across existing bridges between stations. These costs assume some sidewalk removal and/or construction, as well as modifications to the existing bridge to construct a 6’ sidewalk on one side of the bridge.

Additional Earthwork and Retaining Walls

Additional earthwork and retaining wall improvements are categorized as either major or minor improvements based on a review of aerial photography. Major improvements are assumed in locations where a station is placed on an existing severe slope and will require significant grading and/or retaining walls to accommodate the station. Minor improvements are assumed in locations where some grading and/or retaining walls will be required to accommodate a station platform.

Utility and Drainage Improvements

Utility and drainage improvements are categorized as either a major or minor improvement based on the existing above ground utilities at each station site. Major utility and drainage improvements assume that multiple utilities will need to be relocated as part of the station construction. Minor utility and drainage improvements assume that only one or two utilities require relocation as part of

the station construction. This cost estimate assumes that existing power poles will not require relocation as part of the station construction.

Traffic Control

Traffic control costs vary based on the station platform location and type. The estimate reflects costs for long term traffic control needs as well as traffic control that will be necessary during project construction. The project assumes online stations will have the most significant traffic control impacts and costs during construction. The following traffic control assumptions were made for each station type:

- Inline stations: Assumes detours and temporary closure of the on/off-ramp leading to the station during portions of construction.
- Online stations: Assumes major lane closures during construction.
- Offline stations: Assumes minor traffic control for existing platform modifications.

Platform Systems Allowance

The platform systems allowance costs include equipment for the various off-board fare collection, security, and electrical/communications systems on the station platform. The following items are included in the cost.

- One ticket vending machine (TVM)
- One emergency phone and security camera (assumes DVR-recorded, remotely downloadable cameras)
- One electronic readerboard
- Wireless communication connection and intelligent transportation systems (ITS) network and system components
- Electrical service connection
- Street signage (2 per station)

BRT Maintenance Facility Costs

The requirements for BRT support facilities are dependent on the type of vehicle, the size of the fleet, and the maintenance needs of the system. It is currently unclear whether entirely new facilities would be needed to support Highway BRT vehicles or whether existing facilities could be modified and expanded to meet the need. Therefore, to estimate the costs for operating and maintenance facility space this study assumed a cost of $250,000 for each bus required for a corridor's station-to-station service. For example, if the proposed station-to-station service requires four buses, a cost of one million dollars was assumed for operating and maintenance facility space for the corridor. These costs could either be applied towards a new facility or towards a facility expansion.

Right-of-way

At this level of analysis it was assumed that no right-of-way (ROW) acquisition will be required to accommodate the proposed Highway BRT stations and corridor improvements because all station

locations have the potential to accommodate a station platform within the existing public ROW. However, some ROW acquisition is assumed in corridors where new or expanded park-and-ride locations are required. ROW assumptions will need to be refined based upon additional information and design development work in future project phases.

Vehicles

The number of Highway BRT vehicles required for each corridor is based on the level of service outlined in the corridor operating plans. The total capital cost assumes each vehicle has the following characteristics:

- Low floor 40-foot long buses with two doors
- On-board validators (1 per door)
- Costs for video screens/ electronic stop displays, and annunciator equipment are not broken out separately, but instead are included as part of the overall bus costs.

The quantity of buses assumed for each corridor reflects a spare ratio of not less than 20 percent.

Professional Service Fees

Professional services fees, or soft costs, include all non-direct construction costs and are listed below in Table 2. The soft costs for the Highway BRT estimates were generated by applying assumed rates to different cost categories of the estimate.

Table 2: Professional Service Assumptions

	Construction	Right-of-way	Vehicles
Preliminary Engineering	4%	-	-
Final Design	6%	2%	1%
Project Management for Design and Construction	2%	2%	2%
Construction Administration and Management	8%	1%	-
Insurance	4%	-	-
Legal, Permits, Review Fees by Other Agencies	1%	5%	-
Surveys, Testing, Investigation, Inspection	2%	10%	2%
Agency Force Account Work	6%	10%	1%
Public Art	1%	-	-
Total	30%	30%	6%

Operating and Maintenance Cost Methodology

Operating and maintenance (O&M) costs for each corridor were estimated using methodology recently defined for the Robert Street, Nicollet-Central and Midtown Corridor Alternatives Analysis studies. Fiscal year (FY) 2011 Metro Transit cost data was used to develop unit costs and adjusted to account for unique Highway BRT operations. For typical bus operations and maintenance expenditures, cost drivers were assumed to specific line items. For example, annual revenue bus-miles were assigned to bus mechanic wages, fuel, and bus parts and annual revenue bus-hours were assigned to operator wages and bus operations administration. O&M unit costs by cost driver are shown in Table 3.

Table 3: Operating and Maintenance Unit Costs

Cost Drivers	Cost ($2012)
Peak buses	$38,330 per bus
Annual revenue bus-hour	$75.25 per hour
Annual bus-mile	$3.05 per mile
Inline/offline stop	$18,250 per direction
Online stop	$20,000 per direction

Unique BRT cost items included were included in the O&M costs. These are described in the following sections.

Fare collection

One ticket vending machine and a hardwired Go-To validator was assumed for each station.

BRT Station Maintenance

Costs were included for ongoing daily maintenance and snow removal in the winter. Elevator maintenance costs have been included for online stations.

Police/Fare Enforcement

Costs were included for increased police and fare enforcement presence at BRT stations and on BRT vehicles consistent with assumptions for METRO Red Line service.

Operating and maintenance costs for each corridor are documented in detail in Appendix C.

Ridership

Year 2030 ridership was estimated using the Twin Cities Regional Travel Demand Forecast Model. Ridership forecasts were based on development assumptions consistent with the Metropolitan Council's Regional Development Framework as of January 2012.

As part of the model validation process, the region was divided into corridor or sub corridor level districts so mode choice and travel patterns could be analyzed. Travel patterns were compared for work and non-work trip patterns from the 2010 regional travel behavior inventory and selected parameters were revised where significant differences could be statistically confirmed. Also, model transit network speeds were compared to scheduled speeds on key corridor express routes to verify correctness. The mode choice model parameters used in the model reflect travel behaviors observed in the 2010 regional transit on-board survey (consistent with the Bottineau Corridor Draft Environmental Impact Statement model).

Year 2030 No Build Scenario Assumptions

The HTCS year 2030 No Build scenario includes all currently operating transitways in the region, as well as all transitways with a locally preferred alternative (LPA) identified in the region's 2030 Transportation Policy Plan (TPP), amended in May 2013. It also includes all existing and programmed local and express bus routes identified through existing systems and supportive of the region's Transportation Improvement Program (TIP). These transitways are listed in Table 4. The No Build scenario serves as a point of comparison for the build alternatives.

Table 4: HTCS No Build Transitway Scenario Assumptions

Transitway	Status
Northstar Commuter Rail	Existing
METRO Blue Line (Hiawatha LRT)	Existing
METRO Red Line (Cedar Avenue BRT)	Existing
METRO Green Line (Central Corridor LRT)	Planned
METRO Blue Line Extension (Bottineau LRT)	Planned
METRO Green Line Extension (Southwest LRT)	Planned
METRO Orange Line (I-35W BRT)	Planned
Arterial BRT Routes (9 of 12 planned in TPP as identified in the TPP Appendix F): • Snelling Avenue • American Boulevard • West Broadway Avenue • Chicago-Emerson/Fremont Avenue • West 7th Street • East 7th Street • Central Ave • Nicollet Ave • Robert Street	Planned

Baseline Scenario Assumptions

The 'baseline scenario' includes the introduction of Highway BRT service along the eight study corridors, as described in the concept and operating plans in the previous sections. Walk and drive access links to the eight Highway BRT corridors (i.e., locations where riders could board or alight the proposed transitways) were reviewed for reasonableness. Also, the baseline scenario was modeled as a system (i.e., all eight Highway BRT lines together) as opposed to individual corridors. The study determined few locations where corridor markets may overlap and compete for ridership; however, the system modeling permits the opportunity for additional connectivity, potentially generating slightly higher ridership than may occur for a corridor modeled without other Highway BRT corridors.

Modeling Modal Preferences

The Highway BRT concepts provide travel time and cost savings advantages over No Build conditions. However, BRT's general attractiveness has not been clearly established for each corridor at this level of study. Characteristics that attract riders typically include fixed-guideways that portray a level of 'permanence,' a large span of high-frequency service, enhanced passenger facilities and

vehicle amenities, and the availability of seating.[2] The ridership forecasts in this study assumed the attractiveness level of Highway BRT service was less than observed on light rail transit (LRT), but more attractive than a limited stop bus service.

Ridership Data

The set of ridership information is reported for each corridor in the following sections. The definition of each piece of information is listed below. All figures represent 2030 forecasts unless otherwise noted. Appendix D includes a map showing station boarding ranges.

Unless otherwise noted, a transit "rider" is assumed to mean an individual who takes a one-way trip on transit, as opposed to referring to a person who uses transit. In this context, transit riders and transit trips on a given route or service are interchangeable.

Corridor Bus Route Ridership

'Corridor bus route' ridership reflects the number of forecasted trips taken on local or express route in a study corridor that have the following characteristics:

- Use at least one non-downtown Highway BRT station.
- Utilize a significant portion of the Highway BRT runningway (in this case, the mixed-traffic highway or shoulders)

Generally speaking, routes that were included as corridor bus routes were express routes that travel to the primary downtown served by a study corridor and also serve multiple proposed station locations. Input was provided by Metropolitan Council, Metro Transit, and other regional transit provider staffs to verify which local or express routes were included as corridor bus routes. This definition is consistent with the recommendations in the *Regional Transitway Guidelines* for ridership reporting in Highway BRT corridors.

Highway BRT Station-to-Station Service Ridership

'Station-to-station service' ridership is defined as the number of forecasted trips taken on the Highway BRT route in each corridor.

Transitway Total

'Transitway total' is defined as the sum station-to-station service ridership plus corridor bus route ridership.

[2] Transit Cooperative Research Project (TCRP) Report 95 , Traveler Response to Transportation System Changes (http://www.trb.org/Publications/Blurbs/162432.aspx)

Percent Transit Reliant Ridership

'Percent transit reliant ridership' is the estimated percentage of forecasted station-to-station service trips taken by persons from zero-car households.

New Transit Riders

'New Transit Riders' is the estimated number of net new transit riders that would choose to use the Highway BRT service instead of making a trip with a non-transit option (typically automobile). Most of the new riders would be due to the station-to-station service, but a small amount may be due to supplemented background bus service. This new transit rider value excludes riders that are diverted or attracted from another transit route.

Current Year Ridership with Build Alternative

'Current year ridership with build alternative' is the forecasted number of trips that would be taken on each Highway BRT station-to-station service assuming all build network improvements were implemented in the latest year when complete demographic information is available (in this case, year 2010). This number provides a surrogate measure to distinguish between corridors with an existing strong ridership base versus those that are dependent on future development.

Reverse Commute and Off-Peak Ridership

Reverse commute trips are work or other non-home destinations travelling in the opposite direction (typically away from downtown) of peak travel. Off-peak trips are those made during non-peak hours. Peak hours are between 6:00-9:00 a.m. and 3:00-6:30 p.m. Both of these types of trips are important because they indicate the presence of a potential market for all-day bi-directional station-to-station BRT service.

Corridor Summaries

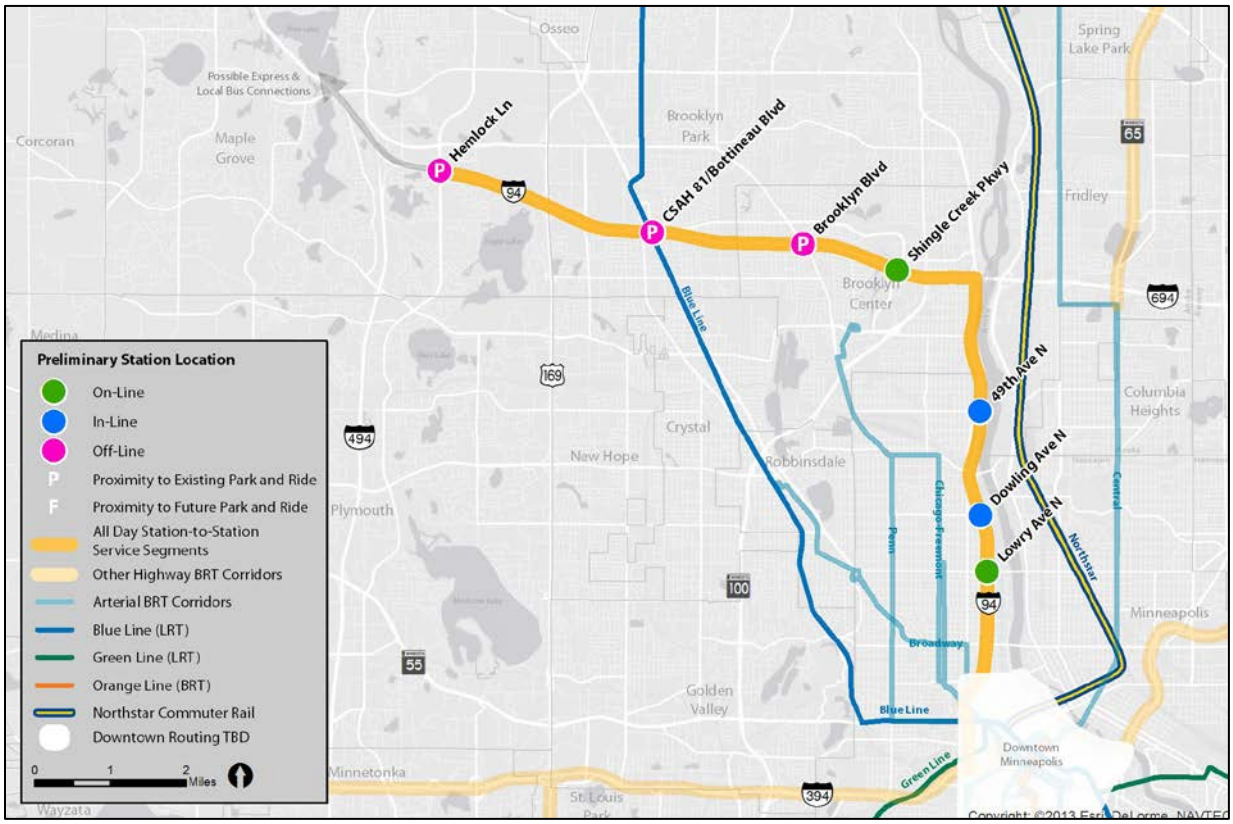
Profiles of the Highway BRT concepts are presented in this section for each of the eight study corridors. Each Highway BRT corridor concept includes:

- Corridor map with conceptual station locations
- Concept operating plan and service frequencies
- Key information on comparative capital cost, comparative operating and maintenance cost, and forecasted ridership

I-94

The I-94 corridor runs from Hemlock Lane (Maple Grove Transit Station) in Maple Grove to downtown Minneapolis, as shown in Figure 6. The corridor has a total of seven stations and is 14.7 miles long. The proposed transitway would directly connect with the planned Bottineau LRT line at the offline CSAH 81/Bottineau Boulevard station. It would also provide service to the Maple Grove Transit Station park-and-ride and the two planned park-and-rides at CSAH 81/Bottineau Boulevard and Brooklyn Boulevard. This concept includes the cost of constructing a new park-and-ride facility at Hemlock Lane due to limited space in the current park-and-ride facility.

Figure 6: I-94 Corridor



Operating Characteristics

Peak period end-to-end travel time	44 minutes
Off-Peak end-to-end travel time	40 minutes
Required fleet	7 peak vehicles, 2 spare vehicles
Background Local and Express Bus Service Adjustments	• Eliminate Route 781 midday service • Improved Route 787 midday service frequency

Capital Costs (2013$)

Cost Categories	Costs
Corridor Improvement	$5,040,000
BRT Station	$48,154,000
BRT Maintenance Facility	$2,700,000
Right of Way	$792,000
Vehicles	$5,508,000
Soft Costs	$16,404,000
25% Contingency	$19,650,000
Corridor Total Cost	**$98,248,000**

Operating and Maintenance Costs (2012$)

Item	Costs
Highway BRT Station–to-Station Service	$5,096,000
Background Bus Changes (Net)	$121,000
Total O&M Costs Increase over No Build	**$5,217,000**

Ridership Data

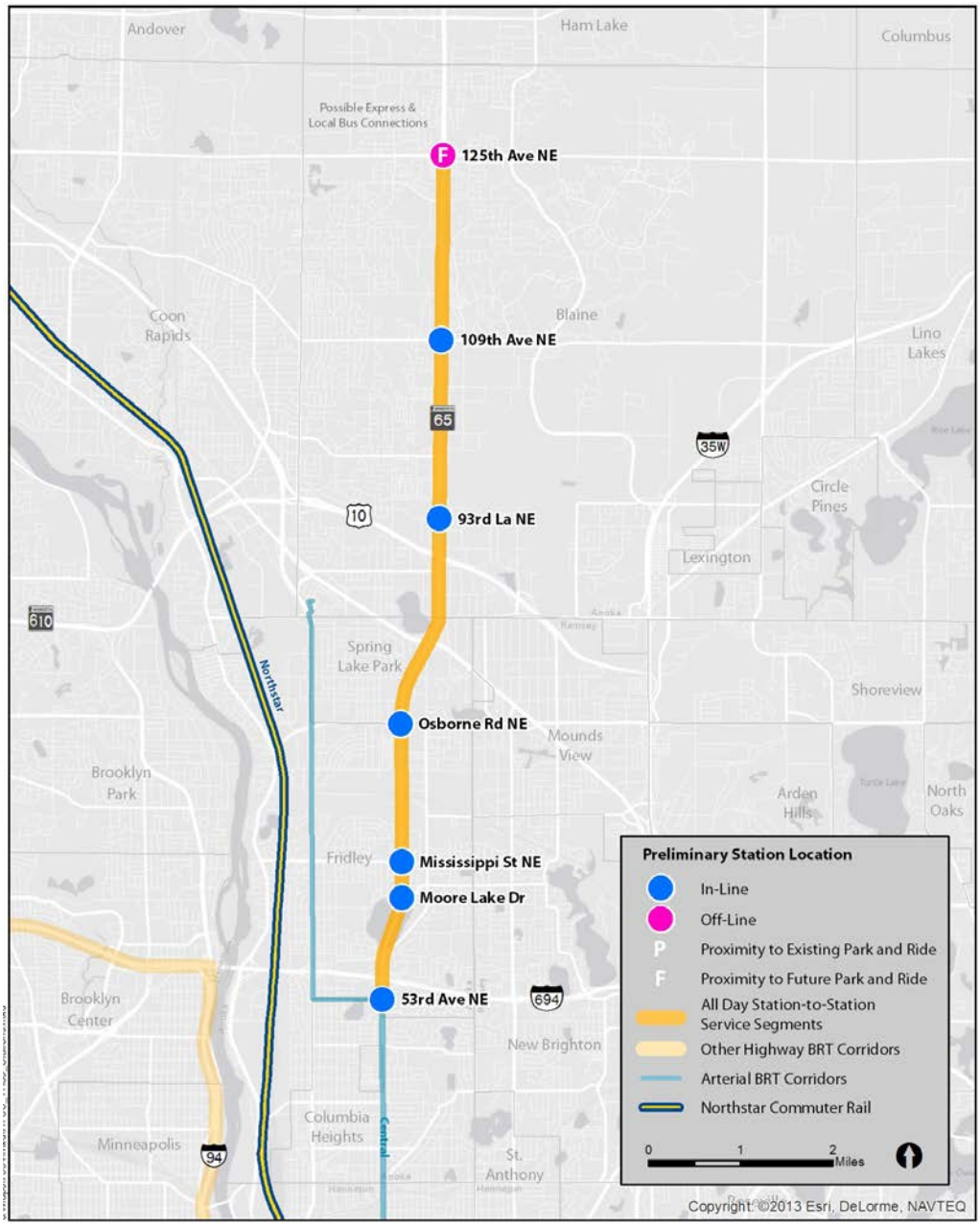
Existing Service (2010)	No Build (2030)	2030		
Corridor Bus Routes	Corridor Bus Routes	Station-to-Station Service	Corridor Bus Routes	**Transitway Total**
8,200	9,300	5,400	8,300	**13,700**

Descriptor	Data
Percent transit reliant ridership (station-to-station service)	45%
Current year ridership on station-to-station service with build alternative (2010)	2,600 riders
New transit riders	1,400 riders

TH 65

The TH 65 corridor runs from 125th Avenue in Blaine to 53rd Avenue NE between Columbia Heights and Fridley, as shown in Figure 7. The corridor has a total of seven stations and is 9.3 miles long. The proposed transitway would directly connect with the planned Central Avenue Arterial BRT line at the 53rd Avenue NE station. It would also provide service to a planned park-and-ride near 125th Avenue NE in Blaine.

Figure 7: TH 65 Corridor



Operating Characteristics

Peak period end-to-end travel time	26 minutes
Off-Peak end-to-end travel time	23 minutes
Required fleet	5 peak vehicles, 1 spare vehicle
Background Local and Express Bus Service Adjustments	• New circulator route between 125th Avenue NE BRT station and Anoka via Highway 14 • Per prior arterial BRT service plans, new Central Avenue Arterial BRT service, Route 10 frequency changes and Route 59 service elimination

Capital Costs (2013$)

Cost Categories	Costs
Corridor Improvement	$0
BRT Station	$11,815,000
BRT Maintenance Facility	$2,400,000
Right of Way	$0
Vehicles	$3,672,000
Soft Costs	$4,234,000
25% Contingency	$5,531,000
Corridor Total Cost	**$27,652,000**

Operating and Maintenance Costs (2012$)

Item	Costs
Highway BRT Station–to-Station Service	$3,241,000
Background Bus Changes (Net)	$407,000
Total O&M Costs Increase over No Build	**$3,648,000**

Ridership Data

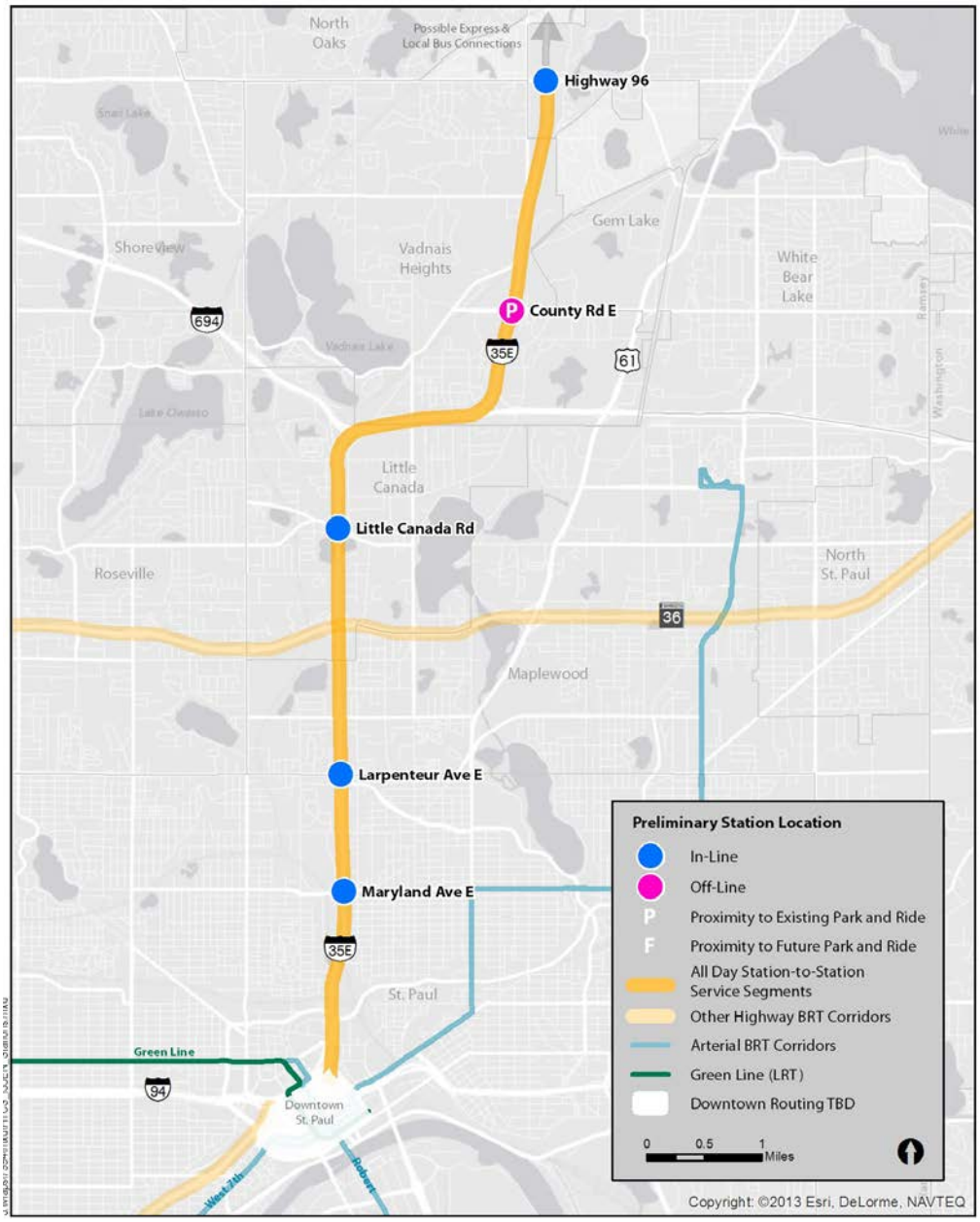
Existing Service (2010)	No Build (2030)	2030		
Corridor Bus Routes	Corridor Bus Routes	Station-to-Station Service	Corridor Bus Routes	Transitway Total
0	600	800	400	1,200

Descriptor	Data
Percent transit reliant ridership (station-to-station service)	26%
Current year ridership on station-to-station service with build alternative (2010)	400 riders
New transit riders	700 riders

I-35E North

The I-35E North corridor runs from Highway 96 in White Bear Lake to downtown St. Paul, as shown in Figure 8. The corridor has a total of five stations and is 10.7 miles long. The corridor would provide service to the future park-and-ride at County Road E in Vadnais Heights and connecting bus service to White Bear Lake.

Figure 8: I-35E North Corridor



Operating Characteristics

Peak period end-to-end travel time	32 minutes
Off-Peak end-to-end travel time	28 minutes
Required fleet	5 peak vehicles, 1 spare vehicle
Background Local and Express Bus Service Adjustments	• New circulator service between Highway 96 BRT station and White Bear Lake • Per prior arterial BRT service plans for Robert Street Arterial BRT, Route 68 service frequency changes

Capital Costs (2013$)

Cost Categories	Costs
Corridor Improvement	$0
BRT Station	$9,701,000
BRT Maintenance Facility	$2,400,000
Right of Way	$0
Vehicles	$3,672,000
Soft Costs	$3,633,000
25% Contingency	$4,852,000
Corridor Total Cost	**$24,258,000**

Operating and Maintenance Costs (2012$)

Item	Costs
Highway BRT Station–to-Station Service	$3,694,000
Background Bus Changes (Net)	$407,000
Total O&M Costs Increase over No Build	**$4,101,000**

Ridership Data

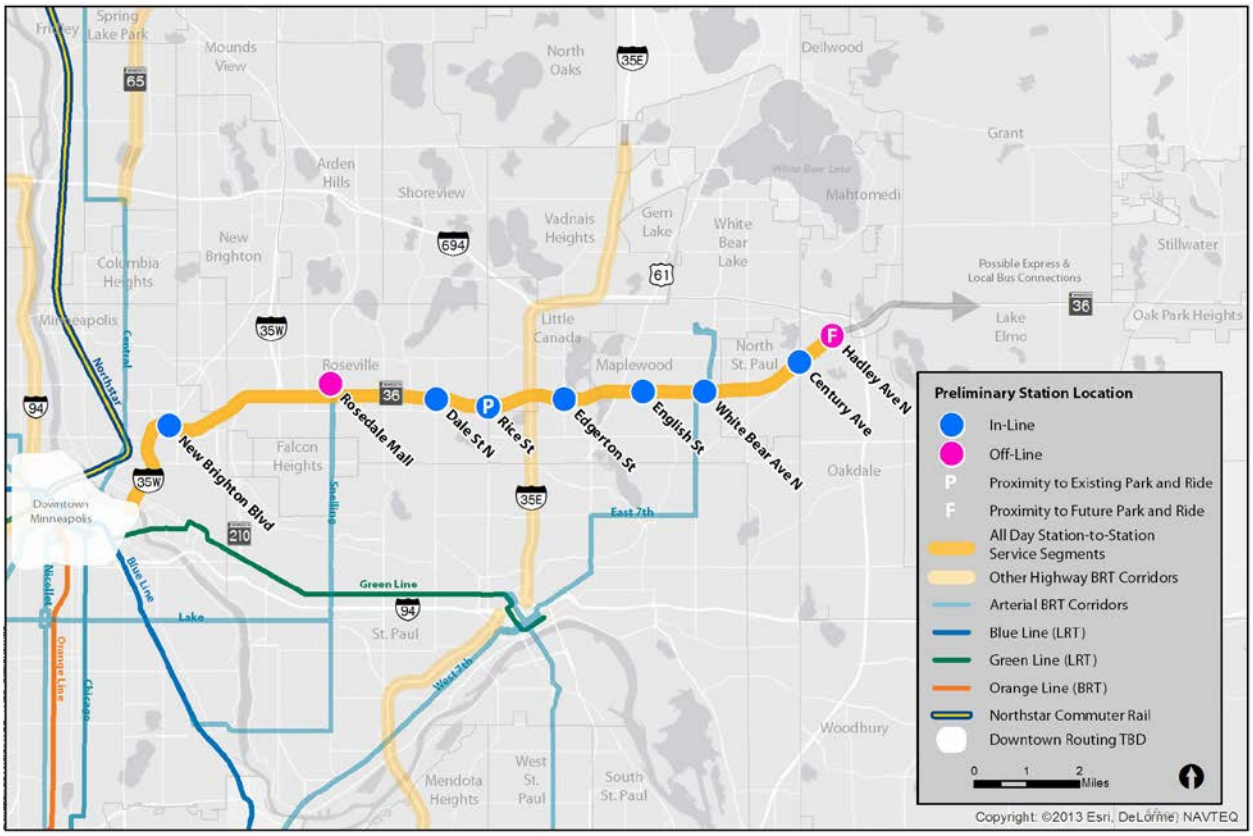
Existing Service (2010)	No Build (2030)	2030		
Corridor Bus Routes	Corridor Bus Routes	Station-to-Station Service	Corridor Bus Routes	Transitway Total
180	300	2,500	900	3,400

Descriptor	Data
Percent transit reliant ridership (station-to-station service)	35%
Current year ridership on station-to-station service with build alternative (2010)	1,300 riders
New transit riders	500 riders

TH 36

The TH 36 corridor runs from Hadley Avenue in Oakdale to downtown Minneapolis, as shown in Figure 9. The corridor has a total of nine stations and is 17.7 miles long. The proposed transitway would directly connect with the planned East 7th Street Arterial BRT line at the inline White Bear Avenue station and with the Snelling Avenue Arterial BRT line at the offline Rosedale Mall station. It would also provide service to the Rice Street park-and-ride lot and a potential park-and-ride lot at Hadley Avenue[3].

Figure 9: TH 36 Corridor



[3] Park-and-ride lot at Hadley Ave currently not identified in regional plans

Operating Characteristics

Peak period end-to-end travel time	47 minutes
Off-Peak end-to-end travel time	42 minutes
Required fleet	8 peak vehicles, 2 spare vehicles
Background Local and Express Bus Service Adjustments	• New circulator route between Hadley Avenue BRT station and Stillwater • Eliminate Route 264 midday service • Per prior arterial BRT service plans, new East 7th Avenue and Snelling Avenue Arterial BRT service and service frequency changes to existing Route 84. • Per Green Line corridor bus service plans, frequency changes to Routes 65 and 87

Capital Costs (2013$)

Cost Categories	Costs
Corridor Improvement	$402,000
BRT Station	$18,533,000
BRT Maintenance Facility	$3,000,000
Right of Way	$1,584,000
Vehicles	$6,120,000
Soft Costs	$6,954,000
25% Contingency	$9,149,000
Corridor Total Cost	**$45,742,000**

Operating and Maintenance Costs (2012$)

Item	Costs
Highway BRT Station–to-Station Service	$5,716,000
Background Bus Changes (Net)	$115,000
Total O&M Costs Increase over No Build	**$5,831,000**

Ridership Data

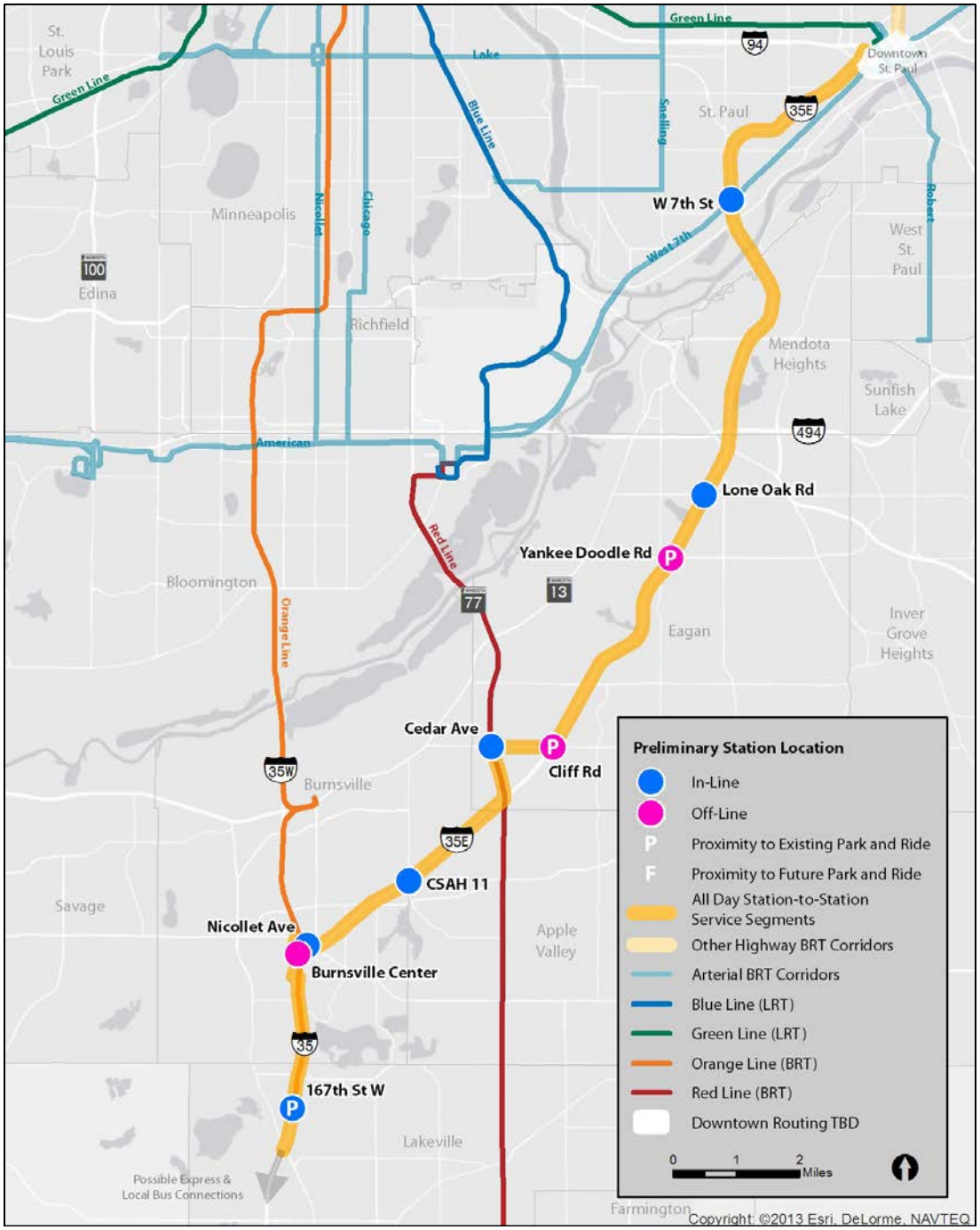
Existing Service (2010)	No Build (2030)	2030		
Corridor Bus Routes	Corridor Bus Routes	Station-to-Station Service	Corridor Bus Routes	**Transitway Total**
1,800	2,100	9,300	2,100	**11,400**

Descriptor	Data
Percent transit reliant ridership (station-to-station service)	35%
Current year ridership on station-to-station service with build alternative (2010)	5,200 riders
New transit riders	1,300 riders

I-35E South

The I-35E South corridor runs from the Kenrick park-and-ride lot at 167th Street West in Lakeville to downtown St. Paul, as shown in Figure 10. The corridor has a total of nine stations and is 24.3 miles long. The corridor would provide connections to the METRO Red Line and the planned METRO Orange Line as well as the planned West 7th Street Arterial BRT. It would also provide service to the Eagan Transit Station and the Blackhawk park-and-ride lot.

Figure 10: I-35E South Corridor



Operating Characteristics

Peak period end-to-end travel time	73 minutes
Off-Peak end-to-end travel time	57 minutes
Required fleet	11 peak vehicles, 3 spare vehicle
Background Local and Express Bus Service Adjustments	• Route 426 extension to Burnsville Center • Per prior arterial BRT service plans, new West 7th Street Arterial BRT service, Route 54 elimination

Capital Costs (2013$)

Cost Categories	Costs
Corridor Improvement	$0
BRT Station	$13,723,000
BRT Maintenance Facility	$4,800,000
Right of Way	$0
Vehicles	$8,568,000
Soft Costs	$5,708,000
25% Contingency	$8,200,000
Corridor Total Cost	$40,999,000

Operating and Maintenance Costs (2012$)

Item	Costs
Highway BRT Station–to-Station Service	$7,542,000
Background Bus Changes (Net)	$407,000
Total O&M Costs Increase over No Build	$7,949,000

Ridership Data

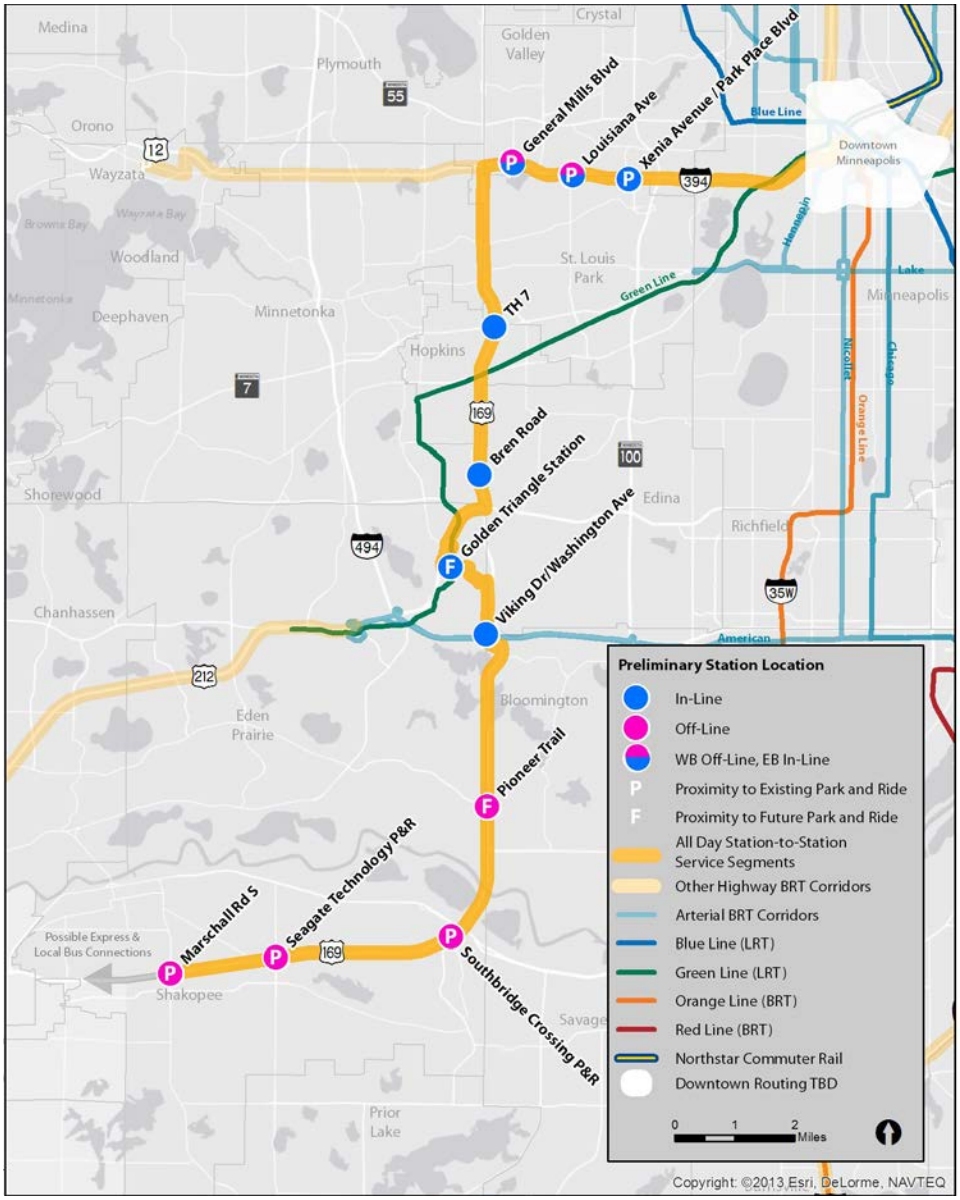
Existing Service (2010)	No Build (2030)	2030		
Corridor Bus Routes	Corridor Bus Routes	Station-to-Station Service	Corridor Bus Routes	**Transitway Total**
800	1,500	4,000	1,700	**5,700**

Descriptor	Data
Percent transit reliant ridership (station-to-station service)	38%
Current year ridership on station-to-station service with build alternative (2010)	2,500 riders
New transit riders	1,200 riders

TH 169

The TH 169 corridor runs from the Marschall Road Transit Station in Shakopee to downtown Minneapolis, as shown in Figure 11. The corridor is made up of eight TH 169 stations, three I-394 stations and is 26.9 miles long. The corridor would provide connections to the planned METRO Green Line Extension (Southwest LRT) and the planned American Boulevard arterial BRT line. It would also provide service to existing park-and-ride lots at Southbridge Crossing, Seagate Technology and Marschall Road as well as the planned park-and-ride lot at Pioneer Trail.

Figure 11: TH 169 Corridor



Operating Characteristics

Peak period end-to-end travel time	88 minutes
Off-Peak end-to-end travel time	69 minutes
Required fleet	14 peak vehicles, 3 spare vehicle
Background Local and Express Bus Service Adjustments	• Routes 17, 615, 667, 668 extended to serve TH 7 BRT station • Per Scott County Operations and Capital Plan, new express service from Marschall Road Transit Center to downtown Minneapolis. • Per prior arterial BRT service plans, new American Blvd. Arterial BRT service

Capital Costs (2013$)

Cost Categories	Costs
Corridor Improvement	$229,000
BRT Station	$15,081,000
BRT Maintenance Facility	$5,100,000
Right of Way	$0
Vehicles	$10,404,000
Soft Costs	$6,337,000
25% Contingency	$9,288,000
Corridor Total Cost	**$46,439,000**

Operating and Maintenance Costs (2012$)

Item	Costs
Highway BRT Station–to-Station Service	$8,895,000
Background Bus Changes (Net)	$0
Total O&M Costs Increase over No Build	**$8,895,000**

Ridership Data

Existing Service (2010)	No Build (2030)	2030		
Corridor Bus Routes	Corridor Bus Routes	Station-to-Station Service	Corridor Bus Routes	**Transitway Total**
2,900	3,400	7,800[4]	4,200	12,000

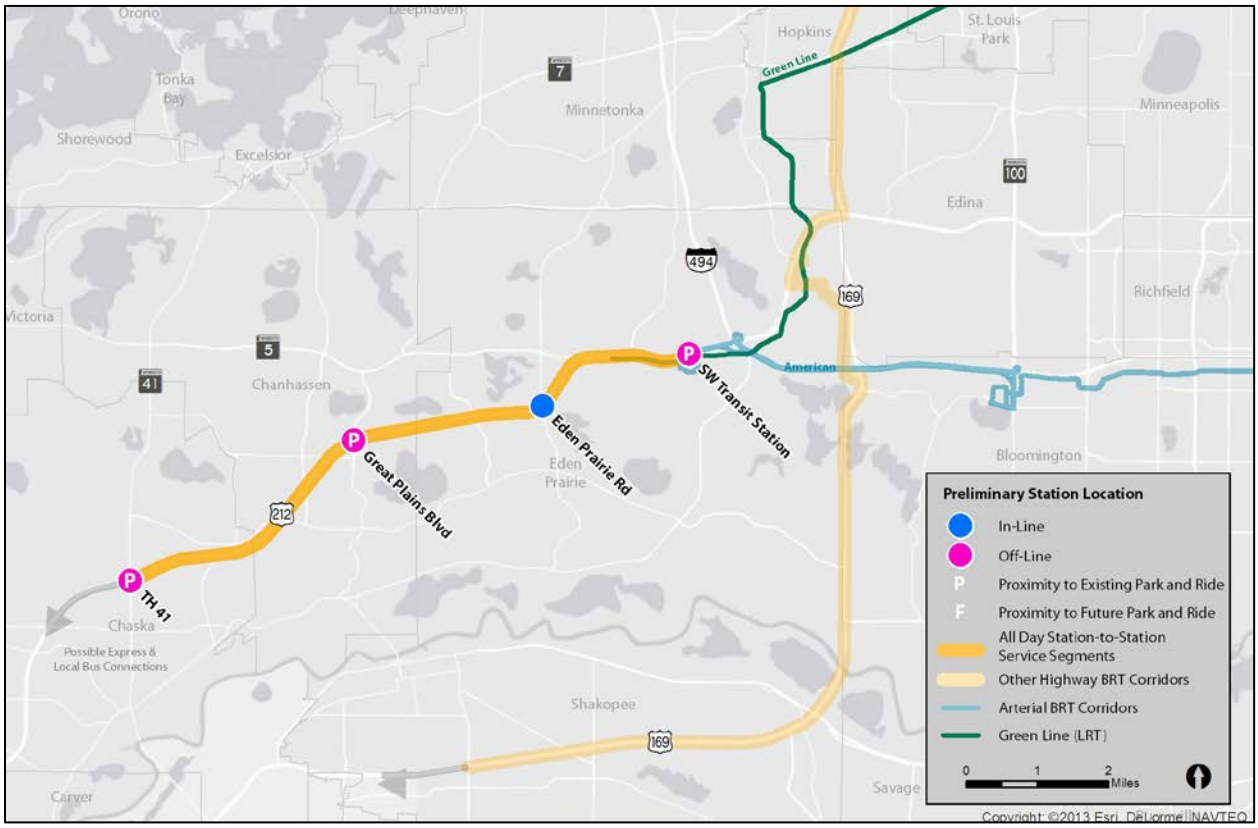
Descriptor	Data
Percent transit reliant ridership (station-to-station service)	33%
Current year ridership on station-to-station service with build alternative (2010)	4,600 riders
New transit riders	2,000 riders

[4] Station-to-station ridership between common stations (General Mills Blvd, Louisiana Ave, and Xenia/Park Place) was split evenly between the I-394 and TH 169 corridors.

TH 212

The TH 212 corridor runs from the East Creek Station park-and-ride lot in Chaska to the SW Transit Station in Eden Prairie, as shown in Figure 12. The corridor has four stations and is 9.0 miles long. The corridor would provide connections to the planned METRO Green Line Extension (Southwest LRT) providing service to downtown Minneapolis and St. Paul and the planned American Boulevard Arterial BRT line. It would also provide service to existing park-and-ride lots at SouthWest Village and at SouthWest Station.

Figure 12: TH 212 Corridor



Operating Characteristics

Peak period end-to-end travel time	27 minutes
Off-Peak end-to-end travel time	23 minutes
Required fleet	5 peak vehicles, 1 spare vehicle
Background Local and Express Bus Service Adjustments	• Reduce Route 698 service • New Chanhassen circulator services (2 routes)

Capital Costs

Cost Categories	Costs
Corridor Improvement	$0
BRT Station	$3,989,000
BRT Maintenance Facility	$1,800,000
Right of Way	$0
Vehicles	$3,672,000
Soft Costs	$1,834,000
25% Contingency	$2,824,000
Corridor Total Cost (2013$)	$14,119,000

Operating and Maintenance Costs

Item	Costs
Highway BRT Station–to-Station Service	$3,094,000
Background Bus Changes (Net)	-$497,000
Total O&M Costs Increase over No Build	$2,597,000

Ridership Data

Existing Service (2010)	No Build (2030)	2030		
Corridor Bus Routes	Corridor Bus Routes	Station-to-Station Service	Corridor Bus Routes	Transitway Total
2,300	2,400	600	3,200	3,800

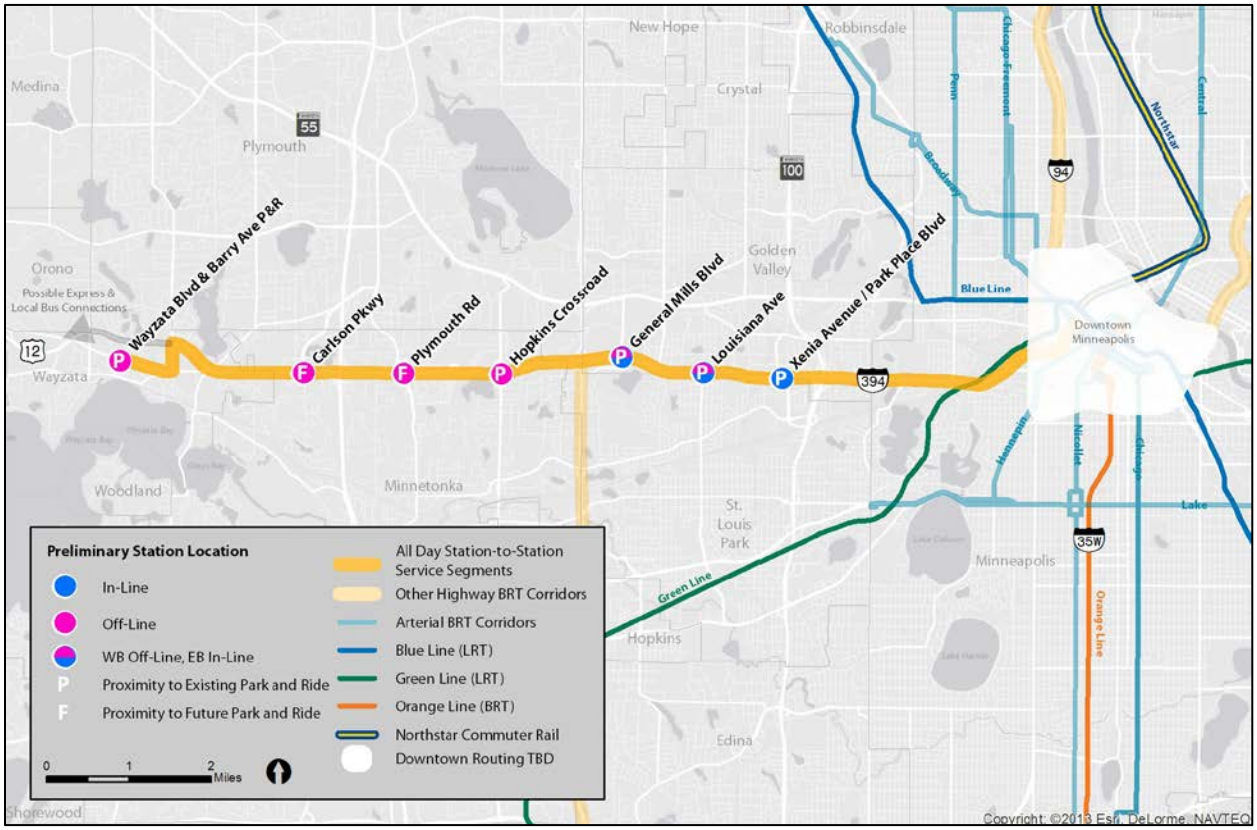
Descriptor	Data
Percent transit reliant ridership	29%
Current year ridership with build alternative (2010)	400 riders
New transit riders	300 riders

I-394

The I-394 corridor runs from the Wayzata Boulevard and Barry Avenue park-and-ride lot in Wayzata to downtown Minneapolis, as shown in

Figure 13. The corridor has a total of seven stations and is 12.6 miles long. The corridor would provide service to the existing park-and-ride at Wayzata Boulevard and Barry Avenue, a future park and ride at Carlson Parkway, a future transit center near Ridgedale Mall at Plymouth Road, and the existing park-and-ride lots at Hopkins Crossroad, General Mills Boulevard, Louisiana Avenue, and Park Place Boulevard.

Figure 13: I-394 Corridor



Operating Characteristics

Peak period end-to-end travel time	58 minutes
Off-Peak end-to-end travel time	45 minutes
Required fleet	9 peak vehicles, 2 spare vehicle
Background Local and Express Bus Service Adjustments	• Eliminate Route 675 • New circulator service between Mounds and Central Avenue/CSAH 101 Station • New circulator service at Highway 55/I-494 • Per Southwest Blue Line LRT service plans, service changes to Routes 615, 604 and 9, and new Route 601 service

Capital Costs (2013$)

Cost Categories	Costs
Corridor Improvement	$0
BRT Station	$20,547,000
BRT Maintenance Facility	$3,300,000
Right of Way	$0
Vehicles	$6,732,000
Soft Costs	$7,133,000
25% Contingency	$9,428,000
Corridor Total Cost	$47,140,000

Operating and Maintenance Costs (2012$)

Item	Costs
Highway BRT Station–to-Station Service	$5,075,000
Background Bus Changes (Net)	-$1,892,000
Total O&M Costs Increase over No Build	$3,183,000

Ridership Data

Existing Service (2010)	No Build (2030)	2030		
Corridor Bus Routes	Corridor Bus Routes	Station-to-Station Service	Corridor Bus Routes	Transitway Total
3,400	6,500	6,600	7,800	14,400

Descriptor	Data
Percent transit reliant ridership (station-to-station service)	37%
Current year ridership on station-to-station service with build alternative (2010)	3,600 riders
New transit riders	1,600 riders

Evaluation

Evaluation Goals and Measures

The eight study corridors were evaluated using a set of evaluation measures that reflect the goals identified in the project scope. The goals and the corresponding evaluation measures are listed below.

Goal 1: Provide mobility benefits and respond to trip patterns/needs and deficiencies for markets identified in the purpose and need.

Measure	Description
1. Transitway Total ridership	The sum of Station-to-Station Service ridership plus other Corridor Bus Route ridership (Year 2030)
2. Growth in guideway total ridership	The difference between Year 2030 Transitway Total ridership and Year 2030 No-Build ridership
3. Reverse-commute direction and off-peak hour ridership	The percentage of Station-to-Station Service reverse-commute riders (Year 2030) The percentage of Station-to-Station Service non-peak hour riders (Year 2030)
4. Transit-reliant ridership	Percentage of Station-to-Station Service trips taken by persons from zero-car households
5. Minority residents in the service area	The percentage of minority residents within two miles of a Highway BRT station (2010 US Census)

Goal 2: Provide affordable, effective transportation improvements.

Measure	Description
6. Cost effectiveness	The alternative's total annualized capital costs plus the alternative's annualized operating and maintenance costs divided by the total annual Station-to-Station Service forecasted trips

Goal 3: Meet Transportation Policy Plan (TPP) ridership goals.

Measure	Description
7. Station-to-Station Service ridership	The number of trips taken on a Highway BRT Station-to-Station Service route (Year 2030)
8. New transit riders	The estimated number of new riders that would choose to use the Highway BRT service instead of making the trip with an automobile (Year 2030)

Goal 4: Seamlessly integrate with existing systems and provide valuable regional connections.

Measure	Description
9. Current year Station-to-Station Service ridership with the Build Alternative	The number of Station-to-Station Service trips taken on the Build Alternative if it was built in the current year
10. Connections to existing or planned high-frequency transitways	The number of times a Highway BRT corridor connects with an existing or planned high-frequency transitway

Goal 5: Support area development plans, forecast growth assignment, redevelopment potential.

Measure	Description
11. Forecast growth in population	The forecasted percent change in population (2010 – 2030) within two miles of a Highway BRT station location included for each corridor
12. Forecast growth in employment	The forecasted percent change in employment (2010 – 2030) within two miles of a Highway BRT station location included for each corridor

Table 5 summarizes the data for each evaluation measure for all eight study corridors.

Table 5: Evaluation Data Summary

	Measure	I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
GOAL 1	1. Transitway Total ridership (Year 2030)	13,700	1,200	3,400	11,400	5,700	12,000	3,800	14,400
	2. Growth in guideway total ridership (from 2030 No Build to 2030 Build)	4,400	600	3,100	9,300	4,200	8,600	1,400	7,900
	3. Off-peak hour ridership and reverse-commute direction (Year 2030)	33% / 37%	56% / 30%	21% / 3%	32% / 24%	41% / 32%	40% / 35%	47% / 43%	39% / 44%
	4. Transit-reliant ridership (Year 2030)	45%	26%	35%	35%	38%	33%	29%	37%
	5. Minority residents in the service area (US 2010 Census	52.1%	18.4%	45.7%	29.9%	21.4%	21.2%	17.0%	17.3%
GOAL 2	6. Cost effectiveness	$5.12	$19.96	$6.81	$2.77	$8.50	$4.67	$18.36	$2.85
GOAL 3	7. Station-to-Station Service ridership (Year 2030)	5,400	800	2,500	9,300	4,000	7,800	600	6,600
	8. New transit riders (Year 2030)	1,400	700	500	1,300	1,200	2,000	300	1,600
GOAL 4	9. 2010 Trips with the Build Alternative	2,600	400	1,300	5,200	2,500	4,600	400	3,600
	10. Connections to existing or planned high-frequency transitways	1	1	0	2	3	2	1	0
AL	11. Forecast growth in population	3%	8%	6%	9%	6%	15%	25%	7%

12. Forecast growth in employment	28%	14%	19%	13%	15%	19%	18%	8%

Evaluation Scoring Methodology

The results of all evaluation measures were comparatively scored on a three-point scale by alternative (i.e., a total maximum score of three points per evaluation measure). However, three separate methodologies were used to set scoring thresholds. The three methodologies are described below.

Threshold Methodology 1

The first methodology was used for results reported as a percentage. To set the threshold for these measures the range between the highest percentage and the lowest percentage was calculated. Then, the range was divided by three. The point thresholds were set by subtracting this value from the highest percentage value.

- Example: I-94 has transit reliant ridership of 45 percent, the highest of all eight corridors. TH 65 has a transit reliant ridership of 26 percent, the lowest of all corridors.
  - (45 – 26)/3 = 6
    - 45 – 6 = 39
    - 39 – 6 = 33

Example Thresholds	Points
Between 39% and 45%	3
Between 33% and 39%	2
≤ 32%	1

Threshold Methodology 2

The second methodology was used for all non-percentage results (except for the Cost Effectiveness measure, as described in Threshold Methodology 3). For these results, the highest value was divided into thirds to determine the scoring thresholds.

- Example: For the Guideway Total Riders measure, the I-394 corridor is estimated to provide 14,400 trips, the largest amount of all eight corridors.
  - 14,400/3 = 4,800
    - 14,400 – 4,800 = 9,600
    - 9,600 – 4,800 = 4,800

Thresholds	Points
Between 9,600 and 14,400	3
Between 4,800 and 9,600	2
≤ 4,800	1

Threshold Methodology 3

The thresholds for the Cost Effectiveness measure were set based on the Small Starts thresholds set in the Federal Transit Administration's *New and Small Starts Evaluation and Rating Process* (August 2013) final policy guidance. The FTA's scoring process is based on a five-point scale, as shown in Table 6.

Table 6: FTA Small Starts Cost Effectiveness Breakpoints

Rating	Small Starts Breakpoints
High	<$1.00
Medium – High	Between $1.01 and $1.99
Medium	Between $2.00 and $3.99
Medium – Low	Between $4.00 and $5.00
Low	>$5.00

The Cost Effectiveness thresholds were adjusted to fit the project's three-point scoring system as well as to present meaningful differences between the results. Since the lower threshold for project is typically the "medium" rating, $4.00 was used from the Small Starts criteria as a break point and $8.00 for the next break point. The thresholds for this measure are shown below:

Thresholds	Points
Between $8.00 and $19.96	1
Between $4.00 and $8.00	2
≤ $4.00	3

Evaluation Scoring Results

The five project goals were weighted equally in the overall score for each corridor. The scores for each alternative are shown in Table 7. For a full list of evaluation measures thresholds please see Appendix E.

Table 7: Evaluation Results

		I-94	Hwy 65	I-35E North	Hwy 36	I-35E South	Hwy 169	Hwy 212	I-394
Goal 1: Provide mobility benefits and respond to trip patterns/needs and deficiencies for markets identified in the purpose and need.									
1	Guideway total ridership	●	○	○	●	◑	●	○	●
2	Growth in guideway total ridership	◑	○	◑	●	◑	●	○	●
3	Off-peak hour ridership and reverse-commute direction	●	●	○	◑	●	●	●	●
4	Transit-reliant ridership	●	○	◑	◑	◑	◑	○	◑
5	Minority residents in the service area	●	○	●	◑	○	○	○	○
Goal 2: Provide affordable, effective transportation improvements.									
6	Cost effectiveness	◑	○	◑	●	○	◑	○	●
Goal 3: Meet Transportation Policy Plan (TPP) ridership goals.									
7	Station-to-station ridership	◑	○	○	●	◑	●	○	●
8	New transit riders	●	◑	○	◑	◑	●	○	●
Goal 4: Seamlessly integrate with existing systems and provide valuable regional connections.									
9	2010 Trips with the build alternative	◑	○	○	●	◑	●	○	●
10	Connections to existing or planned high frequency transitways	○	○	○	◑	●	◑	○	○
Goal 5: Support area development plans, forecast growth assignment, redevelopment potential									
11	Forecast growth in population	○	○	○	○	○	◑	●	○
12	Forecast growth in employment	●	○	◑	○	○	◑	◑	○
	TOTAL	●	○	○	●	◑	●	○	●

KEY TO SYMBOLS

● Strongly supports goal (3 points) ◑ Supports goal (2 points) ○ Does not support goal (1 point)

Sensitivity Tests

A set of ridership sensitivity tests were run to analyze how different operating assumptions would affect Highway BRT Station-to-Station Service ridership results. The sensitivity tests fall into two categories: changes to a Highway BRT Station-to-Station Service route and changes to Highway BRT Station-to-Station Service frequencies. The test results are described in this section.

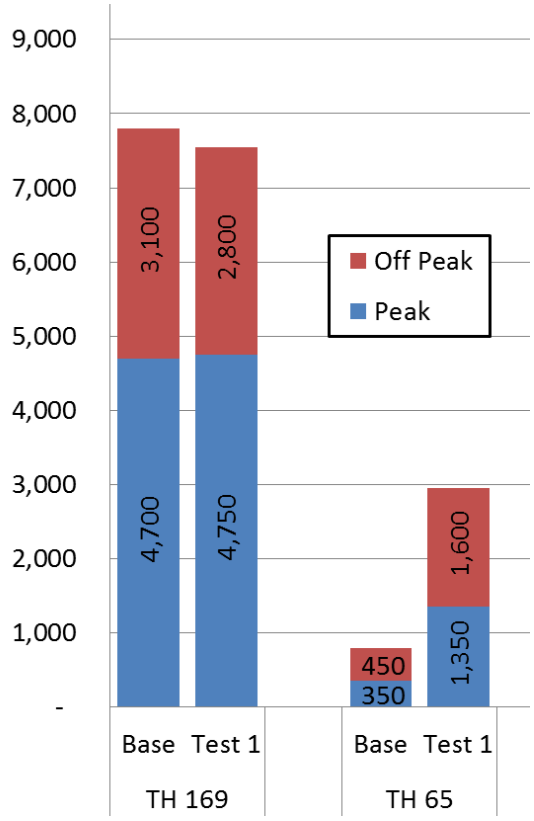
Changes to Highway BRT Routes

The TH 169 and TH 65 corridors were tested for route changes. All other routing and operating plan assumptions, except those described below, were held constant:

TH 169: Hopkins Station Connection

For TH 169, the connection with the METRO Green Line Extension was moved from the Golden Triangle Station to the Hopkins Station. As shown in Figure 14, the routing change produced minimal change in Station-to-Station Service ridership; both peak and off-peak ridership remained almost constant on the TH 169 corridor.

Figure 14: TH 169 and TH 65 Route Change Station-to-Station Ridership Sensitivity Test Results



TH 65: I-94 Routing

For TH 65, the route was extended and routed via I-94 to downtown Minneapolis. The test assumed the TH 65 Highway BRT would stop at the proposed I-94 Lowry Station before terminating in downtown Minneapolis. The adjusted routing and connectivity produced a large increase in Station-to-Station Service ridership in the TH 65 corridor, as shown in Figure 14. When routed via I-94, peak and off-peak ridership is nearly four times as large as the original routing, illustrating that downtown Minneapolis is a strong transit anchor.

Changes to Highway BRT Frequencies

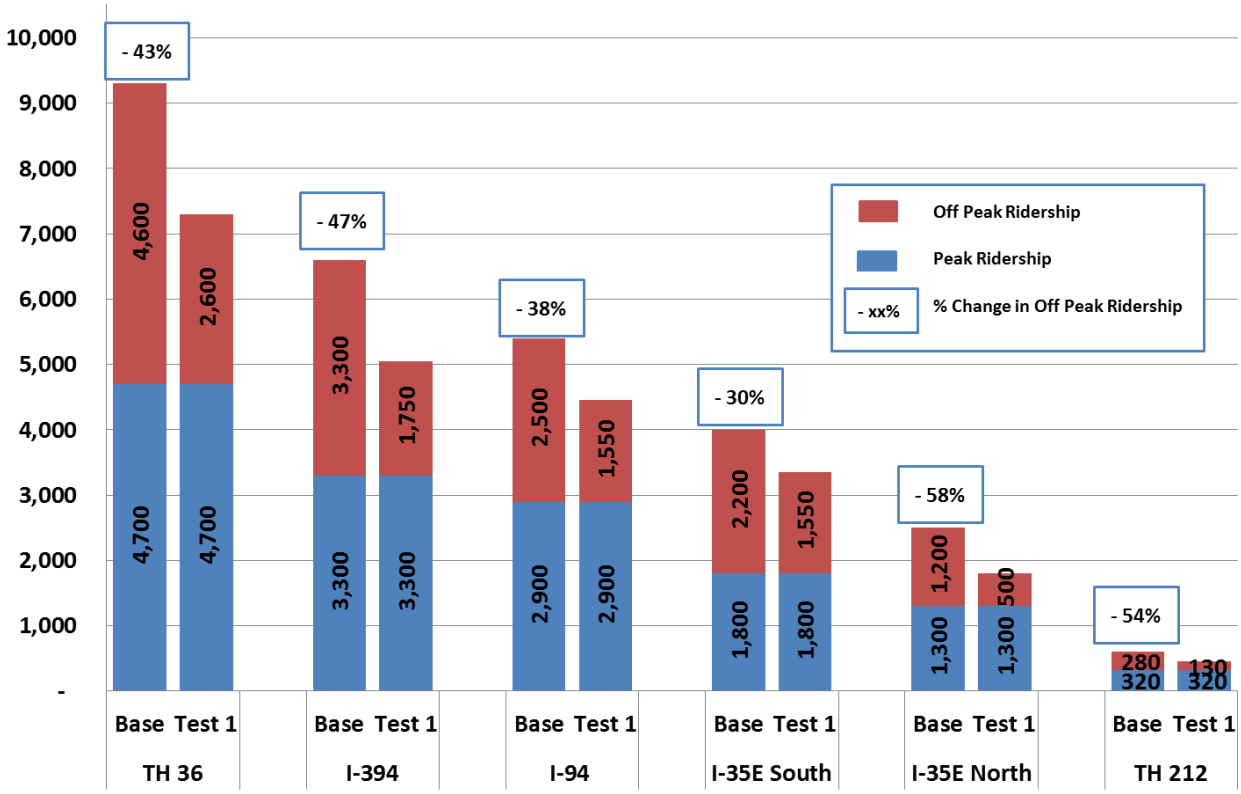
The sensitivity tests analyzed the how Highway BRT Station-to-Station Service ridership changed if frequencies were increased and decreased. The first test analyzed changes in ridership if off-peak frequencies decreased from 15 minutes to 30 minutes (i.e., an off-peak bus passes through a station twice an hour instead of four times an hour). The second test analyzed changes in ridership if peak frequencies increased from 15 minutes to ten minutes (i.e., a peak bus passes through a station six times an hour instead of four times an hour).

Frequency Test 1: Decreased Off-Peak Frequencies

Off-peak Station-to-Station Service ridership decreased across the corridors by 30 to 58 percent when off-peak frequencies were decreased from 15 minutes to 30 minutes, as shown in Figure 15. The decreased frequency scenario was not modeled for TH 169 and TH 65, because the results of the route change sensitivity test was prioritized over the decreased off-peak sensitivity tests for these corridors. The figure also shows that decreasing off-peak frequencies does not change the relative order of the corridors when they are arranged in descending order by Station-to-Station ridership levels (i.e., TH 36 has the highest level of ridership regardless of the frequency change).

Decreasing off-peak frequencies also impacts operating and maintenance costs. When off-peak frequency was decreased from 15 minutes to 30 minutes, annual operating and maintenance costs were reduced between 24 and 27 percent.

Figure 15: Decreased Off-Peak Frequencies: Station-to-Station Ridership by Corridor

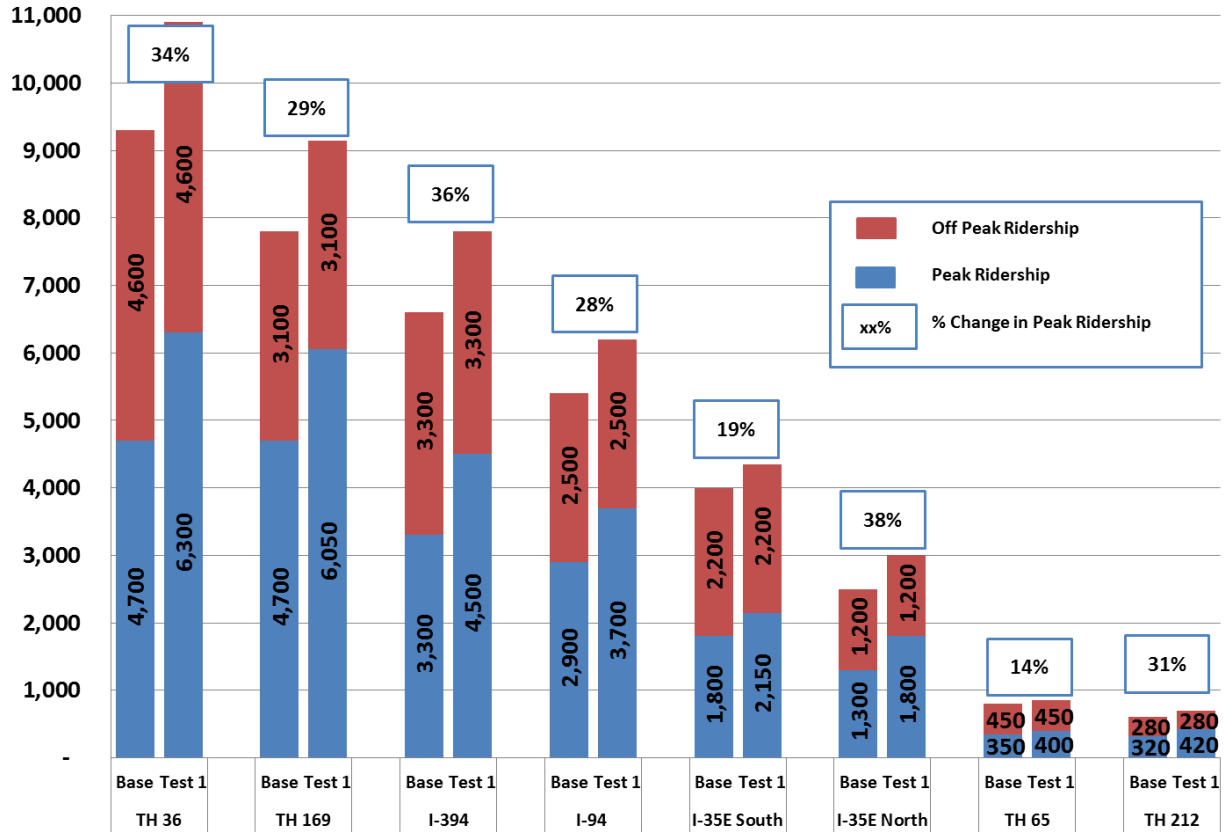


Frequency Test 2: Increased Peak Frequencies

Peak Highway BRT Station-to-Station Service ridership increased across the corridors by 14 to 38 percent when peak frequencies were increased from 15 minutes to 10 minutes, as shown in Figure 16. Similar to the first frequency test, increasing frequencies does not change the relative order of the corridors when they are arranged in descending order by Station-to-Station ridership levels.

Increasing frequencies also impacts operating and maintenance costs. When frequency was increased from 15 minutes to 10 minutes, annual operating and maintenance costs increased between 15 and 18 percent. Increasing frequency also impacted the number of peak buses required between 40 and 60 percent. This would also impact capital costs due to the need for additional vehicles to operate the service.

Figure 16: Increased Peak Frequencies: Station-to-Station Ridership by Corridor



APPENDIX A

CORRIDOR SERVICE PLANS

Trunk Highway 36

New Highway Corridor Station to Station Service

	Hadley Ave.	Century Ave.	White Bear Ave. N.	English St.	Edgerton St.	Rice St.	Dale St.	Rosedale Mall	New Brighton Blvd.	Downtown Minneapolis
Station Type	offline	inline	inline	inline	inline	inline	inline	offline	inline	offline
Incremental Distance	-	0.8	2.0	1.2	1.5	1.5	1.0	2.0	3.4	4.3
Cumulative Distance	-	0.8	2.8	4.0	5.5	7.0	8.0	10.0	13.4	17.7
Peak Period Times										
Incremental Run Time	-	2	4	3	4	4	3	8	7	12
Cumulative Run Time	-	2	6	9	13	17	20	28	35	47
Midday Period Times										
Incremental Run Time	-	2	4	3	3	3	2	8	6	11
Cumulative Run Time	-	2	6	9	12	15	17	25	31	42

Existing Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	Hadley Ave.	Century Ave.	White Bear Ave. N.	English St.	Edgerton St.	Rice St.	Dale St.	Rosedale Mall	New Brighton Blvd.	Destination
261	30	0	0	Shoreview								o	o	Minneapolis
263	15-30	0	0	Rice St. P&R						●	o	o	o	Minneapolis
264	15-30	60	0	I-35W & CR C P&R								●	o	Minneapolis
270	5-15	0	0	Mahtomedi					o	o	o	o	o	Minneapolis
272	60	0	0	Maplewood					o	o	o	o		U of M
● Station Served					o Station Passed but Not Served									

Proposed Corridor Services

Route	Frequency (PK–MD–EVE)			Origin	Hadley Ave.	Century Ave.	White Bear Ave. N.	English St.	Edgerton St.	Rice St.	Dale St.	Rosedale Mall	New Brighton Blvd.	Destination
261	30	0	0	Shoreview								○	○	Minneapolis
263	15-30	0	0	Rice St. P&R						●	○	○	○	Minneapolis
264	15-30	0	0	I-35W & CR C P&R									○	Minneapolis
270	5-15	0	0	Mahtomedi					●	○	○	○	○	Minneapolis
272	60	0	0	Maplewood					●	○	○	○		U of M
● Station Served					**○ Station Passed but Not Served**									

Changes from Existing:

1. Eliminated midday service and Rosedale Mall alignment on Route 264
2. Added stop at Edgerton Street for 270, 272

Connecting Local Route Services

Station	Route	Existing Frequencies Peak	Midday	Comments
Hadley Ave	*Stillwater*	*30*	*30*	*New route from Hadley to Stillwater*
Century Ave	219	30	30	
White Bear Ave.	64	9-14	15	
	80	30	60	
	East 7th ABRT	*10*	*15*	*New ABRT route*
English Street	None	n/a	n/a	
Edgerton	71	15-30	15-30	
Rice Street	62	30	30	
	262	30	--	
Dale Street	65	*20*	*20*	*Freq. modified from 30 to 20 per Green Line Bus Ops plan*
Rosedale Mall	32	30	30	
	65	*20*	*20*	*Freq. modified from 30 to 20 per Green Line Bus Ops plan*
	84	*30*	*30*	*Freq. modified from 15 to 30 per ABRT plans*
	87	*20*	*20*	*Freq. modified from 30 to 20 per Green Line Bus Ops plan*
	223	90	90	
	225	30-60	60	
	227	30	60	
	801	60	60	
	Snelling ABRT	*10*	*10*	*New ABRT route*
New Brighton Blvd.	25	20-30	60	
	118	4 trips	--	
	825	10-20	--	

I-94

New Highway Corridor Station to Station Service

	Hemlock Ln.	CSAH 81/ Bottineau Blvd.	Brooklyn Blvd.	Shingle Creek Pkwy.	49th Ave. N.	Dowling Ave. N.	Lowry Ave. N.	Downtown Minneapolis
Station Type	offline	offline	offline	online	inline	inline	online	offline
Incremental Distance	-	2.9	2.1	1.3	2.7	1.4	0.8	3.5
Cumulative Distance	-	2.9	5.0	6.3	9.0	10.4	11.2	14.7
Peak Period Times								
Incremental Run Time	-	10	9	3	6	3	2	11
Cumulative Run Time	-	10	19	22	28	31	33	44
Midday Period Times								
Incremental Run Time	-	9	8	3	5	3	2	10
Cumulative Run Time	-	9	17	20	25	28	30	40

Existing Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	Hemlock Ln.	CSAH 81/Bottineau Blvd.	Brooklyn Blvd.	Shingle Creek Pkwy.	49th Ave. N.	Dowling Ave. N.	Lowry Ave. N.	Destination
721	30	60	60	Hennepin TC						●	○	Minneapolis
724	30	30	30-60	Oak Grove						●	○	Minneapolis
760	5-30	0	0	Brooklyn Pk			●	○	○	○	○	Minneapolis
761	15-30	0	0	Brooklyn Pk					●	○	○	Minneapolis
762	30	0	0	Brookdale						●	○	Minneapolis
763	30	0	0	Brooklyn Pk					○	○	○	Minneapolis
765	30-60	0	0	Brooklyn Pk					○	○	○	Minneapolis
766	5-10	60-120	60	Champlin					○	○	○	Minneapolis
767	30-60	0	0	Eagle Lake		●	●	○	○	○	○	Minneapolis
780	30	0	0	Maple Grove	○	○	○	○	○	○	○	Minneapolis
781	10-30	120	0	Maple Grove	●	○	○	○	○	○	○	Minneapolis
782	30	0	0	Osseo	○	○	○	○	○	○	○	Minneapolis
783	30	0	0	Weaver Lake	○	○	○	○	○	○	○	Minneapolis
785	15-30	0	0	Maple Grove	○	○	○	○	○	○	○	Minneapolis
789	2 trips	0	0	Maple Grove	●	○	○	○	○	○	○	U of M
850	5-30	0	0	Anoka					○	○	○	Minneapolis
852	30-60	60	60	Ramsey					○	○	○	Minneapolis
854	5-20	0	0	Coon Rapids					○	○	○	Minneapolis
● Station Served				○ Station Passed but Not Served								

Proposed Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	Hemlock Ln.	CSAH 81/Bottineau Blvd.	Brooklyn Blvd.	Shingle Creek Pkwy.	49th Ave. N.	Dowling Ave. N.	Lowry Ave. N.	Destination
721	30	60	60	Hennepin TC						●	○	Minneapolis
724	30	30	30-60	Oak Grove						●	○	Minneapolis
760	5-30	0	0	Brooklyn Pk			●	○	○	○	○	Minneapolis
761	15-30	0	0	Brooklyn Pk					●	○	○	Minneapolis
762	30	0	0	Brookdale						●	○	Minneapolis
763	30	0	0	Brooklyn Pk					●	○	○	Minneapolis
766	5-10	60-120	60	Champlin					●	○	○	Minneapolis
780	30	0	0	Maple Grove	○	○	○	○	○	○	○	Minneapolis
782	30	0	0	Osseo	○	○	○	○	○	○	○	Minneapolis
781	10-30	0	0	Maple Grove	●	○	○	○	○	○	○	Minneapolis
783	30	0	0	Weaver Lake	○	○	○	○	○	○	○	Minneapolis
785	15-30	0	0	Maple Grove	○	○	○	○	○	○	○	Minneapolis
789	2 trips	0	0	Maple Grove	●	○	○	○	○	○	○	U of M
850	5-30	0	0	Anoka					●	○	○	Minneapolis
852	30-60	60	60	Ramsey					●	○	○	Minneapolis
854	5-20	0	0	Coon Rapids					●	○	○	Minneapolis
● Station Served ○ Station Passed but Not Served												

Changes from Existing:

1. Per Bottineau Corridor service plans, Routes 765 and 767 eliminated, replaced with LRT and modified local services.
2. Eliminated midday service on 781 (787 midday frequency improved)
3. Added stop at Hemlock Lane for 783, 785
4. Added stop at 49th Avenue for Routes 763, 766, 850, 852, 854

Connecting Local Route Services

Station	Route	Existing Frequencies Peak	Midday	Comments
Hemlock Lane	787	*30*	*30*	*Improve frequency*
CSAH 81/Bottineau Boulevard	705	60	60	
	716	60	60	
	764	30	--	
	Blue Line LRT	*10*	*15*	
Brooklyn Boulevard	723	60	60	
Shingle Creek Parkway	722	15-30	30	
49th Avenue North	None	n/a	n/a	
Dowling Avenue North	22	11-15	20	
Lowry Avenue North	32	30	30	

TH-65

New Highway Corridor Station to Station Service

	125th Ave. NE	109th Ave. NE	93rd Ln. NE	Osborne Rd. NE	Mississippi St. NE	Moore Lake Dr.	53rd Ave. NE
Station Type	offline	inline	inline	inline	inline	inline	offline
Incremental Distance	-	2.0	2.0	2.3	1.5	0.4	1.1
Cumulative Distance	-	2.0	4.0	6.3	7.8	8.2	9.3
Peak Period Times							
Incremental Run Time	-	4	4	5	4	2	7
Cumulative Run Time	-	4	8	13	17	19	26
Midday Period Times							
Incremental Run Time	-	4	4	4	3	2	6
Cumulative Run Time	-	4	8	12	15	17	23

Existing Corridor Services

Route	Frequency (PK–MD–EVE)			Origin	125th Ave. NE	109th Ave. NE	93rd Ln. NE	Osborne Rd. NE	Mississippi St. NE	Moore Lake Dr.	53rd Ave. NE	Destination
10	7-10	10	30-60	Spring Lk Pk				●		●	●	Minneapolis
59	10-30	0	0	Sand Creek				●	●	●	●	Minneapolis
825	10-20	0	0	Northtown								Minneapolis
865	20	0	0	East Bethel	●	●	●					Minneapolis
● Station Served ○ Station Passed but Not Served												

Proposed Corridor Services

Route	Frequency (PK–MD–EVE)			Origin	125th Ave. NE	109th Ave. NE	93rd Ln. NE	Osborne Rd. NE	Mississippi St. NE	Moore Lake Dr.	53rd Ave. NE	Destination
10	15	15	30-60	Spring Lk Pk				●		●	●	Minneapolis
59	10-30	0	0	Sand Creek				●	●	●	●	Minneapolis
825	10-20	0	0	Northtown								Minneapolis
865	20	0	0	East Bethel	●	●	●					Minneapolis
● Station Served				○ Station Passed but Not Served								

Changes from Existing:

1. Modify Route 10 frequency to 15-15-30 as per ABRT service plan

Connecting Local Route Services

Station	Route	Existing Frequencies Peak	Midday	Comments
125th Avenue NE	854	10-30	--	
	New	30	30	*New service to Anoka via Hwy. 14*
109th Ave. NE	None	n/a	n/a	
93rd Lane NE	831	60	60	
Osborne Road NE	None	n/a	n/a	
Mississippi Street NE	None	n/a	n/a	
Moore Lake Drive	None	n/a	n/a	
53rd Avenue NE	10	*15*	*15*	Frequency reduced upon implementation of Central Avenue BRT
	59	--	--	Route eliminated upon implementation of Central Avenue BRT
	Central Ave. BRT	*7.5*	*15*	New ABRT route

I-35E North

New Highway Corridor Station to Station Service

	Highway 96	County Road E	Little Canada Road	East Larpenteur Avenue	East Maryland Avenue	Downtown St. Paul
Station Type	inline	offline	inline	inline	inline	offline
Incremental Distance	-	2.0	2.9	2.1	1.0	2.7
Cumulative Distance	-	2.0	4.9	7.0	8.0	10.7
Peak Period Times						
Incremental Run Time	-	8	6	5	3	10
Cumulative Run Time	-	8	14	19	22	32
Midday Period Times						
Incremental Run Time		8	5	4	2	9
Cumulative Run Time		8	13	17	19	28

Existing Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	Highway 96	County Rd. E	Little Canada Rd.	E. Larpenteur Ave.	E. Maryland Ave.	Destination
265	30	0	0	White Bear Lake				○	○	St. Paul
275	30-40	0	0	Lino Lakes	●	○	○	○	○	St. Paul
860	15-30	0	0	Coon Rapids				○	○	St. Paul
● Station Served				**○ Station Passed but Not Served**						

Proposed Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	Highway 96	County Rd. E	Little Canada Rd.	E. Larpenteur Ave.	E. Maryland Ave.	Destination
265	30	0	0	White Bear Lake				●	○	St. Paul
275	30-40	0	0	Lino Lakes	●	○	○	○	○	St. Paul
860	15-30	0	0	Coon Rapids				●	○	St. Paul
● Station Served ○ Station Passed but Not Served										

Changes from Existing:

1. Added stop at E. Larpenteur Ave. for Routes 265, 860

Connecting Local Route Services

Station	Route	Existing Frequencies Peak	Midday	Comments
Highway 96	*New*	*30*	*30*	*New connector service from downtown White Bear Lake*
County Road E	None	n/a	n/a	
Little Canada Road	71	15-30	15-30	
	223	90	90	
East Larpenteur Avenue	61	15-30	30	
	68	*30*	30	*Peak frequency reduced upon implementation of Robert Street ABRT*
	71	15-30	15-30	
East Maryland Avenue	68	*30*	30	*Peak frequency reduced upon implementation of Robert Street ABRT*
	71	15-30	15-30	

I-35E South

New Highway Corridor Station to Station Service

	167th St. W.	Burnsville Center	Nicollet Ave.	CSAH 11	Cedar Ave.	Cliff Rd.	Yankee Doodle Rd.	Lone Oak Rd.	W. 7th St.	Downtown St. Paul
Station Type	inline	offline	inline	inline	inline	offline	offline	inline	inline	offline
Incremental Distance	-	2.8	0.7	1.8	3.1	1.4	3.6	1.1	5.1	4.7
Cumulative Distance	-	2.8	3.5	5.3	8.4	9.8	13.4	14.5	19.6	24.3
Peak Period Times										
Incremental Run Time	-	11	2	5	7	8	12	3	11	14
Cumulative Run Time	-	11	13	18	25	33	45	48	59	73
Midday Period Times										
Incremental Run Time		9	2	3	5	7	10	2	8	11
Cumulative Run Time		9	11	14	19	26	36	38	46	57

Existing Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	167th St. W.	Burnsville Center	Nicollet Ave.	CSAH 11	Cedar Ave.	Cliff Rd.	Yankee Doodle Rd.	Lone Oak Rd.	W. 7th St.	Destination
480	30	0	0	Apple Valley					●	●	●	○	○	St. Paul
484	30	0	0	Eagan							●	●	○	St. Paul
489	30-60	0	0	Burr Oaks								●	○	St. Paul
● Station Served ○ Station Passed but Not Served														

Proposed Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	167th St. W.	Burnsville Center	Nicollet Ave.	CSAH 11	Cedar Ave.	Cliff Rd.	Yankee Doodle Rd.	Lone Oak Rd.	W. 7th St.	Destination
480	15	0	0	Apple Valley					●	●	●	○	○	St. Paul
484	15	0	0	Eagan							●	●	○	St. Paul
489	30-60	0	0	Burr Oaks								●	○	St. Paul
● Station Served ○ Station Passed but Not Served														

- Peak frequency improvement on Routes 480 and 484 from CMAQ Grant

Connecting Services

Station	Route	Existing Frequencies Peak	Midday	Comments
167th Street West	None	n/a	n/a	
Burnsville Center	426	30	n/a	*Extend to Burnsville Center*
	442	30	30	*Extend to Glendale*
	444	30	30	
	Orange Line BRT	*15*	*15*	
Nicollet Avenue	442	30	30	*Extend to Glendale*
CSAH 11	442	30	30	*Extend to Glendale*
	476	20-30	--	
Cedar Avenue	438	60	60	
	472	10-20	--	
	Red Line BRT	15	15	
Cliff Road	440	30	60	
	472	10-20	--	
Yankee Doodle Road	437	30	--	
	445	30-60	60	
	446	30	60	
	470	10-20	--	
Lone Oak Road	446	30	60	
West 7th Street	54	--	--	*Eliminated upon implementation of West 7th Street ABRT*
	W. 7th St. ABRT	*10*	*15*	*Proposed ABRT Route*

I-394

New Highway Corridor Station to Station Service

	Central Ave./ CSAH 101	Carlson Pkwy.	Plymouth Rd.	Hopkins Crossroad	General Mills Blvd.	Louisiana Ave. S.	Park Place Blvd.	Downtown Minneapolis
Station Type	offline	offline	offline	offline	offline	offline	inline	offline
Incremental Distance	-	1.7	1.2	1.2	1.5	1.0	1.0	5.0
Cumulative Distance	-	1.7	2.9	4.1	5.6	6.6	7.6	12.6
Peak Period Times								
Incremental Run Time	-	9	5	8	9	7	3	17
Cumulative Run Time	-	9	14	22	31	38	41	58
Midday Period Times								
Incremental Run Time	-	7	4	7	7	6	2	12
Cumulative Run Time	-	7	11	18	25	31	33	45

Existing Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	Central Ave./CSAH 101	Carlson Pkwy.	Plymouth Rd.	Hopkins Crossroad	General Mills Blvd.	Louisiana Ave.	Park Place Blvd.	Destination
490	10-20	0	0	Prior Lake					○	○	○	Minneapolis
649	30	0	0	St Louis Park						●	●	Minneapolis
652	10-60	0	0	Plymouth Rd			●	○	○	○	○	U of M
663	15-30	0	0	Cedar Lake						●	○	Minneapolis
665	30-35	0	0	Hopkins					○	○	○	Minneapolis
667	10-60	0	0	Minnetonka							●	Minneapolis
670	30	0	0	Navarre					○	○	○	Minneapolis
671	25-35	0	0	Excelsior			●	○	○	○	○	Minneapolis
672	15-60	0	0	Wayzata	●	●	●	○	●	●	○	Minneapolis
673	10-30	0	0	Zachary Ln				●	○	○	○	Minneapolis
674	25-35	0	0	Forest Lake	●	○	○	○	○	○	○	Minneapolis
675	30-60	30-60	60	Mound	●	●	●	●	●	●	○	Minneapolis
677	30	0	0	Mound	●	○	●	○	○	●	○	Minneapolis
680	1 trip	0	0	Eden Prairie					○	○	○	Minneapolis
690	5-15	0	0	Eden Prairie					○	○	○	Minneapolis
691	1 trip	0	0	Chaska					○	○	○	Minneapolis
692	15-25	0	0	Chanhassen					○	○	○	Minneapolis
698	30-60	60	30-60	Chaska					○	○	○	U of M
699	10-20	0	0	Chaska					○	○	○	Minneapolis
742	45-60	0	0	Bass Lake					○	○	○	Minneapolis
747	25-30	0	0	Plymouth				●	○	○	○	Minneapolis
756	25-35	0	0	New Hope					●	●	○	Minneapolis
772	20-30	0	0	Plymouth				●	○	○	○	Minneapolis
774	60	0	0	Plymouth				●	○	○	○	Minneapolis
776	15-30	0	0	Vicksburg Ln	●	○	○	○	○	○	○	Minneapolis
777	25-30	0	0	Plymouth				●	○	○	○	Minneapolis
790	15-20	0	0	Bass Lake					○	○	○	Minneapolis
793	30-60	0	0	Plymouth					○	○	○	Minneapolis
795	0	120	0	Plymouth				●	○	○	○	Minneapolis
● Station Served					**○ Station Passed but Not Served**							

Proposed Express Route Corridor Services

Route	Frequency (PK–MD–EVE)			Origin	Central Ave./CSAH 101	Carlson Pkwy.	Plymouth Rd.	Hopkins Crossroad	General Mills Blvd.	Louisiana Ave.	Park Place Blvd.	Destination
490	10-20	0	0	Prior Lake					●	○	○	Minneapolis
649	30	0	0	St Louis Park						●	●	Minneapolis
652	10-60	0	0	Plymouth Rd			●	○	○	○	○	U of M
663	15-30	0	0	Cedar Lake						●	○	Minneapolis
665	30-35	0	0	Hopkins					●	○	○	Minneapolis
667	10-20	0	0	Minnetonka							●	Minneapolis
671	25-35	0	0	Excelsior			●	○	○	○	○	Minneapolis
672	15-60	0	0	Wayzata	●	●	●	○	●	●	○	Minneapolis
673	10-30	0	0	Zachary Ln				●	○	○	○	Minneapolis
674	25-35	0	0	Forest Lake	●	○	○	○	○	○	○	Minneapolis
677	30	0	0	Mound	●	○	●	○	○	●	○	Minneapolis
680	1 trip	0	0	Eden Prairie					●	○	○	Minneapolis
690	5-15	0	0	Eden Prairie					●	○	○	Minneapolis
691	1 trip	0	0	Chaska					●	○	○	Minneapolis
692	15-25	0	0	Chanhassen					●	○	○	Minneapolis
698	30-60	60	30-60	Chaska					●	○	○	U of M
699	10-20	0	0	Chaska					●	○	○	Minneapolis
742	45-60	0	0	Bass Lake					●	○	○	Minneapolis
747	25-30	0	0	Plymouth				●	○	○	○	Minneapolis
756	25-35	0	0	New Hope					●	●	○	Minneapolis
772	20-30	0	0	Plymouth				●	○	○	○	Minneapolis
774	60	0	0	Plymouth				●	○	○	○	Minneapolis
776	15-30	0	0	Vicksburg Ln	●	○	○	○	○	○	○	Minneapolis
777	25-30	0	0	Plymouth				●	○	○	○	Minneapolis
790	15-20	0	0	Bass Lake					●	○	○	Minneapolis
793	30-60	0	0	Plymouth					●	○	○	Minneapolis
795	0	120	0	Plymouth				●	○	○	○	Minneapolis
● Station Served					**○ Station Passed but Not Served**							

Changes from Existing:

1. Route 675 eliminated and replaced with new corridor HCTS service
2. Added stop at General Mills Blvd. for 490, 665, 680, 690, 691, 692, 698, 699, 742, 790, 793
3. Other alignment, frequency adjustments per the Southwest LRT Bus Ops Plan

Connecting Local Route Services

Station	Route	Existing Frequencies Peak	Midday	Comments
Central Avenue/CSAH 101	*New*	*30*	*30*	*Eliminate Route 675 and replace with circulator between Mounds and Central Avenue/CSAH 101 Station*
Carlson Parkway	None	n/a	n/a	
Plymouth Road	None	n/a	n/a	
Hopkins Crossroad	615	*30*	60	*Frequency changes as per the Southwest LRT Bus Ops Plan*
General Mills Boulevard	None	n/a	n/a	
Louisiana Avenue South	9	--	--	*Replaced by Route 601 is Southwest LRT Bus Ops Plan*
	601	*30*	*30*	*New crosstown route between West Lake Station and Southdale Transit Center as per the Southwest LRT Bus Ops Plan*
	604	*30*	*30*	*Frequency changes as per the Southwest LRT Bus Ops Plan*
	643	30	--	
	705	60	60	
Park Place Boulevard	9	15-20	*20*	*Frequency changes as per the Southwest LRT Bus Ops Plan*
	601	*30*	*30*	*New crosstown route between West Lake Station and Southdale Transit Center as per the Southwest LRT Bus Ops Plan*
	604	--	--	*Segment replaced by new Route 601 as per the Southwest LRT Bus Ops Plan*
	643	30	--	

US 169

New Highway Corridor Station to Station Service

	Marschall Rd.	Seagate Technology Park & Ride	Southbridge Crossing P&R	Pioneer Tr.	Viking Dr./ Washington Ave.	Golden Triangle Station	Bren Rd. W.	TH 7	General Mills Blvd.	Louisiana Ave. S.	Park Place Blvd.	Downtown Minneapolis
Station Type	offline	offline	offline	offline	inline	inline	inline	inline	offline	offline	inline	offline
Incremental Distance	-	1.7	3.0	3.7	3.3	1.6	2.6	2.5	1.5	1.0	1.0	5.0
Cumulative Distance	-	1.7	4.7	8.4	11.7	13.3	15.9	18.4	19.9	20.9	21.9	26.9
Peak Period Times												
Incremental Run Time	-	8	11	12	8	4	6	6	8	7	3	15
Cumulative Run Time	-	8	19	31	39	43	49	55	63	70	73	88
Midday Period Times												
Incremental Run Time	-	7	9	10	5	3	4	4	7	6	2	12
Cumulative Run Time	-	7	16	26	31	34	38	42	49	55	57	69

Existing Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	Marschall Rd.	Seagate Technology P&R	Southbridge Crossing P&R	Pioneer Tr.	Viking Dr./Washington Ave.	Golden Triangle	Bren Rd. W.	TH 7	Destination
490	10-20	0	0	Prior Lake			●	○	○		○	○	Minneapolis
665	30-35	0	0	Hopkins								○	Minneapolis
670	30	0	0	Navarre								●	Minneapolis
680	1 trip	0	0	Eden Prairie					○	●	○	○	Minneapolis
690	5-15	0	0	Eden Prairie						●	○	○	Minneapolis
691	1 trip	0	0	Chaska						●	○	○	Minneapolis
692	15-25	0	0	Chanhassen							○	○	Minneapolis
698	30-60	60	30-60	Chaska						●	○	○	U of M
699	10-20	0	0	Chaska							○	○	Minneapolis

● Station Served **○ Station Passed but Not Served**

Proposed Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	Marschall Rd.	Seagate Technology P&R	Southbridge Crossing P&R	Pioneer Tr.	Viking Dr./Washington Ave.	Golden Triangle	Bren Rd. W.	TH 7	Destination
490	10-20	0	0	Prior Lake			●	○	○		○	○	Minneapolis
665	30-35	0	0	Hopkins								●	Minneapolis
670	30	0	0	Navarre								●	Minneapolis
680	1 trip	0	0	Eden Prairie					○	●	○	○	Minneapolis
690	5-15	0	0	Eden Prairie						●	○	○	Minneapolis
691	1 trip	0	0	Chaska						●	○	○	Minneapolis
692	15-25	0	0	Chanhassen							●	○	Minneapolis
699	10-20	0	0	Chaska							●	○	Minneapolis
● Station Served ○ Station Passed but Not Served													

Changes from Existing:

1. Added stop at TH 7 for Route 665
2. Added stop at Bren Road W. for Routes 692, 699
3. Per US 212 Corridor plans, Route 698 is eliminated, replaced with new Chanhassen Circulator service.

Connecting Local Route Services

Station	Route	Existing Frequencies Peak	Midday	Comments
Marschall Road	496	60	60	
	498	60	--	
Seagate Technology Park & Ride	496	60	60	
	498	60	--	
Southridge Crossing Park & Ride	496	60	60	
	498	60	--	
Pioneer Trail	589	60	--	
Viking Drive/Washington Avenue	684	60	--	
	American Blvd. ABRT	*15*	*15*	*New ABRT route*
Golden Triangle	684	60	--	
	Green Line LRT	*10*	*15*	
Bren Road	12	15-20	30	
	146	15-30	--	
	568	1 trip	--	
TH 7	17	15	30	*Extend to serve TH 7 Station*
	615	60	60	*Extend to serve TH 7 Station*
	667	30-60	--	*Extend to serve TH 7 Station*
	668	30	--	*Extend to serve TH 7 Station*

US 212

New Highway Corridor Station to Station Service

	TH 41	Great Plains Blvd.	Eden Prairie Rd.	Southwest Transit Center
Station Type	offline	offline	inline	offline
Incremental Distance	-	3.9	2.7	2.4
Cumulative Distance	-	3.9	6.6	9
Peak Period Times				
Incremental Run Time	-	12	6	9
Cumulative Run Time	-	12	18	27
Midday Period Times				
Incremental Run Time	-	10	5	8
Cumulative Run Time	-	10	15	23

Existing Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	TH 41	Great Plains Blvd.	Eden Prairie Rd.	Southwest Transit Center	Destination
690	5-15	0	0	Chanhassen		●	○	●	Minneapolis
691	1 trip	0	0	Chaska	●	●	○	●	Minneapolis
695	15-35	0	0	Chanhassen		●	○	●	Minneapolis
698	30-60	60	30-60	Chaska	●	●	○	●	U of M
699	10-20	0	0	Chaska	●	●	○	○	Minneapolis
● Station Served ○ Station Passed but Not Served									

Proposed Corridor Express Route Services

Route	Frequency (PK–MD–EVE)			Origin	TH 41	Great Plains Blvd.	Eden Prairie Rd.	Southwest Transit Center	Destination
690	5-15	0	0	Chanhassen		●	○	●	Minneapolis
691	1 trip	0	0	Chaska	●	●	○	●	Minneapolis
695	15-35	0	0	Chanhassen		●	○	●	Minneapolis
699	10-20	0	0	Chaska	●	●	○	○	Minneapolis
● Station Served				**○ Station Passed but Not Served**					

Changes from Existing:

1. Convert Route 698 to a local route (labeled as Chanhassen Circulator in table below)

Connecting Local Route Services

Station	Route	Existing Frequencies Peak	Midday	Comments
TH 41				
Great Plains Boulevard	*New*	*30*	*30*	*Chanhassen Circulator*
Eden Prairie Road				
Southwest Transit Center	684	60	--	
	American Blvd. ABRT	*15*	*15*	
	Green Line LRT	*10*	*15*	

APPENDIX B

CAPITAL COST ESTIMATES

BRT Cost Estimate Summary

Note: Costs estimates developed for this study are high-level and should be used for comparison purposes only. More detailed design is necessary to develop more detailed and precise cost information.

Corridor	Corridor Improvement	BRT Station	BRT Maintenance Facility	Right of Way	Vehicles	Soft Costs	25% Contingency	Corridor Total Cost (2013$)
MN 36	$402,000	$18,533,000	$3,000,000	$1,584,000	$6,120,000	$6,954,000	$9,149,000	$45,742,000
I-94	$5,040,000	$48,154,000	$2,700,000	$792,000	$5,508,000	$16,404,000	$19,650,000	$98,248,000
TH 65	$0	$11,815,000	$2,400,000	$0	$3,672,000	$4,234,000	$5,531,000	$27,652,000
I-35E North	$0	$9,701,000	$2,400,000	$0	$3,672,000	$3,633,000	$4,852,000	$24,258,000
I-35E South	$0	$13,723,000	$4,800,000	$0	$8,568,000	$5,708,000	$8,200,000	$40,999,000
I-394	$0	$20,547,000	$3,300,000	$0	$6,732,000	$7,133,000	$9,428,000	$47,140,000
169-394	$229,000	$15,081,000	$5,100,000	$0	$10,404,000	$6,337,000	$9,288,000	$46,439,000
US 212	$0	$3,989,000	$1,800,000	$0	$3,672,000	$1,834,000	$2,824,000	$14,119,000

Corridor	Total # of Stations	Total # of Inline Stations	Total # of Online Stations	Total # of Offline Stations	Total # of Buses	Total Length (miles)
MN 36	9	14	0	2	10	13.3
I-94	7	4	2	3	9	11.2
TH 65	7	12	0	1	6	9.3
I-35E North	5	6	0	2	6	8.1
I-35E South	9	10	0	4	14	19.6
I-394	7	2	0	8	11	7.6
169-394	11	8	0	9	17	20.4
US 212	4	2	0	3	6	9

Cost Estimate Assumptions

1. Existing shoulders are assumed to be used for all BRT corridors. No additional corridor improvement costs are assumed for this type of corridor.
2. Local bus amenities are not included as part of this estimate.
3. Right-of-way costs are inlcuded for future park-and-ride lots at Hemlock Lane/I-94 and Hadley Avenue/MN 36.
4. Downtown station improvements are not included as part of this estimate.
5. Sidewalk improvements include the full reconstruction of the existing sidewalk and roadway curb/gutter within the limits of the 80' platform.
6. Power line relocation costs are not included as part of this estimate. It is assumed that station construction would not impact the existing lines.
7. In-slab radiant heat in the platform sidewalk areas is not included as part of this estimate.
8. All shelters are assumed to be medium size with a windscreen. Shelter configuration is similar in concept to those developed as part of ATCS.
9. Pavement within platform area is assumed to be concrete pavement.
10. Transit signal priority (TSP) costs were not included as part of this estimate.
11. The total corridor length is measured from the end of line station to the station nearest downtown.
12. One Existing traffic signal pole has been assumed to be relocated at all Nearside Inline stations.
13. TVM's are provided at each station location.
14. Station shelter costs include the following amenities:
    - Trash Receptacles - 2
    - Bike Racks - 2
15. Bus costs include the costs for two on-board validators.
16. Future Park and Ride costs are not included as part of this estimate, except at Hadley Avenue on TH 36 and Hemlock Lane on I-94.
17. Traffic control costs assume the temporary closure of the off/on ramp during construction for Inline stations.
18. Bus maintenance facility improvements are included as a cost/bus cost

I-94 Corridor

		Inline	Online	Offline
Length (mi)	11.2			
No. of Stations	7	4	2	3

Item No.	Item Description	Quantity	Unit	Unit Cost	Cost	Allocated	Final Cost
Corridor Improvement					**$4,200,000**	**$840,000**	**$5,040,000**
1	Slip Ramp	1500	LF	$200.00	$300,000	$60,000	$360,000
2	Earthwork(Import/Excavation & Embankment)	10000	CY	$15.00	$150,000	$30,000	$180,000
3	Retaining Wall	15000	SF	$150.00	$2,250,000	$450,000	$2,700,000
4	Modify Existing Bridge Abutment (I-694)	1	LS	$1,500,000.00	$1,500,000	$300,000	$1,800,000
BRT Station					**$40,129,000**	**$8,025,000**	**$48,154,000**
5	Station (Shelter and Amenities)	11	EA	$350,000.00	$3,850,000	$770,000	$4,620,000
6	Inline Station Platform	4	EA	$24,000.00	$96,000	$19,000	$115,000
7	Offline Station Platform	3	EA	$34,000.00	$102,000	$20,000	$122,000
8	Nearside Roadway Improvements	2	EA	$240,000.00	$480,000	$96,000	$576,000
9	Farside Roadway Improvements	2	EA	$92,000.00	$184,000	$37,000	$221,000
10	Online Station (Shingle Creek Pkwy)	1	LS	$22,800,000.00	$22,800,000	$4,560,000	$27,360,000
11	Online Station (Lowry Ave N)	1	LS	$6,200,000.00	$6,200,000	$1,240,000	$7,440,000
12	Structured Park and Ride Lot (Hemlock Ln)	300	STALL	$15,000.00	$4,500,000	$900,000	$5,400,000
13	Additional Earthwork/Retaining Walls (Major)	0	EA	$390,000.00	$0	$0	$0
14	Additional Earthwork/Retaining Walls (Minor)	3	EA	$100,000.00	$300,000	$60,000	$360,000
15	Utilities and Drainage Improvements (Major)	1	EA	$20,000.00	$20,000	$4,000	$24,000
16	Utilities and Drainage Improvements (Minor)	3	EA	$4,000.00	$12,000	$2,000	$14,000
17	Traffic Control (Inline/Online)	5	EA	$30,000.00	$150,000	$30,000	$180,000
18	Traffic Control (Offline)	3	EA	$10,000.00	$30,000	$6,000	$36,000
19	Traffic Control (Shingle Creek Pkwy)	1	EA	$75,000.00	$75,000	$15,000	$90,000
20	Platform Systems Allowance	7	EA	$190,000.00	$1,330,000	$266,000	$1,596,000
BRT Maintenance Facility					**$2,250,000**	**$450,000**	**$2,700,000**
21	BRT Maintenance Facility	9	EA	$250,000.00	$2,250,000	$450,000	$2,700,000
Total Construction Costs					$46,579,000	$9,315,000	$55,894,000
Right of Way					**$660,000**	**$132,000**	**$792,000**
22	Commercial	3	ACRE	$220,000.00	$660,000	$132,000	$792,000
23	Residential		ACRE	$0.00	$0	$0	$0
Vehicles					**$4,590,000**	**$918,000**	**$5,508,000**
24	Low Floor 40-foot Buses	9	EA	$502,000.00	$4,518,000	$904,000	$5,422,000
25	Low Floor 60-foot Buses		EA	$854,000.00	$0	$0	$0
26	Hybrid buses		EA	$1,107,000.00	$0	$0	$0
27	On-Board Go To Validator (per bus door)	18	EA	$4,000.00	$72,000	$14,000	$86,000
Soft Costs							**$16,404,000**
28	Preliminary Engineering						$1,863,000
29	Final Design						$2,854,000
30	Project Management for Design and Construction						$1,037,000
31	Construction Administration and Management						$3,733,000
32	Insurance						$1,863,000
33	Legal; Permits; Review Fees by Other Agencies						$499,000
34	Surveys, Testing, Investigation, Inspection						$1,089,000
35	Agency Force Account Work						$2,907,000
36	Public Art						$559,000
25% Contingency							**$19,650,000**
I-94 Total Cost							**$98,248,000**

Station Location	Inline Station (Nearside)	Inline Station (Farside)	Online Station	Offline Station	Add. Earthwork/Ret. Walls (Minor)	Util & Drainage (Major)	Util & Drainage (Minor)
Hemlock Ln				1			
CSAH 81/Bottineau Blvd				1			
Brooklyn Blvd				1			
Shingle Creek Pkwy			1				
49th Ave N	1	1			2		2
Dowling Ave N	1	1			1	1	1
Lowry Ave N			1				
TOTAL	**2**	**2**	**2**	**3**	**3**	**1**	**3**

TH 65 Corridor

		Inline	Online	Offline
Length (mi)	9.3			
No. of Stations	7	12	0	1

Item No.	Item Description	Quantity	Unit	Unit Cost	Cost	Allocated	Final Cost
Corridor Improvement					**$0**	**$0**	**$0**
1	Slip Ramp	0	LF	$200.00	$0	$0	$0
2	Earthwork(Import/Excavation & Embankment)	0	CY	$15.00	$0	$0	$0
3	Retaining Wall	0	SF	$150.00	$0	$0	$0
BRT Station					**$9,845,000**	**$1,970,000**	**$11,815,000**
4	Station (Shelter and Amenities)	13	EA	$350,000.00	$4,550,000	$910,000	$5,460,000
5	Inline Station Platform	12	EA	$24,000.00	$288,000	$58,000	$346,000
6	Offline Station Platform	1	EA	$34,000.00	$34,000	$7,000	$41,000
7	Nearside Roadway Improvements	0	EA	$240,000.00	$0	$0	$0
8	Farside Roadway Improvements	12	EA	$92,000.00	$1,104,000	$221,000	$1,325,000
9	Additional Earthwork/Retaining Walls (Major)	0	EA	$390,000.00	$0	$0	$0
10	Additional Earthwork/Retaining Walls (Minor)	10	EA	$100,000.00	$1,000,000	$200,000	$1,200,000
11	Utilities and Drainage Improvements (Major)	9	EA	$20,000.00	$180,000	$36,000	$216,000
12	Utilities and Drainage Improvements (Minor)	2	EA	$4,000.00	$8,000	$2,000	$10,000
13	Pedestrian Improvements (TH 65)	1	EA	$21,000.00	$21,000	$4,000	$25,000
14	Traffic Control (Inline/Online)	0	EA	$15,000.00	$0	$0	$0
15	Traffic Control (Offline)	1	EA	$10,000.00	$10,000	$2,000	$12,000
16	Traffic Control (TH 65)	12	EA	$15,000.00	$180,000	$36,000	$216,000
17	Platform Systems Allowance	13	EA	$190,000.00	$2,470,000	$494,000	$2,964,000
BRT Maintenance Facility					**$2,000,000**	**$400,000**	**$2,400,000**
18	BRT Maintenance Facility	8	EA	$250,000.00	$2,000,000	$400,000	$2,400,000
Total Construction Costs					$11,845,000	$2,370,000	$14,215,000
Right of Way					**$0**	**$0**	**$0**
19	Commercial		ACRE	$220,000.00	$0	$0	$0
20	Residential		ACRE	$0.00	$0	$0	$0
Vehicles					**$3,060,000**	**$612,000**	**$3,672,000**
21	Low Floor 40-foot Buses	6	EA	$502,000.00	$3,012,000	$602,000	$3,614,000
22	Low Floor 60-foot Buses		EA	$854,000.00	$0	$0	$0
23	Hybrid buses		EA	$1,107,000.00	$0	$0	$0
24	On-Board Go To Validator (per bus door)	12	EA	$4,000.00	$48,000	$10,000	$58,000
Soft Costs							**$4,234,000**
25	Preliminary Engineering						$474,000
26	Final Design						$741,000
27	Project Management for Design and Construction						$298,000
28	Construction Administration and Management						$948,000
29	Insurance						$474,000
30	Legal; Permits; Review Fees by Other Agencies						$118,000
31	Surveys, Testing, Investigation, Inspection						$298,000
32	Agency Force Account Work						$741,000
33	Public Art						$142,000
25% Contingency							**$5,531,000**
TH 65 Total Cost							**$27,652,000**

Station Location	Inline Station (Farside)	Offline Station	Add. Earthwork/Ret. Walls (Minor)	Util & Drainage (Major)	Util & Drainage (Minor)	Ped. Improv. (TH 65)
125 Ave NE		1				
109 Ave NE	2		2	2		
93rd La NE	2		1		1	1
Osborne Rd NE	2		2	2		
Mississippi St NE	2		2	2		
Moore Lake Dr	2		2	2		
53rd Ave NE	2		1	1	1	
TOTAL	**12**	**1**	**10**	**9**	**2**	**1**

MN 36 Corridor

		Inline	Online	Offline
Length (mi)	13.3			
No. of Stations	9	14	0	2

Item No.	Item Description	Quantity	Unit	Unit Cost	Cost	Allocated	Final Cost
Corridor Improvement					**$335,000**	**$67,000**	**$402,000**
1	Slip Ramp	700	LF	$200.00	$140,000	$28,000	$168,000
2	Earthwork(Import/Excavation & Embankment)	13000	CY	$15.00	$195,000	$39,000	$234,000
3	Retaining Wall	0	SF	$150.00	$0	$0	$0
BRT Station					**$15,444,000**	**$3,089,000**	**$18,533,000**
4	Station (Shelter and Amenities)	16	EA	$350,000.00	$5,600,000	$1,120,000	$6,720,000
5	Inline Station Platform	14	EA	$24,000.00	$336,000	$67,000	$403,000
6	Offline Station Platform	2	EA	$34,000.00	$68,000	$14,000	$82,000
7	Nearside Roadway Improvements	10	EA	$240,000.00	$2,400,000	$480,000	$2,880,000
8	Farside Roadway Improvements	4	EA	$92,000.00	$368,000	$74,000	$442,000
9	Surface Park and Ride Lot (Hadley Ave)	300	EA	$4,000.00	$1,200,000	$240,000	$1,440,000
10	Additional Earthwork/Retaining Walls (Major)	3	EA	$390,000.00	$1,170,000	$234,000	$1,404,000
11	Additional Earthwork/Retaining Walls (Minor)	7	EA	$100,000.00	$700,000	$140,000	$840,000
12	Utilities and Drainage Improvements (Major)	1	EA	$20,000.00	$20,000	$4,000	$24,000
13	Utilities and Drainage Improvements (Minor)	5	EA	$4,000.00	$20,000	$4,000	$24,000
14	Pedestrian Improvements (Major)	2	EA	$36,000.00	$72,000	$14,000	$86,000
15	Pedestrian Improvements (Minor)	1	EA	$10,000.00	$10,000	$2,000	$12,000
16	Traffic Control (Inline/Online)	14	EA	$30,000.00	$420,000	$84,000	$504,000
17	Traffic Control (Offline)	2	EA	$10,000.00	$20,000	$4,000	$24,000
18	Platform Systems Allowance	16	EA	$190,000.00	$3,040,000	$608,000	$3,648,000
BRT Maintenance Facility					**$2,500,000**	**$500,000**	**$3,000,000**
19	BRT Maintenance Facility	10	EA	$250,000.00	$2,500,000	$500,000	$3,000,000
Total Construction Costs					$18,279,000	$3,656,000	$21,935,000
Right of Way					**$1,320,000**	**$264,000**	**$1,584,000**
20	Commercial	6	ACRE	$220,000.00	$1,320,000	$264,000	$1,584,000
21	Residential		ACRE	$0.00	$0	$0	$0
Vehicles					**$5,100,000**	**$1,020,000**	**$6,120,000**
22	Low Floor 40-foot Buses	10	EA	$502,000.00	$5,020,000	$1,004,000	$6,024,000
23	Low Floor 60-foot Buses		EA	$854,000.00	$0	$0	$0
24	Hybrid buses		EA	$1,107,000.00	$0	$0	$0
25	On-Board Go To Validator (per bus door)	20	EA	$4,000.00	$80,000	$16,000	$96,000
Soft Costs							**$6,954,000**
26	Preliminary Engineering						$731,000
27	Final Design						$1,174,000
28	Project Management for Design and Construction						$494,000
29	Construction Administration and Management						$1,476,000
30	Insurance						$731,000
31	Legal; Permits; Review Fees by Other Agencies						$249,000
32	Surveys, Testing, Investigation, Inspection						$600,000
33	Agency Force Account Work						$1,280,000
34	Public Art						$219,000
25% Contingency							**$9,149,000**
MN 36 Total Cost							**$45,742,000**

Station Location	**Inline Station (Nearside)**	**Inline Station (Farside)**	**Offline Station**	**Add. Earthwork/Ret. Walls (Major)**	**Add. Earthwork/Ret. Walls (Minor)**	**Util & Drainage (Major)**	**Util & Drainage (Minor)**	**Ped. Improv. (Major)**	**Ped. Improv. (Minor)**
Hadley Ave			1						
Division St N		2			1				1
White Bear Ave N	2				1		1		
English St	1	1		2			2	1	
Edgerton St	2			1	1				
Rice St	2				1	1	1		
Dale St	1	1			2				
Rosedale Mall			1						
N Brighton Rd	2				1		1	1	
TOTAL	**10**	**4**	**2**	**3**	**7**	**1**	**5**	**2**	**1**

I-35 E North Corridor

		Inline	Online	Offline
Length (mi)	8.1			
No. of Stations	5	6	0	2

Item No.	Item Description	Quantity	Unit	Unit Cost	Cost	Allocated	Final Cost
Corridor Improvement					**$0**	**$0**	**$0**
1	Slip Ramp	0	LF	$200.00	$0	$0	$0
2	Earthwork(Import/Excavation & Embankment)	0	CY	$15.00	$0	$0	$0
3	Retaining Wall	0	SF	$150.00	$0	$0	$0
BRT Station					**$8,084,000**	**$1,617,000**	**$9,701,000**
4	Station (Shelter and Amenities)	8	EA	$350,000.00	$2,800,000	$560,000	$3,360,000
5	Inline Station Platform	6	EA	$24,000.00	$144,000	$29,000	$173,000
6	Offline Station Platform	2	EA	$34,000.00	$68,000	$14,000	$82,000
7	Nearside Roadway Improvements	5	EA	$240,000.00	$1,200,000	$240,000	$1,440,000
8	Farside Roadway Improvements	1	EA	$92,000.00	$92,000	$18,000	$110,000
9	Additional Earthwork/Retaining Walls (Major)	4	EA	$390,000.00	$1,560,000	$312,000	$1,872,000
10	Additional Earthwork/Retaining Walls (Minor)	1	EA	$100,000.00	$100,000	$20,000	$120,000
11	Utilities and Drainage Improvements (Major)	0	EA	$20,000.00	$0	$0	$0
12	Utilities and Drainage Improvements (Minor)	4	EA	$4,000.00	$16,000	$3,000	$19,000
13	Pedestrian Improvements (With bridge modifications)	1	EA	$384,000.00	$384,000	$77,000	$461,000
14	Traffic Control (Inline/Online)	6	EA	$30,000.00	$180,000	$36,000	$216,000
15	Traffic Control (Offline)	2	EA	$10,000.00	$20,000	$4,000	$24,000
16	Platform Systems Allowance	8	EA	$190,000.00	$1,520,000	$304,000	$1,824,000
BRT Maintenance Facility					**$2,000,000**	**$400,000**	**$2,400,000**
17	BRT Maintenance Facility	8	EA	$250,000.00	$2,000,000	$400,000	$2,400,000
Total Construction Costs					$10,084,000	$2,017,000	$12,101,000
Right of Way					**$0**	**$0**	**$0**
18	Commercial		ACRE	$220,000.00	$0	$0	$0
19	Residential		ACRE	$0.00	$0	$0	$0
Vehicles					**$3,060,000**	**$612,000**	**$3,672,000**
20	Low Floor 40-foot Buses	6	EA	$502,000.00	$3,012,000	$602,000	$3,614,000
21	Low Floor 60-foot Buses		EA	$854,000.00	$0	$0	$0
22	Hybrid buses		EA	$1,107,000.00	$0	$0	$0
23	On-Board Go To Validator (per bus door)	12	EA	$4,000.00	$48,000	$10,000	$58,000
Soft Costs							**$3,633,000**
24	Preliminary Engineering						$403,000
25	Final Design						$636,000
26	Project Management for Design and Construction						$263,000
27	Construction Administration and Management						$807,000
28	Insurance						$403,000
29	Legal; Permits; Review Fees by Other Agencies						$101,000
30	Surveys, Testing, Investigation, Inspection						$263,000
31	Agency Force Account Work						$636,000
32	Public Art						$121,000
25% Contingency							**$4,852,000**
I-35E North Total Cost							**$24,258,000**

Station Location	**Inline Station (Nearside)**	**Inline Station (Farside)**	**Offline Station**	**Add. Earthwork/Ret. Walls (Major)**	**Add. Earthwork/Ret. Walls (Minor)**	**Util & Drainage (Minor)**	**Ped. Improv. (w/bridge mods)**
County Rd 96			1				
Round Rd E			1				
Little Canada Rd	1	1		2		1	
E Larpenteur Ave	2				1	1	1
E Maryland Ave	2			2		2	
TOTAL	**5**	**1**	**2**	**4**	**1**	**4**	**1**

I-35 E South Corridor

		Inline	Online	Offline
Length (mi)	19.6			
No. of Stations	9	10	0	4

Item No.	Item Description	Quantity	Unit	Unit Cost	Cost	Allocated	Final Cost
Corridor Improvement					**$0**	**$0**	**$0**
1	Slip Ramp	0	LF	$200.00	$0	$0	$0
2	Earthwork(Import/Excavation & Embankment)	0	CY	$15.00	$0	$0	$0
3	Retaining Wall	0	SF	$150.00	$0	$0	$0
BRT Station					**$11,436,000**	**$2,287,000**	**$13,723,000**
4	Station (Shelter and Amenities)	14	EA	$350,000.00	$4,900,000	$980,000	$5,880,000
5	Inline Station Platform	10	EA	$24,000.00	$240,000	$48,000	$288,000
6	Offline Station Platform	4	EA	$34,000.00	$136,000	$27,000	$163,000
7	Nearside Roadway Improvements	5	EA	$240,000.00	$1,200,000	$240,000	$1,440,000
8	Farside Roadway Improvements	5	EA	$92,000.00	$460,000	$92,000	$552,000
9	Additional Earthwork/Retaining Walls (Major)	2	EA	$390,000.00	$780,000	$156,000	$936,000
10	Additional Earthwork/Retaining Walls (Minor)	7	EA	$100,000.00	$700,000	$140,000	$840,000
11	Utilities and Drainage Improvements (Major)	0	EA	$20,000.00	$0	$0	$0
12	Utilities and Drainage Improvements (Minor)	5	EA	$4,000.00	$20,000	$4,000	$24,000
13	Traffic Control (Inline/Online)	10	EA	$30,000.00	$300,000	$60,000	$360,000
14	Traffic Control (Offline)	4	EA	$10,000.00	$40,000	$8,000	$48,000
15	Platform Systems Allowance	14	EA	$190,000.00	$2,660,000	$532,000	$3,192,000
BRT Maintenance Facility					**$4,000,000**	**$800,000**	**$4,800,000**
16	BRT Maintenance Facility	16	EA	$250,000.00	$4,000,000	$800,000	$4,800,000
Total Construction Costs					$15,436,000	$3,087,000	$18,523,000
Right of Way					**$0**	**$0**	**$0**
17	Commercial		ACRE	$220,000.00	$0	$0	$0
18	Residential		ACRE	$0.00	$0	$0	$0
Vehicles					**$7,140,000**	**$1,428,000**	**$8,568,000**
19	Low Floor 40-foot Buses	14	EA	$502,000.00	$7,028,000	$1,406,000	$8,434,000
20	Low Floor 60-foot Buses		EA	$854,000.00	$0	$0	$0
21	Hybrid buses		EA	$1,107,000.00	$0	$0	$0
22	On-Board Go To Validator (per bus door)	28	EA	$4,000.00	$112,000	$22,000	$134,000
Soft Costs							**$5,708,000**
23	Preliminary Engineering						$617,000
24	Final Design						$998,000
25	Project Management for Design and Construction						$452,000
26	Construction Administration and Management						$1,235,000
27	Insurance						$617,000
28	Legal; Permits; Review Fees by Other Agencies						$154,000
29	Surveys, Testing, Investigation, Inspection						$452,000
30	Agency Force Account Work						$998,000
31	Public Art						$185,000
25% Contingency							**$8,200,000**
I-35E South Total Cost							**$40,999,000**

Station Location	Inline Station (Nearside)	Inline Station (Farside)	Offline Station	Add. Earthwork/Ret. Walls (Major)	Add. Earthwork/Ret. Walls (Minor)	Util & Drainage (Minor)
W 7th St	1	1			2	
Lone Oak Rd	2			1	1	1
Yankee Doodle			1			
Cliff Rd			1			
Cedar Ave	1	1			2	
CSAH 11		2			2	2
Nicollet Ave	1	1		1		2
Burnsville Center			1			
167th Street W			1			
TOTAL	**5**	**5**	**4**	**2**	**7**	**5**

169-394 Corridor

		Inline	Online	Offline
Length (mi)	20.4			
No. of Stations	11	8	0	9

Item No.	Item Description	Quantity	Unit	Unit Cost	Cost	Allocated	Final Cost
Corridor Improvement					**$191,000**	**$38,000**	**$229,000**
1	Slip Ramp	400	LF	$200.00	$80,000	$16,000	$96,000
2	Earthwork(Import/Excavation & Embankment)	7400	CY	$15.00	$111,000	$22,000	$133,000
3	Retaining Wall	0	SF	$150.00	$0	$0	$0
BRT Station					**$12,568,000**	**$2,513,000**	**$15,081,000**
4	Station (Shelter and Amenities)	17	EA	$350,000.00	$5,950,000	$1,190,000	$7,140,000
5	Inline Station Platform	8	EA	$24,000.00	$192,000	$38,000	$230,000
6	Offline Station Platform	9	EA	$34,000.00	$306,000	$61,000	$367,000
7	Nearside Roadway Improvements	4	EA	$240,000.00	$960,000	$192,000	$1,152,000
8	Farside Roadway Improvements	4	EA	$92,000.00	$368,000	$74,000	$442,000
9	Additional Earthwork/Retaining Walls (Major)	3	EA	$390,000.00	$1,170,000	$234,000	$1,404,000
10	Additional Earthwork/Retaining Walls (Minor)	0	EA	$100,000.00	$0	$0	$0
11	Utilities and Drainage Improvements (Major)	0	EA	$20,000.00	$0	$0	$0
12	Utilities and Drainage Improvements (Minor)	4	EA	$4,000.00	$16,000	$3,000	$19,000
13	Pedestrian Improvements (Major)	1	EA	$36,000.00	$36,000	$7,000	$43,000
14	Pedestrian Improvements (Minor)	1	EA	$10,000.00	$10,000	$2,000	$12,000
15	Traffic Control (Inline/Online)	8	EA	$30,000.00	$240,000	$48,000	$288,000
16	Traffic Control (Offline)	9	EA	$10,000.00	$90,000	$18,000	$108,000
17	Platform Systems Allowance	17	EA	$190,000.00	$3,230,000	$646,000	$3,876,000
BRT Maintenance Facility					**$4,250,000**	**$850,000**	**$5,100,000**
18	BRT Maintenance Facility	17	EA	$250,000.00	$4,250,000	$850,000	$5,100,000
Total Construction Costs					$17,009,000	$3,401,000	$20,410,000
Right of Way					**$0**	**$0**	**$0**
19	Commercial		ACRE	$220,000.00	$0	$0	$0
20	Residential		ACRE	$0.00	$0	$0	$0
Vehicles					**$8,670,000**	**$1,734,000**	**$10,404,000**
21	Low Floor 40-foot Buses	17	EA	$502,000.00	$8,534,000	$1,707,000	$10,241,000
22	Low Floor 60-foot Buses		EA	$854,000.00	$0	$0	$0
23	Hybrid buses		EA	$1,107,000.00	$0	$0	$0
24	On-Board Go To Validator (per bus door)	34	EA	$4,000.00	$136,000	$27,000	$163,000
Soft Costs							**$6,337,000**
25	Preliminary Engineering						$680,000
26	Final Design						$1,107,000
27	Project Management for Design and Construction						$514,000
28	Construction Administration and Management						$1,361,000
29	Insurance						$680,000
30	Legal; Permits; Review Fees by Other Agencies						$170,000
31	Surveys, Testing, Investigation, Inspection						$514,000
32	Agency Force Account Work						$1,107,000
33	Public Art						$204,000
25% Contingency							**$9,288,000**
169-394 Total Cost							**$46,439,000**

Station Location	**Inline Station (Nearside)**	**Inline Station (Farside)**	**Offline Station**	**Add. Earthwork/Ret. Walls (Major)**	**Util & Drainage (Minor)**	**Ped. Improv. (Major)**	**Ped. Improv. (Minor)**
Park Place Blvd (I-394)			1				
Louisiana Ave S (I-394)			2				
General Mills Blvd (I-394)			2				
TH 7	2			1		1	
Bren Rd W	2			2	2		
70th Ave		2					
Viking Dr/Washington Ave		2			2		1
Pioneer Trail			1				
Stagecoach Rd			1				
Canterbury Rd			1				
Marschall Rd			1				
TOTAL	**4**	**4**	**9**	**3**	**4**	**1**	**1**

US 212 Corridor

		Inline	Online	Offline
Length (mi)	9			
No. of Stations	4	2	0	3

Item No.	Item Description	Quantity	Unit	Unit Cost	Cost	Allocated	Final Cost
Corridor Improvement					**$0**	**$0**	**$0**
1	Slip Ramp	0	LF	$200.00	$0	$0	$0
2	Earthwork(Import/Excavation & Embankment)	0	CY	$15.00	$0	$0	$0
3	Retaining Wall	0	SF	$150.00	$0	$0	$0
BRT Station					**$3,324,000**	**$665,000**	**$3,989,000**
4	Station (Shelter and Amenities)	5	EA	$350,000.00	$1,750,000	$350,000	$2,100,000
5	Inline Station Platform	2	EA	$24,000.00	$48,000	$10,000	$58,000
6	Offline Station Platform	3	EA	$34,000.00	$102,000	$20,000	$122,000
7	Nearside Roadway Improvements	0	EA	$240,000.00	$0	$0	$0
8	Farside Roadway Improvements	2	EA	$92,000.00	$184,000	$37,000	$221,000
9	Additional Earthwork/Retaining Walls (Major)	0	EA	$390,000.00	$0	$0	$0
10	Additional Earthwork/Retaining Walls (Minor)	2	EA	$100,000.00	$200,000	$40,000	$240,000
11	Utilities and Drainage Improvements (Major)	0	EA	$20,000.00	$0	$0	$0
12	Utilities and Drainage Improvements (Minor)	0	EA	$4,000.00	$0	$0	$0
13	Traffic Control (Inline/Online)	2	EA	$30,000.00	$60,000	$12,000	$72,000
14	Traffic Control (Offline)	3	EA	$10,000.00	$30,000	$6,000	$36,000
15	Platform Systems Allowance	5	EA	$190,000.00	$950,000	$190,000	$1,140,000
BRT Maintenance Facility					**$1,500,000**	**$300,000**	**$1,800,000**
16	BRT Maintenance Facility	6	EA	$250,000.00	$1,500,000	$300,000	$1,800,000
Total Construction Costs					$4,824,000	$965,000	$5,789,000
Right of Way					**$0**	**$0**	**$0**
17	Commercial		ACRE	$220,000.00	$0	$0	$0
18	Residential		ACRE	$0.00	$0	$0	$0
Vehicles					**$3,060,000**	**$612,000**	**$3,672,000**
19	Low Floor 40-foot Buses	6	EA	$502,000.00	$3,012,000	$602,000	$3,614,000
20	Low Floor 60-foot Buses		EA	$854,000.00	$0	$0	$0
21	Hybrid buses		EA	$1,107,000.00	$0	$0	$0
22	On-Board Go To Validator (per bus door)	12	EA	$4,000.00	$48,000	$10,000	$58,000
Soft Costs							**$1,834,000**
23	Preliminary Engineering						$193,000
24	Final Design						$320,000
25	Project Management for Design and Construction						$158,000
26	Construction Administration and Management						$386,000
27	Insurance						$193,000
28	Legal; Permits; Review Fees by Other Agencies						$48,000
29	Surveys, Testing, Investigation, Inspection						$158,000
30	Agency Force Account Work						$320,000
31	Public Art						$58,000
25% Contingency							**$2,824,000**
US 212 Total Cost							**$14,119,000**

Station Location	**Inline Station (Farside)**	**Offline Station**	**Add. Earthwork/Ret. Walls (Minor)**
MN TH 41		1	
Great Plains Blvd		1	
Eden Prairie Rd	2		2
Southwest Transit Center		1	
TOTAL	**2**	**3**	**2**

I-394 Corridor

		Inline	Online	Offline
Length (mi)	7.6			
No. of Stations	7	2	0	8

Item No.	Item Description	Quantity	Unit	Unit Cost	Cost	Allocated	Final Cost
Corridor Improvement					**$0**	**$0**	**$0**
1	Slip Ramp	0	LF	$200.00	$0	$0	$0
2	Earthwork(Import/Excavation & Embankment)	0	CY	$15.00	$0	$0	$0
3	Retaining Wall	0	SF	$150.00	$0	$0	$0
BRT Station					**$17,122,000**	**$3,425,000**	**$20,547,000**
4	Station (Shelter and Amenities)	10	EA	$350,000.00	$3,500,000	$700,000	$4,200,000
5	Inline Station Platform	2	EA	$24,000.00	$48,000	$10,000	$58,000
6	Offline Station Platform	8	EA	$34,000.00	$272,000	$54,000	$326,000
7	Nearside Roadway Improvements	2	EA	$240,000.00	$480,000	$96,000	$576,000
8	Farside Roadway Improvements	0	EA	$92,000.00	$0	$0	$0
9	Ridgedale Transit Center Improvements	1	LS	$10,000,000.00	$10,000,000	$2,000,000	$12,000,000
10	Additional Earthwork/Retaining Walls (Major)	1	EA	$390,000.00	$390,000	$78,000	$468,000
11	Additional Earthwork/Retaining Walls (Minor)	0	EA	$100,000.00	$0	$0	$0
12	Utilities and Drainage Improvements (Major)	0	EA	$20,000.00	$0	$0	$0
13	Utilities and Drainage Improvements (Minor)	2	EA	$4,000.00	$8,000	$2,000	$10,000
14	Pedestrian Improvements (With bridge modifications)	1	EA	$384,000.00	$384,000	$77,000	$461,000
15	Traffic Control (Inline/Online)	2	EA	$30,000.00	$60,000	$12,000	$72,000
16	Traffic Control (Offline)	8	EA	$10,000.00	$80,000	$16,000	$96,000
17	Platform Systems Allowance	10	EA	$190,000.00	$1,900,000	$380,000	$2,280,000
BRT Maintenance Facility					**$2,750,000**	**$550,000**	**$3,300,000**
18	BRT Maintenance Facility	11	EA	$250,000.00	$2,750,000	$550,000	$3,300,000
Total Construction Costs					$19,872,000	$3,975,000	$23,847,000
Right of Way					**$0**	**$0**	**$0**
19	Commercial		ACRE	$220,000.00	$0	$0	$0
20	Residential		ACRE	$0.00	$0	$0	$0
Vehicles					**$5,610,000**	**$1,122,000**	**$6,732,000**
21	Low Floor 40-foot Buses	11	EA	$502,000.00	$5,522,000	$1,104,000	$6,626,000
22	Low Floor 60-foot Buses		EA	$854,000.00	$0	$0	$0
23	Hybrid buses		EA	$1,107,000.00	$0	$0	$0
24	On-Board Go To Validator (per bus door)	22	EA	$4,000.00	$88,000	$18,000	$106,000
Soft Costs							**$7,133,000**
25	Preliminary Engineering						$795,000
26	Final Design						$1,248,000
27	Project Management for Design and Construction						$510,000
28	Construction Administration and Management						$1,590,000
29	Insurance						$795,000
30	Legal; Permits; Review Fees by Other Agencies						$199,000
31	Surveys, Testing, Investigation, Inspection						$510,000
32	Agency Force Account Work						$1,248,000
33	Public Art						$238,000
25% Contingency							**$9,428,000**
I-394 Total Cost							**$47,140,000**

Station Location	Inline Station (Nearside)	Offline Station	Add. Earthwork/Ret. Walls (Major)	Util & Drainage (Minor)	Ped. Improv. (Major)
Central Ave/CSAH 101		1			
Carlson Pkwy	2		1	2	1
Plymouth Rd		1			
Hopkins Crossroad		1			
General Mills Blvd		2			
Louisiana Ave S		2			
Park Place Blvd		1			
TOTAL	**2**	**8**	**1**	**2**	**1**

Slip Ramp	QTY	UNIT	UNIT PRICE	TOTAL	
Asphalt Pavement	22	SF	$ 7.00	$ 154	
Subgrade Prep	22	SF	$ 1.75	$ 39	
			TOTAL	**$ 193**	**/L.F.**

Inline Station Platform	QTY	UNIT	UNIT PRICE	TOTAL
Concrete Pavement	960	SF	$ 13	$ 12,480
Special Sidewalk	640	SF	$ 10	$ 6,400
Detectable Warning Strip	160	SF	$ 32	$ 5,120
			TOTAL	**$ 24,000**

Offline Station Platform	QTY	UNIT	UNIT PRICE	TOTAL
Sidewalk Removal	740	SF	$ 2	$ 1,500
Pavement Removal	1260	SF	$ 3	$ 3,800
Remove Curb	90	LF	$ 3	$ 300
Remove Lights	2	EA	$ 1,000	$ 2,000
Miscellaneaous Removals	1	LS	$ 2,000	$ 2,000
				$ 10,000
Concrete Pavement	960	SF	$ 13	$ 12,480
Special Sidewalk	640	SF	$ 10	$ 6,400
Detectable Warning Strip	160	SF	$ 32	$ 5,120
				$ 24,000
			TOTAL	**$ 34,000**

Additional Earthwork/Retaining Walls (Major)				
Excavation/Import	2000	CY	$ 15	$ 30,000
Retaining Wall	2400	SF	$ 150	$ 360,000
			TOTAL	**$ 390,000**

Additional Earthwork/Retaining Walls (Minor)				
Excavation/Import	666.67	CY	$ 15	$ 10,000
Retaining Wall	600	SF	$ 150	$ 90,000
			TOTAL	**$ 100,000**

Minor Utility Improvements	QTY	UNIT	UNIT PRICE	TOTAL
Remove Catch Basin	1	EA	$ 500	$ 500
Remove Storm Drain	25	LF	$ 10	$ 300
Catch Basin	1	EA	$ 2,000	$ 2,000
Storm Drain	25	LF	$ 40	$ 1,000
			TOTAL	**$ 4,000**

Major Utility Improvements	QTY	UNIT	UNIT PRICE	TOTAL
Remove Catch Basin	2	EA	$ 500	$ 1,000
Remove Storm Drain	100	LF	$ 10	$ 1,000
Remove Fire Hydrant	1	EA	$ 500	$ 500
Remove Watermain	100	LF	$ 10	$ 1,000
Catch Basin	2	EA	$ 2,000	$ 4,000
Storm Drain	100	LF	$ 40	$ 4,000
Fire Hydrant	1	EA	$ 3,000	$ 3,000
Watermain	100	LF	$ 50	$ 5,000
			TOTAL	**$ 20,000**

Platform Systems Allowance	QTY	UNIT	UNIT PRICE	TOTAL
Street Signage (2 per station)	1	EA	$ 1,000	$ 1,000
Ticket Vending Machine	1	EA	$ 75,000	$ 75,000
Emergency Phone	1	EA	$ 1,000	$ 1,000
Readerboards	1	EA	$ 25,000	$ 25,000
Security Cameras	1	EA	$ 20,000	$ 20,000
Wireless Connection	1	EA	$ 5,000	$ 5,000
Electrical Service	1	EA	$ 10,000	$ 10,000
Platform Network Equipment	1	EA	$ 25,000	$ 25,000
ITS System Allowance	1	EA	$ 25,000	$ 25,000
			TOTAL	**$ 187,000**

Pedestrian Improvements (Major)				
Sidewalk Removal	1500	SF	$ 2	$ 3,000
Concrete Sidewalk	4800	SF	$ 5	$ 24,000
ADA Ramp	6	EA	$ 1,500	$ 9,000
			TOTAL	**$ 36,000**

Pedestrian Improvements (Minor)				
Sidewalk Removal	500	SF	$ 2	$ 1,000
Concrete Sidewalk	1200	SF	$ 5	$ 6,000
ADA Ramp	2	EA	$ 1,500	$ 3,000
			TOTAL	**$ 10,000**

Pedestrian Improvements (TH 65)				
Concrete Sidewalk	3000	SF	$ 5	$ 15,000
ADA Ramp	4	EA	$ 1,500	$ 6,000
			TOTAL	**$ 21,000**

Pedestrian Improvements (With bridge modifications)				
Sidewalk Removal	1500	SF	$ 2	$ 3,000
Concrete Sidewalk	2400	SF	$ 5	$ 12,000
ADA Ramp	6	EA	$ 1,500	$ 9,000
Bridge Modifications	1200	SF	$ 300	$ 360,000
			TOTAL	**$ 384,000**

Assumptions:

Curb and Gutter = $20.00/LF

Concrete Pavement Section

7" Concrete Pavement

Concrete Pavement = $13/SY

3" Class 5 Aggregate Base

1 Ton = 0.55 CY

Class 5 = $14/Ton

12" Select Granular

Select Granular = $12/CY

Total Section Cost = $13.00/SF

Asphalt Pavement Section

*1.5" 12.5mm surface course, poly-mod

*Poly-mod = $130/Ton ($1.20/SF)

*3" 19mm binder course

*8" 25mm base course

*Recycled Asphaltic Concrete = $65/Ton ($4.37/SF)

*Recycled Asphaltic Concrete Unit Weight = 110 lb/sy*in

*12" Graded Aggregate Base

*1 Ton = 0.55 CY

*GAB = $15/Ton ($1.01/SF)

*Tack Coat (Three Layers)

*0.05 Gallons Tack Coat/SY

*Tack Coat = $3/Gallon ($0.05/SF)

***Total Section Cost = $6.63/SF**

Earthwork/Walls (Major)

*Assumes 18,000 SF with an average fill of 3'

*Assumes 400 LF and and an average wall height of 6'

Earthwork/Walls (Minor)

*Assumes 9,000 SF with an average fill of 2'

*Assumes 200 LF and and an average wall height of 3'

APPENDIX C

OPERATIONS AND MAINTENANCE COST ESTIMATES

Highway Transitway Corridor Study (HTCS)
Highway Corridor Service Statistics

Corridor	From	To	Time Period	Travel Time	Distance (miles)	Day	Headway AM	Mid	PM	Eve	Late	Vehicles Peak	Total	Annual Rev.-Miles	Rev.-Hrs	Buses AM	Mid	PM	Eve	Late	One-way daily bus trips AM	Mid	PM	Eve	Late	Total	AM PEAK Layover	Cycle	MIDDAY Layover	Cycle	PM PEAK Layover	Cycle	EARLY EVE Layover	Cycle	LATE EVE Layover	Cycle
Hwy 36	Hadley Ave.	Downtown	Peak	47	17.70	M-F	15	15	15	15	n/a	8	10	577,700	30,090	8.0	7.0	8.0	7.0	0.0	24	52	24	28	0	128	26.00	120.00	21.00	105.00	26.00	120.00	21.00	105.00	n/a	n/a
Minneapolis to		Minneapolis	Midday	42	17.70	Sat	15	15	15	30	n/a			104,900	5,280	7.0	7.0	7.0	4.0	0.0	24	52	24	14	0	114	21.00	105.00	21.00	105.00	21.00	105.00	36.00	120.00	n/a	n/a
Stillwater						Sun	n/a	30	30	30	n/a			53,400	3,020	0.0	4.0	4.0	4.0	0.0	0	26	12	14	0	52	36.00	120.00	36.00	120.00	36.00	120.00	36.00	120.00	n/a	n/a
												8	**10**	**736,000**	**38,390**																				
I-94	Hemlock Ln.	Downtown	Peak	44	14.70	M-F	15	15	15	15	n/a	7	9	479,800	28,560	7.0	7.0	7.0	7.0	0.0	24	52	24	28	0	128	17.00	105.00	25.00	105.00	17.00	105.00	25.00	105.00	n/a	n/a
Minneapolis to		Minneapolis	Midday	40	14.70	Sat	15	15	15	30	n/a			87,100	5,280	7.0	7.0	7.0	4.0	0.0	24	52	24	14	0	114	25.00	105.00	25.00	105.00	25.00	105.00	40.00	120.00	n/a	n/a
Maple Grove						Sun	n/a	30	30	30	n/a			44,300	3,020	0.0	4.0	4.0	4.0	0.0	0	26	12	14	0	52	40.00	120.00	40.00	120.00	40.00	120.00	40.00	120.00	n/a	n/a
												7	**9**	**611,200**	**36,860**																				
Hwy 65	125th Ave.	53rd Ave. NE	Peak	26	9.30	M-F	15	15	15	15	n/a	5	6	303,600	17,850	5.0	4.0	5.0	4.0	0.0	24	52	24	28	0	128	23.00	75.00	14.00	60.00	23.00	75.00	14.00	60.00	n/a	n/a
Minneapolis to	NE		Midday	23	9.30	Sat	15	15	15	30	n/a			55,100	2,960	4.0	4.0	4.0	2.0	0.0	24	52	24	14	0	114	14.00	60.00	14.00	60.00	14.00	60.00	14.00	60.00	n/a	n/a
Blaine						Sun	n/a	30	30	30	n/a			28,000	1,510	0.0	2.0	2.0	2.0	0.0	0	26	12	14	0	52	14.00	60.00	14.00	60.00	14.00	60.00	14.00	60.00	n/a	n/a
												5	**6**	**386,700**	**22,320**																				
I-35E North	Highway 96	Downtown St.	Peak	32	10.7	M-F	15	15	15	15	n/a	5	6	349,200	20,400	5.0	5.0	5.0	5.0	0.0	24	52	24	28	0	128	11.00	75.00	19.00	75.00	11.00	75.00	19.00	75.00	n/a	n/a
St. Paul to		Paul	Midday	28	10.7	Sat	15	15	15	30	n/a			63,400	3,800	5.0	5.0	5.0	3.0	0.0	24	52	24	14	0	114	19.00	75.00	19.00	75.00	19.00	75.00	34.00	90.00	n/a	n/a
Forest Lake						Sun	n/a	30	30	30	n/a			32,300	2,260	0.0	3.0	3.0	3.0	0.0	0	26	12	14	0	52	34.00	90.00	34.00	90.00	34.00	90.00	34.00	90.00	n/a	n/a
												5	**6**	**444,900**	**26,460**																				
I-35E South	167th St. W	Downtown St.	Peak	73	24.30	M-F	15	15	15	15	n/a	11	14	793,200	39,780	11.0	9.0	11.0	9.0	0.0	24	52	24	28	0	128	19.00	165.00	21.00	135.00	19.00	165.00	21.00	135.00	n/a	n/a
St. Paul to		Paul	Midday	57	24.30	Sat	15	15	15	30	n/a			144,100	6,760	9.0	9.0	9.0	5.0	0.0	24	52	24	14	0	114	21.00	135.00	21.00	135.00	21.00	135.00	36.00	150.00	n/a	n/a
Burnsville						Sun	n/a	30	30	30	n/a			73,300	3,770	0.0	5.0	5.0	5.0	0.0	0	26	12	14	0	52	36.00	150.00	36.00	150.00	36.00	150.00	36.00	150.00	n/a	n/a
												11	**14**	**1,010,600**	**50,310**																				
I-394	Central Ave. /	Downtown	Peak	58	12.60	M-F	15	15	15	15	n/a	9	11	411,300	31,620	9.0	7.0	9.0	7.0	0.0	24	52	24	28	0	128	19.00	135.00	15.00	105.00	19.00	135.00	15.00	105.00	n/a	n/a
Minneapolis to	CSAH 101	Minneapolis	Midday	45	12.60	Sat	15	15	15	30	n/a			74,700	5,280	7.0	7.0	7.0	4.0	0.0	24	52	24	14	0	114	15.00	105.00	15.00	105.00	15.00	105.00	30.00	120.00	n/a	n/a
Plymouth						Sun	n/a	30	30	30	n/a			38,000	3,020	0.0	4.0	4.0	4.0	0.0	0	26	12	14	0	52	30.00	120.00	30.00	120.00	30.00	120.00	30.00	120.00	n/a	n/a
												9	**11**	**524,000**	**39,920**																				
Hwy 169	Marschall	Downtown	Peak	88	26.90	M-F	15	15	15	15	n/a	14	17	878,000	49,470	14.0	11.0	14.0	11.0	0.0	24	52	24	28	0	128	34.00	210.00	27.00	165.00	34.00	210.00	27.00	165.00	n/a	n/a
Minneapolis to	Rd.	Minneapolis	Midday	69	26.90	Sat	15	15	15	30	n/a			159,500	8,240	11.0	11.0	11.0	6.0	0.0	24	52	24	14	0	114	27.00	165.00	27.00	165.00	27.00	165.00	42.00	180.00	n/a	n/a
Shakopee						Sun	n/a	30	30	30	n/a			81,100	4,520	0.0	6.0	6.0	6.0	0.0	0	26	12	14	0	52	42.00	180.00	42.00	180.00	42.00	180.00	42.00	180.00	n/a	n/a
												14	**17**	**1,118,600**	**62,230**																				
Hwy 212	TH 41	Southwest	Peak	27	9.00	M-F	15	15	15	15	n/a	5	6	293,800	17,850	5.0	4.0	5.0	4.0	0.0	24	52	24	28	0	128	21.00	75.00	14.00	60.00	21.00	75.00	14.00	60.00	n/a	n/a
SW LRT to		Transit	Midday	23	9.00	Sat	15	15	15	30	n/a			53,400	2,960	4.0	4.0	4.0	2.0	0.0	24	52	24	14	0	114	14.00	60.00	14.00	60.00	14.00	60.00	14.00	60.00	n/a	n/a
Chaska		Center				Sun	n/a	30	30	30	n/a			27,100	1,510	0.0	2.0	2.0	2.0	0.0	0	26	12	14	0	52	14.00	60.00	14.00	60.00	14.00	60.00	14.00	60.00	n/a	n/a
												5	**6**	**374,300**	**22,320**																				
TOTALS FOR ALL CORRIDORS:												**44**	**54**	**3,472,400**	**201,240**																				

Highway Transitway Corridor Study (HTCS)
Background Bus Service Changes (Order-of-Magnitude Estimates)

Corridor	Background Bus Change	Pk Buses	Daily Hrs	Daily Mi's.	Ann. Hrs.	Ann. Miles	
I-35 N.	New Hwy 96 White Bear Lake Circ.	1	12	180	3,060	45,900	Assume 1 bus for circ.
I-35 S.	Extend 426 to Burnsville Ctr.	1	12	180	3,060	45,900	Assume an extra bus
I-94	Eliminate midday service on 781	0	-1.5	-45	-383	-11,475	3 trips, about 30 min. each, assume 30 mph
	Improve midday freq. on 787.	0	6	90	1,530	22,950	Assume 6 hours of midday service
		0	4.5	45	1,148	11,475	
I-394	Eliminate Route 675 Weekday	-4	-72	-1077.5	-18,360	-274,763	About an hour per trip, 21 daily trips - assume 30 mph?
	Eliminate Route 675 Saturday	n/a	-30	-465	-1,560	-24,180	
	Eliminate Route 675 Sunday	n/a	-21	-325.5	-1,218	-18,879	
	New circ. Between Mounds & Cental	1	12	180	3,060	45,900	Assume 1 bus for circ.
	New Hwy 55/Hwy 494 Circ.	1	12	180	3,060	45,900	Assume 1 bus for circ.
		-2	-99	-1508	-15,018	-226,022	
TH 36	Eliminate 264 midday service.	-1	-6	-180	-1,530	-45,900	12 trips, about 30 min. each - assume 30 mph?
	New Stillwater Circ.	1	12	180	3,060	45,900	
		0	6	0	1,530	0	
TH 65	New Anoka-125th Ave Circ.	1	12	180	3,060	45,900	Assume 1 bus for circ.
US 169	Rtes 17, 615,667,668 ext. to TH 7 St	0	0	0	0	0	Assume cost neutral.
US 212	1/2 Elimination of Route 698	-2	-24.75	-742.5	-6,311	-189,338	33 1-way trips, about 90 min. each, 30 mph? Guess on buses. Took 1/2 with assumption that 1/2 would be
	New Chanhassen-Eden Prarie Route	1	9	135	2,295	34,425	SW Transit proposed route, used 15 mph eliminated with Green Line opening (i.e., route would
	New Chaska-Chanhassen Route	1	9	135	2,295	34,425	SW Transit proposed route, used 15 mph be turned back with Green Line, eliminated
		0	-7	-473	-1,721	-120,488	under HCTS)

Note - change sin peak buses, annual revenue bus-hours and bus-miles of service estimated, based on estimated changes in daily trips, average route distance and average scheduled travel time.

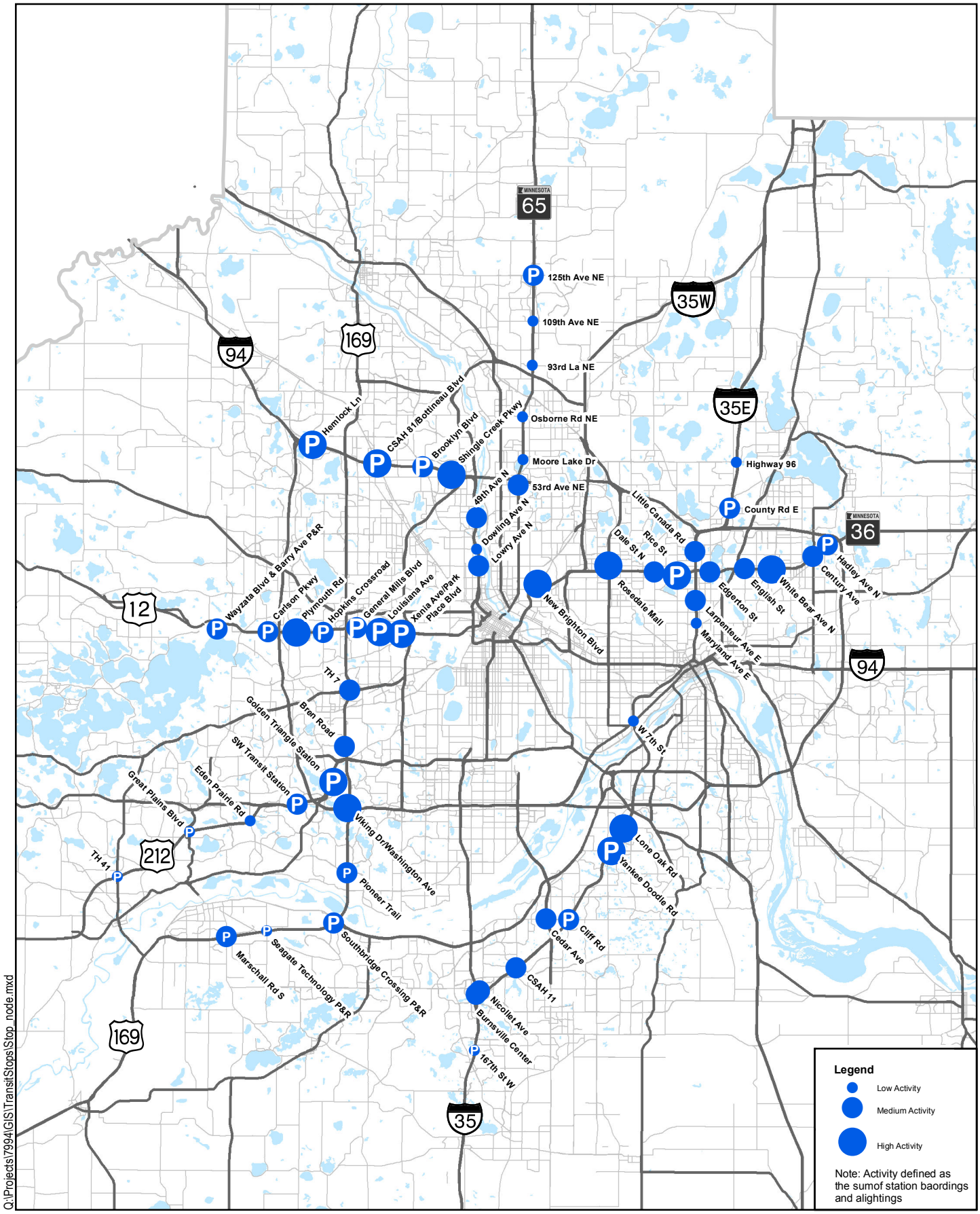
Highway Transitway Corridor Study (HTCS)
Annual O&M Cost Estimates ($2012)

Transit Service	Cost Drivers	Unit Cost ($2012)	HWY 36	I-94	HWY 65	I-35 North	I-35 South	I-394	HWY 169	HWY 212
Highway	Peak Buses	$36,330	8	7	5	5	11	9	14	5
BRT	Ann. Rev. Bus-Hr.	$75.25	38,390	36,860	22,320	26,460	50,310	39,920	62,230	22,320
Service	Ann. Rev. Bus-Mi. (40')	$3.05	736,000	611,200	386,700	444,900	1,010,600	524,000	1,118,600	374,300
	Directional Stops	$18,250	16	9	11	9	15	8	16	5
	On-line Stops with Elevators	$20,000	0	2	0	0	0	0	0	0
	O&M Cost Estimate		$5,716,300	$5,096,400	$3,241,400	$3,694,000	$7,541,500	$5,075,200	$8,895,200	$3,094,100
Background	Change in Peak Buses	$36,330	0	0	1	1	1	-2	0	0
Bus	Change in Ann. Rev. Bus-Hr.	$75.25	1,530	1,148	3,060	3,060	3,060	-15,018	0	-1,721
Changes	Change in Ann. Rev. Bus-Mi. (40')	$3.05	0	11,475	45,900	45,900	45,900	-226,022	0	-120,488
	Change in O&M Cost *(from Existing)*		$115,100	$121,300	$406,600	$406,600	$406,600	-$1,892,100	$0	-$497,000
TOTAL CORRIDOR O&M COST ESTIMATE			**$5,831,400**	**$5,217,700**	**$3,648,000**	**$4,100,600**	**$7,948,100**	**$3,183,100**	**$8,895,200**	**$2,597,100**

Notes
1. Counts of directional stops do not include downtown Minneapolis or St. Paul Stations. In-line stations counted as two (for each direction).
2. Vertical circulation (elevators (assumed at each in-line stop (one per stop, on each side of highway.
3. No exclusive lane miles or TSP costs are included.
4. All cost estimates ass ume 40' buses.
5. HTCS service plans assume 16 hour span of service Mon-Sat, 13-hours on Sun.
6. HCTS service plans assume 15-min. all-day service on weekdays and Saturdays, 30-min. on Sat. nights and Sundays.
7. Costs for background bus changes are general.
8. Unit costs consistent with those used in current Met Council corridor studies (Robert St., Nicollet-Central, Midtown).

APPENDIX D

STATION ACTIVITY



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SRF Consulting Group, Inc.

Station Activity

Highway Transitway Corridor Study

Metropoplitan Council

APPENDIX E

EVALUATION THRESHOLDS

GOAL 1

Guideway Total Ridership

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
13,700	1,200	3,400	11,400	5,700	12,000	3,800	14,400
3	1	1	3	2	3	1	3

Used threshold methodology 2

Thresholds	Points
14,400	3
9,600	2
4,800	1

Growth in Guidway Total Ridership

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
4,400	600	3,100	9,300	4,200	8,600	1,400	7,900
2	1	2	3	2	3	1	3

Used threshold methodology 2

Thresholds	Points
9,300	3
6,200	2
3,100	1

Off-peak hour ridership and reverse-commute direction

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
35%	43%	12%	28%	37%	38%	45%	42%
3	3	1	2	3	3	3	3

Used threshold methodology 1

Thresholds	Points
45%	3
34%	2
23%	1

Transit Reliant Ridership

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
45%	26%	35%	35%	38%	33%	29%	37%
3	1	2	2	2	2	1	2

Used threshold methodology 1

Thresholds	Points
45%	3
39%	2
32%	1

Minority residents in the service area

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
52%	18%	46%	30%	21%	21%	17%	17%
3	1	3	2	1	1	1	1

Used threshold methodology 1

Thresholds	Points
52%	3
41%	2
29%	1

GOAL 2

Cost Effectiveness

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
$5.12	$19.96	$6.81	$2.77	$8.50	$4.67	$18.36	$2.85
2	1	2	3	1	2	1	3

Used threshold methodology 3

Thresholds	Points
$ 19.96	1
$ 8.00	2
$ 4.00	3

GOAL 3

Station to Station Ridership

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
5,400	800	2,500	9,300	4,000	7,800	600	6,600
2	1	1	3	2	3	1	3

Used threshold methodology 2

Thresholds	Points
9,300	3
6,200	2
3,100	1

New Transit Riders

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
1,400	700	500	1,300	1,200	2,000	300	1,600
3	2	1	2	2	3	1	3

Used threshold methodology 2

Thresholds	Points
2,000	3
1,333	2
667	1

GOAL 4

2010 Trips with Build Alternative

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
2,600	400	1,300	5,200	2,500	4,600	400	3,600
2	1	1	3	2	3	1	3

Used threshold methodology 2

Thresholds	Points
5,200	3
3,467	2
1,733	1

Connections to existing or planned high frequency transitways

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
1	1	0	2	3	2	1	0
1	1	1	2	3	2	1	1

Used threshold methodology 2

Thresholds	Points
3	3
2	2
1	1

GOAL 5

Forecast growth in population

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
3%	8%	6%	9%	6%	15%	25%	7%
1	1	1	1	1	2	3	1

Used threshold methodology 1

Thresholds	Points
25%	3
18%	2
10%	1

Forecast growth in employment

I-94	TH 65	I-35E North	TH 36	I-35E South	TH 169	TH 212	I-394
28%	14%	19%	13%	15%	19%	18%	8%
3	1	2	1	1	2	2	1

Used threshold methodology 1

Thresholds	Points
28%	3
21%	2
15%	1