



Highway 169 Mobility Study

Executive Summary

Prepared for: Minnesota Department of Transportation



Why Highway 169?

Highway 169 connects residents, employers, and communities, including Shakopee and Savage in Scott County, and Bloomington, Eden Prairie, Edina, Hopkins, Minnetonka, St. Louis Park, Golden Valley, and Plymouth in Hennepin 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.

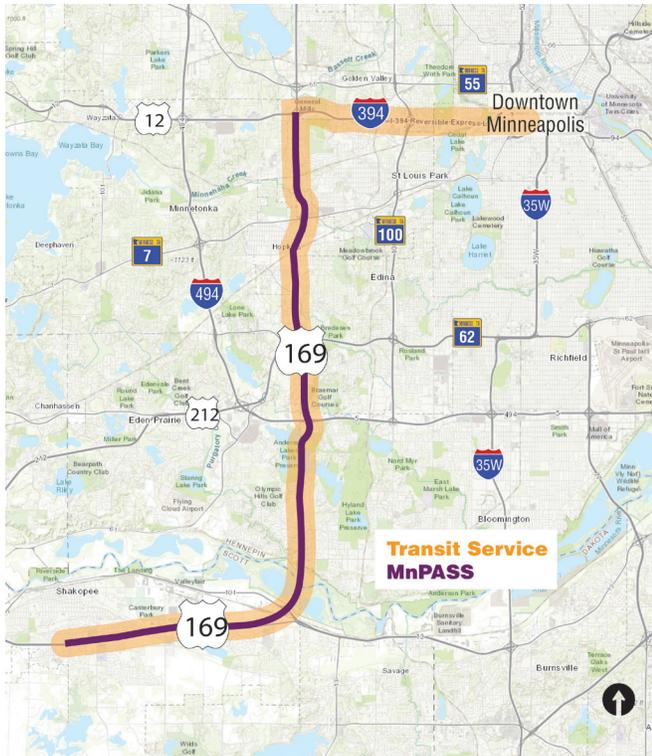
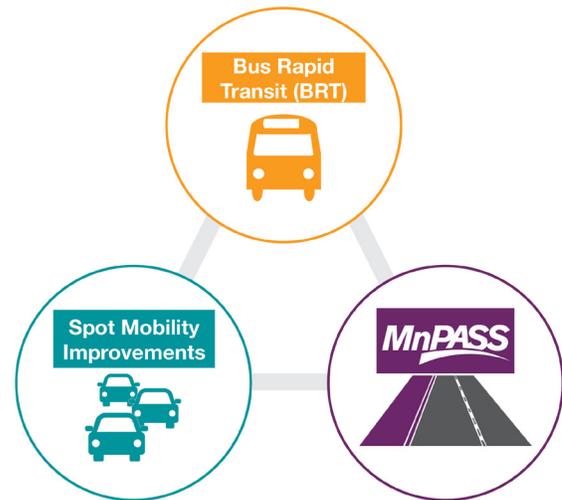


Figure 1 - Study Area

Highway 169 has been the subject of several recent studies. The Highway Transitway Corridor Study (2014) compared bus rapid transit on Highway 169 between downtown Minneapolis (via I-394) and Marschall Road in Shakopee to bus rapid transit on other highway corridors across the region. Highway 169 was found to be a comparatively strong candidate for highway bus rapid transit (BRT). As part of the MnPASS System Study Phase 3 (2018), Highway 169 was

reaffirmed to be a strong candidate corridor for adding MnPASS Express Lane capacity. These previous studies, as well as the Scott County Transit Operations and Capital Plan (2013), led to the unique scope of the Highway 169 Mobility Study, which considers BRT, MnPASS, and highway spot mobility improvements in a single, coordinated effort.



- Bus Rapid Transit –uniquely branded transit service that operates frequently for at least 16 hours each day and stops at well-defined stations with amenities such as pre-pay boarding, well-lit and heated waiting areas, and information for customers.
- MnPASS- highway lanes that during peak travel times provide a congestion-free option to transit and vehicles with two or more people (i.e. carpools), motorcycles, and solo motorists willing to pay a fee.
- Spot Mobility Improvements- these are highway improvements that improve the roadway so that more people can use the road safely and without as much delay.

For full documentation, see the Highway 169 Mobility Study Implementation Plan.

Outreach and Engagement

Stakeholders were involved early in the project through more than twenty events in the suburban portion of the study area. Employer surveys were returned by representatives from more than 22 employers and nearly 3,000 responses were collected from an online survey on personal use of Highway 169. Fact sheets about the project were shared at all MnDOT tabling events in the study area during early 2016. Business chamber meetings, employer round tables, and pop-up events at community events and large employers all shaped the purpose and need statement, goals, and evaluation measures used to guide decision-making on the project.

The project was guided by three committees, the Project Management Team (PMT), the Technical Advisory Committee (TAC), and the Policy Advisory Committee (PAC). The PMT, comprised of staff from MnDOT, Scott and Hennepin Counties, the Metropolitan Council, and the consultant team, guided development and ensured progress of the study. The PMT facilitated coordination among partner agencies, study committees, and the consultant team. The TAC, tasked with providing technical input on the study process, was staffed by the Shakopee Mdewakanton Sioux Community, county and city staff as well as MnDOT and Metro Transit. The PAC, staffed by elected and appointed officials from cities counties and partner agencies in the Highway 169 corridor, considered project information and provided input on the study process, issues, and recommendations.

Selection Among Alternatives

The project progressed through four main areas of work. First, the purpose and need was created with the committees and the feedback from the community. Next, initial alternatives and evaluation measures were assessed. Concept development included a deep technical analysis of alternatives to help choose and refine the Recommended Improvements. The project was wrapped up with the full definition of the Recommended Improvements detailed in the Implementation Plan.

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. The needs of the project were:

- Improved connections between people, jobs, and other destinations throughout the corridor
- Move a growing number of people and goods with more travel options
- Solutions that fit within the existing transportation system, current policy plans, and financial constraints



Three alternatives were created to assess options along the corridor:

- Alternative 1: MnPASS along Highway 169 and BRT Service on Highway 169 and I-394 between Marschall Road and Downtown Minneapolis
- Alternative 2: MnPASS along Highway 169 and BRT Service on Highway 169 and Highway 55 Between Marschall Road and Downtown Minneapolis
- Alternative 3: MnPASS on Highway 169 between Marschall Road and I-494

The study area for the BRT, MnPASS, and spot mobility improvements considered in the Highway 169 Mobility Study runs roughly 20 miles from Marschall Road in Shakopee in Scott County to Highway 55 in Golden Valley in Hennepin County, and then another seven miles to downtown Minneapolis. The BRT alternatives in the study considered the use of either I-394 or Highway 55 to travel from Highway 169 to downtown Minneapolis. In the study area, 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. Significant users include both commuters and freight.

Each alternative was evaluated using measures derived from study goals, including travel models, cost, and environmental impact.

- Improve Access
- Mobility
- Transit Ridership
- Return on Investment
- Supportive Conditions
- Preserve Environment

Alternative 3 was only assessed by metrics for the goals it satisfies-- Access, Mobility, Return on Investment, and Preserve Environment. Both Alternatives 1 and 2 were found to meet all study goals, and so they were tested with different station combinations and frequencies to find cost savings where available. With support from the Technical Advisory Committee, the Project Management Team selected Alternative 2 as the basis for the Recommended Improvements.

The Recommended Improvements most effectively deliver the vision for mobility and access along the Highway 169 Corridor.

The TAC came to consensus that Alternative 2 best met the project goals and recommended it for further development in the implementation plan because it provides service to a currently unserved area with a population that is most likely to use the service. Another factor that influenced the selection of Alternative 2 include connections to other regional transitways including the Blue Line Extension light rail and C Line Arterial BRT on Penn Avenue in Minneapolis.

Given the rationale for the TAC's recommendation, the project management team proceeded with preparation of this implementation plan for Alternative 2. Later, if project sponsors wish to pursue Alternative 1, a similar plan may be drafted for that alternative.

At their final meeting, the PAC passed a resolution in support of the Recommended Improvements and Interim Bus Service Option 2 with one abstention from the City of Bloomington. This resolution will allow the Metropolitan Council to designate Highway 169 and Highway 55 as a project with study recommendations under the increased revenue scenario.

Recommended Improvements

The Recommended Improvements most effectively deliver the vision for mobility and access along the Highway 169 Corridor, including MnPASS, highway improvements, and bus rapid transit service.

Highway Spot Mobility Improvements

Spot mobility improvements are lower-cost/high-benefit highway concepts that seek to reduce existing congestion issues. These solutions are ideally able to be implemented more quickly and at lower cost than traditional capacity expansion projects. Successful improvements are expected to provide benefits for the existing facility and would also be compatible with the addition of MnPASS lanes to the facility.

Full information on the spot mobility improvements can be found in the Implementation Plan, but a few examples include:

- Solution to reconfigure lane alignment at the Highway 169 southbound exit to Highway 101
- Eliminating the south ramps at the Cedar Lake Road interchange
- Adding a frontage road connection on the east side of Highway 169 between Highway 55 and Betty Crocker Drive

MnPASS

The Recommended Improvements call for adding center-running MnPASS lanes in both directions on Highway 169 from Marschall Road in Shakopee to Highway 55 in Golden Valley. MnPASS on Highway 169 would be part of the same system of MnPASS lanes currently on I-394 and planned on I-494 in Bloomington. However, direct connections between these MnPASS lanes that allow users to stay in MnPASS from one corridor to the next are not assumed as part of the MnPASS construction on Highway 169.

MnPASS would be constructed in the median of Highway 169 from Marschall Road to south of the I-494 interchange on Highway 169. The existing Bloomington Ferry Bridge over the Minnesota River would be used with expansions to several spans of the bridge to accommodate the lanes and recommended shoulder widths. In this and all segments, bridges over Highway 169 would need to be expanded accordingly. From south of the I-494 interchange to north of the Highway 62 interchange, Highway 169 will be expanded to the inside for the MnPASS lanes. North of Highway 62, widening of Highway 169 would be required to accommodate the addition of MnPASS lanes.

The MnPASS and spot mobility improvements between Marschall Road and Highway 55 are estimated to cost approximately \$400 million to implement if coordinated with planned bridge and pavement preservation projects.

Bus Rapid Transit (BRT)

The BRT recommendation would provide service to 10 new stations from Shakopee to downtown Minneapolis primarily along Highway 169 and Highway 55.

Bus rapid transit (BRT) would operate on Highway 169 for the portion of the corridor between Marschall Road in Shakopee and Betty Crocker Drive in Golden Valley, using MnPASS lanes from Canterbury Road to Viking Drive, and between Hopkins and General Mills. When BRT buses are not in MnPASS lanes, they will use general travel lanes unless traffic is moving slower than 35 miles per hour, allowing them to use bus-only-shoulders. BRT would also operate on Betty Crocker Drive and General Mills Boulevard to reach Highway 55 and operate on Highway 55 to 7th Street near downtown Minneapolis.

The BRT would serve 15 stations every 15 minutes during peak periods, including five stations in downtown Minneapolis. Some stations are offline and require the bus to leave the highway and make a few turns to access the station. Other stations are inline, which are adjacent to the highway on interchange ramps. BRT is assumed to begin after completion of the Green Line Extension (Southwest) light rail and use planned arterial BRT stations in and near downtown Minneapolis. This timing allows for greater ridership from connections to other service and cost-savings as BRT will be able to share stations with areterial BRT.

Ridership estimates for the BRT service in year 2040 are 5,600 daily riders, 2,300 of whom are transit dependent, 2,800 off-peak riders, and 3,200 who are reverse-commuters (traveling from the central cities towards Scott County.)



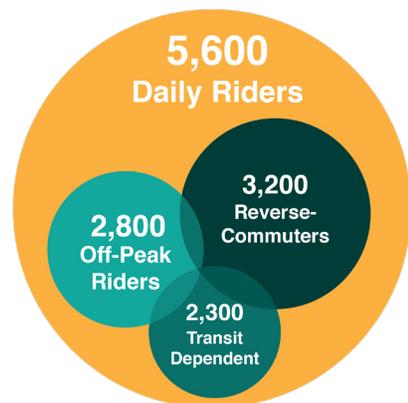
Online Station



Inline Station



Offline Station



The estimated total cost of construction and vehicle costs for the BRT is \$45.5 million, and the estimated annual cost to operate BRT is \$13.6 million.

Connecting Bus Service

The background transit network assumes the following major transit improvements to be in place connecting or adjacent to the corridor by 2040:

- Green and Blue Line light rail extensions and Orange Line BRT on I-35W south of downtown
- Penn Avenue and Chicago/Emerson-Fremont arterial BRT
- Background bus network changes from Green and Blue Line light extension bus service plans

There are proposed changes to several existing routes operated by Minnesota Valley Transit Authority (495, 497, 499), Plymouth Metrolink Route 774, and Metro Transit Routes 46 and 542. Two new Minnesota Valley Transit Authority routes are considered as part of the Recommended Improvements, extending service connections to the Amazon Distribution Center, Canterbury Park and Seagate Technology in Shakopee. Several new or altered transit routes that are part of the Green Line Extension bus service plan will also connect to Highway 169 BRT service with no alignment or frequency changes. For more detail on the supporting bus network, including maps of proposed routes, see Tech Memo 12: Recommended BRT Service Plan, Operations and Maintenance Costs, and Interim Service Plan.

Bus Rapid Transit by the Numbers

Length: 28 miles

Stations: 15

Forecast 2040 Ridership: 5,600

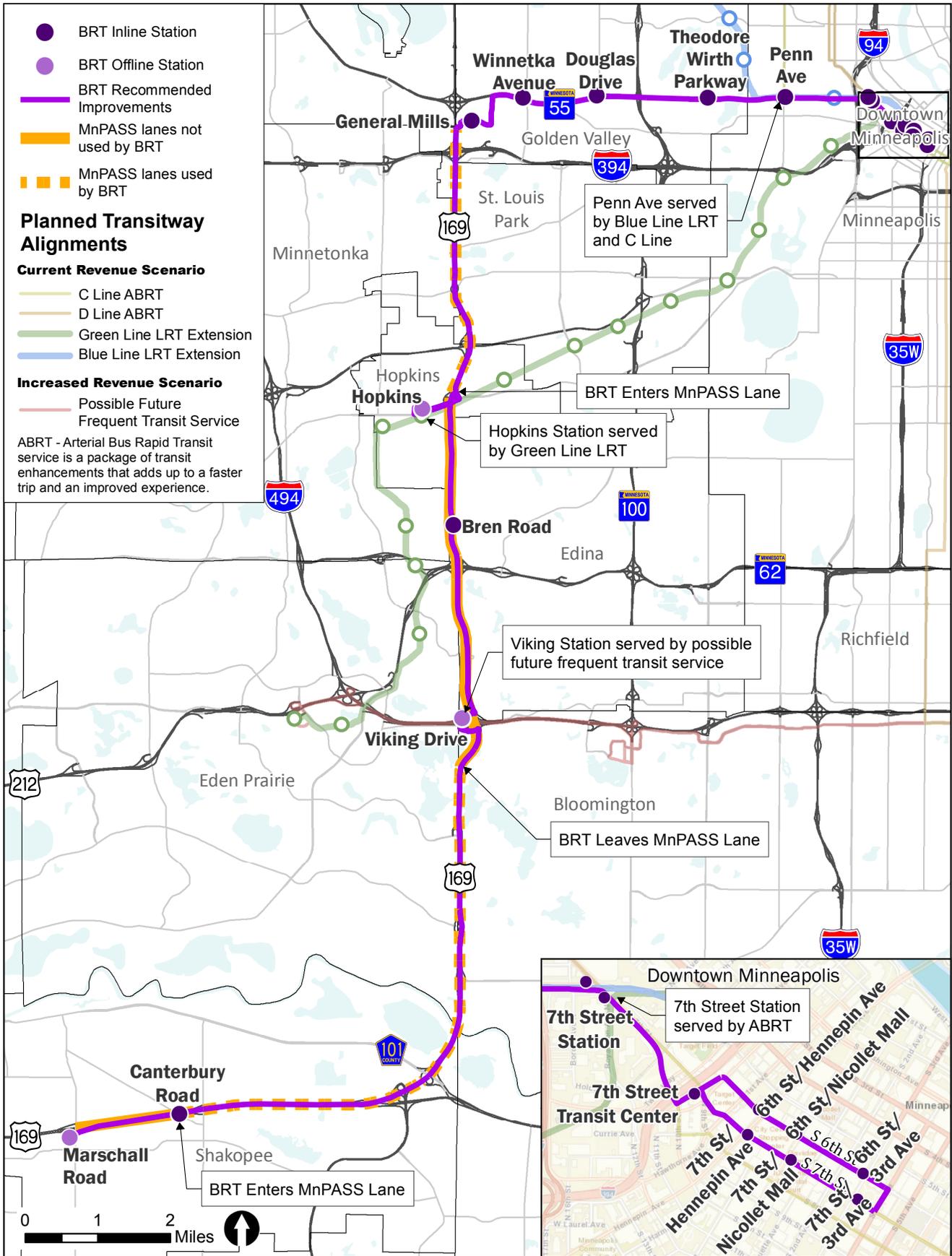
Estimated Cost to Construct: \$45.5 million*

Estimated Annual Cost to Operate: \$13.6 million*

Service Frequency: every 15 minutes

End-to-End Travel Time: 75 minutes

**2018 dollars*



Recommended Improvements – Bus Rapid Transit

Implementation and Next Steps

Both highway infrastructure and BRT are best completed in stages. Highways age and need scheduled maintenance and repairs, so changes to highway infrastructure are best timed with scheduled work. Frequent transit service like BRT performs best when it is preceded by other transit service. The following are approaches to build toward the Recommended Improvements.

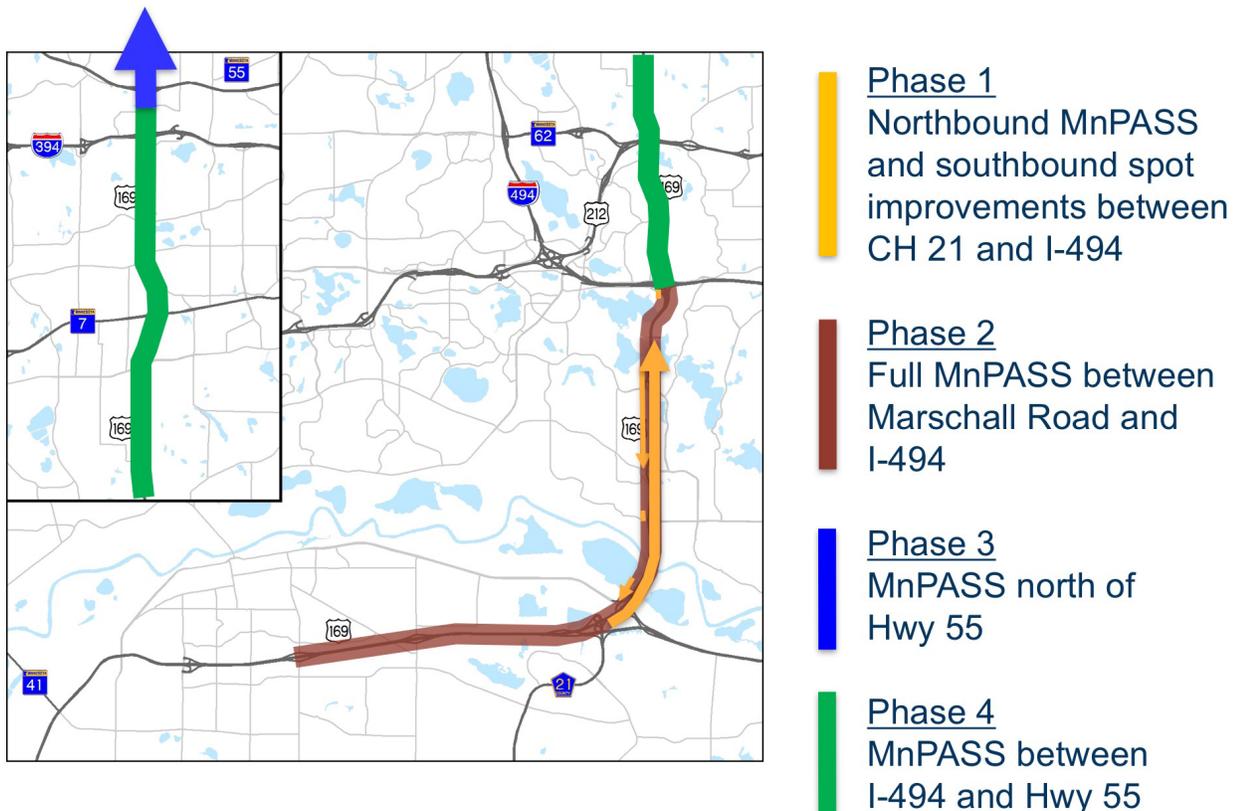
Phasing of Highway Infrastructure

Highway infrastructure, including both the spot mobility improvements and completion of MnPASS, will be completed in phases to reduce construction impacts and maximize cost savings. Due to planned updates to infrastructure, funding timelines, and political realities, it will take many years and separate stages for the Recommended Improvements to be completed. Preservation needs along the corridor were assessed for compatibility with the Recommended Improvements. Several preservation projects (including repaving and bridge maintenance) allow for cost savings in the phasing plan, where nearby improvements are

timed with planned preservation investments.

Work in stages is grouped into four phases based on timing of preservation and location of improvements. Full information on work completed in each stage can be found in the Implementation Plan. Phase 1 provides quick relief to significant areas of congestion along the corridor by completing southbound spot mobility improvements and a northbound MnPASS over the Minnesota River. Phase 2 covers work necessary to complete MnPASS between Marshall Road in Shakopee up to I-494 in both directions. Phase 2 includes considerable bridge work on more than 15 bridges to create enough space to complete MnPASS south of I-494. Phase 3 is implementation of MnPASS north of Highway 55 (outside the study area) that will have an impact on the construction of MnPASS south of Highway 55. Phase 4 will complete MnPASS between I-494 and Highway 55. Some of the work for Phase 4 includes removing exits from the highway near Cedar Lake Road, changing ramp access near Betty Crocker Drive, and several bridge widenings.

Phases of Highway Infrastructure



Interim Bus Route Options

To build a market for BRT service and to begin serving demand for trips in the corridor currently not served by existing service, such as suburb-to-suburb and reverse commute trips, two interim service options are proposed. Because Green Line Extension and the bus service improvements planned to be implemented alongside it are important connections for the interim service, it is assumed that interim bus service would not be implemented until after Green Line Extension opens, currently anticipated in 2023. Furthermore, while the interim service is important to building the market, its usefulness depends on its connectivity to the broader transit network. Interim service should be implemented in conjunction with the supporting transit network.

Interim bus route Option 1 assumes service from the Marschall Road Transit Station in Shakopee to General Mills. Interim stops are proposed at Viking Drive/Washington Avenue and Downtown Hopkins. Option 2 assumes continuation of Option 1 service along Highway 55 from General Mills to downtown Minneapolis, stopping at all Recommended Improvements proposed stops along Highway 55 and in downtown Minneapolis. Interim route will serve existing bus stops and improvements to the pedestrian and bicycle networks can support the interim bus stops. Interim service bus route options would have more flexibility than BRT to consider additional stops as planning progresses, because the level of capital investment in stops can potentially be low. The details of actual bus routing and service design would be determined by transit providers in conjunction with local governments and the public through efforts that build off the recommendations in this study.

It is assumed that interim routes will begin service after the Green Line Extension (Southwest) light rail service begins so that they can benefit from connections to other transit service described in detail on page six. Interim routes will need to capture approximately 600 (Option 1) to 1,000 (Option 2) weekday passenger trips per day to reach suburban transit service expectations, and would need to exceed these to be considered for an upgrade to BRT service and infrastructure.

Interim routes are proposed to have 30-minute frequencies at peak and hour frequencies midday and on weekends. Annual cost estimates were created for operation of both Option 1 and Option 2 for weekday and seven-day service. Capital cost estimates total \$4.12 million dollars for Option 1 and \$8.48 million for Option 2. The lowest cost interim service option would be Option 1 weekday only service, with \$1.7 million in operating and \$4.12 million in capital costs, totaling \$6.1 million.

Interim Service Operations and Maintenance Cost Estimates (2018\$)

Cost Item	Weekday Only Service	7-Day Service
Interim Service Option 1	\$1,700,000	\$2,200,000
Interim Service Option 2	\$2,600,000	\$3,300,000

Interim Service Capital Costs (2018\$)

Cost Item	Capital Cost of Interim Service
Interim Service Option 1	\$4,120,000
Interim Service Option 2	\$8,480,000

Next Steps

Highway and transit projects require sustained attention and support from local governments to acquire funding and gain support. A coalition of project champions made up of staff and elected officials from governments along the corridor can support the project, continue to involve local employers, and apply for funding for spot mobility improvements and interim bus service. Local governments may also undertake projects that bolster pedestrian and bicyclist connections to future stops and stations with small area plans and in their comprehensive plan updates.

Details about funding sources, improvements for pedestrian access to future stops and stations, and spot mobility improvements can be found in the Implementation Plan and supporting technical memos.