Technical Memo 10: Evaluation Summary Report

Highway 169 Mobility Study

Version 4.0

Prepared for: Minnesota Department of Transportation

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Purpose of this Report

The purpose of this Evaluation Summary is to document the process used for evaluating the alternatives in the Highway 169 Mobility Study. A set of evaluation measures, defined during establishment of the project's purpose and need statement, will be used to measure how each alternative performs related to the defined project goals. The results of this evaluation process will be used as the basis for the recommendation on a locally preferred alternative (LPA) for Highway 169.

Purpose and Need

Purpose of the Project

The purpose of the project is to increase access to jobs and destinations, provide transportation choices, and improve safety and travel time for Highway 169 users.

Need for the Project

Need improved connections between people, jobs, and other destinations throughout the corridor

Highway 169 crosses a range of landscapes and land uses that include corporate campuses, industrial and warehouse facilities, retail centers, single-family residential neighborhoods, clusters of apartment buildings, and several prominent natural features. Highway 169 in the study area connects the cities of Plymouth, Golden Valley, St. Louis Park, Minnetonka, Hopkins, Edina, Eden Prairie, and Bloomington in Hennepin County, and Savage and Shakopee in Scott County. The corridor is populous and jobs-rich, with more than 215,000 residents and 187,000 employees at thousands of businesses in a range of industries within two miles of Highway 169.

Both employment and population growth are expected to occur in the corridor over the next 25 years; by 2040 the corridor is projected to add more than 58,000 jobs and 63,000 people. Traffic volumes on Highway 169 in the study area range from 49,000 vehicles per day near Canterbury Road to more than 112,000 vehicles each day near I-394. Volumes are approaching the highway's capacity today on most of Highway 169 in the study area and reliance on single-occupancy vehicles limits the amount of residential and employment growth the corridor can absorb without significantly increasing delay on the highway.

The diversity of job types in office, industrial, medical, retail, and entertainment sectors requires a labor force with a wide variety of skills, education, and experience. However, the only way to reach most of the jobs in the Highway 169 study area is by automobile. According to Consumer Reports research, the median annual cost of owning a car is $9,100,[1] an expense that many workers who might otherwise pursue lower-wage employment in the corridor cannot afford. Because of the lack of transportation options to their locations, large employers in the southern part of the study area such as ValleyFair, Mystic Lake Casino, Canterbury Park, Shutterfly, and Amazon experience difficulty attracting workers to hourly-wage jobs. Meanwhile, low-income populations living in Golden Valley, Hopkins, and St. Louis Park cannot reach these jobs, or jobs at any of the other major employers in the corridor, without a car. In comparison to car ownership, unlimited rides on all Metro

[1] "What That Car Really Costs to Own". Consumer Reports, August 2012. Accessed at http://www.consumerreports.org/cro/2012/12/what-that-car-really-costs-to-own/index.htm May 2016

Transit, MVTA, Plymouth Metrolink, and SouthWest Transit local bus, light rail, and express service is a maximum of $113.50 each month, or $1,362 each year.[2] Please see the Land Use and Demographics section of the Existing Conditions and Market Analysis Memo for maps of large employers and demographic indicators in the study area.

Currently, nearly all transit service in the corridor is peak-period, peak-direction express bus service to and from downtown Minneapolis. Most roadway networks and development in the corridor exemplify typical post-war suburban American patterns, which limit the effectiveness of local-route bus service as well as commutes by foot or on bicycle. There are few transit options for reverse commuters or suburb-to-suburb commuters and few options available for transit-dependent populations (5.7 percent) in the corridor to reach jobs and destinations located outside of downtown Minneapolis. Please see the Transit Conditions section of the Existing Conditions and Market Analysis Memo for more detail on transit service in the corridor.

The results of the *Highway Transitway Corridor Study* demonstrated that there is relatively strong demand for high-frequency station-to-station transitway service on Highway 169 between Marschall Road Transit Station in Shakopee and downtown Minneapolis (via I-394). The study indicated potential 2030 forecasted daily ridership of approximately 7,800, based on demographic forecasts and transit improvements. Of these daily riders, about a quarter would be new transit riders, half would use the corridor during off-peak periods, and 40 percent would use the service to reverse commute to the south in the morning and/or to the north in the evening. Outside of downtown Minneapolis, the highest ridership potential were observed at:

- A station with a connection to Golden Triangle light rail station on the planned Green Line Extension
- Three stations along I-394 at Park Place Blvd, Louisiana Avenue, and General Mills Boulevard
- A station with a connection to potential arterial bus rapid transit on American Boulevard

Need Highway 169 to move a growing number of people and goods with more travel options

Efficient use of Highway 169 for all users—transit riders, carpoolers, individual drivers, and freight haulers—is compromised by several conditions present in the corridor today. First, Highway 169 is congested during both the morning and evening peak periods. South of Highway 62, the congestion is more intense in the northbound lanes during the morning peak period, and in the southbound lanes in the evening peak period. North of Highway 62,

[2] A 31-day pass good for unlimited rides of $3.00 fare is $113.50 per month without subsidy. Employer and school-based subsidies are available that could reduce this cost to the rider. If the rider does not use express service they could purchase a 31-day pass for unlimited rides of $2.25 if they ride during rush hour ($85.00 per month) or $1.75 if they do not ride during rush hour ($59.00) per month. Fares are regional and apply to Metro Transit, SouthWest Transit, MVTA, and Plymouth Metrolink routes in the study area. Source: Metro Transit.

Highway 169 is congested in both directions for two to more than three hours in both the morning and evening peak periods. Among metro area highways, Highway 169 comprises 11.5 percent of total metro freeway congestion and has the fourth-most congested freeway miles in the region (after I-494, I-94, and I-35W).

Highway 169 is freight corridor as well as a commuter corridor. It plays a key role in moving goods, such as corn, soybeans, and ethanol produced in south-central and southwestern Minnesota, to regional and international markets. Highway 169 provides access to principal highways, rail lines, and the Ports of Savage for agricultural, energy, and mineral shippers.

Congestion is problematic because it results in delay for all users, makes travel times unreliable, and increases the likelihood of crashes. Crashes hurt people, cost money, and can disrupt highway operations, causing more congestion and in turn more crashes. Highway 169 between Highway 62 and I-394 has a crash rate greater than the average crash rate for segments with similar characteristics. Two of the segments in the corridor—between I-394 and Highway 55, and between I-494 and Highway 62—have a crash rate greater than the critical crash rate. While a higher than average crash rate does not necessarily indicate a significant crash problem, a crash rate that is greater than the critical crash rate indicates that there may be a geometric design or other issues that warrant further review or mitigation. In addition to crashes on the highway mainline, four interchanges in the study area are in the top 100 crash locations in the region: I-494, I-394, Highway 101, and Highway 7. Among metro area highways, Highway 169 has the third highest crash costs[3] after I-35W and I-94, and similar to I-494.

Reliable travel times are important because the more travel times vary on a given route, the earlier travelers must leave to ensure on-time arrival. A congested but consistent commute is easier to plan for than a less congested but very unreliable commute. In short, congestion affects quality of life by introducing uncertainty into commutes and other trips on Highway 169. Uncertain travel times especially affect transit riders, as transit routes must adhere to a schedule that is based on realistic travel times. If on a given day travel times are longer, it is likely that buses will be late picking up riders. When travel times are shorter, the bus still must stay on schedule, so riders cannot enjoy an appreciably shorter ride. Because of the congestion and lack of travel time reliability, SouthWest Transit has shifted several of its routes from Highway 169 to I-494.

Large segments of Highway 169 have poor travel time reliability in the peak periods: northbound Highway 169 between Scott County Highway 69 and Excelsior Boulevard in the morning, and southbound between Excelsior Boulevard and Old Shakopee Road and northbound between I-494 and Highway 55 in the evening. These segments all experience large amounts of delay lasting anywhere from 71 to 446 hours (for all vehicles) during an average peak period. For more detail on crashes and travel time reliability, please refer to the Travel Time Reliability section of the Existing Conditions and Market Analysis Memo.

The second condition affecting efficient movement of people and goods in the corridor is the absence of a "congestion-free" option in the form of a MnPASS lane. MnPASS lanes are

[3] Crash costs refer to the monetary representation of crash severity.

available only to transit vehicles, carpools, motorcycles, and individual motorists willing to pay a fee that fluctuates with the current level of congestion. By limiting users, MnPASS lanes are generally free-flowing, but dynamic pricing and policy allow them to be an option for anyone who wants to avoid congestion, whether that's by paying a fee, or by changing travel behavior from driving a single-occupancy vehicle to carpooling or taking transit.

The average vehicle occupancy rate[4] in the metro area is approximately 1.3 people per vehicle. This rate represents all roadway types and all times of day. Occupancy rates during the morning and evening peak periods tend to be lower, as most trips are commutes to work. Rates also tend to be lower on freeway facilities, since they are commuter-oriented and carry longer regional trips. Non-work trips such as shopping or school trips are more prevalent in off-peak times of day and tend to have higher occupancies. These trips are also frequently made within local communities and not on freeways. Though occupancy rates for Highway 169 are not available, the highway is estimated to have similar vehicle occupancy characteristics to other metro area freeways without MnPASS facilities, with a range of 1.05 to 1.10 persons per vehicle in the morning peak and 1.10 to 1.15 in the evening peak. Congestion-free MnPASS lanes offer an incentive to drivers to carpool, potentially increasing the vehicle occupancy rates on the highway, and allowing more people to use the corridor without increasing congestion. MnPASS lanes offer a congestion-free alternative to users who opt in, and movement of those users from general purpose lanes to MnPASS lanes helps to ease overall congestion.

Currently, express buses operating on Highway 169 during congested conditions use bus-only shoulders to bypass congestion. However, bus speeds are limited to 35 mph on shoulders so availability of MnPASS lanes to transit vehicles represents a significant potential increase in speed and corresponding reduction in travel time.

Finally, transportation technology continues to evolve in nearly every way. Dynamic pricing and flexible use of lanes, sophisticated signal timing and communication with vehicles, ride sharing subscription services like Uber and Lyft, car sharing programs like Car2Go, ZipCar, and Hourcar, real time transit information, and emerging driverless car technology make it very likely that the Twin Cities region, along with other urban centers in the United States, will experience a fairly radical departure from current transportation practices and patterns. These changes in technology all point toward more efficient use of both vehicles and infrastructure and are opportunities to positively affect the overall performance of Highway 169 and other regional highways.

Need improvements to fit within the existing transportation system, current policy plans, and financial constraints

Transportation funding available at the federal, state, and regional levels of government is limited and highly sought. In order for potential improvements to Highway 169 to qualify

[4] As measured in the 2010 Metro Area Travel Behavior Inventory.

for funding and be implementable, they must be consistent with regional policy regarding highways and transitways. The TPP sets forth several strategies for realizing regional transportation goals that are directly applicable to the development of potential investments in Highway 169:

- *"The Council and regional transit providers will use regional transit design guidelines and performance standards, as appropriate based on Transit Market Areas, to manage the transit network, to respond to demand, and balance performance and geographic coverage.*
- *Regional transportation partners will continue to work together to plan and implement transportation systems that are multimodal and provide connections between modes. The Council will prioritize regional projects that are multimodal and cost-effective and encourage investments to include appropriate provisions for bicycle and pedestrian travel.*
- *Regional transportation partners will promote multimodal travel options and alternatives to single-occupant vehicle travel and highway congestion through a variety of travel demand management initiatives, with a focus on major job, activity, and industrial and manufacturing concentrations on congested highway corridors and corridors served by regional transit service.*
- *Regional transportation partners will manage and optimize the performance of the principal arterial system as measured by person throughput.*
- *Regional transportation partners will prioritize all regional highway capital investments based on a project's expected contributions to achieving the outcomes, goals, and objectives identified in Thrive MSP 2040 and the Transportation Policy Plan."*

Furthermore, with regard to investment in the highway system, the TPP states:

> *"If traffic management technologies and spot mobility improvements do not address the highway capacity issue identified, adding more physical capacity – expansion improvements – should be explored. Expansion improvements include new or extended MnPASS lanes, strategic capacity enhancements, and highway access investments. The regional objective of providing a congestion-free, reliable option for transit users, carpoolers and those willing to pay through MnPASS lanes is the region's priority for expansion improvements. General purpose lane strategic capacity enhancements should only be considered if adding capacity through MnPASS lanes has been evaluated and found to not be feasible, the improvement is affordable, and the improvement is approached with a lower cost/high-return-on-investment philosophy."*

Consistent with this approach, MnPASS lanes are being considered for Highway 169 but the addition of general purpose lanes are not because they would not constitute a plausible project. As the study advances a MnPASS alternative will be developed that, to the extent possible, uses existing transportation right-of-way, structures, pavement, and other infrastructure.

With regard to investment in the Twin Cities transitway system, the 2040 TPP states:

> *"The region will also need to build, operate, and maintain a system of transitways that will improve service in high-demand corridors and connect more areas of the region with frequent, reliable transit*

service…Expansion of the transitway system will be guided by investment factors that will assist the region in setting priorities for investment that have the greatest return for the region."

In following with this policy guidance, the Highway 169 Mobility Study will consider transit improvements that are consistent with regional strategies and provide a strong return on investment. Based on the results of previous studies, highway BRT will be the only transitway mode considered for the Highway 169 corridor.

Project Goals and Objectives

Goal 1: Improve access to local and regional destinations, activity centers, and employment concentrations

- Improve transit access to people, places, and jobs
- Accommodate existing and future travel needs
- Improve opportunities for future economic development along the corridor
- Improve travel time reliability

Goal 2: Provide better mobility in the corridor and options to avoid congestion

- Maximize the number of users that can be served during peak periods
- Improve travel times and limit congestion's impact on all users
- Limit the duration and extent of congestion that contributes to safety issues
- Contribute to an improved overall travel experience across the transportation network

Goal 3: Improve the attractiveness of transit to serve more people in the corridor

- Provide transit advantages in addition to those already in place
- Provide transit options to serve a variety of riders including seniors, those who are transit reliant, and the emerging workforce of the future
- Link the variety of job types and times in the corridor to potential employees already living there

Goal 4: Provide a high long-term return on the transportation investment

- Limit capital and operating costs as they relate to benefits
- Qualify for potential funding based on policy parameters

Goal 5: Prioritize service to existing transit-supportive areas and to those committed to implementing development patterns that support transit service

- Improve transit in areas where planning policies for land use, zoning, densities, and parking requirements are transit-supportive
- Improve transit in areas with supportive plans and policies for direct and complete pedestrian and bicycle networks
- Provide travel options to accommodate forecast population and employment growth in the corridor

Goal 6: Preserve and enhance the quality of the built and natural environments

- Minimize impacts to community assets and the natural environment
- Use existing infrastructure and right-of-way to the maximum extent possible

Evaluation Criteria

Based on the project's goals and objectives, specific evaluation criteria have been identified to quantitatively and qualitatively evaluate alternatives. At this time in the analysis, it is assumed that the defined project goals will not be weighted. Evaluation results for the alternatives are shown in below. Because the alternatives share a great deal of the corridor in common, some ratings are very similar, while some criteria will differentiate the two alternatives.

Evaluation Measure	Evaluation Data Source	Measure Type		Alternative 1: BRT on US 169 & I-394; MnPASS on US 169	Alternative 2: BRT on US 169 & TH 55; MnPASS on US 169	Alternative 3: MnPASS on US 169 to I-494	Technical Memo Location
Goal 1: Improve access to local and regional destinations, activity centers, and employment concentrations							
Current population within ½ mile of station areas (transitway alternatives)	Met Council TAZ current population and employment	Quantitative		16,300	21,900 (27,300 with 7th Street Station)	-	**Addendum 1**
Current employment within ½ mile of station areas (transitway alternatives)				38,100	32,800 (47,600 with 7th Street Station)	-	**Addendum 1**
Travel-time reliability (peak period free flow person trips, % change from no build, does not include transit trips)	Highway forecast and operations analysis	Quantitative	NB AM	7,000 , 179%	7,000 , 179%	5,900 , 133%	**Traffic ops/forecast memo**
			NB PM	7,300 , 82%	7,300 , 82%	4,800 , 19%	
			SB AM	6,800 , 11%	6,800 , 11%	6,200 , 1%	
			SB PM	6,900 , 54%	6,900 , 54%	6,500 , 43%	
Alternative serves employment centers in the corridor (no downtown stations, including 7th street station)	Metropolitan Council list of regional employment centers	Qualitative		Regional: 1 Large: 2 Medium: 1 Small: 3	Regional: 1 Large: 1 Medium: 2 Small: 5	-	**Addendum 2**
Goal 2: Provide better mobility in the corridor and options to avoid congestion							
Total AM peak-hour person throughput, percent improvement from no build - Hwy 169 at Minnesota River	Highway forecast and operations analysis	Quantitative		13,400, 9%	13,600, 11%	13,100, 7%	**Traffic ops/forecast memo**
Total AM peak-hour person throughput, percent improvement from no build - Hwy 169 South of I-394				12,300, 21%	12,400, 22%	10,100, <1%	**Traffic ops/forecast memo**

Delay per user (general purpose lane users, and bus-on-shoulder users (% change in minutes of delay from no build to alternative, delay in minutes for alternative)	Highway forecast and operations analysis	Quantitative	Northbound AM	-77%, 6:10	-77%, 6:10	-72%, 7:50	**Traffic ops/forecast memo**
			Northbound PM	-67%, 3:20	-67%, 3:20	-23%, 7:50	
			Southbound AM	-39%, 0:30	-39%, 0:30	-3%, 0:40	
			Southbound PM	-56%, 4:30	-56%, 4:30	-52%, 4:50	
Change in vehicle hours traveled from No Build (does not include transit vehicles)	Highway forecast and operations analysis	Quantitative		-5,500	-5,500	-2,200	**Traffic ops/forecast memo**
Reduction in crash risk factors (recurring congestion and freeway access conflicts (%))	Highway forecast and operations analysis	Quantitative		-44% congestion reduction in mile hours -35% bottleneck conflicts	-44% congestion reduction in mile hours -35% bottleneck conflicts	22% congestion reduction in mile hours 5% bottleneck conflicts	**Traffic ops/forecast memo**
Goal 3: Improve the attractiveness of transit to serve more people in the corridor							
Total corridor ridership benefitting from improved transit advantages (includes BRT and express routes 490 and 493)	Ridership forecast	Quantitative		8,400	7,600	1,000	**Traffic ops/forecast memo**
Southwest Transit routes with potential to shift to US 169 (670, 671, 690, 691, 692, 697, 698, and 699)	Ridership forecast	Quantitative		2,500	2,500	-	**Traffic ops/forecast memo**
Off-peak period ridership	Ridership forecast	Quantitative		3,100	2,700	-	**Traffic ops/forecast memo**
Reverse-commute direction ridership	Ridership forecast	Quantitative		2,800	3,600	-	**Traffic ops/forecast memo**
Transit-dependent ridership	Ridership forecast	Quantitative		2,000	2,400	-	**Traffic ops/forecast memo**
Bus rapid transit ridership	Ridership forecast	Quantitative		7,400	6,600	-	**Traffic ops/forecast memo**
Goal 4: Provide a high long-term return on the transportation investment							
Capital costs	Capital cost estimate	Quantitative		High: $658.6 million Low: $396.3 million	High: $660.2 million Low: $397.9 million	High: $135.7 million Low: $115.8 million	**Cap Cost Tech Memo**
Operating and maintenance costs (BRT Alts, 2015 dollars)	O&M cost estimate	Quantitative		$16,521,500	$17,142,900	-	**O&M Cost Tech Memo**
Cost per reliable trip (MnPASS costs only)	Capital and operating cost estimates	Quantitative		$4.05	$4.05	$1.11	**Addendum 3**

Annualized capital plus operating costs per trip	Capital and operating cost estimates	Quantitative	$8.85	$10.25	-	
Operations and maintenance factors (maintenance performance, ease of enforcement, incident management)	Highway forecast and operations analysis	Qualitative	MnPASS Operations & Enforcement: Fair	MnPASS Operations & Enforcement: Fair	MnPASS Operations & Enforcement: Good	**Traffic ops/forecast memo**
			Incident Management: Good-Fair	Incident Management: Good-Fair	Incident Management: Fair	
			O&M Cost Factors: Fair	O&M Cost Factors: Fair	O&M Cost Factors: Good-Fair	
Goal 5: Prioritize service to existing transit-supportive areas and to those committed to implementing development patterns that support transit service						
Existing multi-modal-supportive policies	Cities' comprehensive plans	Qualitative	Over all better option. Saint Louis Park has more supportive multi-modal policies and existing transit hubs at/near proposed stations.	Golden Valley has weaker policies, less established transit at proposed stations.		**Environmental Scan**
Existing bicycle and pedestrian policies and networks	Cities' comprehensive plans and counties' bicycle plans	Qualitative	Over all worse option. More supportive policies, but focus is not on areas near stations and existing infrastructure is difficult to change.	Over all better option. Slightly less supportive policies, but more focus on connections across TH 55 and existing infrastructure is easy to supplement.		**Environmental Scan**
Forecast population within ½ mile of station areas (transitway alternatives)	Met Council TAZ forecast population and employment	Quantitative	26,300	30,400 (42,100 with 7th Street Station)	-	**Addendum 1**
Forecast employment within ½ mile of station areas (transitway alternatives)			57,100	49,800 (67,600 with 7th Street Station)	-	**Addendum 1**
Goal 6: Preserve and enhance the quality of the built and natural environments (Environmental & Community Analysis)						
Noise and Vibration (number of noise/vibration sensitive sites located within 500' of alignment)		Quantitative	Category 1: 4	Category 1: 2	Category 1: None	**Environmental Scan** Category 1: noise sensitive uses, Category 2: where people sleep, Category 3: quiet daytime uses.)
			Category 2: 3,501	Category 2: 2,776	Category 2: 971	
			Category 3: 26	Category 3: 17	Category 3: 2	

Cultural and Historic Resources (number of sites located within 500 feet of alignment and likelihood for Section 106 adverse effects/Section 4(f) use of cultural and historic resources)		Quantitative	4 listed NRHP Properties	8 listed NRHP Properties	None	**Environmental Scan**
		Qualitative	Section 106 – Low	Section 106 – Low	No Section 106 or Section 4(f) impacts	
			Section 4(f) – Low	Section 4(f) – Low		
Parks, Trails, and Recreation Areas (number of sites located within 500 feet of alignment and likelihood for potential Section 4(f) use of park and recreational properties		Quantitative	4 Section 6(f) sites	3 Section 6(f) sites	2 Section 6(f) sites	**Environmental Scan**
		Qualitative	Section 106 - Low	Section 106 - Low	Section 106 – Low	
			Section 4(f) – Low (Temporary occupancy)	Section 4(f) – Low (Temporary occupancy)	Section 4(f) – Low	
Threatened and Endangered Species (likelihood for impacts to threatened & endangered species)		Qualitative	Low	Low	Low	**Environmental Scan**
Wetlands (acres of potential impacts to NWI and PWI mapped wetlands)		Quantitative	None	None	None	**Environmental Scan**
Floodplains (acres of floodplain encroachment)		Quantitative	None	None	None	**Environmental Scan**
Hazardous Materials and Existing Contamination (likelihood for alternative to require soil excavation or grading)		Quantitative	607 Total Sites, 344 Active Sites	494 Total Sites, 282 Active Sites	49 Total Sites, 28 Active Sites	**Environmental Scan**
		Qualitative	High likelihood near station locations	High likelihood near station locations	Low	
Land Use		Qualitative	Conducive to transit use and transit oriented development	Conducive to transit use and transit oriented development		**Environmental Scan**
Business Impacts (likelihood for temporary and permanent business impacts)		Qualitative	***Low***	***Low***	***Low***	**Environmental Scan**
Environmental Justice		Qualitative	EJ communities in the corridor; however few impacts expected	EJ communities in the corridor; however few impacts expected	***In process***	**Environmental Scan**

Property Acquisition		Quantitative	Low – minor property acquisition required near station locations	Low – minor property acquisition required near station locations	Low	**Environmental Scan**

Addendum 1: Population and Employment

A spatial analysis was performed to calculate the population and employment within a half mile of stations in the corridor. The total area of developable land was calculated within the half mile buffer of each station by extracting existing parcel data. This was used to determine the existing and future population and employment in the buffer area using the existing and year 2040 socioeconomic data by the Metropolitan Council. The stations closest to the downtown area are highly population, and the employment rate is higher compared to the stations in Scott County.

Addendum 2: Employment in Corridor

An effort was made to determine how effective each alternative was in providing transit connections to employment centers. This analysis used the Metropolitan Council lists of regional employment centers and public transit stops to perform the comparison evaluation. It was of interest to distinguish how the sizes of transit-connected employment centers compared amongst the alternatives. Therefore, regional employment centers were categorized by the number of employees. The following table summarizes the size criteria of each category type:

Employment Center Size Category	Size Range (Number of Employees)
Regional	>20,000
Large	15,000-20,000
Medium	10,000-15,000
Small	3,500-10,000

Each alternative was determined to provide adequate transit access to an employment center if transit stops along the route were within 1/2 mile of the employment center. The number of employment centers, by size category, that can be feasibly served by transit routes are summarized for each alternative in the evaluation summary matrix.

Addendum 3: Cost per Reliable Trip

Using the capital costs from the Capital Costs Technical Memo and dividing those by the sum of all times and directions values for Travel Time Reliability provides values for Capital and Operating Cost Estimates. Please see the table below for details on the calculation.

	Alt 1: I-394	Alt 2: TH 55	Alt 3: MnPASS
NB AM	7000	7000	5900
NB PM	7300	7300	4790
SB AM	6800	6800	6200
SB PM	6900	6900	6500
TOTAL	28,000	28,000	23,390
High Capital Costs (MnPass Only)	$591,200,000	$591,200,000	$135,700,000
Low Capital Costs (MnPass Only)	$328,900,000	$328,900,000	$115,800,000
High Capital Costs (BRT & MnPASS)	$658,600,000	$660,200,000	$135,700,000
Low Capital Costs (BRT & MnPASS)	$396,300,000	$397,900,000	$115,800,000
High Cost per Reliable Trip (MnPass Only)	$21,000	$21,000	$5,800
Low Cost per Reliable Trip (MnPass Only)	$11,700	$11,700	$5,000
High Cost per Reliable Trip (BRT & MP)	$23,400	$23,500	$5,800
Low Cost per Reliable Trip (BRT & MP)	$14,100	$14,200	$5,000