2 Alternatives

This chapter describes the process of developing alternatives that could meet the proposed METRO Blue Line Light Rail Transit (BLRT) Extension project's purpose and need, including a summary of the alternatives considered in the Alternatives Analysis (AA) Study (*Bottineau Transitway Alternatives Analysis Study Final Report* [Hennepin County Regional Railroad Authority (HCRRA), 2010]), the *Bottineau Transitway* Draft Environmental Impact Statement (Draft EIS) (Federal Transit Administration [FTA], HCRRA, and Metropolitan Council, 2014) (www.metrocouncil.org/Transportation/Projects/Current-Projects/METRO-Blue-Line-Extension/Environmental/DEIS.aspx), and the locally preferred alternative (LPA) for the proposed Bottineau Transitway project, now called the BLRT Extension project.

This chapter summarizes the primary project decision-making for the proposed BLRT Extension project to date, including the selection and approval of the LPA. This chapter also presents the two alternatives that are the subject of this Final Environmental Impact Statement (Final EIS): the No-Build Alternative and the Preferred Alternative. With the exception of **Chapter 2** in this Final EIS, the *Preferred Alternative* is referred to as the *proposed BLRT Extension project*.

Changes to This Chapter since the AA Study and Draft EIS Were Published

This chapter updates the discussion in the Draft EIS on the alternatives considered and includes the following sections:

- **Section 2.1** describes the alternatives-development process documented in the AA. This section has been summarized from the Draft EIS.
- **Section 2.2** describes the Draft EIS Scoping process. This section has been summarized from the Draft EIS.
- **Section 2.3** describes those alternatives that were advanced for further study in the Draft EIS. This section has been updated to reflect the decisions made during and subsequent to the completion of the Draft EIS.
- **Section 2.4** describes the LPA selection process. This section has been updated to reflect the decisions made during and subsequent to the completion of the Draft EIS.
- **Section 2.5** describes the No-Build Alternative and the Preferred Alternative, including the proposed alignment for the Preferred Alternative, stations, track type, operations and maintenance facility (OMF), ancillary facilities, and service and operating characteristics. The Preferred Alternative represents the design refinements to the LPA that have been made in response to comments received on the Draft EIS and to resolve technical issues raised since the publication of the Draft EIS.

2.1 Alternatives-Development Process

The Hennepin County Regional Railroad Authority (HCRRA), in consultation with the Metropolitan Council (Council), the Federal Transit Administration (FTA), and local jurisdictions—together referred to as the *study team*—completed an AA Study for the Bottineau Transitway in 2010. The study evaluated a wide range of transit modes and alignments (*Bottineau Transitway Alternatives Analysis Study Final Report*, HCRRA, 2010; www.hennepin.us/~/media/hennepinus/residents/transportation/bottineau/bottineau-alternative-analysis-summary-report.pdf).

The AA Study developed and evaluated a No-Build Alternative, an Enhanced Bus/Transportation System Management (TSM) Alternative, and a broad range of transit alternatives (see **Figure 2.1-1**). To narrow this initial universe of alternatives, the study team evaluated alternatives using screening criteria developed in consultation with local Advise, Review, and Communicate Committee (ARCC) members and other stakeholders. Alternatives that met all the screening criteria were advanced in the AA Study. The study did not advance alternatives that did not meet all the screening criteria.

The AA Study considered the mode, alignment, and facility types listed in **Table 2.1-1**.

Table 2.1-1. Elements Considered in the Alternatives Analysis Study

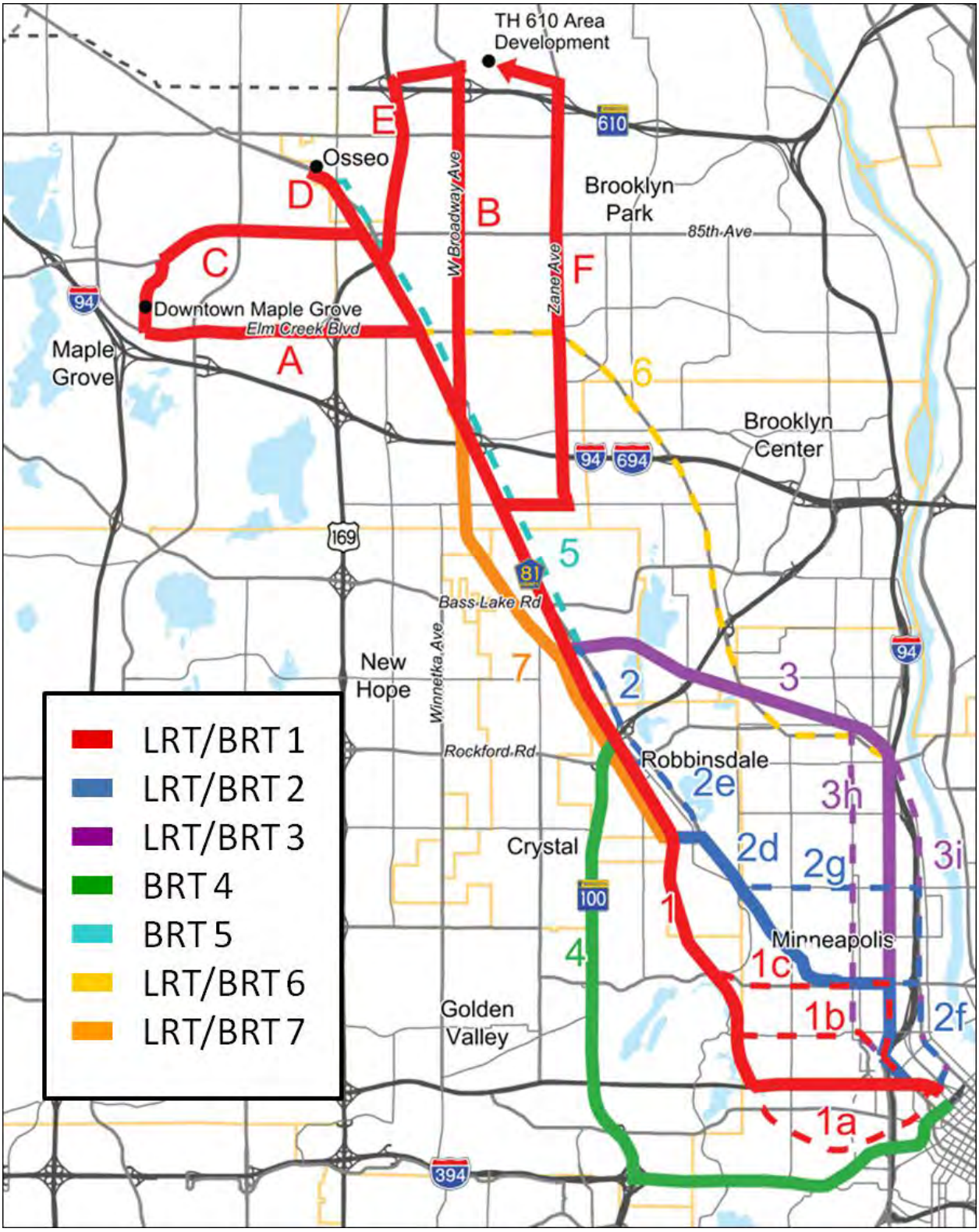
Element	Options Considered	Results of Analysis
Modes	Commuter rail Light rail transit (LRT) Bus rapid transit (BRT)	LRT and BRT were carried forward; commuter rail was not advanced because it did not serve communities in North Minneapolis or Robbinsdale
Alignments	Multiple options evaluated (**Figure 2.1-1**)	Five alignments met all screening criteria and were carried forward
Facility types	Focused on dedicated transitway options; considered certain mixed-traffic facilities	Dedicated transitway facility option was selected

AA Study Decision: Continue Studying Four LRT Alternatives and One BRT Alternative

At the conclusion of the AA Study, five alternatives were advanced. The alternatives included the three most promising LRT alternatives identified in the AA Study, a fourth LRT alternative considered in the study that was less promising but still of interest, and a refined BRT alternative.

The study team developed the refined BRT alternative based on additional understanding that the team gained during the AA Study. The study team explored modifications to routing, alignment, and operations to maximize the potential benefits of BRT. The resulting alternative had substantially improved performance over the BRT alternatives considered in the AA Study, and the study team decided to advance this refined BRT alternative for further study.

Figure 2.1-1. Range of Alternatives from the AA Study



2.2 Draft EIS Scoping Process

2.2.1 Definition of Alignments

For ease of comparison, the alternatives considered following the AA Study were named in terms of their component alignments.

As illustrated in **Figure 2.2-1**, there were two alignment options at the north end of the proposed BLRT Extension project corridor:

- **Alignment A:** Began in Maple Grove at Hemlock Lane/Arbor Lakes Parkway and followed the future Arbor Lakes Parkway and Elm Creek Boulevard to the BNSF Railway (BNSF) rail corridor located on the west side of Bottineau Boulevard (County Road 81).
- **Alignment B:** Began in Brooklyn Park south of Oak Grove Parkway near the Target North Campus (located just north of Trunk Highway [TH] 610), followed West Broadway Avenue (County State-Aid Highway 103), and crossed Bottineau Boulevard at 73rd Avenue to enter the BNSF rail corridor.

In the middle portion of the proposed BLRT Extension project corridor, there was one alignment option:

- **Alignment C:** Just south of 71st Avenue, both the A and B alignments would transition to the C alignment in the BNSF rail corridor on the west side of Bottineau Boulevard through southern Brooklyn Park, Crystal, and Robbinsdale. Alignment C is common to all the alternatives.

South of Robbinsdale and into downtown Minneapolis, there were two alignment options:

- **Alignment D1:** Continued along the BNSF rail corridor to Olson Memorial Highway (TH 55), and then followed Olson Memorial Highway to downtown.
- **Alignment D2:** Exited the rail corridor near 34th Avenue, joined West Broadway Avenue, and traveled on Penn Avenue to Olson Memorial Highway and into downtown.

2.2.2 EIS Scoping

The Notice of Intent to prepare an EIS for the proposed Bottineau Transitway was published on January 10, 2012, in the Federal Register (Volume 77, Number 6). The environmental process began with Scoping to determine the content of the Draft EIS. Using the findings from the AA Study, the Bottineau Transitway project team presented the following alternatives during the EIS Scoping process, a process that served to define the alternatives and to identify the issues that would be evaluated in the Draft EIS:

- No-Build Alternative
- Enhanced Bus/TSM Alternative
- LRT A-C-D1 (Maple Grove to Minneapolis via BNSF/Olson Memorial Highway)
- LRT B-C-D1 (Brooklyn Park to Minneapolis via BNSF/Olson Memorial Highway)
- LRT A-C-D2 (Maple Grove to Minneapolis via West Broadway Avenue/Penn Avenue/Olson Memorial Highway)
- LRT B-C-D2 (Brooklyn Park to Minneapolis via West Broadway Avenue/Penn Avenue/Olson Memorial Highway)
- BRT B-C-D1 (Brooklyn Park to Minneapolis via BNSF/Olson Memorial Highway)

During the Scoping process, the project team coordinated with the cities in the proposed BLRT Extension project corridor and incorporated the findings of the Theodore Wirth Regional Park (TWRP) master planning effort. These actions produced further refinements to the alignments, including the following:

- Modifications to Alignment B to better integrate with master planning activities for the Target North Campus
- The addition of the Plymouth Avenue Station on Alignment D1 to provide better access to TWRP facilities and surrounding residences
- Modifications to Alignment D2 near the transition from the BNSF rail corridor to reduce impacts to Bottineau Boulevard and the Terrace Mall in Robbinsdale

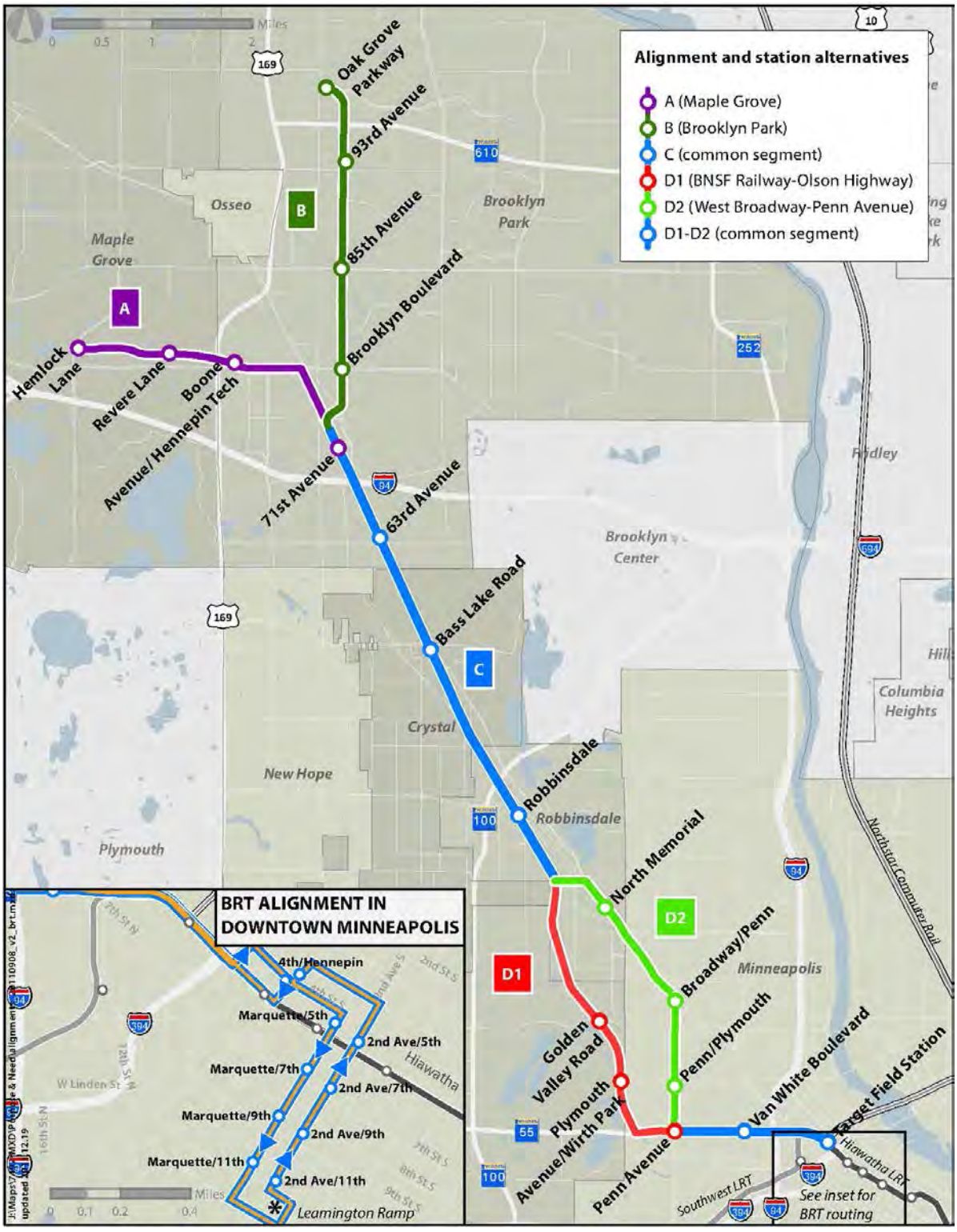
Figure 2.2-1 illustrates the alternatives that were proposed for study during Scoping.

2.2.2.1 Scoping Results: Stop Studying the BRT Alternative and Continue Studying Four LRT Alternatives in the Draft EIS

Based on the results of the technical analysis and Scoping input, and input from the ARCC and the Community Advisory Committee (CAC), the Policy Advisory Committee (PAC) resolved in April 2012 that the BRT alternative should no longer be studied (HCRRA, 2012). The PAC also recommended the continued study of the four LRT alternatives in the Draft EIS in addition to the No-Build and Enhanced Bus/TSM alternatives. Following the PAC action, HCRRA passed a resolution adopting the Scoping Decision recommended by the PAC. This resolution and other supporting documentation to the Scoping process are included in the *Bottineau Transitway Scoping Decision Document*, June 2012 (www.metrocouncil.org/METC/files/db/db2475ff-4d17-40fe-b06b-f0e3c81e2fa1.pdf).

Section 2.3 of the Draft EIS discusses the reasons for not advancing the study of BRT in the Draft EIS.

Figure 2.2-1. Build Alternatives Proposed for Study during Scoping (*as Defined in the Scoping Booklet*)



2.3 Alternatives Advanced for Further Study in the Draft EIS

A No-Build Alternative, an Enhanced Bus/TSM Alternative, and four LRT build alternatives were advanced for further study in the Draft EIS. These alternatives are described in more detail below.

2.3.1 Draft EIS No-Build Alternative

The Draft EIS No-Build Alternative reflected existing and committed improvements to the regional transit network for the horizon year of 2030. The Draft EIS No-Build Alternative included transportation improvements identified in the Council's *2030 Transportation Policy Plan* (*2030 TPP*) (www.metrocouncil.org/Transportation/Planning/Transportation-Policy-Plan/2030-Transportation-Policy-Plan-(1).aspx).

2.3.2 Draft EIS Enhanced Bus/TSM Alternative

The Draft EIS Enhanced Bus/TSM Alternative was defined as enhancements and upgrades to the existing transportation system in the proposed BLRT Extension project corridor. In developing this alternative, the project team attempted to meet the project's purpose and need as much as possible without a major transit capital investment. The purpose of the Draft EIS Enhanced Bus/TSM Alternative was to provide a comparable transit service to the build alternatives without the significant capital investment of building a transitway.

In addition to the improvements included in the Draft EIS No-Build Alternative, the Draft EIS Enhanced Bus/TSM Alternative included the following elements:

- New transit center and park-and-ride facility in Brooklyn Park on West Broadway Avenue near TH 610
- Additional limited stop bus routes 731 and 732
- Improvements in frequency of service to existing transit routes
- Restructuring of existing bus routes in the proposed BLRT Extension project corridor to connect to the Route 731/732 services and enhance connections within the corridor

2.3.3 Draft EIS Build Alternatives

Four LRT build alternatives were considered in the Draft EIS, as illustrated in **Figure 2.3-1** and summarized below.

- Alternative A-C-D1 (Maple Grove to Minneapolis via BNSF/Olson Memorial Highway)
- Alternative A-C-D2 (Maple Grove to Minneapolis via West Broadway Avenue/Penn Avenue/Olson Memorial Highway)
- Alternative B-C-D1 (Brooklyn Park to Minneapolis via BNSF/Olson Memorial Highway)
- Alternative B-C-D2 (Brooklyn Park to Minneapolis via West Broadway Avenue/Penn Avenue/Olson Memorial Highway)

2.3.3.1 Descriptions of Draft EIS Build Alternatives

The Draft EIS LRT build alternatives are summarized in **Table 2.3-1**. The features below are based on assumptions associated with the conceptual level of engineering conducted on the alternatives as of the date when the Draft EIS was published (March 2014). With each of the proposed Draft EIS build alternatives, the LRT alignment would connect to the regional LRT system at the Target Field Station in downtown Minneapolis.

Table 2.3-1. Elements of the Draft EIS Build Alternatives

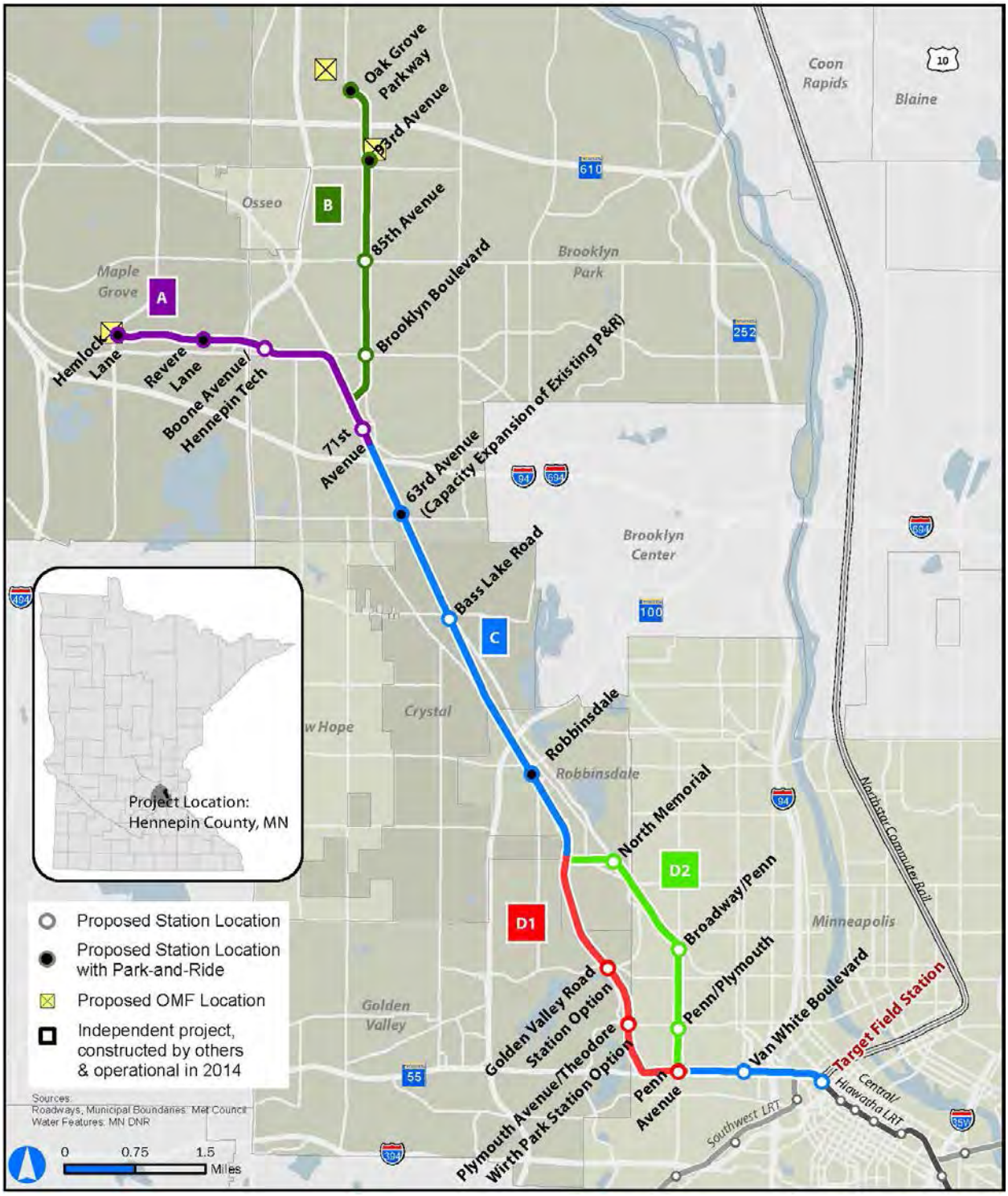
Element	Draft EIS Alternative			
	A-C-D1	A-C-D2	B-C-D1	B-C-D2
Northern terminus	Maple Grove	Maple Grove	Brooklyn Park	Brooklyn Park
Length[1]	12.6 miles	12.7 miles	13.3 miles	13.4 miles
Bottineau stations	**10 Stations** ■ Penn Avenue ■ Van White Blvd. ■ Golden Valley Road or Plymouth Avenue/TWRP[3] ■ Robbinsdale[2] ■ Bass Lake Road ■ 63rd Avenue[2] ■ 71st Avenue ■ Boone Avenue/ Henn Tech ■ Revere Lane[2] ■ Hemlock Lane[2]	**11 Stations** ■ Penn/Plymouth ■ Van White Blvd. ■ Broadway/Penn ■ North Memorial ■ Robbinsdale[2] ■ Bass Lake Road ■ 63rd Avenue[2] ■ 71st Avenue ■ Boone Avenue/ Henn Tech ■ Revere Lane[2] ■ Hemlock Lane[2]	**10 Stations** ■ Penn Avenue ■ Van White Blvd. ■ Golden Valley Road or Plymouth Avenue/TWRP[3] ■ Robbinsdale[2] ■ Bass Lake Road ■ 63rd Avenue[2] ■ Brooklyn Blvd. ■ 85th Avenue ■ 93rd Avenue[2] ■ Oak Grove Parkway	**11 Stations** ■ Penn/Plymouth ■ Van White Blvd. ■ Broadway/Penn ■ North Memorial ■ Robbinsdale[2] ■ Bass Lake Road ■ 63rd Avenue[2] ■ Brooklyn Blvd. ■ 85th Avenue ■ 93rd Avenue[2] ■ Oak Grove Parkway
Ridership (total)	27,600	27,200	27,000	26,000

[1] The length represents the full end-to-end length of the proposed Draft EIS build alternatives. Based on direction provided during the AA Study and affirmed during the Scoping process, the alternatives evaluation in the Draft EIS reflected full corridor analysis.

[2] Proposed station location where park-and-ride lot would be provided.

[3] The Draft EIS evaluated a Golden Valley Road station *and* a Plymouth Avenue/TWRP station on Alignment D1.

Figure 2.3-1. Draft EIS Build Alternatives

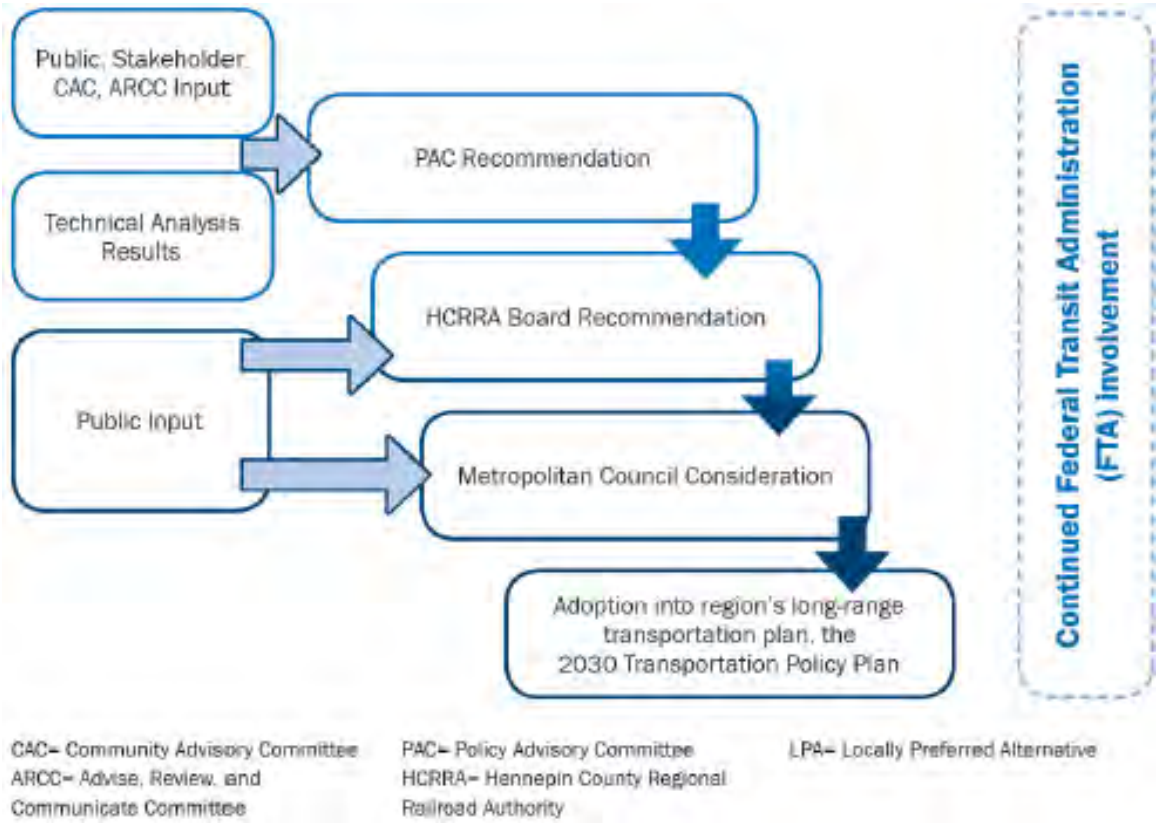


2.4 Process for Selecting the Locally Preferred Alternative (LPA)

The LPA is the transitway alternative that the cities in the proposed BLRT Extension project corridor, Hennepin County, and the Council recommended for detailed study through engineering and environmental review. The LPA specifies both the type of transit that would be used (mode) and the location (alignment). Other elements of the proposed BLRT Extension project, including termini and final station locations, are established formally during subsequent engineering based on additional information, including forecasts of travel demand in the project's opening year. Further documentation of the LPA selection process can be found in Hennepin County's *Alternatives Analysis Summary Report*, May 2013 (www.hennepin.us/~/media/hennepinus/residents/transportation/bottineau/bottineau-alternative-analysis-summary-report.pdf?la=en).

The multi-step process to formally recommend and select an LPA for the Bottineau Transitway began following the technical analysis and Scoping decisions described in **Sections 2.1** and **2.2**. **Figure 2.4-1** illustrates the process for recommending and selecting the LPA.

Figure 2.4-1. LPA Recommendation and Selection Process



Opportunities for public input on the LPA selection were included in these major steps:

- *Bottineau Transitway Alternatives Analysis Study Final Report*, March 2010
- Locally Preferred Alternative Selection, April 2011 to Spring 2013

During the LPA selection process, the PAC recommended Alignment D1 over Alignment D2 because Alignment D1 would result in significantly less property and neighborhood impacts, improved travel time, greater cost-effectiveness, and less disruption of roadway traffic operations. Discussion focused on the adverse impacts of Alignment D2 and that Alignment D1 better meets the project goals. Specifically, the PAC recognized past transportation projects in the region that have had adverse community impacts such as destruction of the Rondo neighborhood from construction of Interstate Highway 94 (I-94) and impacts on northside neighborhoods from construction of Olson Memorial Highway, and the desire not to repeat the past. In terms of the portion of the proposed alignment known as "A" and "B," the PAC recommended Alignment B over Alignment A because it would provide better service to people who depend on transit and to key civic and educational destinations, and access to greater numbers of new jobs and development.

Other steps included a PAC public hearing and recommendation; passage of resolutions of support by the cities of Minneapolis, Robbinsdale, Crystal, and Brooklyn Park; and an HCRRA-sponsored LPA public hearing. Following these steps, at a meeting on June 26, 2012, HCRRA passed a resolution recommending Alternative B-C-D1 as the LPA for the Bottineau Transitway. The city of Golden Valley followed with its resolution in December 2012.

On May 8, 2013, the Council formally adopted amendments to the *2030 TPP*—the region's long-range transportation plan at the time[1]—to include the Bottineau Transitway LPA as Alternative B-C-D1 (see **Figure 2.4-2**). This action, which concluded the LPA process, followed a public comment period and input from the Council's Transportation Advisory Board.

The LPA process was not the only time when cities have had input into the approval of the project. The cities have been engaged in resolving design issues throughout the project-development process (see **Section 2.5.2.1**), and the cities were required to review municipal consent[2] engineering plans and provide municipal approval for portions of the project within their jurisdiction.

In a letter dated September 27, 2013, FTA and the Federal Highway Administration (FHWA) concurred with the Council's amendment to the *2030 TPP* that selected LRT following the B-C-D1 alignment as the LPA for the Bottineau Transitway Project (see Appendix D of the Draft EIS). The Minnesota Pollution Control Agency (MPCA) approved the update to the *2030 TPP*, which included the LPA in their August 8, 2012 letter to the Council. The letter verified the conformance to the relevant sections of the Federal Transportation Conformity Rule and to the applicable sections of the Minnesota State Implementation Plan for Air Quality.

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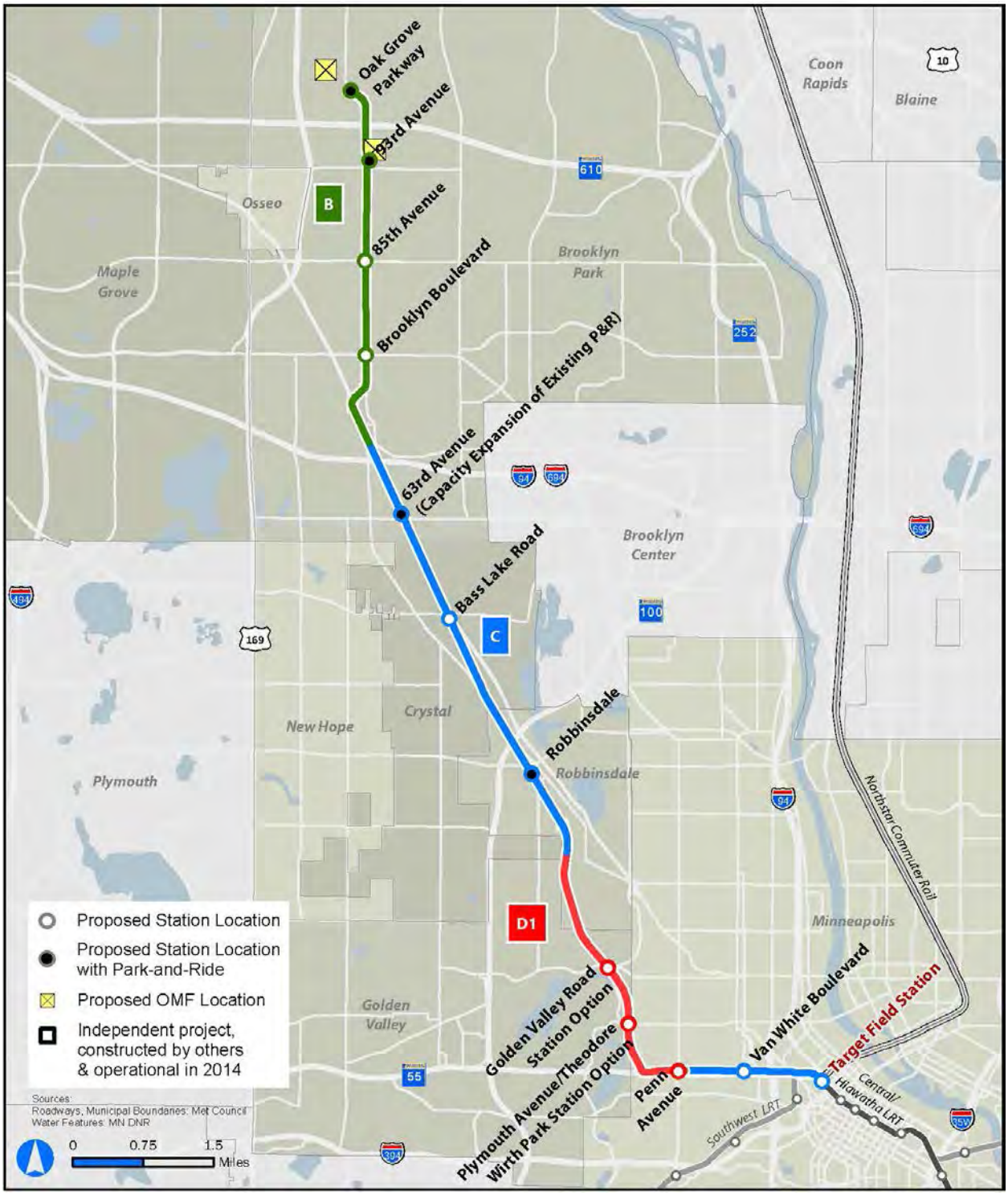
[1] The current regional plan is the *2040 Transportation Policy Plan*, and the Bottineau Transitway LPA is included in that document.

[2] Minnesota municipal consent process is codified in Minnesota Statues Chapter 473.3994

Figure 2.4-2. Draft EIS Alternative B-C-D1 (LPA)



Although HCRRA was the local public agency responsible for completing the Draft EIS, the Council is the project sponsor and federal grantee responsible for completing this Final EIS and completing the preliminary engineering, final design and construction if the project proceeds. The Council also reconstituted the various project advisory committees once the transfer of local sponsorship occurred.

After the selection of the LPA, the Council prepared and submitted the necessary documentation to FTA for entry into the Project Development phase of the New Starts process. FTA approved the proposed BLRT Extension project's entry into Project Development on August 22, 2014. The Project Development phase is where engineering is advanced to a point where key design decisions are made to support the environmental review and the environmental review process is completed.

2.5 Alternatives Evaluated in the Final EIS

A No-Build Alternative and the Preferred Alternative (the proposed BLRT Extension project) were advanced for further study in this Final EIS. These alternatives are described in more detail in this section. The term *Preferred Alternative* as used in this Final EIS refers to the Council's current proposed action, which is the LPA as refined through Project Development and with input from stakeholders through the Council's issue resolution process.

2.5.1 Final EIS No-Build Alternative

The Final EIS No-Build Alternative reflects existing and committed improvements to the regional transit network for the horizon year of 2040. The Final EIS No-Build Alternative does not include the proposed BLRT Extension project. Based on the Council's *Thrive MSP 2040 Transportation Policy Plan* (*2040 TPP*), major transportation improvements assumed under the No-Build Alternative include:

- Interstate Highway 494 (I-494) expansion to six lanes from TH 55 to I-94/I-694
- TH 610 extension to I-94 in Maple Grove
- Expansion of West Broadway Avenue to four lanes between 85th Avenue North and 93rd Avenue North
- Bottineau Boulevard reconstruction/expansion from north of 63rd Avenue North to TH 169 in Brooklyn Park
- I-94 Auxiliary Lane Construction in St. Michael to Rogers

The adopted regional 2040 TPP includes several improvements in its fully funded transit scenario. Near the proposed BLRT extension, this includes the Penn Avenue BRT (C Line) and Chicago-Fremont Avenue Arterial BRT line. The plan assumes modest changes to transit service in the corridor, as reflected in the No-Build Alternative, particularly to reflect the arterial BRT lines (C Line and Emerson-Fremont) or feeder service to the METRO Green Line Extension.

2.5.1.1 West Broadway Avenue Reconstruction Project

The reconstruction of West Broadway Avenue, which is one of the major transportation improvements included in the Final EIS No-Build Alternative (**Section 2.5.1**), is occurring in the same geographic location as the proposed BLRT Extension project. Funds for the reconstruction of West Broadway Avenue have been identified in Hennepin County's Capital Improvement Program (CIP) for several years, but the schedule for designing and reconstructing the roadway is now progressing in parallel with planning, designing, and constructing the proposed BLRT Extension project. The West Broadway Avenue Reconstruction and proposed BLRT Extension projects each have independent utility (that is, each project can function without the other being constructed), as explained below.

The West Broadway Avenue Reconstruction project consists of reconstructing the existing roadway from south of Candlewood Drive to north of 93rd Avenue. This section of the road is currently four lanes between Candlewood Drive and 85th Avenue. North of 85th Avenue, West Broadway Avenue is primarily two lanes with sections that have been widened to accommodate turn lanes and passing lanes.

Since there is no federal funding for the West Broadway Avenue Reconstruction project, it was documented in an Environmental Assessment Worksheet (EAW) in accordance with the Minnesota Environmental Policy Act (MEPA). At the conclusion of the EAW process, Hennepin County prepared its Findings of Fact and Conclusions and finalized the environmental review process through a Negative Declaration on the Need for an EIS. Once this step was completed, the County had the necessary environmental clearance to proceed with permitting and the other activities required to finalize the roadway project.

In summary, and consistent with all applicable environmental review requirements:

- An independent need for the roadway improvements on West Broadway Avenue has long been identified
- Funding has long been dedicated for the West Broadway Avenue Reconstruction project. This funding comes from County State Aid and local sources; there is no federal funding for the roadway project
- The partner agencies are committed to preserving sufficient right-of-way in the West Broadway Avenue corridor for future transit needs
- The partner agencies are committed to constructing the West Broadway Avenue Reconstruction project and the proposed BLRT Extension project at the same time to minimize construction impacts to the community

2.5.2 Preferred Alternative (Proposed BLRT Extension Project)

The proposed BLRT Extension project begins at the Target Field Station in downtown Minneapolis and follows Olson Memorial Highway west to the BNSF rail corridor just west of Thomas Avenue, where it enters the BNSF right-of-way. Adjacent to the freight rail tracks, it continues in the rail corridor through the cities of Golden Valley, Robbinsdale, Crystal, and into Brooklyn Park. It then

crosses Bottineau Boulevard at 73rd Avenue to West Broadway Avenue and terminates just north of TH 610 near the Target North Campus, as illustrated in **Figure 2.5-1**.

The proposed BLRT Extension project includes seven new LRT bridges: a 350-foot-long crossing of the Hennepin Energy Recovery Center (HERC) driveway, a 700-foot-long crossing of the ponds immediately north of Golden Valley Road, a 1,200-foot-long crossing of Grimes Pond in Robbinsdale, a 375-foot-long bridge over TH 100, a 1,200-foot-long bridge over the Canadian Pacific Railway (CP) rail tracks, a 925-foot-long bridge over the 73rd Avenue/Bottineau Boulevard intersection, and a 250-foot-long bridge over TH 610.

Five reconstructed roadway bridges are part of the proposed BLRT Extension project: a 375-foot-long Olson Memorial Highway bridge over the BNSF rail corridor, a 375-foot-long Plymouth Avenue bridge, a 120-foot-long Theodore Wirth Parkway bridge, a 215-foot-long Golden Valley Road bridge, and a 110-foot-long 36th Street bridge. The Olson Memorial Highway bridge over I-94 in Minneapolis and the I-94/I-694 bridge over the BNSF rail corridor in Brooklyn Park would require modifications to accommodate LRT. In addition, the proposed BLRT Extension project includes a pedestrian bridge over Bottineau Boulevard at Bass Lake Road.

2.5.2.1 Issue Resolution Process

This section summarizes the process used by the Council, local partners, and stakeholders to identify design adjustments to the LPA since the end of the Draft EIS public comment period on May 29, 2014. The Council developed and evaluated 16 technical segment-specific and system-wide issues (see **Figure 2.5-2** and **Table 2.5-1**) that could result in design adjustments, including proposed adjustments to accommodate local goals and objectives, improve the performance of the proposed light rail extension, reduce project costs, and avoid or minimize adverse environmental impacts.

The issue resolution process was supported by the Technical Project Advisory Committee (TPAC), which is composed of staff from the Council, Minnesota Department of Transportation (MnDOT), Metro Transit Operations Division, Hennepin County, HCRRA, and Minneapolis Park and Recreation Board (MPRB). The Corridor Management Committee (CMC), which advises the Council on project-related issues, consists of elected officials of the corridor cities and Hennepin County, MnDOT, the Council, MPRB, and representatives from the CAC and the Business Advisory Committee (BAC). The ongoing engagement and communication with the affected public has been a fundamental element of planning for the proposed BLRT Extension project. Community representatives serve on the BAC and CAC, which provide input and recommendations to the CMC, including design adjustments developed as a part of the issue resolution process.

Issue Resolution Teams (IRTs) were formed to carry out the issue resolution process for each of the 16 issues identified (see **Figure 2.5-2** and **Table 2.5-1**). IRTs were composed of representatives of the Council engineering and environmental staff from the proposed BLRT Extension project team and other Metro Transit departments, and staff from Hennepin County, MnDOT, municipalities along the proposed BLRT Extension project alignment, and administrators of park properties in the corridor. Each of the technical and system-wide issues was examined, and possible project design adjustments to the Draft EIS LPA were analyzed. Results and recommendations from each of the IRTs were documented in a technical issue summary and were incorporated into the project elements discussion for the proposed BLRT Extension project Final EIS.

Figure 2.5-1. Proposed BLRT Extension Project

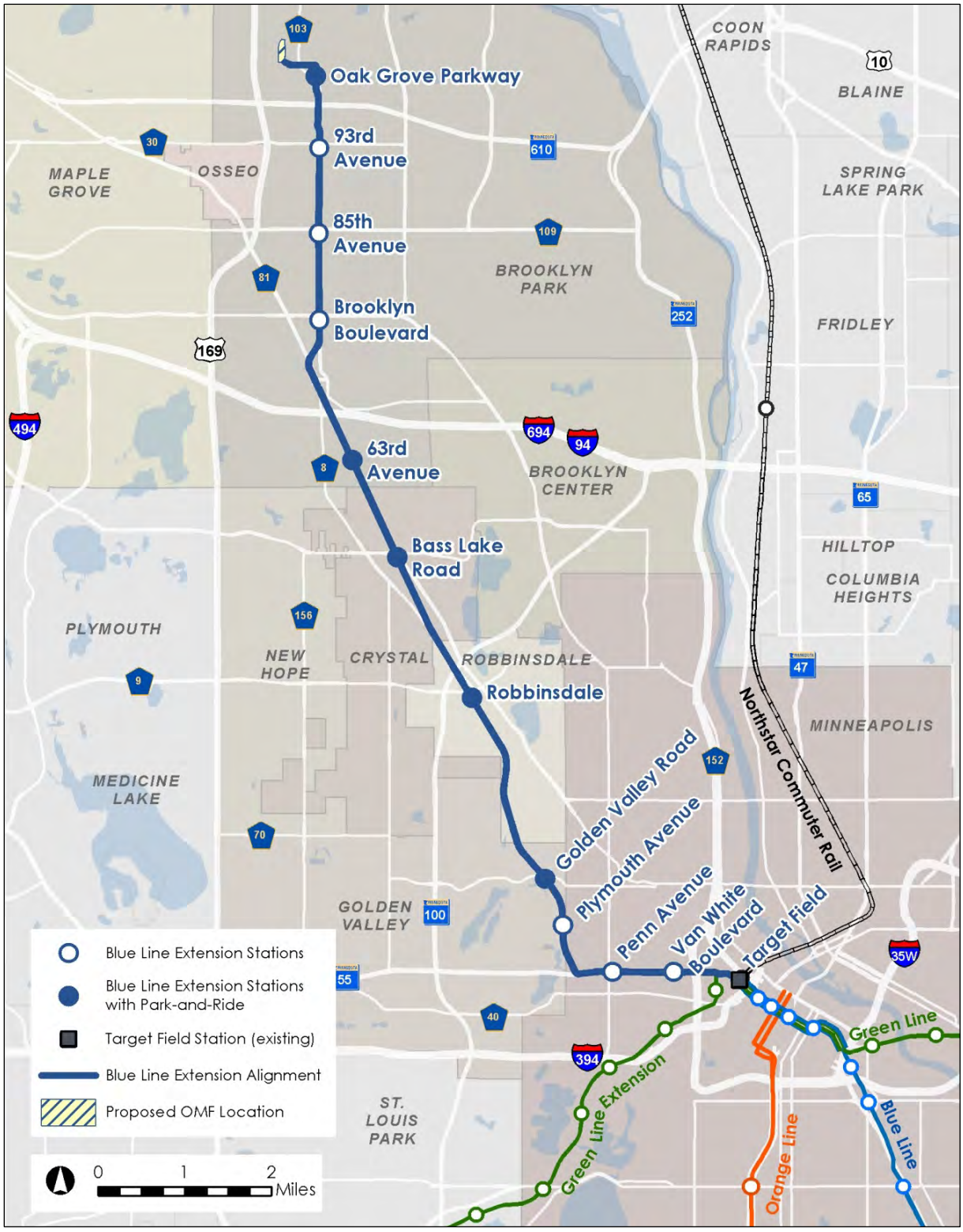


Figure 2.5-2. Final EIS Technical Issues

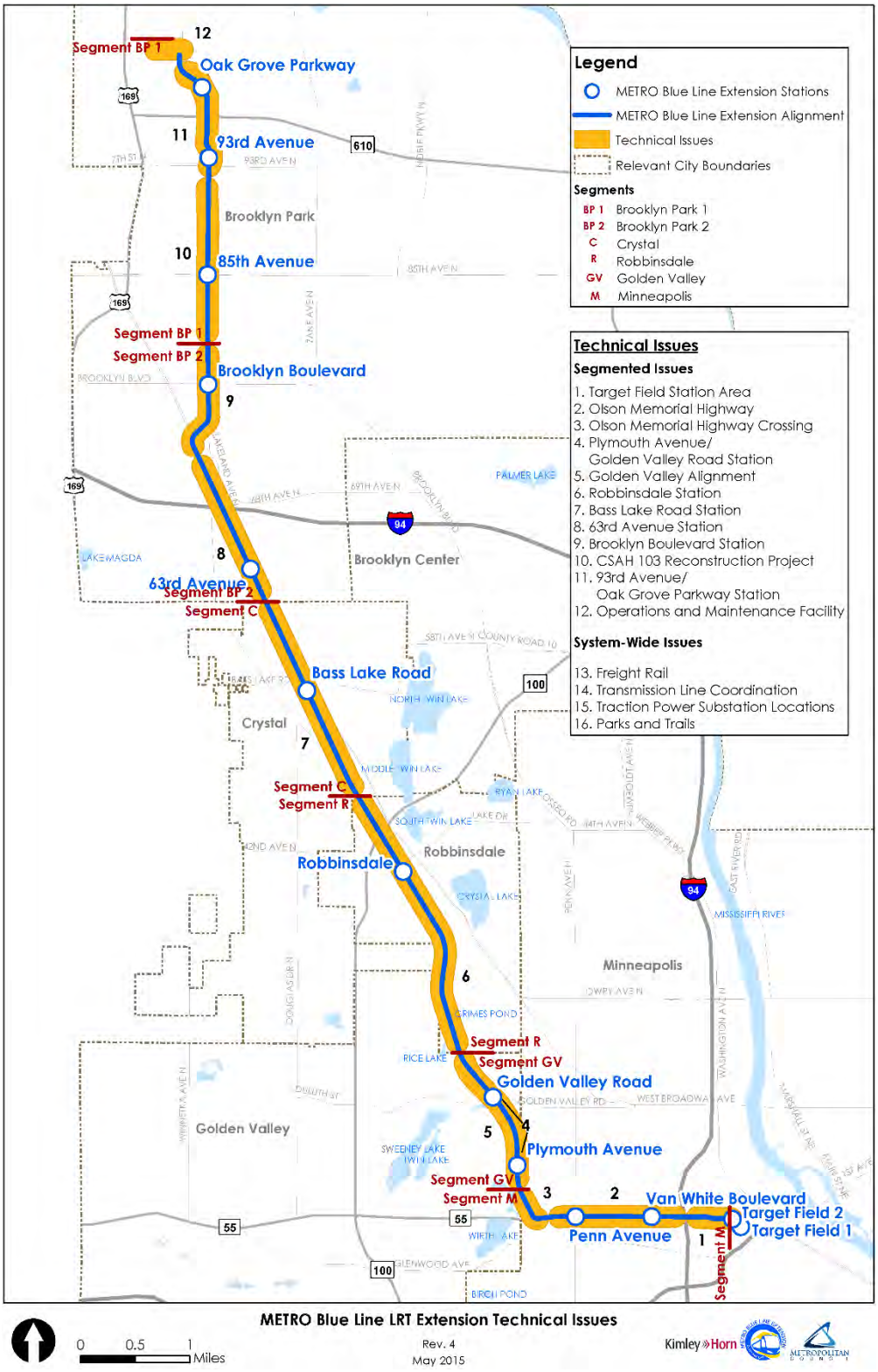


Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
M – Minneapolis	1. Target Field Station Area	■ **Target Field Station Connection and 7th Street Intersection Design** • The 7th Street/Olson Memorial Highway intersection was evaluated to explore opportunities to create an intersection that would safely and efficiently accommodate all users. The IRT evaluated multiple layout options that considered LRT alignment and intersection geometry as they accommodate the different users of the intersection.	■ Modify intersection of 7th Street/Olson Memorial Highway by relocating the LRT transition from the center of the intersection to the east of the intersection, eliminating existing and/or proposed lanes for every approach and improving pedestrian crossing movements. • Reduces number of travel lanes through the intersection. • Provides more-direct routing for pedestrians and bicyclists, thereby reducing overall length of crossings compared to existing conditions and Draft EIS concept. • Provides pedestrian refuge areas at intersection corners and median. • Provides pedestrian crossings of LRT tracks wide enough to accommodate perpendicular crossings of tracks by wheelchairs and bicycles. • Minimizes impact to the planned arterial BRT stations located at the intersection. • Accommodates all existing vehicle movements at the intersection.
	2. Olson Memorial Highway	■ **I-94/Olson Memorial Highway Interchange Operations** • Placing the proposed BLRT Extension guideway in the center of the Olson Memorial Highway bridge over I-94 reduces the number of through lanes crossing the bridge, thereby requiring further analysis to confirm that an acceptable traffic operations level of service (LOS) would be maintained.	■ Based on the traffic analysis completed and discussions with the IRT and MnDOT, the project would accommodate the LRT guideway in the middle of the existing bridge. This would eliminate one through lane in each direction on the Olson Memorial Highway bridge over I-94; however, an acceptable LOS would be maintained.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
		■ **Olson Memorial Highway Design Treatment** • Adding an LRT guideway within the existing median of Olson Memorial Highway was further studied to evaluate concerns regarding vehicle speeds on Olson Memorial Highway, enhancing pedestrian and bicycle crossing movements across, to, and along the corridor, and finding a way to balance the needs of all modes through this segment of the proposed BLRT Extension project, and ensuring that appropriate redevelopment could occur with LRT as the catalyst.	■ The IRT recommended advancing a six-lane Olson Memorial Highway alternative, with center station platforms at Penn Avenue and Van White Memorial Boulevard. The IRT also agreed that the speed limit on Olson Memorial Highway should be reduced to 35 mph and the project team should consider incorporating boulevard trees during the final design of the proposed BLRT Extension project to promote traffic calming. • Provide pedestrian crossings at each signalized intersection: Thomas Avenue (new), Penn Avenue, Morgan Avenue, Humboldt Avenue, Van White Memorial Boulevard, Bryant Avenue, and West Lyndale Avenue. Provide three additional midblock pedestrian crossings at Russell Avenue, James Avenue, and east of the Penn Avenue Station. Midblock crossing locations would have some form of traffic control. • Provide accommodation for a cycle track on the north side of the roadway. The cycle track cross-section would consist of a 10-foot boulevard, 10-foot-wide bicycle path, 2-foot buffer area, and a 6-foot sidewalk. • Shift the roadway and track alignment north from its existing location to maximize the space available for future development on the south side of the roadway.
		■ **Olson Memorial Highway Tree Impacts** • About half of the 500 existing Olson Memorial Highway median trees along the corridor would be removed by construction of the proposed BLRT Extension project. MPRB has indicated that it might be possible to relocate some of the removed trees to MPRB property.	■ City and MPRB requirements for tree replacement will be considered as the design of the proposed BLRT Extension project moves forward.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
	3. Olson Memorial Highway Crossing	■ **Olson Memorial Highway Crossing of the LRT Guideway** • The Draft EIS concept design represented the westbound lanes of Olson Memorial Highway shifted north (on a new bridge) to accommodate the LRT guideway. As the LRT guideway approaches the BNSF rail corridor in the median of Olson Memorial Highway from the east, it drops in elevation so that it can turn north and pass beneath the proposed Olson Memorial Highway westbound bridge. Retaining walls are represented within the median from just west of Thomas Avenue to the proposed Olson Memorial Highway westbound bridge. The existing westbound Olson Memorial Highway bridge would be removed.	■ The IRT agreed that the transition of the proposed BLRT Extension project guideway from Olson Memorial Highway to the BNSF rail corridor should follow the Draft EIS concept, with further refinements developed during the Engineering phase of project development. ■ A traffic signal at Thomas Avenue and Olson Memorial Highway would accommodate this transition.
GV – Golden Valley	4. Plymouth Avenue/ Golden Valley Station(s)	■ **Golden Valley Road versus Plymouth Avenue Station Resolution** • The environmental analysis completed as part of the Draft EIS evaluated both the Golden Valley Road and Plymouth Avenue Station areas, but only the Golden Valley Road Station was included in the project scope and budget. Further study was required to evaluate whether one or both stations should be constructed to maximize access to the proposed BLRT Extension project, adjacent communities, and TWRP.	■ Rigorous evaluation of transportation needs and floodplain and wetland impacts, noise and vibration impacts, cultural resource impacts, parking impacts, and parkland impacts resulted in the decision to carry both stations in the project scope and cost estimate.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
		■ **Golden Valley Road Station Parking/Passenger Drop-off Needs** • Parking opportunities and drop-off needs near the station were considered to maximize access, enhance connections to the station, and avoid conflicts with parking on residential streets adjacent to the Golden Valley Road Station.	■ A park-and-ride lot with 100 surface parking spaces and additional bus and passenger drop-off areas would be added for direct access to the Golden Valley Road Station area.
	5. Golden Valley Alignment	■ **Bassett Creek Floodplain Impacts** • Construction of the proposed BLRT Extension project would decrease the existing floodplain areas of Bassett Creek. Coordination is needed with the Bassett Creek Watershed Management Commission and the cities of Golden Valley and Minneapolis to design mitigation measures that comply with regulations and can be permitted.	■ About 16,800 cubic yards of existing Bassett Creek floodplain would be decreased by the construction of the proposed BLRT Extension project. Recommended mitigation includes creating necessary mitigation volumes by removing existing soil to create the approximately 16,800 cubic yards of new floodplain storage volume. The property for the area identified is owned by the Soo Line Railroad and MPRB, which is located north of Olson Memorial Highway and west of the BNSF rail corridor.
		■ **Poor Soils through Bassett Creek Watershed** • Available soil log data indicate that poor soils exist within the Bassett Creek watershed area, including portions of the proposed BLRT Extension project alignment within the BNSF rail corridor. Analysis of the poor soil limits and design mitigation options that might be used to compensate for the poor soil conditions are needed early in the design process.	■ Use a combination of conventional bridge, land bridge, load transfer platform (on columns and/or piers), helical piles, in-situ ground improvements, geofoam (lightweight fill), and/or wick drains and surcharge to develop site-specific track foundations suitable for the proposed BLRT Extension project guideway. ■ BNSF tracks to remain on existing embankment over Grimes Pond and Golden Valley Pond. LRT would be constructed on a bridge in these locations.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
		■ **Theodore Wirth Regional Park (TWRP) Property Impacts** • Constructing the proposed BLRT Extension project would require temporary and permanent easement over the existing TWRP property. In the areas of proposed Golden Valley Road and Plymouth Avenue stations, right-of-way acquisition and/or temporary and permanent easements are required to allow for needed construction. Additionally, an area of TWRP property near Olson Memorial Highway and the BNSF rail corridor has been identified to mitigate the proposed impacts to the Bassett Creek floodplain.	■ Constructing the proposed BLRT Extension project would require a combination of temporary and permanent easements on TWRP, which is owned by MPRB. • Grading work on the west side of the BNSF right-of-way just south of Theodore Wirth Parkway to just north of Golden Valley Road would require a temporary easement. • Golden Valley Road Station platform access and retaining wall construction would require a permanent easement. • Reconstruction of the Golden Valley Road, Theodore Wirth Parkway, and Plymouth Avenue roadway bridges would require temporary easements. • Plymouth Avenue Station construction and maintenance of secondary access would require a permanent easement. • Widening the railway corridor to accommodate the proposed BLRT Extension project and the Plymouth Avenue Station would require the Plymouth Avenue Bridge to be replaced. As a part of the railway corridor widening, both Bassett Creek and the existing Bassett Creek Trail would need to shift westward. A temporary easement would be required over TWRP property to shift the creek and trail, as well as to construct the new bridge. ■ Construct trailhead at eastern corner of the Golden Valley Road Station park-and-ride to provide access to the existing MPRB trail system to the proposed Bassett Creek Regional Trail. ■ Existing TWRP trail that parallels Bassett Creek would be relocated to the west from its current location within the BNSF right-of-way.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
R- Robbinsdale	6. Robbinsdale Station	■ **Park-and-Ride/Bus Transit Center Assessment** • Parking needs for patrons using the Robbinsdale Station would require constructing a parking ramp near the station. Further evaluation was needed to confirm a location for the ramp that would meet the needs of transit patrons and complement existing and future development in the area. The location and operations of the existing Metro Transit bus transit center also required coordination with the new parking ramp.	■ The IRT determined that a four-level, 550-stall parking ramp/bus transit center concept is the preferred concept to move into the design process. • Provides riders with convenient access to the LRT station. • Allows for transit-oriented development adjacent to the parking structure. • Accommodates the bus transit center.
		■ **Traffic Congestion at Crossings Analysis** • In response to the Draft EIS, concerns were raised that the proposed BLRT Extension project could cause traffic congestion around the Robbinsdale Station, specifically on 42nd Avenue. Further traffic evaluation was needed to confirm whether the 42nd Avenue and West Broadway Avenue intersection, as well as traffic crossing the at-grade crossing, would continue to function at an acceptable LOS.	■ The IRT found that traffic operations around the Robbinsdale Station would function at acceptable levels with the addition of the 550-stall park-and-ride and the additional LRT train traffic. Improvements to the 42nd Avenue/West Broadway Avenue intersection include adding dedicated northbound and southbound left-turn lanes on West Broadway Avenue and providing a left-turn signal phase for the westbound left-turn movement on 42nd Avenue.
		■ **Pedestrian Crossing Evaluation** • The Draft EIS identified improvements to existing pedestrian crossings at each of the at-grade crossings in Robbinsdale. Further evaluation of pedestrian crossings, the number of crossings provided, and the type of crossing (at-grade versus grade-separated) near the Robbinsdale Station were necessary to confirm whether safe and efficient pedestrian crossings of the LRT/freight rail corridor would be provided.	■ The IRT found that pedestrian movements across the rail corridor, specifically at 42nd Avenue and 41st Avenue, should be maintained as at-grade crossings. Grade-separated pedestrian facilities were eliminated from further consideration.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
		■ **Evaluation of Existing At-grade Crossing Closures** • The Council was asked to evaluate potential crossing closures through the BNSF rail corridor to improve safety, reduce noise impacts, and prepare the rail corridor for future designation as a Quiet Zone.	■ The IRT found that 39½ Avenue is the best candidate for closure. The Final EIS evaluates the environmental impacts of the 39½ Avenue closure (see **Chapter 3**).
		■ **Evaluation of Raised LRT Profile near TH 100** • As the LRT guideway approaches the proposed bridge over TH 100, the LRT track profile raises above adjoining residential properties, generally matching the existing BNSF rail elevation. Concerns were raised during the Draft EIS process about the impacts associated with the LRT guideway being elevated above existing homes, which were constructed at a lower elevation than the existing BNSF rail track. Further evaluation was needed to review possible impacts and mitigation measures that might be required due to the elevated LRT tracks.	■ The increase in grade and the proposed retaining wall are being reviewed as part of the Section 106 (National Historic Preservation Act) process. This is because of the adjacent West Broadway Avenue Residential Historic District, which is eligible for the National Register of Historic Places. This issue was not reviewed further by the IRT.
C – Crystal	7. Bass Lake Road Station	■ **Bass Lake Road Station Location**	■ Bass Lake Road Station is changed to a center platform and is located south of Bass Lake Road and 20 feet south of the location shown in Draft EIS. This change was made to improve the transit passenger experience, as well as to provide for improved flexibility of transit operations.
		■ **Need for Parking/Passenger Drop-off** • City of Crystal and community members identified need for additional access facilities—parking and passenger drop off location.	■ Parking/passenger drop-off needs would be accommodated by a 170-space surface park-and-ride lot with provisions for passenger drop-off.
		■ **At-Grade Crossings of Major Roadways** • City of Crystal identified need for grade separation of the LRT tracks over Bass Lake Road.	■ The IRT found that traffic operations of the Bass Lake Road and Bottineau Boulevard intersection would function at acceptable levels and does not warrant grade separation. LRT tracks would cross Bass Lake Road at grade.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
		■ **Quiet Zone Needs for At-grade Crossings** • In commenting on the Draft EIS, the city of Crystal requested the infrastructure for a Quiet Zone be included in the proposed BLRT Extension project cost.	■ Intersection of LRT/BNSF tracks and Bass Lake Road would be ready for designation as a Quiet Zone.
		■ **Pedestrian Access**	■ Addition of pedestrian bridge over Bottineau Boulevard at Bass Lake Road.
BP 2 – Brooklyn Park 2	8. 63rd Avenue Station	■ **Need for 63rd Avenue Park-and-Ride Expansion** • Draft EIS identified a need to add capacity to the existing parking ramp at 63rd Avenue. Further study of this need was required.	■ Change to a center platform design with a pedestrian overpass of the rail lines from the parking structure to the station platform to provide better rider access. ■ Ridership analysis shows sufficient parking (565 spaces) in existing parking ramp. No further modifications to add parking capacity are being considered as part of the proposed BLRT Extension project.
	9. Brooklyn Boulevard Station	■ **73rd Avenue Crossing** • Further study was needed to determine whether a grade separation for the LRT over the 73rd Avenue/Bottineau Boulevard intersection would be required to maintain safety and acceptable intersection traffic operations.	■ A grade-separated crossing of 73rd Avenue was found to be the preferred design alternative to maintain safety for vehicular traffic, light rail vehicles, and LRT maintenance activities.
		■ **West Broadway/Brooklyn Boulevard Station** • Further study of the Brooklyn Boulevard Station was needed to evaluate station access and enhance connections between the nearby Starlite Transit Center and other destinations near the station. Bus and passenger drop-off/pick-up needs within the Starlite Transit Center as well as near the Brooklyn Boulevard Station should be considered in the overall station area design.	■ A center platform located on the south side of Brooklyn Boulevard was the preferred design alternative. This location provided the best overall access to the station, and the center platform configuration is consistent with other platforms along the line. ■ Adding bus stops on West Broadway Avenue on the north side of 76th Avenue North was the preferred design alternative. This layout provides bus stops for all routes with close access to the LRT station.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
BP 1 – Brooklyn Park 1	10. West Broadway Reconstruction Project	■ **West Broadway Reconstruction by Hennepin County** • See Section 2.5.1.1.	■ Hennepin County completed an Environmental Assessment Worksheet for a four-lane roadway alternative for West Broadway Avenue.
		■ **Need for Gates at Minor Signalized Intersections**	■ Based on the proposed LRT operating speeds, automatic gates are not needed at signalized intersections along West Broadway Avenue.
		■ **Additional Maintenance Responsibilities for Locals**	■ City of Brooklyn Park would review maintenance issues and would bring specific concerns to the Council for discussion. Metro Transit is responsible only for the operation and maintenance of the LRT facilities, platform, and track components. As the design progresses, maintenance issues would be assessed.
	11. 93rd Avenue/Oak Grove Parkway Station	■ **Location and New Roadway Network Supporting Oak Grove Parkway Station** • Further evaluation was needed to locate the Oak Grove Parkway Station and parking ramp, improve the pedestrian and bicycle environment, accommodate a center LRT platform, and support development opportunities being pursued by the city of Brooklyn Park. • Determine roadway network necessary to support opening-day operations at the Oak Grove Parkway Station.	■ Locate a center platform and 850-space parking ramp west of West Broadway Avenue between Oak Grove Parkway and Main Street. Reconfigure the roadway network to accommodate the station and parking ramp. • Design parking ramp to support development opportunities. • Construct West Broadway Avenue with a wide center median to accommodate Xcel transmission lines. • Construct Main Street and intersection to parking ramp. • Construct road west of parking ramp from Oak Grove Parkway to Main Street. • Construct a portion of Xylon Avenue, located west of the proposed OMF site, to provide access to the OMF.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
	12. Operations and Maintenance Facility (OMF)	■ **Location and Layout of OMF** • Further evaluation was needed to confirm a location and layout for the proposed OMF. Determination of a preferred OMF location and layout and the effects of the OMF on the development of the Oak Grove Parkway area are needed.	■ The IRT determined that the 93rd Avenue OMF site should no longer be considered since construction of commercial development by CSM Corporation on the 93rd Avenue site had occurred since publication of the Draft EIS. ■ The IRT found that the preferred location for the OMF is on the east side of proposed Xylon Avenue, north of Oak Grove Parkway. This proposed location would meet the needs of the proposed BLRT Extension project and give the Oak Grove Parkway area the space needed to develop based on the concepts created by the city of Brooklyn Park. ■ Additionally, the IRT found that the proposed downsized OMF layout that is oriented north-south should be moved forward into the design process.
All Segments	13. Freight Rail	■ **BNSF Commuter Principles** • Preserve the ability of BNSF to make future freight rail capacity improvements in the western 50 feet of its right-of-way. Also, provide BNSF the ability to make future capacity improvements in a configuration that can be constructed today without any LRT facilities. • Manage potential liability associated with LRT facilities and operations.	■ Reconstruct bridges over the BNSF right-of-way at Plymouth Avenue, Theodore Wirth Parkway, Golden Valley Road, and 36th Avenue. ■ Design and build appropriate separation or a physical barrier to ensure safe operations in the event of a freight or LRT derailment. • Implement corridor-protection treatments: ▪ Ditch ▪ Crash wall ▪ Retained embankment ▪ Intrusion detection
	14. Transmission Line Coordination	■ **Xcel Energy Transmission Line Corridor** • Xcel intends to own and maintain a transmission line in the proposed BLRT Extension project corridor. • Need to protect the ability of Xcel to access and maintain its transmission line as necessary. • Accommodate the ability of Xcel to replace transmission line structures in the future if they are not replaced when the proposed BLRT Extension project is constructed.	■ Shift the existing transmission line, which is located on the eastern edge of the current BNSF right-of-way, to the western edge of the right-of-way. New transmission line towers would be a monopole design, and would replace the existing metal lattice structures.

Table 2.5-1. Final EIS Technical Issues

Segment	Technical Issue	Description	Resolution
	15. Traction Power Substation Locations	■ **Refinement of locations for Traction Power Substations (TPSSs)** • Typically, TPSS sites are spaced less than 1 mile apart. Refinement of locations is needed since the Draft EIS was published.	■ Preliminary analysis shows that TPSS sites would be required at about 0.75-mile to 1-mile intervals along the proposed BLRT Extension project alignment to supply electrical power to the traction networks, stations, and the OMF. ■ Currently, the IRT identified 17 sites (**Figure 2.5-5**). ■ Most TPSSs would be located within existing transportation right-of-way.
	16. Parks	■ **Avoid, Minimize, or Mitigate Impacts to Park Resources along the proposed BLRT Extension project Alignment**	■ The Council avoided a Section 4(f) use of the Rush Creek Regional Trail property by modifying the layout of the OMF. ■ The proposed BLRT Extension project would require temporary occupancy of Sochacki Park: Sochacki Management Unit for construction access and staging. In addition to restoring the park to its pre-construction condition, the Council is negotiating enhancements to the park that would be part of the mitigation for the temporary occupancy and the purchase of replacement parkland. ■ Construction of the proposed BLRT Extension project would involve temporary occupancy of Sochacki Park: Mary Hills Management Unit, but would not be subject to Section 6(f) requirements. Minnesota Department of Natural Resources (DNR) coordination would be required. ■ The proposed BLRT Extension project would require less than 0.01 acre from Glenview Terrace Park. DNR coordination would be required. ■ The proposed BLRT Extension project would require 2.1 acres of permanent easement from TWRP for station and track components and for the Golden Valley Road Station park-and-ride. ■ The proposed BLRT Extension project would relocate the TWRP Trail adjacent to Basset Creek off the BNSF right-of-way. ■ The proposed BLRT Extension project would require a water resources easement for proposed floodplain mitigation in a combination of current CP property and MPRB property.

2.5.2.2 Description of the Proposed BLRT Extension Project

The proposed BLRT Extension project is described below and summarized in **Table 2.5-2**, including the differences between the LPA identified in the Draft EIS and the proposed BLRT Extension project identified in this Final EIS. The features below are based on the Council's assumptions associated with the level of engineering conducted for the proposed BLRT Extension project to date and as approved by the CMC (November 12, 2015) and the Council (December 9, 2015).

Table 2.5-2. Comparison of Draft EIS LPA and Final EIS Proposed BLRT Extension Project

Feature	Draft EIS LPA Description	Final EIS Proposed BLRT Extension Project Description
Level of engineering design	1%	15%
Northern terminus	Brooklyn Park	Brooklyn Park
Length[1]	13.3 miles	13.49 miles
Capital cost (in millions)[2, 3]	$997 ($2017)	$1.496 (year-of-expenditure $)
Annual operating and maintenance cost (in millions)[2]	$32.5 ($2013)	$50.21 ($2040)
Ridership (total)	27,000	27,000
BLRT stations[4]	**10 Stations** ■ Van White Boulevard ■ Penn Avenue ■ Golden Valley Road or Plymouth Avenue/TWRP ■ Robbinsdale[5] ■ Bass Lake Road ■ 63rd Avenue[5] ■ Brooklyn Boulevard ■ 93rd Avenue[5] ■ 85th Avenue ■ Oak Grove Parkway	**11 Stations** ■ Van White Boulevard ■ Penn Avenue ■ Plymouth Avenue/TWRP ■ Golden Valley Road[5] ■ Robbinsdale[5] ■ Bass Lake Road[4] ■ 63rd Avenue[5] ■ Brooklyn Boulevard ■ 85th Avenue ■ 93rd Avenue ■ Oak Grove Parkway[5, 6]
Station constructed by others where proposed BLRT alignment would connect with regional rail system	Target Field Station	Target Field Station
Reconfiguration of roadway network north of TH 610	Not applicable	■ Construct West Broadway Avenue with a wide center median to accommodate Xcel transmission lines ■ Construct Main Street and intersection to parking ramp ■ Construct road west of parking ramp from Oak Grove Parkway to Main Street ■ Construct a portion of Xylon Avenue, located west of the proposed OMF site, to provide access to the OMF.

Table 2.5-2. Comparison of Draft EIS LPA and Final EIS Proposed BLRT Extension Project

Feature	Draft EIS LPA Description	Final EIS Proposed BLRT Extension Project Description
Key bridge structures (length in feet)	**4 new LRT bridges:** ■ HERC driveway (125)[7] ■ TH 100 (400) ■ CP rail tracks (500) ■ TH 610 (300) **Existing bridges modified:** ■ Olson Memorial Highway ■ Railroad bridge north of Olson Memorial Highway ■ Plymouth Avenue ■ Theodore Wirth Parkway ■ Golden Valley Road ■ TH 100 ■ 36th Avenue ■ I-94	**7 new LRT bridges:** ■ HERC driveway (350)[7] ■ Golden Valley Road ponds (700) ■ Grimes Pond (1,250) ■ TH 100 (375) ■ CP rail tracks (1,250) ■ 73rd Avenue/Bottineau Boulevard (925) ■ TH 610 (300) **5 reconstructed roadway bridges:** ■ Olson Memorial Highway over BNSF rail corridor (375) ■ Plymouth Avenue (375) ■ Theodore Wirth Parkway (120) ■ Golden Valley Road (215) ■ 36th Avenue (110) **Modification to existing bridges:** ■ Olson Memorial Highway over I-94 ■ I-94 over BNSF rail corridor **Pedestrian bridge:** ■ Bottineau Boulevard at Bass Lake Road
Operations and maintenance facility site(s)	In Brooklyn Park at one of two potential sites: 93rd Avenue park-and-ride or in the northwest quadrant of Winnetka Avenue and 101st Avenue intersection with West Broadway	In Brooklyn Park at 101st Avenue and new Xylon Avenue North
Traction power substations	19 proposed	17 proposed

[1] The length represents the full end-to-end length of the proposed alternatives.
[2] Cost estimates provided are a snapshot in time and are based on the level of design development completed at the date of publication of Draft EIS (LPA) and the date of publication of this Final EIS (proposed BLRT Extension project).
[3] Draft EIS (LPA) capital cost estimate was updated to $1,002 million for the proposed BLRT Extension project New Starts application filed subsequent to publication of the Draft EIS; the change was due to the addition of finance costs.
[4] Decisions regarding the locations of stations were made consistent with the Council's *Regional Transitway Guidelines* (www.metrocouncil.org/Transportation/Publications-And-Resources/RegionalTransitwayGuidelines-pdf.aspx).
[5] Proposed station locations where park-and-ride would be provided.
[6] Station located west of West Broadway Avenue between Oak Grove Parkway and Main Street. Roadway network would be reconfigured to accommodate the station and parking ramp.
[7] The Hennepin Energy Recovery Center (HERC) driveway structure is proposed specifically for the proposed BLRT Extension project and would be an expansion of the structure required for the independent Target Field Station in downtown Minneapolis.

2.5.2.3 General Elements of the Proposed BLRT Extension Project

The general elements of the proposed transitway system are stations, the OMF, TPSSs, fare collection, trackway, vehicles, train control, and operating frequencies. These features of the proposed BLRT Extension project are summarized below. (Also see **Appendix E – Engineering Drawings**.)

- **Stations** – See **Table 2.5-3** for a list and description of the stations. Both the Golden Valley Road and Plymouth Avenue stations are included in the Final EIS proposed BLRT Extension project. Both stations would have vertical circulation (elevator and stairs) to allow passengers to access the station platforms. The 63rd Avenue Station would have a pedestrian overpass of the BNSF freight tracks to provide better rider access between the parking ramp and the LRT platform. The Bass Lake Road Station would have pedestrian bridge over Bottineau Boulevard. **Figure 2.5-3** depicts park-and-ride locations on the proposed BLRT Extension project.

Table 2.5-3. Stations on the Final EIS Proposed BLRT Extension Project

Station	Platform Configuration	Passenger Drop-off	Park-and-Ride Facility
Target Field[1]	Not applicable	Not applicable	Not applicable
Van White Boulevard	Center	No	No
Penn Avenue	Center	No	No
Plymouth Avenue/TWRP	Center	Yes	No
Golden Valley Road	Center	Yes	100 spaces (surface lot)
Robbinsdale	Center	Yes	550 spaces (parking ramp)
Bass Lake Road	Center	Yes	170 spaces (surface lot)
63rd Avenue	Center	Yes	565 spaces (existing ramp spaces)
Brooklyn Boulevard	Center	Yes	No
85th Avenue	Center	Yes	No
93rd Avenue	Center	Yes	No
Oak Grove Parkway	Center	Yes	850 spaces (parking ramp)

[1] Built separately from the proposed BLRT Extension project and included under the No-Build Alternative definition.

- **Operations and Maintenance Facility** – The OMF site would be located at the north end of the proposed BLRT Extension project in Brooklyn Park. The proposed OMF site is illustrated in **Figure 2.5-4**. The OMF site was selected based on its proximity to the end of the line, adequate space for the special trackwork required between the mainline track and the facility, and adequate property for the facility (about 10.4 acres). The OMF site would be occupied by a storage and maintenance building that is about 140,000 square-feet, surface parking for employees and visitors, trackwork, and open space. The facility would include areas to store, service, and maintain up to 30 light rail vehicles (LRVs), vehicle washing and cleaning equipment, and office space to accommodate staff who would report for work at this facility. The facility would be equipped to perform daily cleaning and repair activities on the LRVs as they enter and leave revenue service. Scheduled service and maintenance inspections also would be performed in this facility.
- **Traction Power Substations** – Potential locations for the TPSS sites are shown in **Figure 2.5-5**. A total of 17 potential TPSS locations have been identified along the proposed BLRT Extension project. The TPSS locations, as shown in **Figure 2.5-5,** are represented by areas with a 300-foot diameter. The precise location of each TPSS would be refined during the engineering phase of project development to minimize impacts to surrounding properties and resources and to balance safety, reliability, cost, and operational efficiencies. TPSS sites, once located, would be about 4,000 square feet and able to accommodate a single-story building about 40 feet by 20 feet. Access to the building by Metro Transit maintenance personnel must also be accommodated. The Council anticipates that most TPSS sites would be located within existing transportation rights-of-way.
- **Fare-Collection System** – A self-service, proof-of-payment fare-collection system was assumed for the proposed BLRT Extension project, consistent with the ticketing structure currently used on the other regional transitways. A proof-of-payment fare-collection system minimizes the right-of-way needed for each station. The fare collection kiosks would be located at the station platform entrance, and would be about 5 feet tall, 3 feet wide, and 2 feet deep.

- **Trackway** – LRVs would operate on standard-gauge rail. The proposed system would be double-tracked throughout to provide separate tracks for northbound and southbound trains. Crossovers to allow trains to migrate from the northbound to the southbound tracks would be provided at regular intervals for special operations or emergencies. Typically, the trackway in the BNSF rail corridor would be ballasted and separate from the freight rail track. Alignments in streets would be either ballasted or embedded depending on the location and the context of the street. See **Appendix E – Final EIS Engineering Drawings** for typical sections of representative segments of the corridor, including:
  - City of Minneapolis Interchange Connection
  - I-94 Bridge
  - Olson Memorial Highway
  - Olson Memorial Highway at Stations
  - BNSF Right-of-Way
  - Golden Valley Road Bridge Section
  - BNSF Pond Sections
  - TH 100 Bridge Section
  - 73rd Avenue Bridge
  - West Broadway Avenue
  - West Broadway Avenue at Stations
- **Vehicles** – The conceptual engineering to support the Final EIS assumes the following LRV characteristics:
  - Articulated train cars could be operated in either direction as a single-unit or multi-unit train.
  - Cars would be designed for use with an overhead catenary system.
  - Each car would have 66 seats and capacity for 160 passengers (sitting and standing).
  - Two- to three-car trains would operate at speeds up to 55 mph.
  - Cars would be fully compatible with Americans with Disabilities Act (ADA) standards.
- **Train Control** – An operator would occupy each train and have control over acceleration and braking as well as operating the passenger doors. Automated systems would inform the operator of various train and transitway operating conditions and would manage traffic signal priority, activation of crossing gates, and track switch operations.
- **Operating Frequencies** – The Final EIS assumes that trains would operate at 10-minute frequencies for weekday operations.

Figure 2.5-3. Proposed BLRT Extension Project Park-and-Ride Locations

Golden Valley Road Station

Robbinsdale Station

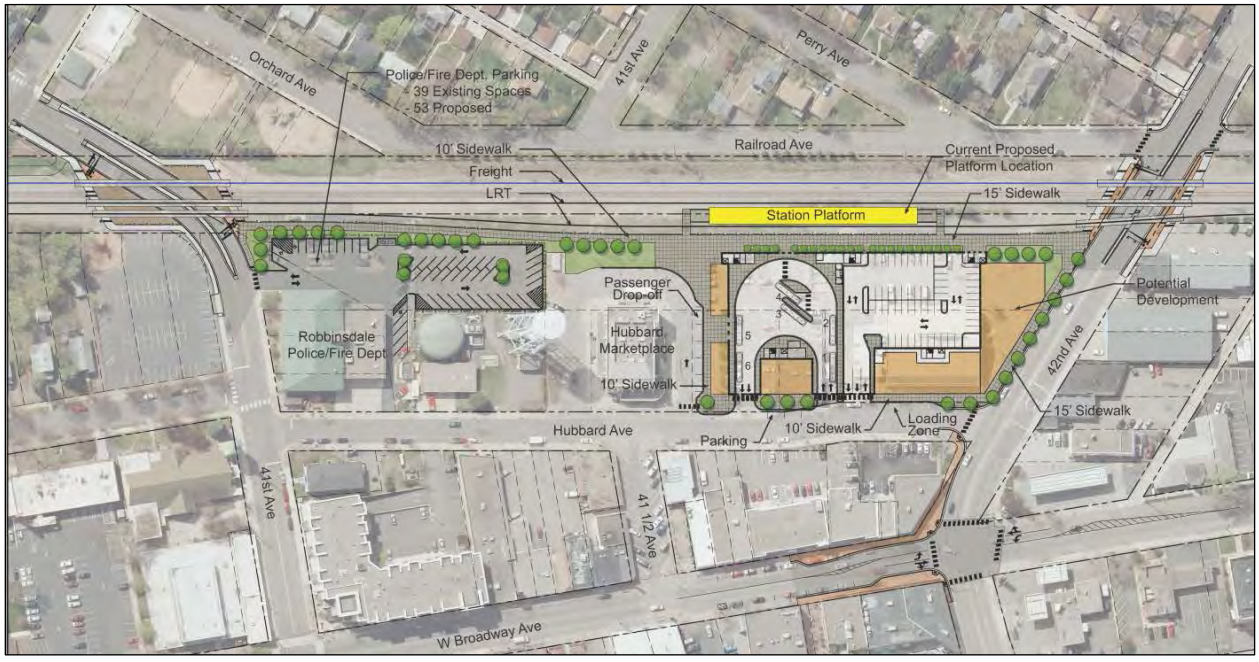


Figure 2.5-3. Proposed BLRT Extension Project Park-and-Ride Locations – continued

Bass Lake Road Station

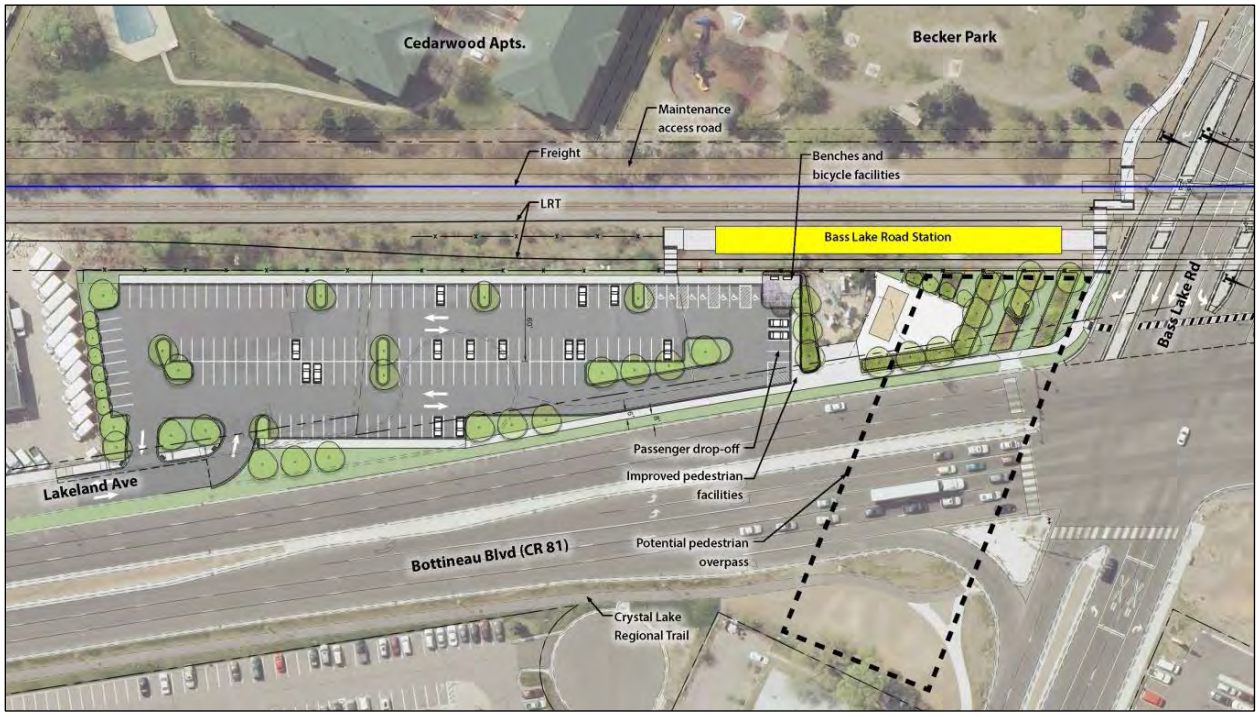


Figure 2.5-3. Proposed BLRT Extension Project Park-and-Ride Locations – continued

63rd Avenue Station

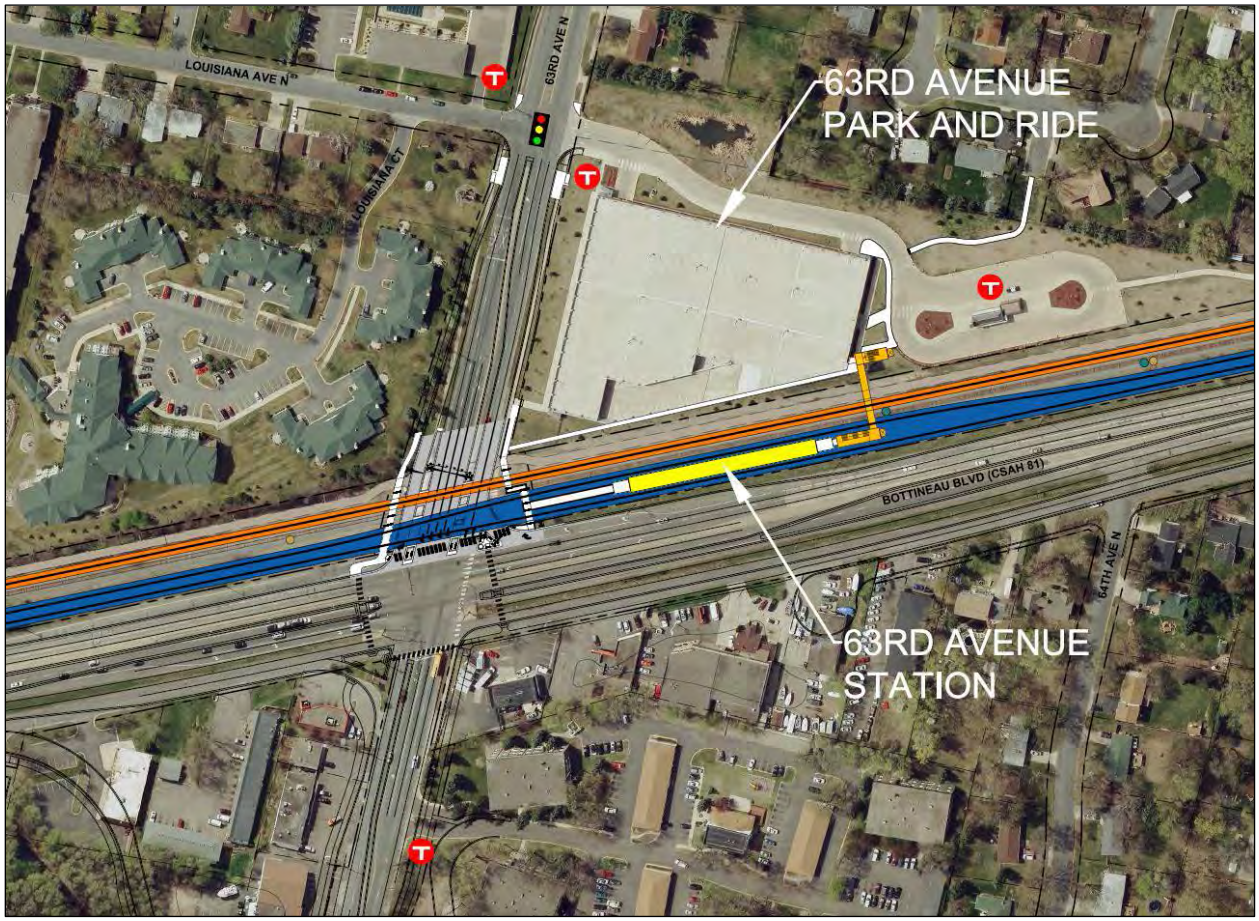


Figure 2.5-3. Proposed BLRT Extension Project Park-and-Ride Locations – continued

Oak Grove Parkway Station

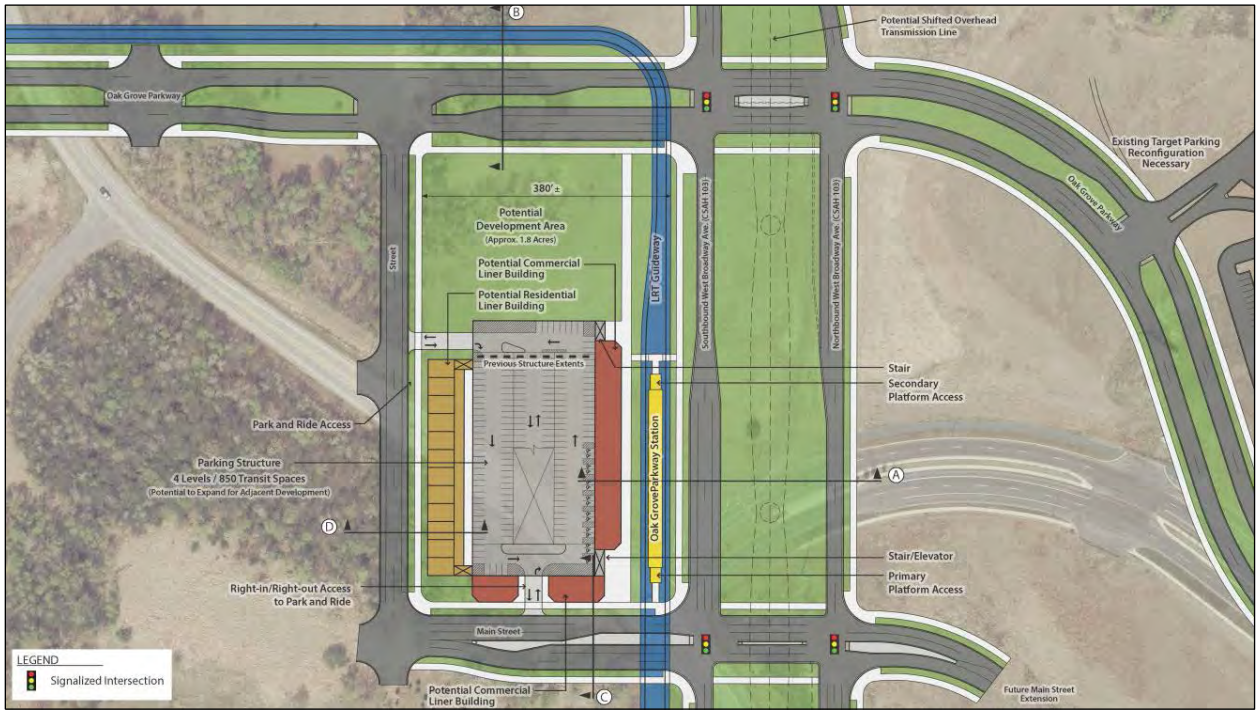


Figure 2.5-4. Proposed OMF Site

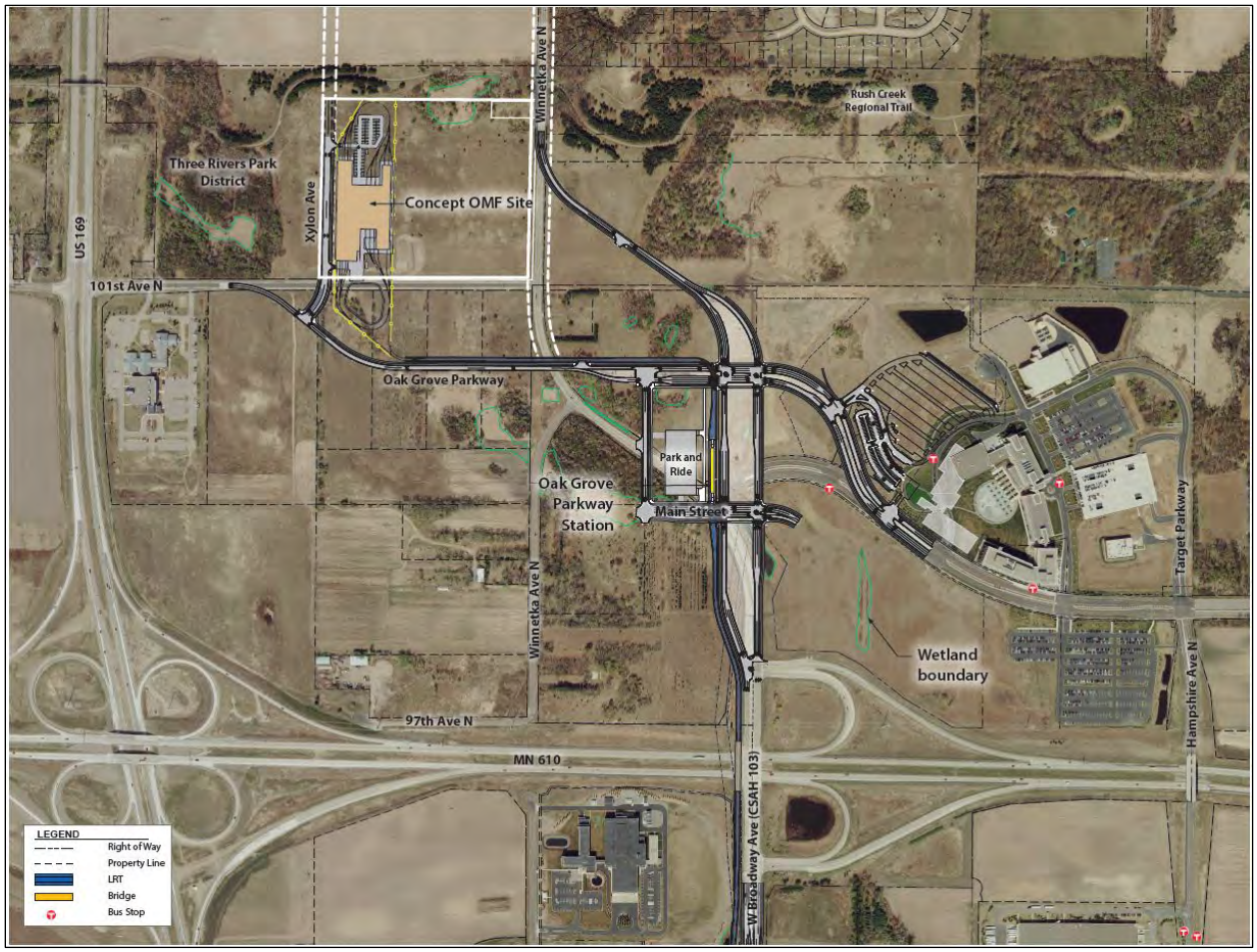


Figure 2.5-5. TPSS Locations for the Proposed BLRT Extension Project

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