3.0 Transportation Analysis

Chapter 3 presents results from the analysis of impacts on the transportation system. Results are presented for the N o-Build alternative for the purpose of establishing a base from which to identify impacts of the other alternatives. Operating phase (long-term) and construction phase (short-term) impacts are identified for the Enhanced Bus/Transportation System Management (TSM) alternative and four Build alternatives, which includes a Locally Preferred Alternative. The alternatives are described and illustrated in Chapter 2 Alternatives.

This chapter identifies and evaluates effects to six parts of the transportation system: transit, freight rail, general motor vehicle traffic, pedestrians and bicycles, parking, and aviation.

- Transit is analyzed for the Bottineau Transitway.
- Freight rail is analyzed within the affected Burlington Northern Santa Fe (BNSF) and Canadian Pacific Railway (CP) rights-of-way.
- General motor vehicle traffic is analyzed at all intersections along the transitway alignments that are signalized, would be anticipated to be signalized, or unsignalized and anticipated to be controlled by gate arms.
- Pedestrians and bicycles are analyzed within ½ mile of the transitway alignments.
- Parking is analyzed within anticipated construction limits.
- Aviation impacts are analyzed for the areas where the preliminary construction limits are within the Crystal Airport Runway Protection Zone and Safety Zone A.

The study area considered for each area of analysis in this chapter is summarized in Table 3.0-1. Greater detail is provided in each section of this chapter. For reference, conceptual engineering plans are located in Appendix E.

Table 3.0-1. Summary of Defined Study Areas – Transportation Analysis

Resource Evaluated	Study Area Definition	Basis for Study Area
Transit Conditions	Bottineau Transitway	Estimated area where changes would occur for the proposed project at this stage of design
Freight Rail Conditions	BNSF and CP Railway rights-of-way	Freight rail infrastructure and operations lie within BNSF and CP rights-of-way
Vehicular Traffic	All signalized intersections and proposed signalized intersections along the transitway alignments	Intersections capture concentrated area of potential impacts and delay
Pedestrians and Bicycles	½ mile on either side of alignments and stations	Captures bike/walk area around alignments and stations
Parking	Within potential area of disturbance	Estimated area where construction would occur for the proposed project at this stage of design

Resource Evaluated	Study Area Definition	Basis for Study Area
Aviation	Preliminary construction limits for the Build alternatives that are outside the Crystal Airport property boundaries but within the Runway Protection Zone (RPZ) and Safety Zone A for Runway 6L (the No-Build and Enhanced Bus/TSM alternatives do not include any improvements within the RPZ)	Crystal Airport is the only aviation facility in the project area; RPZ and Safety Zone are the areas with specific requirements

3.1 Transit Conditions

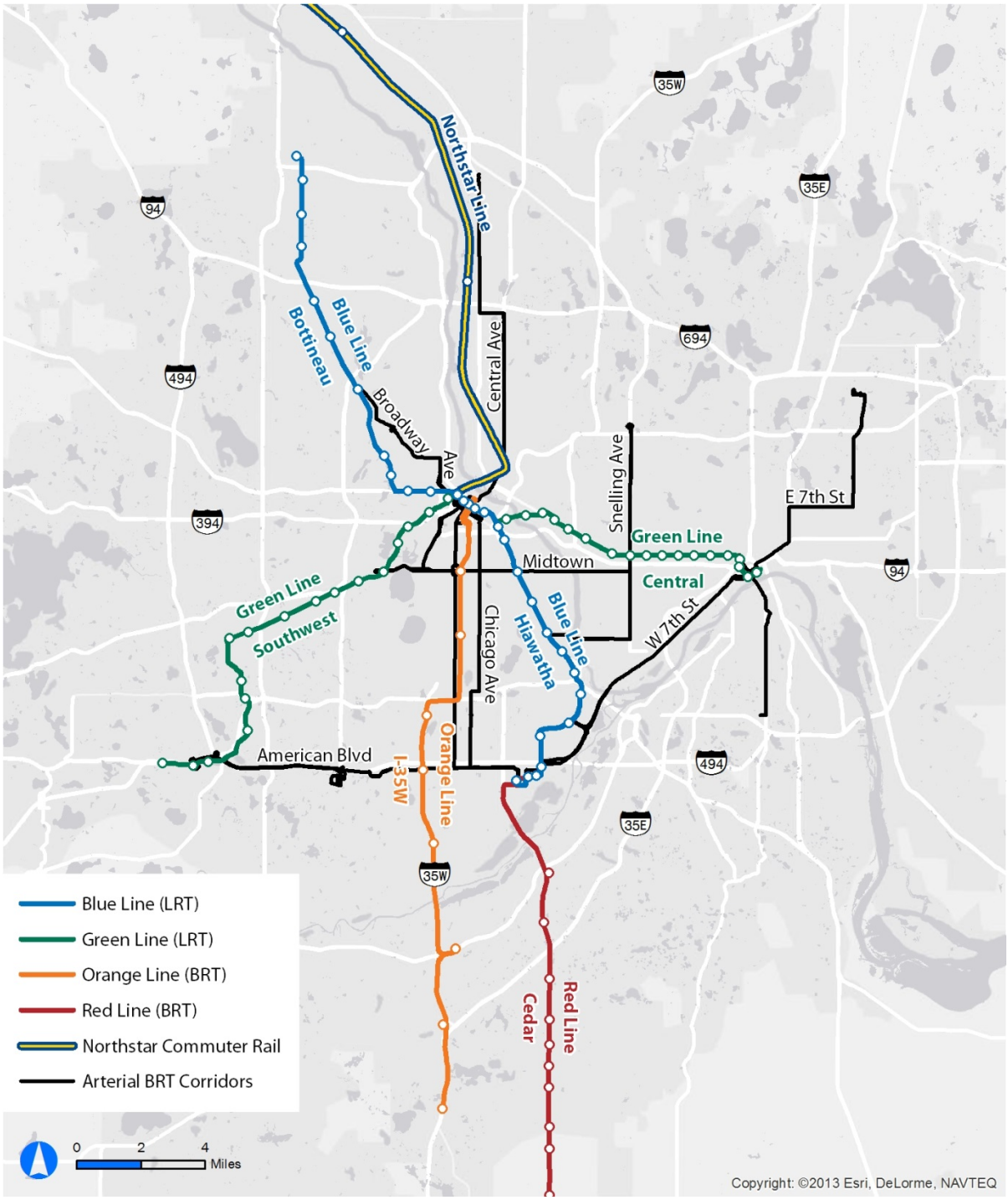
Information in this section is based on the information provided in the Transportation Technical Report (Kimley-Horn and Associates & SRF Consulting Group, 2012).

3.1.1 Regulatory Context and Methodology

Transit demand forecasts for year 2030 were developed for the six alternatives evaluated in the Draft EIS (No-Build, Enhanced Bus/TSM, and four Build alternatives). The Regional Travel Demand Forecast Model, developed by the Metropolitan Council, was used for this project. The model is consistent with the regional *2030 Transportation Policy Plan (TPP)*, and was updated in 2012 to incorporate the most current employment, population, land development, and Transit On-Board survey data, as well as adjusted parameters for gasoline prices, automotive fuel efficiency, the Consumer Product Index (CPI), and transit fares.

The model is designed to forecast travel on the entire Twin Cities Metropolitan Area transit and highway system. As such, it contains a network of all existing and planned transitways, as documented in the regional *2030 TPP*. Planned transitways include: Green Line (Central Corridor) LRT, Green Line (Southwest) LRT, Red Line (Cedar Ave) BRT, Orange Line (I-35W South) BRT, and Arterial BRT on Snelling Ave, E 7th Street, W 7th Street, Chicago Avenue, Central Avenue, Lake Street, West Broadway Avenue, and American Boulevard, as shown in Figure 3.1-1. The model network contains service frequency (i.e., how often trains and buses arrive at any given transit stop), routing, travel time, and fares for all these lines. In the highway system, all express highways, all principal arterial roadways, and many minor arterial and local roadways are included. Other primary inputs used in the model include population, employment, household information, parking costs, automobile operating costs, and highway travel time factors. Model outputs can provide information relating to transit ridership demand, which includes estimates of passenger boardings on all existing and proposed transitways. The model also generates statistics that can be used to evaluate the performance of a transportation system at several levels of geographic detail.

Figure 3.1-1. Existing and Planned Regional Transitways (as represented in the *2030 TPP*)



3.1.2 Study Area

The Regional Travel Demand Forecast Model described above is designed to analyze the effects of a transit improvement on travel patterns in the entire Twin Cities Metropolitan Area and provides information available at different levels of geographic detail.

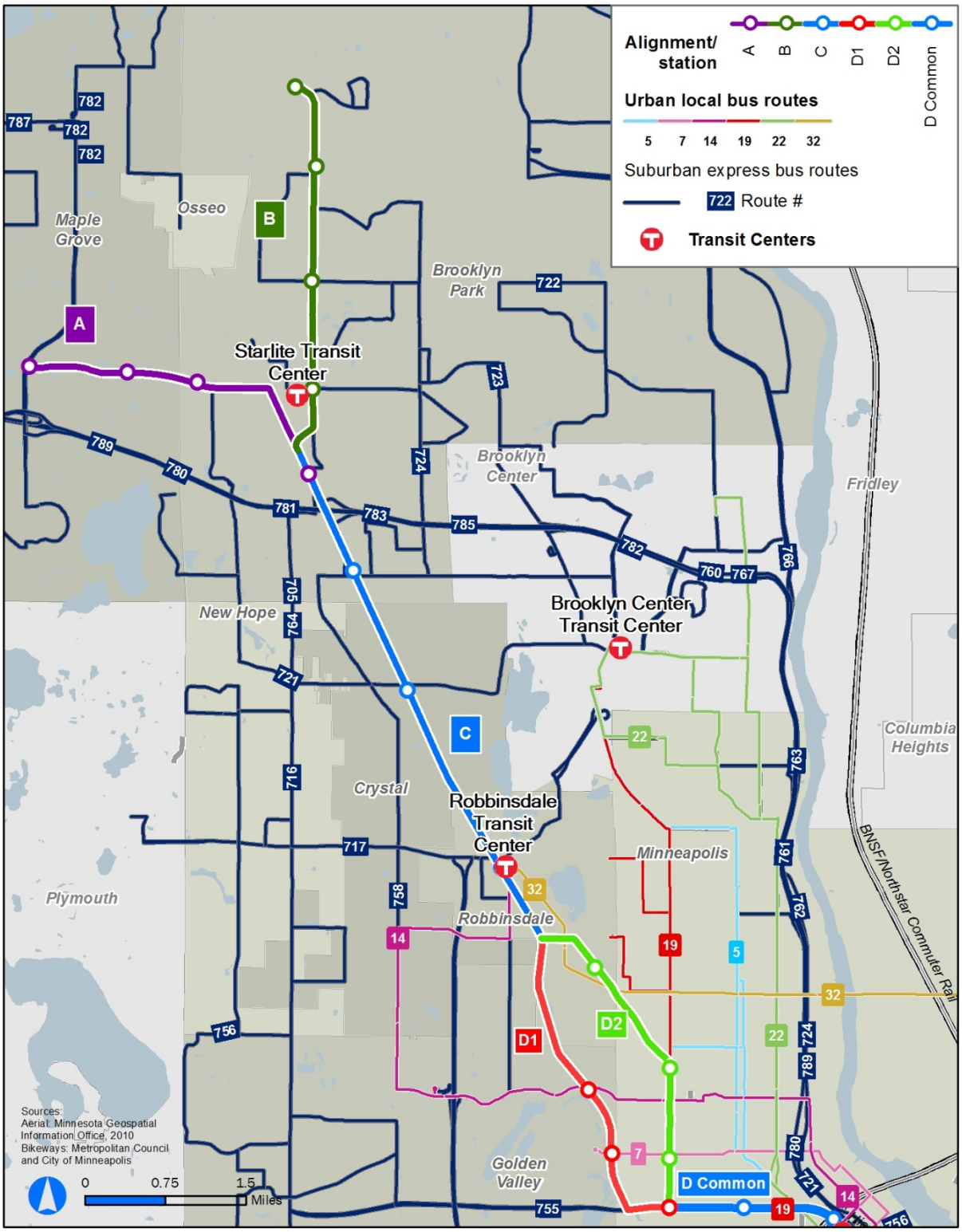
3.1.3 Affected Environment

The Bottineau Transitway's transit service area is generally defined by the Mississippi River to the north and east, TH 55 to the south, and I-494 to the west. The area is served by a network of urban and suburban local routes that make timed connections at three transit centers throughout the corridor (Robbinsdale Transit Center, Brooklyn Center Transit Center, and the Starlite Transit Center). The area is also served by express routes, most of which are oriented toward downtown Minneapolis and serve the peak-period ("rush hour") commuter travel market. Existing transit service in the area is described in detail in the Transit Operations Plans Report (Connetics Transportation Group, 2012) and is shown in Figure 3.1-2. Table 3.1-1 presents an overview of existing routes that would change as a result of the Bottineau Transitway alternatives.

Each of the alternatives analyzed in the Regional Travel Demand Forecast Model uses the existing service as a base and includes specific network modifications to form the basis for the transit ridership forecasts. Modifications to existing transit service for the modeled alternatives include changes in routing, frequency, and travel time. Network modifications are focused on providing an integrated connecting, bus network to connect people to LRT stations. These changes are detailed for each alternative in the Transit Operations Plans Report (Connetics Transportation Group, 2012). Bus networks and transit plans would continue to be refined as the project progresses.

Travel time is an important factor in forecasting ridership for the various alternatives. Table 3.1-2 shows the end-to-end travel times for the Enhanced Bus/TSM and Build alternatives. Routes 731 and 732 are new services in the Enhanced Bus/TSM alternative designed to provide reverse commute and intra-corridor access along the Bottineau Transitway between downtown Minneapolis and Brooklyn Park (Route 731) and Maple Grove (Route 732), supplementing the existing express and limited stop service. Table 3.1-3 shows the planned operating frequencies.

Figure 3.1-2. Transit Service Area and Existing Service



3.1.4 Environmental Consequences

3.1.4.1 Operating Phase (Long-Term) Impacts

The existing transit service in the Bottineau Transitway study area consists of several Metro Transit urban and suburban routes, routes operated by contracted service providers for the Metropolitan Council, and routes operated by Maple Grove Transit. A detailed summary of service changes as they apply to specific build levels and alignments is provided in the Transit Operations Plans Report (Connetics Transportation Group, 2012) portion of the Draft EIS document. This report first describes each route's characteristics, including facilities, geography, frequency, and span of service, then sets transit service plans for each alternative in the year 2030. The transit service changes recommended modify existing routes to eliminate redundancy in the system and provide access to the Bottineau Transitway. Routes are realigned to provide connectivity to major origins and destinations and to be better coupled with the level of transit offered by the particular Build alternative (see Table 3.1-1).

Table 3.1-1. Summary of Existing Transit Service and Changes Under Alternatives

Route	Existing Frequency and Span of Service	Proposed Route Changes
Urban Local Routes		
Metro Transit Route 5	■ Rush Hour: 5-10 min. ■ Off-Peak: 7-15 min. ■ Owl: 60 min.	■ A-C-D2 and B-C-D2: Route 5F trips would be extended to the Broadway/Penn station.
Metro Transit Route 7	■ Rush Hour: 15-30 min. ■ Off peak: 30-60 min.	■ Route would be extended to Robbinsdale Transit Center
Metro Transit Route 14	■ Rush Hour: 10-20 min. ■ Off Peak: 20-30 min.	■ No-Build: West Broadway Avenue portion of route is eliminated, routing modified to follow Lyndale Avenue & 7th Street ■ Rapid Bus route added to West Broadway Avenue corridor with 15 min frequencies, connecting Robbinsdale Transit Center to downtown.
Metro Transit Route 19	■ Rush Hour: 8-15 min. ■ Off-peak: 15-30 min. ■ Owl: 60 min.	■ Eliminate Route 19H, a branch of the Route 19 that serves the far northwest corner of Minneapolis.
Metro Transit Route 22	■ Rush Hour: 11-15 min. ■ Off Peak: 20-30 min.	■ Increase midday[1] frequencies on Penn Avenue alignment
Metropolitan Council Route 32	■ Rush Hour: 30 min. ■ Off-peak: 60 min.	■ Increase midday frequencies
Suburban Local Routes		
Metropolitan Council Route 705	■ Weekdays: 60 min.	■ Extend route to Target North Campus via Route 724 alignment
Metropolitan Council Route 716	■ Weekdays/Saturdays: 60 min.	■ Route modified to include stops at Bass Lake Road stations ■ Frequencies increased to 30 min.
Metropolitan Council/ Metro Transit Route 721	■ Rush Hour: 30 min. ■ Off-peak: 60 min.	■ Increase midday frequencies
Metropolitan Council/Metro Transit Route 722	■ Weekdays/Weekends: 30 min.	■ Increase midday frequencies to 30 min. for full route alignment

Route	Existing Frequency and Span of Service	Proposed Route Changes
Metropolitan Council Route 723	■ Weekdays/ Weekends: 60 min.	■ Frequencies improved to 30 min. ■ A-C-D1 and A-C-D2: route extended to 71st Avenue station ■ B-C-D1 and B-C-D2: route terminates at Brooklyn Center/Starlite Transit Station
Metro Transit Route 724	■ Weekdays/Weekends: 30 min. ■ Evenings: 30-60 min.	■ No-Build: Midday trips from Target North Campus are extended to downtown. ■ Enhanced Bus/TSM: Target North Campus service replaced with Route 705 ■ A-C-D1, B-C-D1, and A-C-D2: route deviates to 63rd Avenue station
Limited Stop and Express Routes		
Metro Transit Route 758	■ Rush Hour Service ■ AM: 7 SB ■ PM: 8 NB	■ Replace Route 758N trips with Route 7 service, Route 758D to Robbinsdale
Metro Transit Route 760	■ Rush Hour Service ■ AM: 8 SB ■ PM: 7 NB	■ Route modified to terminate at 63rd Avenue/Brooklyn Boulevard Park-and-Ride. Local service replaced with new Route 759.
Metro Transit Route 764	■ Rush Hour Service ■ AM: 3 SB ■ PM: 4 NB	■ Converted to local route operating 60 min. frequencies between Robbinsdale and Starlite Transit Centers
Metro Transit Route 765	■ Reverse Commute Rush Hour Service ■ AM: 3 NB ■ PM: 3 SB	■ TSM, A-C-D1, and A-C-D2: route modified to operate in both directions ■ B-C-D1 and B-C-D2: route eliminated
Metro Transit Route 767	■ Rush Hour Service ■ AM: 6 SB ■ PM: 6 NB	■ No-Build: no change ■ Other alignments: route eliminated
Maple Grove Transit Routes		
Maple Grove Transit 781	■ Rush Hour Service ■ AM: 20 SB ■ PM: 22 NB ■ Midday: 1 SB/1NB	■ No-Build: no change ■ Other alignments: Route 781 becomes local service that connects to LRT Stations
Maple Grove Transit 782	■ Rush Hour Service ■ AM: 5 SB ■ PM: 5 NB	■ A-C-D1 and A-C-D2: local route serving Hemlock Lane LRT Station and Maple Grove Transit Station
Maple Grove Transit 785	■ Rush Hour Service ■ AM: 8 SB ■ PM: 7 NB	■ Add trips
Maple Grove Transit 787	■ Flex Route Service ■ PM: 3 NB	■ No-Build: no change ■ Other alignments: route eliminated
Maple Grove Transit 788	■ Rush Hour Service ■ AM: 4 NB ■ PM: 5 SB	■ Add trips on all service, connect to LRT stations where applicable

[1] Midday is between the hours of 9 am and 3 pm.

There are no changes proposed for the following routes under any alternative: 717, 755, 756, 761, 762,763, 766,780, and 783.

In addition to the routes listed in Table 3.1.1, four new routes would be developed in the study area. Routes 729 and 759 would provide local service with 30 and 60 minute frequencies, respectively. Routes 731 and 732 are new services in the Enhanced Bus/TSM alternative designed to provide reverse commute and intra-corridor access along the Bottineau Transitway between downtown Minneapolis and Brooklyn Park (Route731) and Maple Grove (Route 732), supplementing the existing express and limited stop service. Please see Transit Operations Plans Report (Connetics Transportation Group, 2012) for a full explanation of all proposed changes to the bus transit network associated with each alternative.

Comparisons between the performance of the No-Build, Enhanced Bus/TSM, and Build alternatives considered the following four evaluation criteria: percentage of daily trips by transit mode, bus and rail ridership within the study area, daily passenger miles and passenger hours of travel, and LRT boardings by station. Each alternative would have a different impact on transit service markets. Table 3.1-1 summarizes the level of impact associated with restructuring and eliminating routes.

Table 3.1-2. End-to-End Travel Times for Enhanced Bus/TSM and Build Alternatives

Alternative		From	To	Travel Time
Enhanced Bus/TSM	Route 731[1]	Oak Grove Parkway	5th St/Marquette Ave	0:48:44
	Route 732[1]	Maple Grove Transit Station	5th St/Marquette Ave	0:50:50
A-C-D1		Hemlock Lane	5th St/Nicollet Mall Station	0:29:20
A-C-D2		Hemlock Lane	5th St/Nicollet Mall Station	0:33:19
B-C-D1 (Preferred Alternative)		Oak Grove Parkway	5th St/Nicollet Mall Station	0:32:47
B-C-D2		Oak Grove Parkway	5th St/Nicollet Mall Station	0:36:46

[1] Routes 731 and 732 are new services in the Enhanced Bus/TSM alternative designed to provide reverse commute and intra-corridor access along the Bottineau Transitway between downtown Minneapolis and Brooklyn Park (Route731) and Maple Grove (Route 732), supplementing the existing express and limited stop service.

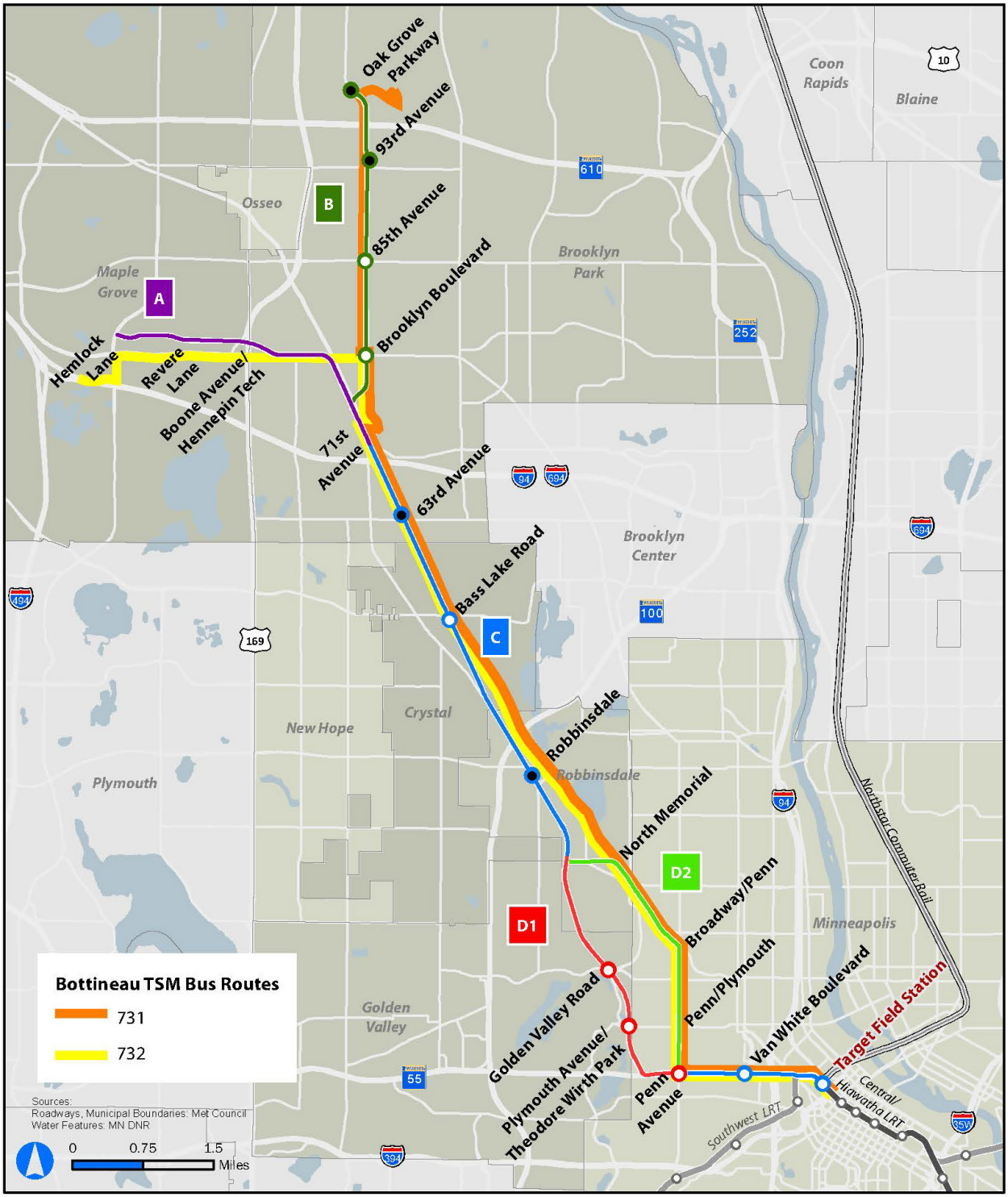
Table 3.1-3. Summary of Operating Frequencies (Minutes between Buses/Trains)[1]

Day of Week	Time Period	Enhanced Bus/TSM			LRT
		Route 731	Route 732	Routes 731 + 732 Combined[2]	All alternatives
Weekday	Peak[3]	15	15	7.5	7.5
Weekday	Off-Peak	20	20	10	10
Saturday	Day/evening	20	20	10	10
Sunday	Day/evening	20	20	10	10

[1] The frequencies presented in this table are general and used in travel demand modeling inputs. Frequencies are defined at a more detailed level for times of day for service planning and cost estimation efforts conducted as part of the Draft EIS.
[2] Routes follow same path south of Brooklyn Boulevard (Starlite Transit Center).
[3] Peak periods refer to 6:00 a.m. to 9:00 a.m. (morning) and 3:00 p.m. to 6:30 p.m. (evening).

A map of the Enhanced Bus/TSM Routes 731 and 732 is shown below in Figure 3.1-3.

Figure 3.1-3. Enhanced Bus/TSM Routes 731 and 732



Transit Ridership Results

Unlinked Trips/Corridor Transit Boarding

Table 3.1-4 shows the Bottineau Transitway ridership totals by alternative and service type. These are "unlinked" trips, representing individual transit boardings (as opposed to a "linked" trip, which represents a transit user who makes a trip between an origin and destination, regardless of the number of transfers). Corridor service restructuring in the Enhanced Bus/TSM and Build alternatives is intended to enhance intra-corridor connectivity by creating the potential for more trips involving transfers. Therefore, the number of unlinked trips is greater than that of linked trips.

- Compared to 2010 levels, ridership is expected to increase 35 percent by the year 2030 under the No-Build alternative, including 4,700 daily trips on the assumed West Broadway Avenue enhanced transit service through north Minneapolis into Robbinsdale.
- Service improvements and restructuring in the Enhanced Bus/TSM alternative are forecast to increase transit trips in the corridor by an additional 29 percent over the No-Build alternative, including 18,300 daily trips on the Enhanced Bus/TSM routes (731 and 732) by the year 2030.
- Selective elimination or restructuring of routes (as described in Table 3.1-1) would slightly reduce the amount of express ridership from a 2030 forecast of 8,000 riders per day to between 6,500 to 7,900 riders per day. Most peak express ridership to downtown Minneapolis would remain on buses, while some existing express riders would choose to use transitway service where time savings can be realized.

The Build alternatives are forecast to carry 26,000 to 27,600 trips per day on the LRT transitway, depending on the alternative. Overall corridor ridership for Build alternatives is 21 to 27 percent greater than for the Enhanced Bus/TSM alternative.

Table 3.1-4. Bottineau Corridor Transit Ridership Summary (Average Weekday Unlinked Trips)

	2010	2030 No-Build	2030 Enhanced Bus/TSM	2030 A-C-D1	2030 A-C-D2	2030 B-C-D1 (Preferred Alternative)	2030 B-C-D2
Local Bus	25,300	30,600	27,200	31,100	30,100	29,900	29,300
Express Bus	6,800	8,000	7,900	7,500	7,700	6,700	6,800
West Broadway Avenue transit service improvement[1]	--	4,700	2,300	2,500	2,000	2,500	2,000
Enhanced Bus/TSM Routes 731/732	--	--	18,300	2,200	2,100	3,500	3,400
LRT	--	--	--	27,600	27,200	27,000	26,000
Total Corridor Boardings	32,100	43,300	55,700	70,900	69,100	69,600	67,500
Change over Enhanced Bus/TSM	--	--	--	15,200	13,400	13,900	11,800
Percent change over Enhanced Bus/TSM	--	--	--	27%	24%	25%	21%

[1] Includes transit service improvements along West Broadway Avenue connecting downtown Minneapolis with north Minneapolis, extending to downtown Robbinsdale in correlation with the rapid bus concept identified in the regional *Transportation Policy Plan*. Does not include a planning initiative underway (being led by the City of Minneapolis) for an alternatives analysis which will include study of a streetcar alternative along West Broadway Avenue.

Reverse Commute/Off-Peak Period Ridership

Table 3.1-5 provides a summary of selected Bottineau Transitway ridership characteristics. For each of the LRT alternatives, 55-56 percent of total daily ridership occurs in the peak period. These results are consistent with those currently observed on the Blue Line (Hiawatha LRT). Work trips make up 65-66 percent of the peak period demand, which is higher than the 61 percent found on the Blue Line. Reverse commute trips (work trips in the non-peak direction) constitute 37-42 percent of the peak work trips. Travel in the off-peak time periods is 44-45 percent of the daily transit ridership.

Table 3.1-5. Ridership by Peak/Off-Peak and Direction (2030)

	A-C-D1	A-C-D2	B-C-D1 (Preferred Alternative)	B-C-D2
Total Daily Transitway Riders	27,600	27,200	27,000	26,000
Peak Period Trips	15,500	15,100	15,000	14,200
Percent of Daily Total	56%	56%	56%	55%
Peak Period Work Trips	10,250	9,950	9,700	9,200
Percent of Peak Period Trips	66%	66%	65%	65%
Peak Direction Work Trips	6,100	5,800	6,100	5,650
Percent of Peak Period Work Trips	60%	58%	63%	61%
Non-Peak Direction (Reverse Commute) Work Trips	4,150	4,150	3,600	3,550
Percent of Peak Period Work Trips	40%	42%	37%	39%
Off-Peak Period Trips	12,100	12,100	12,000	11,800
Percent of Daily Total	44%	44%	44%	45%

Linked Trips/New Transit Trips

A linked trip represents a transit user who makes a trip between an origin and destination, regardless of the number of transfers the user makes. The net regional increase of all of these linked trips is commonly referred to as "new transit trips." Table 3.1-6 provides a regional summary of linked transit trips for existing service (2010) and projected "new transit trips" that would result from the No-Build, Enhanced Bus/TSM, and Build alternatives.

Even without improvements to the Bottineau Transitway, significant growth in regional transit ridership is forecast to occur between 2010 and 2030 as a result of planned investment in the regional transit system, including other LRT, BRT, and arterial BRT corridors. These improvements are included in the No-Build alternative. For the Build alternatives, new transit trips are attributable only to those improvements associated with the Bottineau Transitway. Compared to the Enhanced Bus/TSM alternative, the LRT alternatives attract 6,450-8,400 new transit trips each weekday.

Table 3.1-6. Regional Linked/New Transit Trips

	2010	2030 No-Build	2030 Enhanced Bus/TSM	2030 A-C-D1	2030 A-C-D2	2030 B-C-D1 (Preferred Alternative)	2030 B-C-D2
Average Weekday Linked Trips	203,600	324,100	331,450	339,850	339,250	338,600	337,900
Change over Enhanced Bus/ TSM New Transit Trips	--	--[1]	--[2]	8,400	7,800	7,150	6,450
Percent Change over Enhanced Bus/ TSM	--	--	--	2.5%	2.4%	2.2%	2.0%

[1] Increase of 120,550 linked trips over 2010 (59% increase)
[2] Increase of 7,350 trips over No-Build (2.2% increase)

User Benefits

The results of the Regional Travel Demand Forecast Model can be used to illustrate the extent to which different geographic areas in the region would potentially benefit from the Bottineau Transitway Build alternatives, as compared to the Enhanced Bus/TSM alternative. These benefits are usually projected as the overall travel time savings (called user benefits). Using the travel demand model results, the performance of the Enhanced Bus/TSM and Build alternatives are compared, and the overall time and cost savings of each alternative are estimated. To make the comparison easier, all cost savings are converted to equivalent time savings.

These savings are generally expressed as daily hours of user benefit for regional transit riders. They are used in the estimation of the project's cost effectiveness index (CEI), which is one of the factors that the Federal Transit Administration (FTA) uses to evaluate a project's potential for federal funding.[1] Table 3.1-7 summarizes the daily hours of user benefit that would accrue to transit riders as a result of each alternative.

Table 3.1-7. Daily (Weekday) Hours of User Benefit (2030)

	A-C-D1	A-C-D2	B-C-D1 (Preferred Alternative)	B-C-D2
Daily User Benefit Hours	9,460	9,000	8,520	7,940

User benefits for a given alternative vary by geographic area within the alternative. Detailed maps of the distribution of user benefits are provided in Appendix A of the Transportation Technical Report (Kimley-Horn and Associates & SRF Consulting Group, 2012).

Vehicle Miles Traveled

The Build alternatives would reduce the number of trips made by persons in automobiles, decreasing the amount of automobile (vehicle) travel in the region by 62,800 to 73,800 vehicle miles traveled (VMT) per

[1] Under the Safe Accountable Flexible Efficient Transportation Equity Act-A Legacy for Users (SAFETEA-LU), the Federal Transit Administration used user benefits and the cost effectiveness index (CEI) to evaluate a transitway's potential for federal funding. With the expiration of SAFETEA-LU and the enactment of Moving Ahead for Progress in the 21st Century (MAP-21), FTA no longer measures cost effectiveness with the user benefits metric and instead uses a simple ratio of annual capital and operating costs per trip on the transitway.

day compared to the baseline Enhanced Bus/TSM alternative. On a per person basis (reflecting both auto drivers and passengers switching to transit) the reduction would range from 8.8 to 9.7 VMT per new rider. The Build alternatives would reduce the number, as shown in Table 3.1-8.

Table 3.1-8. Daily (Weekday) Reduction in Vehicle Miles Traveled (2030)

	Enhanced Bus/TSM	A-C-D1	A-C-D2	B-C-D1 (Preferred Alternative)	B-C-D2
Daily Reduction in VMT over No-Build	-51,700	--	--	--	--
Daily Reduction in VMT over Enhanced Bus/TSM	--	-73,800	-72,600	-64,300	-62,800
New Transit Riders	--	8,400	7,800	7,150	6,450
Daily Reduction in VMT per New Rider	---	-8.8	-9.3	-9.0	-9.7

Figure 3.1-4 is a graphical representation of the boardings and alightings at each station on each Bottineau LRT Build alternative. Circle sizes are proportional; the circles in the legend provide a reference for approximate boardings and alightings.

3.1.4.2 Operating Phase Impacts

No-Build Alternative

No operating phase impacts would be associated with the No-Build alternative.

Enhanced Bus/TSM Alternative

The Enhanced Bus/TSM alternative would result in a reduction in vehicle miles traveled, and an increase in average weekday trips on transit. Please see Table 3.1-9.

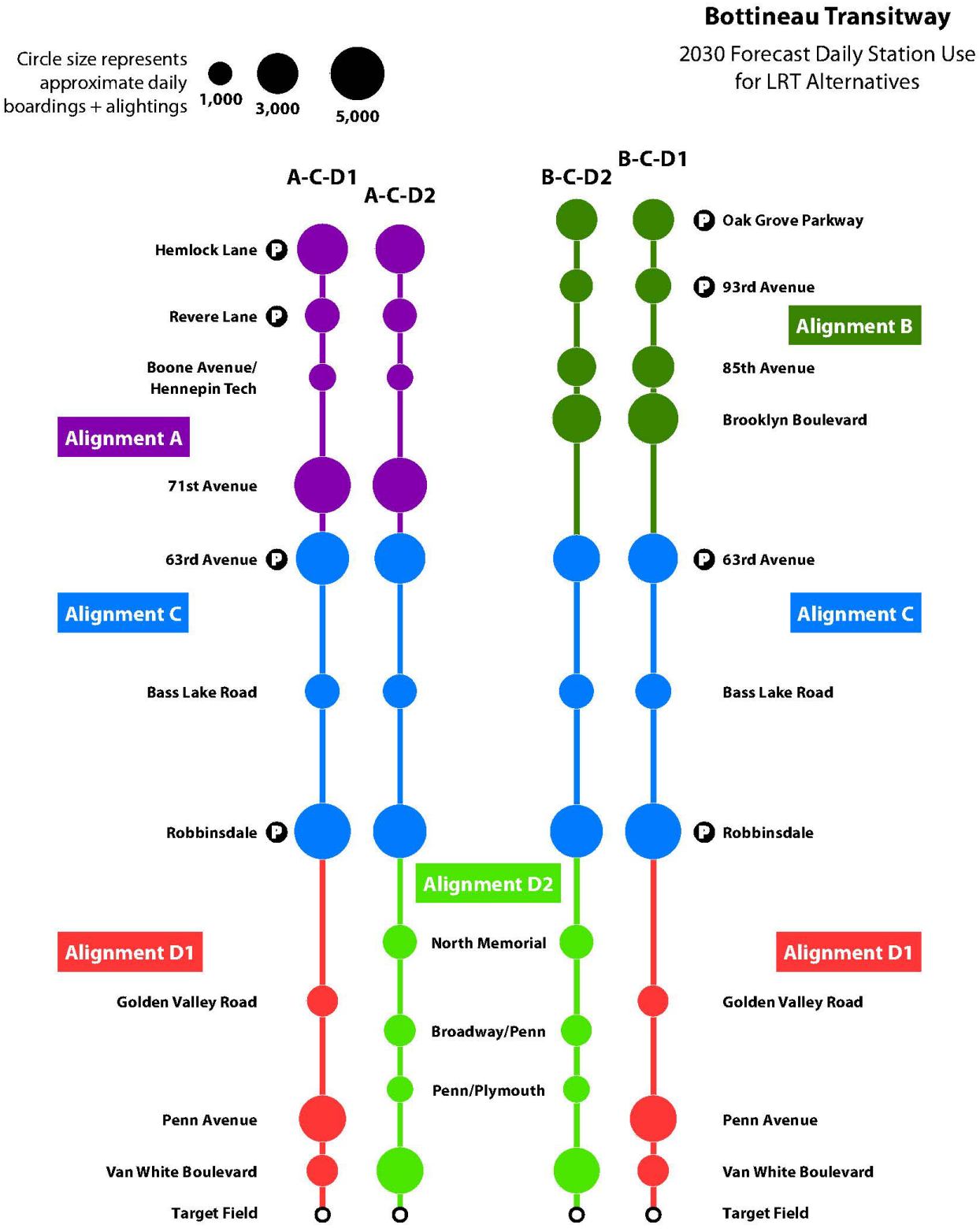
Build Alternatives

Operations of any of the Build alternatives would result in reduced vehicle miles traveled, an increase in new transit riders, an increase in daily user benefit hours, and an increase in average weekday trips on transit. Specifics are shown in Table 3.1-9

Table 3.1-9. Summary of Build Alternative Benefits

	Enhanced Bus/TSM	A-C-D1	A-C-D2	B-C-D1 (Preferred Alternative)	B-C-D2
Daily Reduction in VMT	-51,700	-73,800	-72,600	-64,300	-62,800
New Transit Riders		8,400	7,800	7,150	6,450
Total Corridor Boardings	55,700	70,900	69,100	69,600	67,500
Change over TSM		15,200	13,400	13,900	11,800
Daily User Benefit Hours		9,460	9,000	8,520	7,940
Average Weekday Linked Trips	331,450	339,850	339,250	338,600	337,900
Change over TSM		8,400	7,800	7,150	6,450
Percent change over TSM		2.5%	2.4%	2.2%	2.0%

Figure 3.1-4. 2030 Forecast Daily Station Use for Build Alternatives



3.1.4.3 Construction Phase Impacts

No-Build Alternative

No construction phase impacts would be associated with the No-Build alternative.

Enhanced Bus/TSM Alternative

No construction phase impacts would be associated with the Enhanced Bus/TSM alternative.

Build Alternatives

Existing routes in the Bottineau Corridor are shown in Figure 3.1-1. Construction of any of the Build alternatives could result in intermittent impacts to bus operations on any of these routes within the construction area. These may include temporary stop relocations or closures, route detours, or suspensions of service on segments of routes operating on streets where LRT is being constructed. As project planning and engineering advances, transit routes will be reevaluated and transitway construction will be planned to minimize disruption to transit service.

3.1.5 Avoidance, Minimization, and/or Mitigation Measures

For short-term changes to bus operations during construction, Metro Transit would post information at bus stops indicating temporary stop closures and/or detour details. Information would also be published in advance of detours on Metro Transit's website and in its on-board information brochure, *Connect*.

For implementation of the Preferred Alternative, Metro Transit would develop and refine a service plan to enhance the transitway service, including service changes to improve transfers from connecting bus service to LRT. Metro Transit would follow standard procedures for route changes, additions, and deletions which will include a Title VI analysis to determine how service changes would affect low-income and minority communities, a community outreach process in designing route changes, a public hearing for the proposed service changes, and ongoing outreach efforts to communicate service changes prior to implementation.[2]

3.2 Freight Rail Conditions

Information in this section is based on the information provided in the Transportation Technical Report (Kimley-Horn and Associates & SRF Consulting Group, 2012).

HCRRA and the Metropolitan Council applied for a preliminary jurisdictional determination from the Federal Railroad Administration (FRA) in a letter dated June 17, 2013. FRA concluded that Bottineau Transitway would be an urban rapid transit (URT) operation; therefore, FRA would not exercise its safety jurisdiction over the Bottineau Transitway except to the extent necessary to ensure railroad safety at any limited shared connections between the Bottineau Transitway and other railroad carriers that operate on the general railroad system of transportation (see Appendix D).

HCRRA has discussed with BNSF representatives the acquisition of the eastern 50 feet of BNSF's right-of-way for LRT purposes and preserving the western 50 feet for the freight track and access road. Additional coordination will take place as the project advances into further stages of project development.

[2] Metro Transit recently completed a transit service study for the Central Corridor LRT line, which involved extensive outreach to the communities along the corridor including: contacting and meeting with neighborhood and community groups and District Councils; holding five public hearings; posting brochures with comment cards for current customers and the general public; and hiring "trusted advocates", well-connected members of the community who conducted individual meetings in their communities to gather feedback and explain the route change process. The study also evaluated potential impacts to low-income and minority populations by completing a Title VI analysis, as well as evaluating the efficiency and effectiveness, route coverage, and budgetary impacts of the proposed service changes. A similar process would be completed for the Bottineau Transitway Project.

3.2.1 Regulatory Context and Methodology

Preliminary Bottineau Transitway design drawings and existing BNSF track charts were used to identify potential physical impacts to freight rail infrastructure. Minnesota State Statute 219.46, BNSF Railway, American Railway Engineering and Maintenance-of-Way Association (AREMA), and Minnesota Department of Transportation (MnDOT) requirements were reviewed to determine vertical and horizontal clearance requirements for the freight rail track. Per Minnesota State Statue 219.46, subd. 2, a minimum of 14 feet horizontal separation is required between the rail track centerline. The Bottineau Transitway Project provides a horizontal separation greater than 14 feet. This additional separation would allow a service road to be constructed between the LRT and freight rail track and also would allow Metropolitan Council and BNSF to perform maintenance on their respective track without impacting service on the other track.

3.2.2 Study Area

The study area for freight impacts is approximately 8.4 miles of the BNSF right-of-way within the Monticello Subdivision located between Brooklyn Boulevard in Brooklyn Park (Mile Post (MP) 9.99) and TH 55 in Minneapolis (MP 1.56). The width of the BNSF-owned right-of-way is generally 100 feet (approximately 50 feet on either side of the existing freight rail track).

3.2.3 Affected Environment

Within the study area, the BNSF operates on one freight rail track generally located in the center of a 100-foot right-of-way that the railroad owns and maintains. Within this area, there are several locations where the BNSF right-of-way is less than 100 feet. BNSF operates one freight train per day on this track. During peak operations in previous years, up to five trains per day operated in the corridor. Future freight operations could increase or decrease based on the future needs of BNSF.

This portion of the BNSF system is located in “dark territory,” which means that train movements are controlled by track warrants or train order operations, with train dispatchers issuing orders by radio communication with train engineers, not by train signals. This type of system allows only one train to be on a particular segment of the track at any given time. This portion of the corridor is Class II track and operates at a maximum speed of 25 miles per hour (mph) based on existing track conditions.

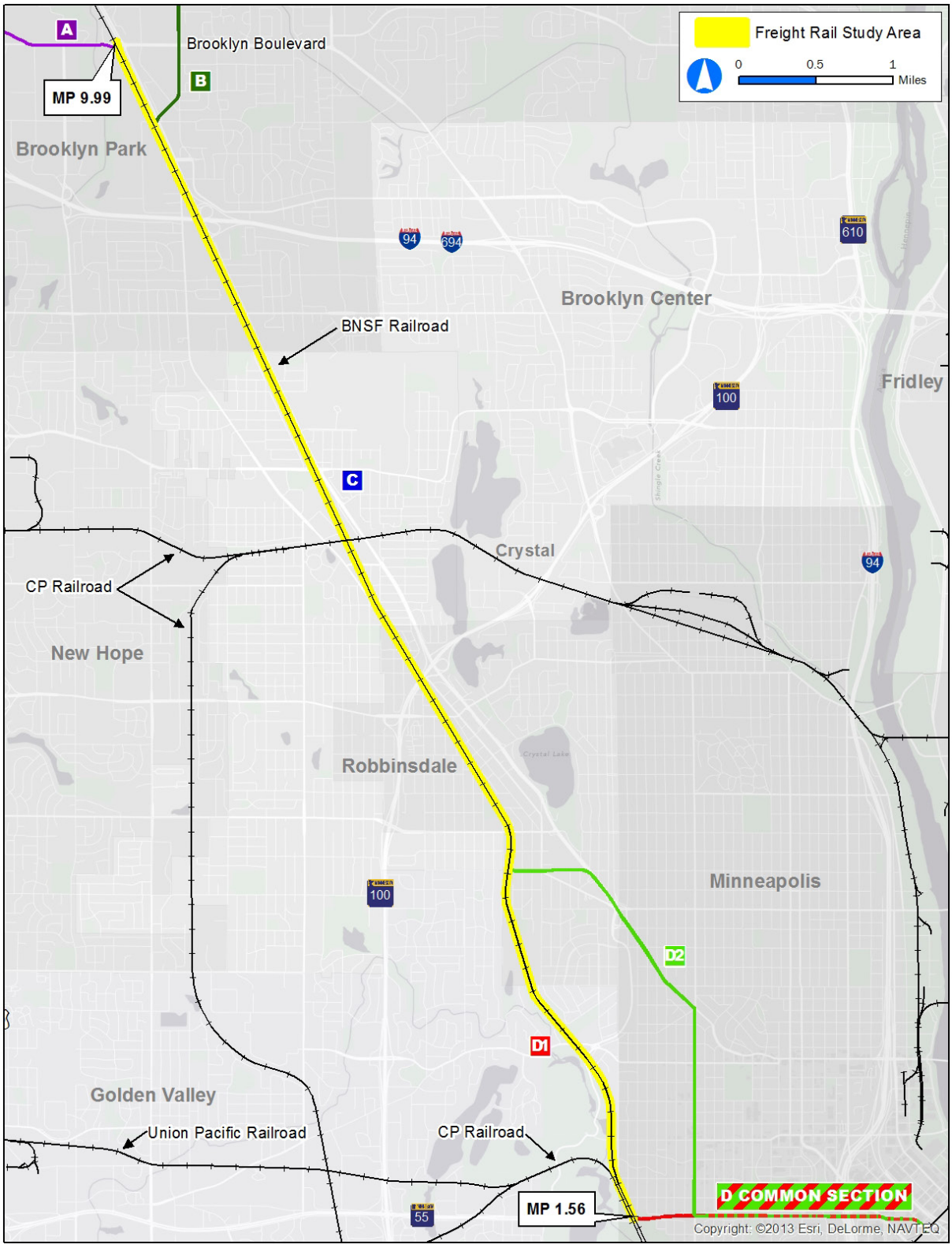
Between Brooklyn Boulevard and I-94, four siding tracks allow rail service to be provided to the Anchor Block site, Atlas Cold Storage building, former Knox Lumber site, and the current Feed My Starving Children building. BNSF has not provided service to these sites for several years.

The CP Railway has two tracks that come into contact with the BNSF rail line. One is located between Bass Lake Road and Corvallis Avenue and generally runs east-west. At this location, the BNSF track crosses the CP track perpendicularly with a diamond crossing. The second track is located at the south end of Alignment D1, where the CP track connects to the BNSF track with a crossover.

Within Alignments A, B, and C, the existing freight rail track is generally at the same elevation as the adjacent roadways. There are 10 at-grade crossings, with active warning devices provided at nine of them (detailed in the Transportation Technical Report (Kimley-Horn and Associates and SRF Consulting Group, 2012)). Passive warning devices are provided at the 40th Avenue at-grade crossing, located within Alignment C.

Between 36th Avenue N and TH 55 in Alignment D1, the freight rail track is located in a 100-foot right-of-way within a “trench” at an elevation that is lower than the adjacent infrastructure. In these areas there are vegetated side slopes on either side of the track and no at-grade crossings. The track crosses under five bridge structures, two of which (Golden Valley Road and Theodore Wirth Parkway) were designed to accommodate a future LRT track. The track located in the remaining portion of Alignment D1 is generally at the same elevation or higher than the adjacent roadways.

Figure 3.2-1. Freight Rail Study Area



3.2.4 Environmental Consequences

3.2.4.1 Operating Phase (Long-Term) Impacts

No-Build Alternative

No operating phase (long-term) impacts to the freight rail corridor would be associated with the No-Build alternative.

Enhanced Bus/TSM Alternative

No operating impacts to the freight rail corridor would be associated with the Enhanced Bus/TSM alternative.

Build Alternatives

The Build alternatives include constructing the proposed LRT guideway in the eastern half of the BNSF right-of-way (see discussion under Section 3.2). The project would divide the existing 100-foot right-of-way to accommodate both the BNSF and LRT tracks. This would require that the BNSF track be relocated approximately 25 feet to the west, allowing BNSF to operate within the western 50 feet of the right-of-way while, providing 25 feet of horizontal clearance from the rail track centerline at most locations. The LRT tracks would operate in the eastern 50 feet of the existing right-of-way. Proposed project construction would include a 12-foot wide access road generally located between the relocated BNSF track and the LRT guideway. See Figure 3.2-2 for a typical section diagram.

The Build alternatives include modifications to active warning devices and signals for at-grade crossings in order to accommodate the relocated BNSF and new LRT tracks. This would include relocation of existing active warning devices, such as gate arms, to accommodate the relocated BNSF track and LRT track, and installation of new active warning devices, such as gate arms, at locations where they are not currently provided. The project would include fencing at LRT stations to provide additional separation between pedestrians using the LRT station platform and the freight rail operations. Replacement of existing fence located on the BNSF right-of-way line affected by construction would also be provided.

While BNSF would be required to operate within the western 50 feet of their right-of-way, the incorporation of an access road would improve BNSF's overall accessibility to their track. No additional right-of-way is required to implement the access road. The project is relocating the existing freight track but is not changing the overall configuration or location of the freight track; therefore, no operational changes are anticipated.

Table 3.2-1 provides a summary of the operating impacts of the various alternatives on freight rail.

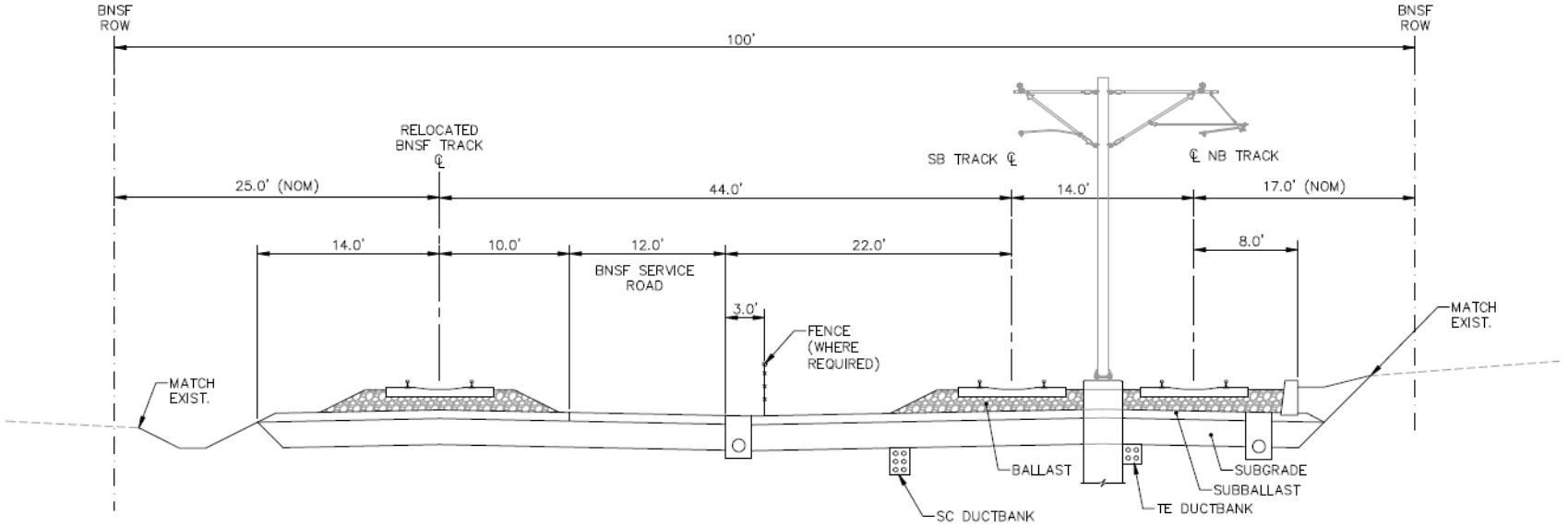
Further discussion of the impacts and improvements needed to accommodate the relocated freight rail alignment is provided below. Unless otherwise noted, these impacts do not have a permanent impact to freight rail operations.

Table 3.2-1. Operating Phase (Long-Term) Impacts By Alternative – Freight Rail

Alternative	Total Freight Rail Impact[1]
No-Build	No impact
Enhanced Bus/TSM	No impact
A-C-D1	No direct impact to freight rail operations in Alignments A, C, and D1. Potential impact to CP Rail in Alignments C and D1.[2]
A-C-D2	No direct impact to freight rail operations in Alignment A and C. Potential impact to CP Rail in Alignment C.
B-C-D1 (Preferred Alternative)	No direct impact to freight rail operations in Alignments B, C, and D1. Potential impact to CP Rail in Alignments C and D1.
B-C-D2	No direct impact to freight rail operations in Alignments B and C. Potential impact to CP Rail in Alignment C.

[1] There are no anticipated freight rail impacts associated with the proposed park-and-ride or OMF facilities.
[2] Potential impacts to CP Rail include relocation of an existing diamond crossing where CP Rail and BNSF Railway cross each other north of TH 100 and reconstruction of an existing turnout that provides a connection between CP Rail and BNSF Railway north of TH 55.

Figure 3.2-2. Typical Railway Section (Alignment C)



Bridge Modifications

As shown in Table 3.2-2, between two and six bridges within the limits of the freight rail corridor may need to be modified, depending on the alternative. Modifications range from slope and retaining wall changes to bridge piers to construction of a new bridge structure. Further details are provided in Table 3.2-3 and in the Transportation Technical Report (Kimley-Horn and Associates & SRF Consulting Group, 2012).

Table 3.2-2. Location of Potential Bridge Modifications Along Rail Corridor

Alternative	Potential Bridge Modifications					
	TH 100	36th Avenue	Golden Valley Road	Theodore Wirth Parkway	Plymouth Avenue	TH 55
A-C-D1	X	X	X	X	X	X
A-C-D2	X	X				
B-C-D1 (Preferred Alternative)	X	X	X	X	X	X
B-C-D2	X	X				

Table 3.2-3. Potential Bridge Modifications

Alignment	Bridge Location	Proposed Improvements
Alignment C (part of the Preferred Alternative)	TH 100	Provide two separate bridge structures for LRT and BNSF tracks. The existing BNSF bridge structure will be widened to accommodate two LRT tracks and a new BNSF bridge structure will be constructed south of the existing alignment. The BNSF track alignment will be shifted to accommodate the new BNSF bridge structure. BNSF operations would only occur on the new BNSF bridge structure, which they would be required to maintain.
	36th Avenue	The existing slope paving and portions of the embankment would be removed and new retaining walls would be constructed to accommodate the relocated freight rail track. A horizontal clearance of approximately 15 feet would be provided between the existing bridge pier and new retaining wall within the west portal of the bridge structure. Existing piers would require modifications to provide adequate crash wall protection based on current MnDOT and AREMA standards. No change to BNSF operations or maintenance requirements.
Alignment D1 (part of the Preferred Alternative)	Golden Valley Road	Existing slope paving and portions of the embankment would be removed and new retaining walls would be constructed within the west portal to accommodate the relocated freight rail track. The west abutment was designed to accommodate a future track within the west portal of the bridge. Existing piers would require modifications to provide adequate crash wall protection based on current MnDOT and AREMA standards. No change to BNSF operations or maintenance requirements.

Alignment	Bridge Location	Proposed Improvements
	Theodore Wirth Parkway	Existing slope paving and portions of the embankment would be removed and new retaining walls would be constructed within the west portal in order to accommodate the relocated freight rail track. Within the east portal, removal of the existing slope paving and portions of the embankment along with construction of a new retaining wall would occur in order to accommodate the LRT guideway. The west abutment was designed to accommodate a future track within the west portal of the bridge. Existing piers would require modifications in order to provide adequate crash wall protection based on current MnDOT and AREMA standards. No change to BNSF operations or maintenance requirements.
	Plymouth Avenue	Existing slope paving and portions of the embankment would be removed and new retaining walls would be constructed within the portal east of the existing track in order to accommodate the LRT guideway. Existing piers would require modifications in order to provide adequate crash wall protection based on current MnDOT and AREMA standards. No change to BNSF operations or maintenance requirements.
	TH 55	The north half of the TH 55 Bridge would be reconstructed in order to accommodate the transition of the LRT guideway out of the BNSF right-of-way into the median of TH 55. These bridge reconstruction impacts are not associated with the relocation of the freight rail track. No change to BNSF operations or maintenance requirements.

Alignment A

The BNSF freight rail track would be relocated approximately 25 feet west of its current alignment. South of 71st Avenue, a portion of the BNSF right-of-way is less than 100 feet wide due to the 71st Avenue roadway configuration. This may require installation of a barrier between the existing roadway (back of sidewalk) and freight rail track. Existing sidings that are located south of Brooklyn Boulevard are currently out of service, and in some cases not connected to the existing freight track. The relocated freight track may need to reconnect these existing sidings, if service to these customers is anticipated to resume.

Alignment B (part of the Preferred Alternative)

The BNSF freight rail track would be relocated approximately 25 feet west of its current alignment. South of 71st Avenue, a portion of the BNSF right-of-way is less than 100 feet wide due to the 71st Avenue roadway configuration. This may require installation of a barrier between the existing roadway (back of sidewalk) and freight rail track. Existing sidings that are located south of Brooklyn Boulevard are currently out of service, and in some cases not connected to the existing freight track. The relocated freight track may need to reconnect these existing sidings, if service to these customers is anticipated to resume.

Alignment C (part of the Preferred Alternative)

The BNSF freight rail track would be relocated 25 feet west of its current alignment. The existing diamond crossing that is located at the BNSF/CP Railway at-grade intersection would require relocation as part of shifting the freight rail track. The southern portion of Alignment C is located within the “trench” described previously. In some areas, retaining walls would replace the existing vegetated side slopes on either side

of the BNSF railroad corridor to accommodate the relocated freight rail track and minimize adjacent property impacts.

The existing BNSF bridge that crosses over TH 100 would require modifications to accommodate the LRT guideway, and a new BNSF bridge would be constructed south of the existing bridge. Two bridge structures are proposed to minimize construction impacts to BNSF operations. This would allow BNSF to utilize the existing bridge structure until the new bridge structure is constructed. Once constructed, BNSF would transition to the new bridge structure allowing the existing bridge structure to be widened for the LRT guideway. See Table 3.2-3 for proposed modifications.

The 36th Avenue Bridge, which is located at the south end of Alignment C, would require modifications to accommodate the relocated freight rail track and LRT guideway, including new retaining walls and some modifications to existing piers to provide adequate crash wall protection (see Appendix E for additional detail). Unlike some of the bridges located within Alignment D1, this bridge was not designed to accommodate a future track within the west portal. See Table 3.2-3 for proposed modifications.

Alignment D1 (part of the Preferred Alternative)

Alignment D1 is located within the "trench" described previously. In some locations, retaining walls would replace the existing vegetated side slopes on either side of the BNSF railway corridor to accommodate the relocated freight rail track and elevation difference and to minimize adjacent property impacts. At Plymouth Avenue and TH 55, the proposed freight rail alignment transitions to the existing alignment to minimize impacts to existing bridge structures. The Golden Valley Road Bridge, Theodore Wirth Parkway Bridge, Plymouth Avenue Bridge, and TH 55 Bridge would all require modifications in order to accommodate the relocated freight rail track and LRT guideway. See Table 3.2-3 for proposed modifications.

The existing crossover located north of TH 55 at the south end of Alignment D1 would require reconstruction to accommodate the relocated freight rail track.

Alignment D2

Freight rail impacts associated with Alignment D2 would be minimal and would be located at the northerly end of Alignment D2 where the alignment exits the BNSF right-of-way at 34th Avenue. North of 34th Avenue the freight rail track would be relocated generally 25 feet west of its existing alignment to accommodate the LRT guideway. South of 34th Avenue, the freight rail track would transition back to its existing alignment, which is generally located in the center of the BNSF right-of-way.

Alignment D Common Section (part of the Preferred Alternative)

There are no impacts associated with freight rail in the Alignment D Common Section.

Traction Power Substations

TPSS sites would be located on the east side of the proposed LRT track, with a minimum horizontal clearance between the TPSS stations and the LRT track centerline of eight feet. Larger horizontal clearances, a minimum of 15 feet, would be required if located adjacent to the BNSF freight rail track. However, they could be located on property adjacent to the tracks to avoid or minimize impacts to the freight rail tracks. Depending on the location of the TPSS site, utilities may need to cross under or over the freight rail tracks. Vertical and horizontal clearances, as required by the BNSF Utility Accommodation Policy, would need to be maintained for these utility crossings.

3.2.4.2 Construction Phase Impacts

No-Build Alternative

No construction phase impacts to freight rail are associated with the No-Build alternative.

Enhanced Bus/TSM Alternative

No construction phase impacts to freight rail are associated with the Enhanced Bus/TSM alternative.

Build Alternatives

Construction activities required to relocate the freight rail track, located within Alignments A, B, C and D1, required as part of constructing the LRT guideway, would affect existing freight service within the corridor. Construction phase impacts would be minimized through phasing, which would allow freight rail operations to continue throughout the duration of construction. Construction phasing would likely consist of constructing the new freight rail track adjacent to the existing track, shifting freight rail operations to the new freight rail track and then removing the existing freight rail track to allow for construction of the LRT guideway. Grade crossing improvements will likely be constructed during 48-hour weekend closures (for road and civil work). Construction signage and traffic control devices will be provided and vehicular/pedestrian traffic will be detoured around the grade crossing construction zone. Bridge modifications identified at 36th Avenue, Golden Valley Road, Theodore Wirth Parkway and Plymouth Avenue are located under the bridge deck and would have a minimal impact to general traffic and bike/pedestrian movements. Relative to modifications to the existing BNSF bridge over TH 100, construction/modifications to the bridge structures would not physically occur on TH 100 and should have a minimal impact to vehicular traffic on TH 100. It is anticipated that some lane closures may be required to construct the bridge, but a complete roadway closure is not anticipated.

It is anticipated that the majority of the construction work associated with relocating the freight rail track would occur during the traditional construction season when ambient temperatures remain above freezing. Some work, such as bridge, retaining wall piling and foundation work may be able to occur during the winter months.

Construction activities associated with relocation of the freight rail track will primarily occur within the existing BNSF Railway right-of-way, with some temporary easements to accommodate construction outside of the in-place railroad right-of-way.

Impacts to vehicular traffic on TH 100 would occur during construction of the two bridge structures over TH 100. It is anticipated that these impacts would not be significant and may require lane closures during portions of the construction.

Construction activities may also result in temporary impacts to sidings used by freight customers. Temporary crossovers between the existing and relocated freight rail track would be required to facilitate construction phasing and maintain freight operations. Construction of these crossovers would occur to minimize impacts to freight rail operations within the corridor. Construction impacts associated with each alternative are shown in Table 3.2-4.

Table 3.2-4. Construction Impacts by Alternative – Freight Rail

Alternative	Total Freight Rail Impact[1]
No-Build	No impact
Enhanced Bus/TSM	No impact
A-C-D1	Operational impact during construction associated with track relocation in Alignments A, C, and D1
A-C-D2	Operational impact during construction associated with track relocation in Alignments A and C. Minor impact at the north end of Alignment D2.
B-C-D1 (Preferred Alternative)	Operational impact during construction associated with track relocation in Alignments B, C, and D1
B-C-D2	Operational impact during construction associated with track relocation in Alignments B and C. Minor impact at the north end of Alignment D2.

[1] There are no anticipated freight rail construction impacts associated with the proposed park-and-ride or OMF facilities.

Construction of Alignments C and D1, as well as the southerly portions of Alignments A and B, would result in temporary impacts and interruptions in freight rail service that would be required as part of relocating and reconstructing the existing freight rail infrastructure. Freight rail operations would be temporarily interrupted when operations shift from the existing freight rail line to the new freight rail track. Coordination with BNSF Railway would be conducted to minimize impacts during construction.

3.2.5 Avoidance, Minimization, and/or Mitigation Measures

Where existing freight rail track is relocated, conditions would be improved compared to the existing rail infrastructure through providing continuously welded rail (CWR) and a new service road adjacent to the relocated freight rail track.

Mitigation measures, such as construction phasing to minimize track outages, would be taken to minimize impacts to existing freight rail operations during construction. Coordination with BNSF Railway and CP Rail would continue through the National Environmental Policy Act (NEPA) process and beyond to affirm appropriate mitigation measures.

3.3 Vehicular Traffic

Information included in this section is based on the information provided in the Traffic Technical Report (Kimley-Horn and Associates, 2012).

3.3.1 Regulatory Context and Methodology

The approach to the traffic operations analysis is derived from the established methodologies documented in the Highway Capacity Manual (HCM). The HCM contains a series of analysis techniques for evaluating the operations of transportation facilities under various operating conditions, such as geometric configuration, intersection control, type of roadway facility, and other factors such as bus stops, parking maneuvers, and percentage of heavy vehicle traffic. The Bottineau Transitway traffic models have been developed using Synchro/SimTraffic and VISSIM, software packages that implement the HCM methodologies. The inputs into the models include lane geometrics, existing and forecast[3] turning movement volumes, intersection traffic control devices, and signal timing characteristics. The level of service (LOS) thresholds, as defined by the HCM, are shown in Table 3.3-1. Based on standard practice in the traffic engineering industry, as well as guidance from the American Association of State Highway and Transportation Officials (AASHTO) and conformance with MnDOT and Hennepin County practice, the threshold for acceptable level of intersection operations is between LOS D and LOS E (with LOS D being considered acceptable and LOS E unacceptable) during the peak hour for urban and suburban areas. The PM peak hour was analyzed as the worst case scenario based on the higher traffic volumes during the PM peak hour compared to the AM peak hour. In addition, initial capacity analysis at selected intersections along the corridor showed that the intersections had higher delays during the PM peak hour compared to the AM peak hour due to the higher overall traffic volumes and greater demand/capacity ratios.

Table 3.3-1. Intersection Level of Service Definitions

Level of Service (LOS)	Average Delay (seconds/vehicle)	
	Signalized Intersection	Unsignalized Intersection
A	<10	<10
B	10-20	10-15
C	20-35	15-25

[3] City and county comprehensive plans were used to identify the 2030 forecasts that were used for the traffic modeling.

Level of Service (LOS)	Average Delay (seconds/vehicle)	
	Signalized Intersection	Unsignalized Intersection
D	35-55	25-35
E	55-80	35-50
F	>80	>50

Source: Highway Capacity Manual 2010, Transportation Research Board.

The traffic operations analysis has also incorporated the requirements and standards documented in the Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD) relative to requirements for signal preemption (manipulation of traffic signals to provide green lights for priority vehicles) and gate operations.

All full-access intersections with the transitway (i.e., locations where all vehicular movements are allowed) were assumed to be signalized to provide safe movement of transit light rail vehicles (LRV) and motorized vehicles. In addition, at-grade roadway crossings with transit LRV speeds greater than 35 mph would be equipped with automatic gates, based on the MN MUTCD standards.

3.3.2 Study Area

The analysis of traffic operations for the Bottineau Transitway Project included existing and proposed signalized intersections along the Bottineau Transitway alternative alignments. In addition, several unsignalized crossings of the transitway that would be controlled with automatic gates have been included in the analysis.

3.3.3 Affected Environment

The regional highway system consists of principal and minor arterials, including Interstate, state highways, and county highways, and some city streets. The *Metropolitan Council 2030 TPP* indicates that the existing roadway network is expected to experience a substantial increase in automobile demand by the year 2030, with a regional forecast of 91.2 million daily VMT, an increase of 37 percent compared to 2005 VMT. This would equate to an approximate average growth of 1.5% per year.

Although the opportunities for roadway expansion to address this increase in VMT are limited within the study area, several roadway improvement projects are planned within the study area by 2030:

- CSAH 103 (West Broadway Avenue) Reconstruction, south of Candlewood Drive to north of CSAH 30 (93rd Avenue) – Capacity expansion from two lanes to four lanes (Hennepin County Transportation)
- CSAH 81 Reconstruction, CSAH 10 (Bass Lake Road) to CSAH 30 (Hennepin County Transportation)
- Candlewood Drive Extension, CSAH 103 to 79th Avenue (City of Brooklyn Park)
- TH 610, CSAH 81 to I-94 – New roadway construction (MnDOT)

3.3.4 Environmental Consequences

3.3.4.1 Operating Phase (Long-Term) Impacts

No-Build Alternative

The results of the 2030 No-Build traffic analysis provide a basis from which to determine the impacts of the Bottineau Transitway Project. The intersections shown in Table 3.3-2 fall into one of two categories:

- The intersection operates at unacceptable levels (LOS E or F) under the future No-Build conditions.
- There are concerns at the intersection relative to the operations in the future Build conditions, and

therefore there is a need for comparison to determine the impacts due to background growth and changes and the impacts due to the Bottineau Transitway Project.

The results of the 2030 No-Build analysis for the PM peak hour are shown in Table 3.3-2. More detailed analysis and results discussion are provided in the Traffic Technical Report (Kimley-Horn and Associates, 2012).

Table 3.3-2. No-Build 2030 PM Peak Traffic Operations

Intersection	Vehicle Delay (seconds/ vehicle)	Intersection LOS
CSAH 81 at Penn Ave/McNair Ave	84	F
TH 55 at Penn Ave	150+	F
TH 55 at W Lyndale Avenue (I-94 West Ramps)[1]	29	C
TH 55 at E Lyndale Avenue (I-94 East Ramps)[1]	26	C

[1]Although the TH 55/Lyndale intersections operate at acceptable levels (LOS C), they are included for comparison to the 2030 Build conditions.

Enhanced Bus/TSM Alternative

The Enhanced Bus/TSM alternative would not be expected to have any significant operating phase (long-term) impacts because the Enhanced Bus/TSM alternative is very comparable to the No-Build alternative from a traffic operations perspective. The increase in the number of transit vehicles, transit stops, and potential transit signal priority along CSAH 81 may have minor effects on traffic flow and vehicle delay but are not expected to be significant. Therefore, traffic operations were not analyzed for the Enhanced Bus/TSM alternative because the analysis would not provide additional information relative to identifying impacts of the Bottineau Transitway Project.

Build Alternatives

The summary of intersections expected to operate at LOS E or LOS F in the 2030 PM peak hour Build conditions is provided in Table 3.3-3. In general, all intersections would be expected to have acceptable operations under any of the Build alternatives. The LOS E/F operations at the CSAH 81/ CSAH 2 (Penn Avenue) and Penn Avenue/TH 55 intersections during the PM peak hour would be expected to occur in 2030 even if the Bottineau Transitway Project was not constructed.

Table 3.3-3. Impacts By Alternative – Traffic Operations

Alternative	Intersections Expected to Operate at LOS E/F
No-Build	CSAH 81 at Penn Avenue Penn Avenue at TH 55
Enhanced Bus/TSM	No impacts
A-C-D1	Penn Avenue at TH 55
A-C-D2	CSAH 81 at Penn Avenue Penn Avenue at TH 55
B-C-D1 (Preferred Alternative)	Penn Avenue at TH 55
B-C-D2	CSAH 81 at Penn Avenue Penn Avenue at TH 55

A description of potential impacts by the component alignments that make up each alternative is provided below. More detailed presentation of the analysis results is provided in the Traffic Technical Report (Kimley-Horn and Associates, 2012).

Alignment A

The intersections in Alignment A affected by the proposed action would be expected to operate acceptably during the PM peak hour. The results of this analysis are shown in Table 3.3-4. The future Arbor Lakes Parkway intersections were not modeled because it has been assumed that the roadway would be designed with adequate geometrics to accommodate future transit operations. The transitway operating speed along Arbor Lakes Parkway would be 35 mph, and therefore the signals would be anticipated to operate under transit priority.

The CSAH 81 and CSAH 130 (Brooklyn Boulevard) intersection would be expected to operate at or near capacity (LOS E). However, this is not due to any effect caused by the operations of the Bottineau Transitway because the transitway would be grade-separated over CSAH 130. The grade separation would eliminate any potential influence of transit operations on the overall intersection operations at this location. The other intersections analyzed in Alignment A would be expected to have acceptable operations during the peak hour.

In Alignment A, three public intersections would be converted from full access to right-in/right-out.[4] In addition, three traffic signals are to be added along the proposed Arbor Lakes Parkway, and two signalized crossings with gates would be added at 73rd and 71st Avenues.

Table 3.3-4. Alignment A 2030 PM Peak Traffic Operations

Intersection	Operations			Comments
	Assumed Traffic Signal Operating Scheme	Vehicle Delay (seconds/ vehicle)	Intersection LOS	
CSAH 130 at Boone Avenue	Transit Priority	41	D	
CSAH 81 at CSAH 130	No transit interaction	60	E	Bottineau Transitway grade separated over CSAH 130
CSAH 81 at 73rd Avenue	Preemption	31	C	
CSAH 81 at 71st Avenue/ CSAH 8	Preemption	50	D	

Alignment B (part of the Preferred Alternative)

Alignment B includes CSAH 103, which is currently in the planning stages for a roadway reconstruction project from north of CSAH 30 to south of Candlewood Drive. The proposed roadway improvement project is a Hennepin County project, separate from the Bottineau Transitway Project, and includes expanding the roadway from a two-lane undivided to a four-lane divided section with a median wide enough to accommodate a future transportation purpose. Construction activities for the CSAH 103 roadway improvements are scheduled for late 2015.

The intersections in Alignment B affected by the proposed action would be expected to operate acceptably during the PM peak hour Build alternative. The results of this analysis are shown in Table 3.3-5.

Seven public intersections would be converted from full access to right-in/right-out in Alignment B. Five new traffic signals would also be added, with a potential for two additional traffic signals with the 101st Avenue OMF Alternative. Two traffic signals would be removed and the intersections would be converted to right-in/right-out. In addition, Alignment B would include two at-grade crossings on Jolly Lane and

[4] Right-in/right-out intersections do not permit left turns or through movements.

Lakeland Avenue. Similar to Alignment A, one signalized crossing with gates would be included at 71st Avenue.

Table 3.3-5. Alignment B 2030 PM Peak Traffic Operations

Intersection	Operations			Comments
	Assumed Traffic Signal Operating Scheme	Vehicle Delay (seconds/ vehicle)	Intersection LOS	
CSAH 103 at 94th Avenue	Preemption	28	C	Diagonal crossing
CSAH 103 at CSAH 30	Preemption	42	D	Diagonal crossing
CSAH 103 at Setzler Parkway	Preemption	17	B	
CSAH 103 at CSAH 109	Preemption	47	D	
CSAH 103 at College Park Drive	Preemption	22	C	
CSAH 103at Candlewood Drive	Preemption	17	B	
CSAH 103 at CSAH 152 (Brooklyn Boulevard)	Preemption	53	D	
CSAH 103 at 76th Avenue	Preemption	28	C	
CSAH 81 at 73rd Avenue	Preemption	12	B	Diagonal crossing
CSAH 81 at 71st Avenue/ CSAH 8	Preemption	50	D	

Alignment C (part of the Preferred Alternative)

The intersections in Alignment C affected by the proposed action would be expected to operate acceptably during the PM peak hour Build alternative. The results of this analysis for the PM peak hour Build alternative are shown in Table 3.3-6.

The queues at the CSAH 9 (42nd Avenue) and CSAH 8 (West Broadway Avenue) intersection were also evaluated to determine whether there would be any safety issues due to vehicle queues from the signal extending to the at-grade transitway crossing. The modeling showed that the maximum eastbound queue on CSAH 9 from the CSAH 8 intersection would be approximately 210 feet compared to a storage distance of 350 feet. Therefore, no operational or safety impacts would be expected at the intersection or the grade crossing due to the Bottineau Transitway.

Alignment C does not include any access closures or modifications, but eight crossings are proposed to become signalized with gates.

Table 3.3-6. Alignment C 2030 PM Peak Traffic Operations

Intersection	Operations			Comments
	Assumed Traffic Signal Operating Scheme	Vehicle Delay (seconds/ vehicle)	Intersection LOS	
CSAH 81 at 63rd Avenue	Preemption	53	D	
CSAH 81 at CSAH 10	Preemption	29	C	
CSAH 9 at Transitway	Unsignalized; Automatic	2	A	

	Gates			

Alignment D1 (part of the Preferred Alternative)

The Bottineau Transitway would be grade separated from the roadway crossings through most of Alignment D1, including at the transition into the median at TH 55. The intersections in Alignment D1 affected by the proposed action would be expected to operate acceptably during the PM peak hour Build alternative, with the exception of the TH 55/Penn Avenue intersection. The results of this analysis are shown in Table 3.3-7.

The TH 55/Penn Avenue intersection would be expected to operate at LOS E in the 2030 Build conditions; however, this would be an improvement over the 2030 No-Build operations. The improvement in intersection operations would be the result of intersection geometric improvements constructed as part of the Bottineau Transitway Project that allow the northbound/southbound phases to operate concurrently, rather than split phased as they do now. The intersection geometric improvements would include median modifications, realignment of the northbound and southbound approach lanes, and additional striping to guide left-turning vehicles through the intersection.

Alignment D1 includes one public access modification along TH 55, west of the Alignment D Common Section. Existing operations at Russell Avenue N allow southbound left turns onto TH 55 which would be restricted with the Bottineau Transitway. Alignment D1 also includes one new traffic signal at TH 55 and Thomas Avenue.

Table 3.3-7. Alignment D1 2030 PM Peak Traffic Operations

Intersection	Operations			Comments
	Assumed Traffic Signal Operating Scheme	Vehicle Delay (seconds/ vehicle)	Intersection LOS	
TH 55 at Penn Avenue	Priority	60	E	

Alignment D2

The D2 alignment along CSAH 81 would include a single traffic lane in each direction from 29th Avenue N to Penn Avenue. Therefore, left-turn movements along the alignment would be prohibited where left-turn lanes could not be provided, due to conflicts with the movement of light rail vehicles, at the following intersections:

- CSAH 81 and 29th Avenue
- CSAH 81 and 26th Avenue
- CSAH 81 and Penn Avenue (west side of intersection)

The intersections in Alignment D2 affected by the proposed action would be expected to operate acceptably during the PM peak hour Build alternative, with the exception of the CSAH 81/Penn Avenue and TH 55/Penn Avenue intersections. The results of this analysis are shown in Table 3.3-8. The TH 55/Penn Avenue intersection would be expected to operate at LOS E in the 2030 Build conditions; however, this would be an improvement over the 2030 No-Build operations. The improvement in intersection operations would be the result of intersection geometric improvements constructed as part of the Bottineau Transitway Project that allow the northbound/southbound phases to operate concurrently, rather than split-phased as they do now (i.e. northbound is allowed to go, then stops and allows southbound to go). The intersection geometric improvements would include median modifications, realignment of the northbound and southbound approach lanes, and additional striping to guide left-turning vehicles through the intersection. The impacts of Alignment D2 on the Penn Avenue intersections

at CSAH 81 and TH 55 are expected to be greater than the impacts of Alignment D1 due to the changes in approach geometrics and the crossing of the alignment diagonally through the intersection.

In Alignment D2, nine public intersections would be converted from full access to right-in/right-out, and two full access intersections would be converted to cul-de-sac. In addition, the CSAH 81/Penn Avenue intersection would remain full access except the fifth leg, the McNair Avenue approach, would be converted to right-in/right-out with access from Penn Avenue. Similarly, the CSAH 81/26th Avenue intersection would remain full access except for the fifth leg, the southbound Sheridan Avenue approach, would be converted to right-in/right-out. The CSAH 81/27th Avenue/Thomas Avenue intersection would also require access modifications due to the Bottineau Transitway. At the intersection, the eastbound 27th Avenue approach would be converted to right-in/right-out, the northbound Thomas Avenue approach would be converted to cul-de-sac, and the westbound 27th Avenue approach would be closed and routed into the southbound Thomas Avenue approach.

In addition, Alignment D2 would include one new traffic signal at Penn Avenue and 23rd Avenue. Three traffic signals would be removed and the intersections converted to right-in/right-out, and one at-grade crossing would be included at France Avenue.

Table 3.3-8. Alignment D2 2030 PM Peak Traffic Operations

Intersection	Operations			Comments
	Assumed Traffic Signal Operating Scheme	Delay (seconds/ vehicle)	Intersection LOS	
France Avenue/Oakdale Avenue at 34th Avenue	Priority	11	B	
CSAH 81 at 29th Avenue	Priority	7	A	Left-turn movements on CSAH 81 would be prohibited
CSAH 81 at 26th Avenue	Priority	19	B	Left-turn movements on CSAH 81 would be prohibited
CSAH 81 at Penn Avenue	Priority	56	E	Eastbound left-turn movements on CSAH 81 would be prohibited
Penn Avenue at Golden Valley Rd	Priority	32	C	
Penn Avenue at Plymouth Avenue	Priority	49	D	
Penn Avenue at TH 55	Priority	79	E	Right angle crossing between north and east legs of intersection

Alignment D Common Section (part of the Preferred Alternative)

The Build conditions at the TH 55/7th Street/6th Avenue intersection would include improvements on 7th Street to provide two northbound left-turn lanes and a southbound left-turn lane, in addition to two through lanes and a bike lane in each direction. These improvements would be needed for the intersection to operate at LOS D or better in the peak hour.

The intersections in the Alignment D Common Section affected by the proposed action would be expected to operate acceptably during the PM peak hour Build alternative. The results of this analysis are shown in Table 3.3-9. The pedestrian crossing of TH 55 on the west side of West Lyndale Avenue was assumed to

be eliminated due to the number of lanes that would need to be crossed and the resulting number of vehicle conflicts and poor signal operations. The operation of the TH 55/West Lyndale Avenue and TH 55/East Lyndale Avenue intersections with one or two traffic signal controllers would also need further exploration in future phases of the project.

Several movements at the TH 55/West Lyndale Avenue and TH 55/East Lyndale Avenue intersections would be expected to operate at LOS E or LOS F in the 2030 PM peak hour. This was mainly due to the high traffic volumes at both intersections and the change in left-turn phasing on TH 55 from protected/permissive to protected only, which would be necessary to protect left-turn movements from conflicts with LRT. The left-turn phasing combined with the short distance between the two intersections would be expected to result in queues that extend through the upstream ramp intersection. However, the queues would primarily occur on TH 55 and would not impact the freeway operations or the intersections at Bryant Avenue and Border Avenue/Oak Lake Avenue. Based on the operation of the overall intersections at LOS D or better, no mitigation would be proposed at the TH 55/West Lyndale Avenue or TH 55/East Lyndale Avenue intersections.

One public intersection would be converted from full access to right-in/right-out in the Alignment D Common Section. No traffic control modifications would be necessary.

Table 3.3-9. Alignment D Common Section 2030 PM Peak Traffic Operations

Intersection	Operations			Comments
	Assumed Traffic Signal Operating Scheme	Delay (seconds/ vehicle)	Intersection LOS	
TH 55 at Van White Memorial Blvd	Priority	34	C	
TH 55 at Bryant Avenue	Priority	18	B	
TH 55 at West Lyndale Avenue (I-94 West Ramps)	Priority	44	D	Pedestrian crossing on west leg eliminated
TH 55 at East Lyndale Avenue (I-94 East Ramps)	Priority	42	D	
TH 55 at Border Avenue/ Oak Lake Avenue	Priority	20	C	
TH 55/6th Avenue at 7th Street	Priority	38	D	
6th Avenue at Bradford St/Hennepin Energy Recovery Center (HERC) driveway	No transit interaction	9	A	Bottineau Transitway grade separated over roadway

Park and Ride Facilities

Several new or expanded park and ride facilities are proposed as part of the Bottineau Transitway Project. Based on data collected from other park and ride facilities in the Twin Cities Metropolitan Area, vehicle trip generation rates have been developed for the AM peak hour, PM peak hour, and weekday: 0.55 trips/parking space in the AM peak hour; 0.51 trips/parking space in the PM peak hour; and 2.63 trips/parking space for a weekday. These trip rates include park and ride vehicle traffic, as well as kiss and ride vehicle traffic.

Given that the station area plans, which would include the park and ride facilities, have not yet been developed a full traffic analysis of these facilities has not yet been conducted. However, a trip generation evaluation, shown in Table 3.3-10, was conducted to identify the number of new vehicle trips expected to

be added to the roadway network as a result of the proposed park and ride facilities. Potential roadway improvements such as turn lanes or additional intersection control may be needed to accommodate the additional traffic generated by the park and ride. These measures would need to be identified based on the detailed analysis of the station area sites, which would be completed during the Final EIS phase of the project.

Table 3.3-10. Park-and-Ride Facility Trip Generation (Preferred Alternative)

Station Name	New Park and Ride Size (parking spaces)	AM Peak Trip Generation (vehicles/ hour)	PM Peak Trip Generation (vehicles/ hour)	Daily Trip Generation (vehicles/day)
63rd Avenue	160	88	80	421
Robbinsdale	500	275	255	1,310
93rd Avenue	800	440	408	2,096

3.3.4.2 Construction Phase Impacts

No-Build Alternative

The No-Build alternative would not be expected to have any construction phase impacts on traffic operations in the project area.

Enhanced Bus/TSM Alternative

The Enhanced Bus/TSM alternative would not be expected to have any construction phase impacts on traffic operations in the project area.

Build Alternatives

For all alignments, construction of the Bottineau Transitway Project would be expected to result in disruptions to traffic operations, including lane closures, short-term intersection and roadway closures, and detours that would cause localized increases in congestion.

The details of construction staging would be developed in future stages of project design. Maintenance of traffic (MOT) plans would be required to be developed during final design or construction and submitted for approval to the roadway authorities. The MOT plans would address construction phasing, maintenance of traffic, traffic signal operations, access through the work zone, any road closures, and any traffic detours.

3.3.5 Avoidance, Minimization, and/or Mitigation Measures

Intersections along the Bottineau Transitway would be expected to have acceptable operations in the 2030 peak hour with any of the alternatives. The CSAH 81/Penn Avenue and TH 55/Penn Avenue intersections are expected to operate at LOS F under the 2030 No-Build conditions. However, any of the Build alternatives would include improvements to the TH 55/Penn Avenue intersection, including signal phasing, median, lane alignment, and striping changes, as part of the Bottineau Transitway Project for LRT to operate more efficiently through the intersection.

The TH 55/7th Street/6th Avenue intersection would necessitate geometric improvements to maintain acceptable LOS operations for all alternatives. 7th Street would need to be widened to construct a second exclusive northbound left-turn lane and a southbound left-turn lane, which would provide additional capacity and improve the signal phasing. The overall roadway width would be increased by less than 10 feet, and will allow the northbound and southbound pedestrian phases to operate together rather than split phased. These improvements would be expected to maintain acceptable LOS with the projected traffic growth.

3.4 Pedestrians and Bicycles

Information included in this section is based on the information provided in the Transportation Technical Report (Kimley-Horn and Associates & SRF Consulting Group, 2012).

3.4.1 Regulatory Context and Methodology

This section describes bicycle and pedestrian facilities, connections in the project corridor, and potential impacts of the No-Build, Enhanced Bus/TSM, and Build alternatives on these facilities.

Non-motorized transportation facilities, including sidewalks, single- and multi-use trails, on-street bike facilities, and pedestrian bridges, are found throughout the project area. Facilities were identified by reviewing trail and comprehensive plan maps, aerial photography, and site visits. Conceptual engineering drawings and preliminary construction limits were used to determine the number and severity of impacts. Potential physical encroachments onto existing facilities were identified and measured to avoid or minimize impacts.

Impacts to pedestrian and/or bicycle routes due to transitway crossing restrictions were identified and alternates examined. Existing pedestrian and bicycle safety characteristics at transitway crossings and measures to improve safety are also addressed. Determination of impacts was made by evaluating the location of the pedestrian or bicycle facility and its connection to the pedestrian and bicycle network in relation to the Bottineau Transitway alternative. If the pedestrian or bicycle facility was disturbed by transitway construction or operations, nearby alternatives were identified or mitigation proposed. These characteristics and measures would be used to inform station area planning or other corridor activities for non-motorized facility improvements. Impacts to publicly-owned recreational facilities, including parks and regional trails, are further analyzed in the Chapter 8, Draft Section 4(f) Evaluation.

Hennepin County adopted a Complete Streets policy in 2009 to promote a safe, efficient, and balanced transportation system among all modes of transportation (including auto, transit, bike, pedestrian, and others). The context of the impacts and mitigations described in this section reflect the flexibility of the policy in addressing multi-modal needs.

3.4.2 Study Area

The study area for impacts to non-motorized transportation consists of the potential area of disturbance, facilities near the alignment, and alternate routes in the surrounding area. The study area for alternate routes varied based on the conditions of the surrounding bicycle/pedestrian network but generally included alternate routes within a half mile of the transitway and/or affected crossing.

3.4.3 Affected Environment

The extent and condition of existing pedestrian and bicycle facilities in the study area vary by alternative. Facilities range from non-existent in the gravel mining area of Maple Grove to intermittent facilities in the more suburban areas of the corridor to complete sidewalk systems and on-street bicycle facilities in Minneapolis and the other more urban portions of the corridor. A detailed description of existing facilities is provided in the Transportation Technical Report (Kimley-Horn and Associates & SRF Consulting Group, 2012).

3.4.4 Environmental Consequences

3.4.4.1 Operating Phase (Long-Term) Impacts

No-Build Alternative

The No-Build alternative is not expected to have any operating phase (long-term) impacts on the non-motorized transportation environment in the project area.

Enhanced Bus/TSM Alternative

The Enhanced Bus/TSM alternative is not expected to have any operating phase (long-term) impacts on the non-motorized transportation environment in the project area.

Build Alternatives

A description of potential impacts by the component alignments that make up each alternative is provided below. These impacts are illustrated in Figure 3.4-1 through Figure 3.4-5, and impacts by alternative are summarized in Table 3.4-1.

Alignment A

One unmarked pedestrian crossing would be closed at Xylon Avenue and Brooklyn Boulevard. This would be a minor impact, as Xylon Avenue is a dead-end street at this location both north and south of Brooklyn Boulevard with little connectivity beyond the destinations directly served by the street. Diversion would be about 1/5 mile east to the Brooklyn Boulevard/Bottineau Boulevard intersection.

At the Hemlock Lane transit station, a connection to an existing north-south off-street trail along Hemlock Lane would be provided.

Alignment B (part of the Preferred Alternative)

Alignment B would result in closing four crossings of West Broadway Avenue in the city of Brooklyn Park: 92nd Avenue, Maplebrook Parkway, 84th Avenue, and 76th Avenue. Alternate crossings are available in each location within 1/8 mile.

The OMF option at 101st Avenue could potentially require realignment of a small portion of the unpaved trail associated with the Three Rivers Park District Rush Creek Regional Trail.

The proposed project and planned improvements by other agencies would result in considerable enhancement of the non-motorized transportation environment within Alignment B. New or improved sidewalk crossings of the BNSF/LRT alignment would be included in final design of the transitway at 73rd Avenue. The existing off-street trails on both sides of West Broadway Avenue north of 93rd Avenue would be crossed by the proposed LRT alignment in vicinity of 94th Avenue. Any direct impacts to the trails would be reconstructed. South of 93rd Avenue, a continuous bicycle/pedestrian facility between 93rd Avenue and Candlewood Drive is included in the design plans for the CSAH 103 reconstruction project, which has been programmed independent of Bottineau Transitway and will be completed by Hennepin County. Reconstruction of the sidewalks south of Candlewood Drive would be completed by the Bottineau Transitway Project, providing for continuous facilities along both sides of West Broadway Avenue for the entire alignment.

Alignment C (part of the Preferred Alternative)

The project would not result in permanent closure of any existing bicycle or pedestrian crossings of the BNSF railroad corridor. The transitway would pass over a local trail on a continuous structure also used for TH 100. The project's construction limits would come within 10 feet of the existing trail in Lee Park but would not alter the trail itself. As a result, no impacts to pedestrian or bicycle access or facilities are expected.

The project would improve existing pedestrian crossings and facilitate connections to station platforms. New or improved sidewalk crossings of the BNSF/LRT corridor would be included in final design of the transitway at nine locations: 71st Avenue, 63rd Avenue, Bass Lake Road, Corvallis Avenue (replacing existing sidewalk on south side of roadway), West Broadway Avenue, 45th ½ Avenue (sidewalk on south side of roadway), 42nd Avenue (with connection to LRT station parallel to BNSF track), 41st Avenue/Noble Avenue (with connection to LRT station parallel to BNSF track), and 39th ½ Avenue (new sidewalk on north side of roadway).

Alignment D1 (part of the Preferred Alternative)

Alignment D1 would result in closure of the existing informal (illegal) BNSF railroad crossings at Mary Hills Nature Area and Sochacki Park. Barriers to discourage non-motorized crossings would be necessary in these locations to preserve pedestrian safety near the LRT tracks.

No impact to the off-road trail that shares the grade-separated crossing with Theodore Wirth Parkway is anticipated. North of Plymouth Avenue the proposed BNSF access road would be relocated adjacent to the trail but would be separated by a fence or other barrier, and no impacts to pedestrian or bicycle facilities would result.

East of the BNSF/TH 55 transition, LRT would operate in the median of TH 55. Non-signalized pedestrian crossings of TH 55 at the intersections with Sheridan, Russell, and Queen Avenues would be closed. Alternate crossings are available within $^1/_8$ mile for each location.

Alignment D2

In the city of Robbinsdale, a new sidewalk would be constructed on the south side of 34th Avenue to replace the existing sidewalk which would be removed to construct the guideway. New vertical circulation would be provided for pedestrian access between the Terrace Mall and North Memorial Medical Center (NMMC) outpatient clinic and the new station platform located at the top of the bluff southeast of the mall area. Bicycle and pedestrian facilities would be provided on the new Halifax Avenue bridge over 34th Avenue. Pedestrian and bicycle access across 34th Avenue at Grimes Avenue would be eliminated to accommodate the guideway as it transitions from the BNSF railroad trench to the elevation of the new station platform. Users would need to divert one block ($^1/_{16}$ mile) to cross 34th Avenue.

Along West Broadway Avenue in the city of Minneapolis, pedestrians would be allowed to cross the LRT guideway only at signalized intersections, which would continue to be located at 29th Avenue, 26th Avenue, and Penn Avenue. These three crossings would be designed to permit safe crossing of both the road and LRT guideway (sidewalk to sidewalk). Unmarked pedestrian crossings of West Broadway Avenue at 27th Avenue/Thomas Avenue and Sheridan Avenue would be closed; alternate crossings are available within $^1/_8$ mile.

Along Penn Avenue, pedestrians would be allowed to cross the LRT guideway only at six signalized intersections: West Broadway Avenue, Golden Valley Road, 16th Avenue, Plymouth Avenue, Oak Park Avenue, and TH 55. These crossings would be designed to permit safe crossing of both the road and LRT guideway (sidewalk to sidewalk). The remaining eight crossings in this segment of Penn Avenue would be closed: 21st, 17th (east and west), 15th, 14th (east and west), 12th, and 8th Avenues. Resulting diversions would be $^1/_8$ mile or less. The street-crossing closures on West Broadway and Penn Avenues, as well as the interruption to the street grid system in north Minneapolis, collectively contribute to decreased walkability and accessibility to and within the neighborhoods surrounding this area of the alignment.

On West Broadway and Penn Avenues, bicyclists would share roadway lanes with vehicular traffic as they do today.

Alignment D Common Section (part of the Preferred Alternative)

Pedestrian crossings will be limited to signalized intersections on TH 55, which are the same intersections where marked pedestrian crossings are currently provided. Four unmarked pedestrian crossings, where a sidewalk is provided in the median but signage is not provided, are proposed to be closed. These unmarked crossings include: Oliver, Newton, Logan, and James Avenues. Additionally, one existing marked pedestrian crossing of TH 55 is proposed to be closed at West Lyndale Avenue due to the number of lanes that would need to be crossed and resulting number of vehicle conflicts and poor signal operations. Due to the urban street grid, each closing would result in a diversion of less than $^{1}/_{10}$ mile to the next nearest crossing.

Traction Power Substations

TPSS sites associated with the various alternatives would have little to no impact on existing bicycle and pedestrian facilities.

Table 3.4-1. Impacts by Alternative – Bicycle and Pedestrian Facilities

Alternative	Alignment/Station Impact	Park-and-Ride Impact	Operation and Maintenance Facility (OMF) Impact[3]	Total Impact
A-C-D1	9 crossings closed:[1] 1 (A) 3 (D1) 5 (D Common Section)	No impact	No impact	9 crossings closed
A-C-D2	17 crossings closed: 1 (A) 11 (D2) 5 (D Common Section)	No impact	No impact	17 crossings closed
B-C-D1 (Preferred Alternative)	12 crossings closed:[1] 4 (B) 3 (D1) 5 (D Common Section)	No impact[2]	No impact (93rd Avenue option) Potential impact (101st Avenue option)	12 crossings closed
B-C-D2	20 crossings closed: 4 (B) 11 (D2) 5 (D Common Section)	No impact[2]	No impact (93rd Avenue option) Potential impact (101st Avenue option)	20 crossings closed

[1] There was no discernible difference in impact between the Golden Valley Road and Plymouth Avenue/Theodore Wirth Regional Park station options.
[2] Park-and-Ride Impacts are the same as the 93rd Avenue OMF impacts; therefore, they were only counted once in the total impact.
[3] No impacts from park-and-rides are anticipated.

Figure 3.4-1. Alignment A: Impacts to Pedestrian and Bicycle Facilities

Figure 3.4-2. Alignment B: Impacts to Pedestrian and Bicycle Facilities

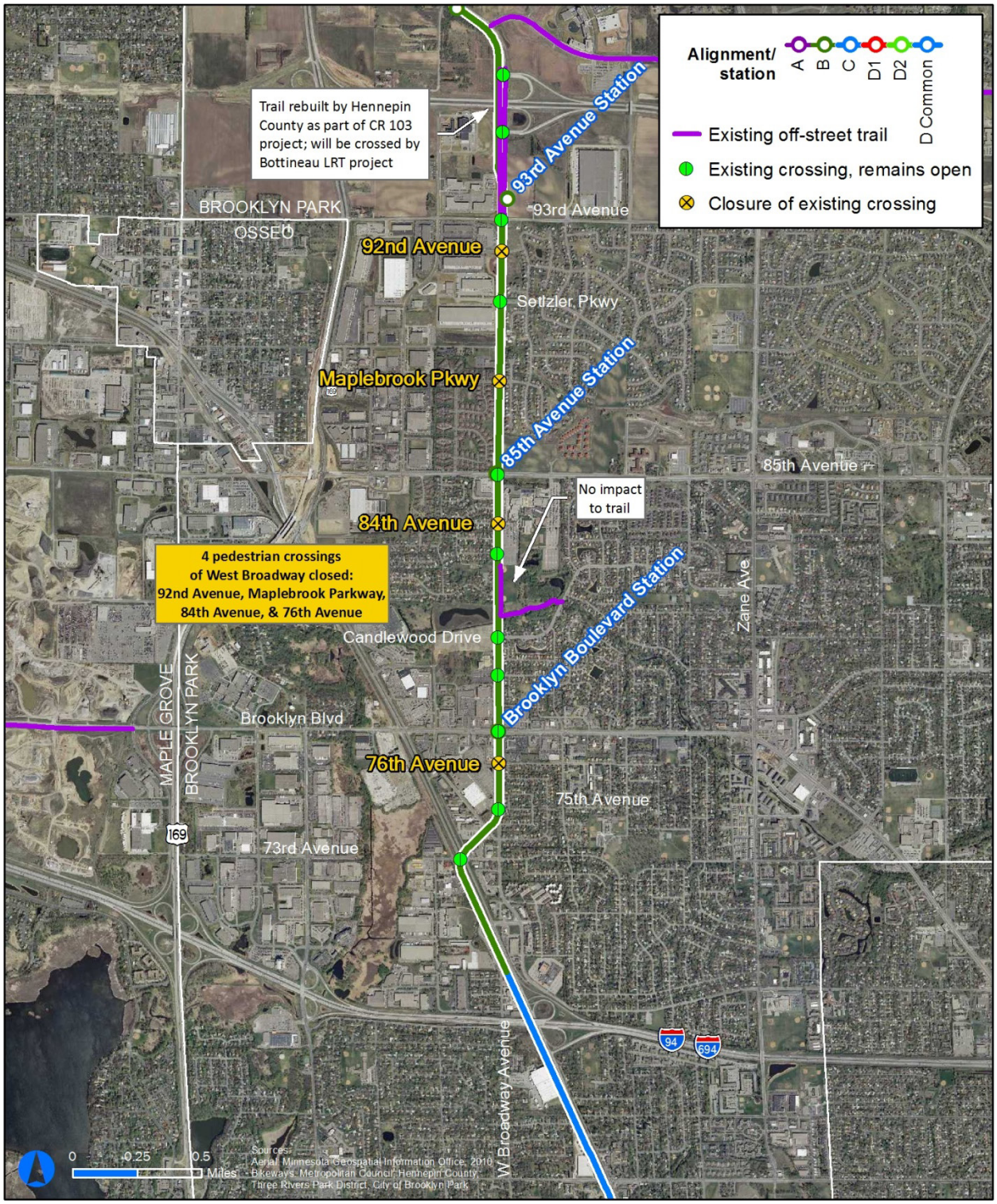


Figure 3.4-3. Alignment C: Impacts to Pedestrian and Bicycle Facilities

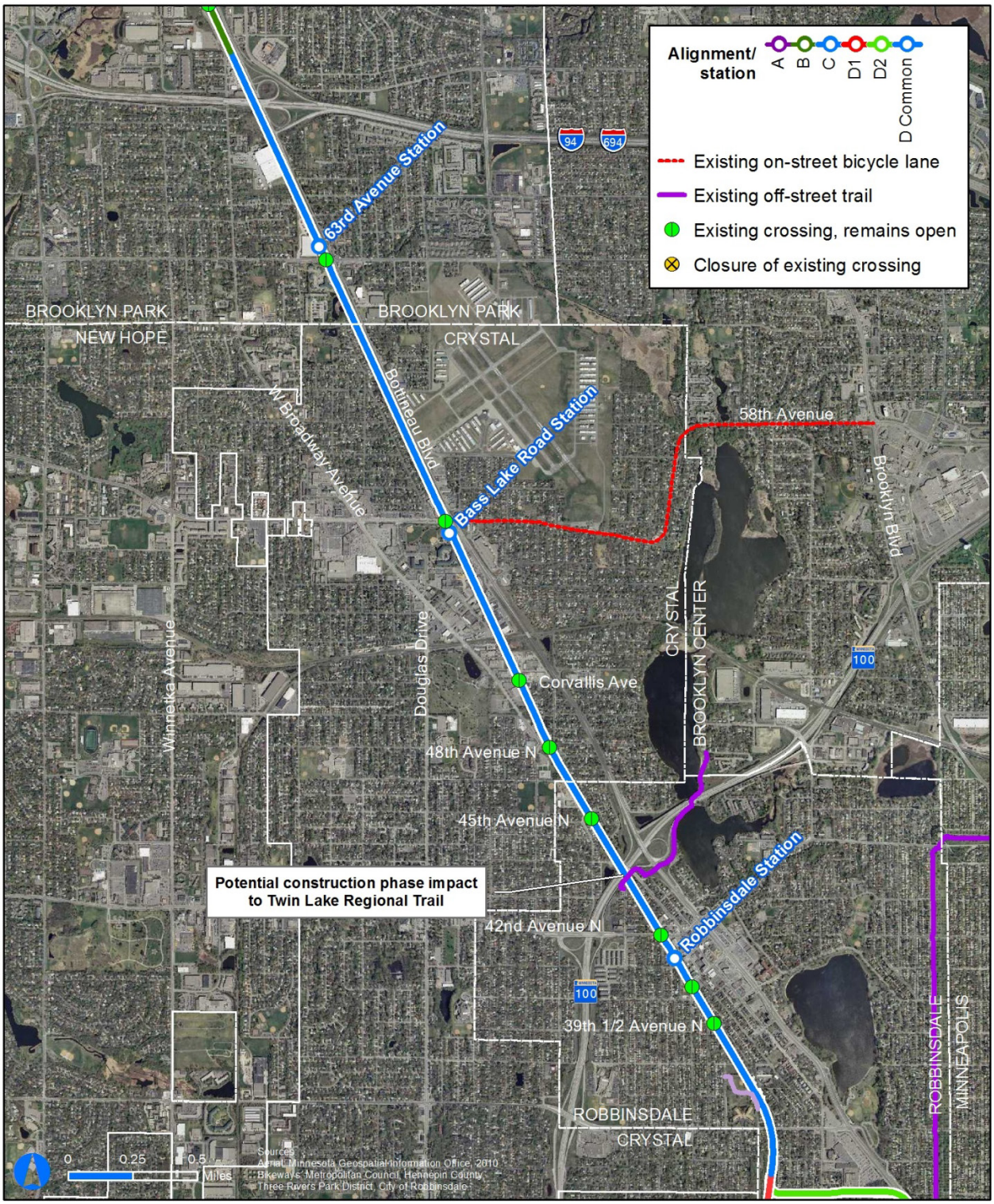


Figure 3.4-4. Alignment D1 and D Common Section: Impacts to Pedestrian and Bicycle Facilities

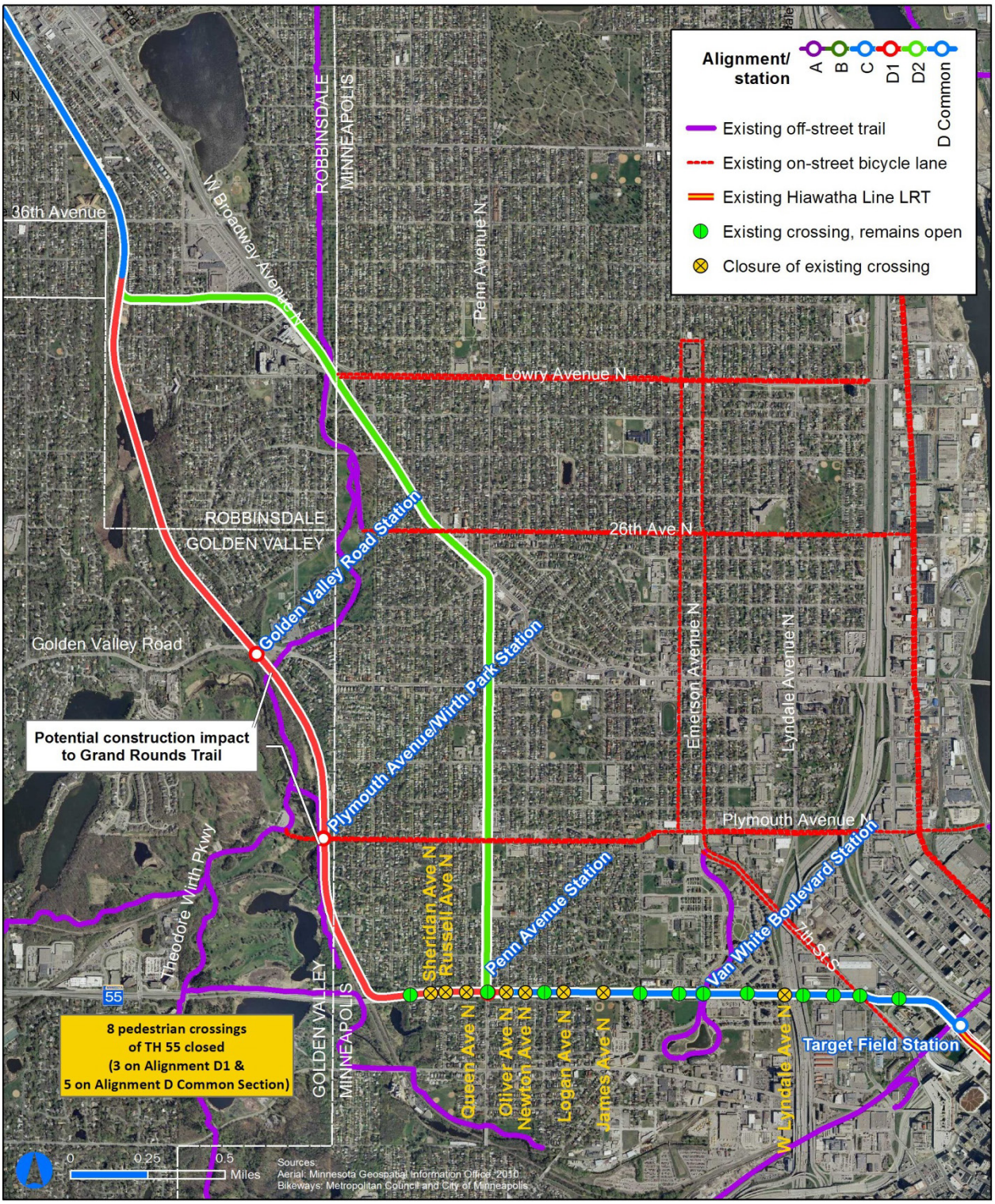
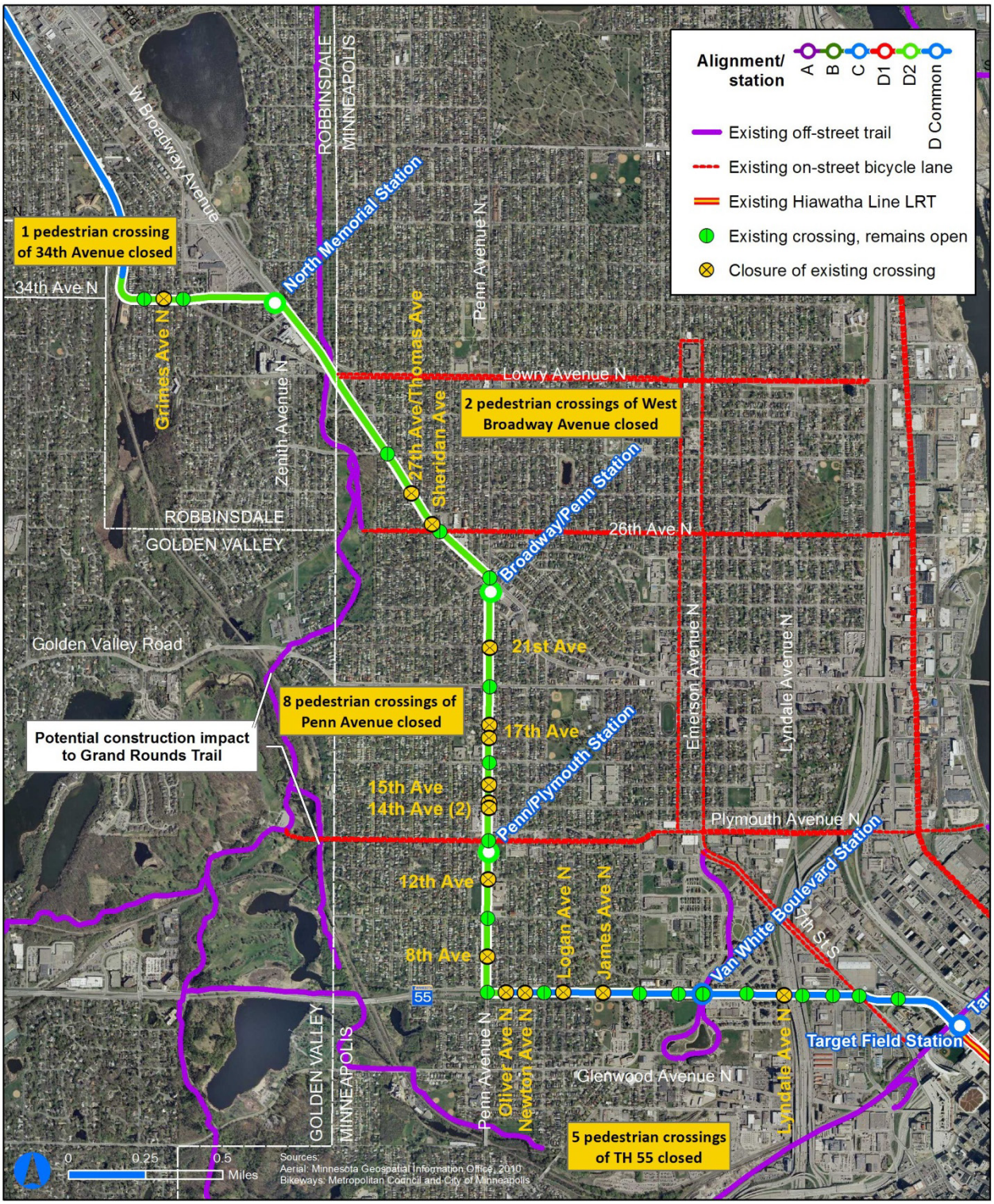


Figure 3.4-5. Alignment D2 and D Common Section: Impacts to Pedestrian and Bicycle Facilities



3.4.4.2 Construction Phase Impacts

No-Build Alternative

The No-Build alternative is not expected to have any construction phase impacts on the non-motorized transportation environment in the project area.

Enhanced Bus/TSM Alternative

The Enhanced Bus/TSM alternative is not expected to have any construction phase impacts on the non-motorized transportation environment in the project area.

Build Alternatives

For all alignments across each alternative, temporary closures or detours are anticipated to affect existing bike and pedestrian facilities. Construction traffic and debris such as excess dirt and gravel, can also pose obstacles or issues for pedestrians and bicyclists. Safe access for non-motorized users, as a result of detours, closures, and other inconveniences during the construction phases, would be included in phasing plans.

Construction phase impacts are generally expected to be similar for each alternative, with greater impacts where there are more existing pedestrian and bicycle facilities in or near the construction zone. In particular, Alignment D2 has more locations where residences and businesses rely on pedestrian access (relative to Alignment D1) and would experience greater construction impact.

3.4.5 Avoidance, Minimization, and/or Mitigation Measures

Current planning for the Bottineau Transitway supports the enhancement of pedestrian facilities. These enhancements are intended to act both as an improvement and as a natural separation to protect pedestrians, bicyclists, and transit vehicles. All pedestrian crossings would be designed in accordance with current American Disabilities Act (ADA) design requirements and standards to ensure access and mobility for all users, and station areas would be designed according to best practices for bicycle and pedestrian safety.

Measures would be taken to discourage pedestrians from illegally crossing the tracks and to enhance safety at permitted crossing locations, such as providing pedestrian signals and well-marked crosswalks.

If trail impacts cannot be avoided, potential reconstruction options and design guidelines would be discussed with the agencies that have jurisdiction over the facility. If trail facilities have restrictive covenants due to funds used for construction, these requirements would also be addressed. Potential indirect impacts to trail facilities, including safety concerns and visual impacts, would also be identified.

In the short-term, mitigation for potential disruptions to bicycle and pedestrian facilities during construction would include appropriate access provisions in MOT plans, and best management practices (BMPs) to manage debris.

If crosswalks are temporarily closed, pedestrians would be directed to use alternate crossings nearby. Every effort would be made not to close adjacent crosswalks at the same time to allow for continued pedestrian movement across streets. All sidewalks and crosswalks would be required to meet minimum standards for accessibility and be free of slipping and tripping hazards. Temporary sidewalk closures would be discouraged but, if required, would be conducted in such a way as to minimize impacts. Depending on how construction activities would impact sidewalk areas, special facilities (such as handrails, fences, barriers, ramps, walkways, and bridges) may be required to maintain bicyclist and pedestrian safety. During final design, it is expected that a plan would be developed to manage the closure of pedestrian crossings and other restrictions on non-motorized transportation facilities and crossings throughout the construction process. For proposed closures on TH 55, MnDOT's policy regarding Temporary Pedestrian Access Routes will be followed.

3.5 Parking

Information in this section is based on the information provided in the Transportation Technical Report (Kimley-Horn and Associates & SRF Consulting Group, 2012).

3.5.1 Regulatory Context and Methodology

This section describes parking in the Bottineau Transitway and potential impacts of the No-Build, Enhanced Bus/TSM, and Build alternatives on the number and location of parking spaces. The construction of LRT and associated modifications to roadway geometry would alter the supply of on-street and off-street parking, particularly for the alternatives that include Alignment D2. These changes may, in turn, affect convenient access to businesses and residences. Dedicated park and ride facilities have been identified as part of the transitway Build alternatives which are not addressed as part of this impact assessment of existing parking conditions.

The Bottineau Transitway is characterized by highway facilities with no parking, arterial and local streets with some on-street parking, and off-street parking that serves commercial and institutional facilities. The arterial and local streets that provide on-street parking include 34th Avenue, West Broadway Avenue, and Penn Avenue in Alignment D2. Off-street parking affected as part of the Build alternatives is both publicly and privately owned and is discussed in more detail within the property impacts portion of the Draft EIS.

The analysis is focused on the existing on-street parking conditions. A review of the existing on-street parking supply, which included reviewing aerial photography and field reviews, was performed to assess the impacts of changes in parking supply.

3.5.2 Study Area

The study area for parking consists of the potential area of disturbance.

3.5.3 Affected Environment

Vehicle parking in the project corridor is a combination of on-street and surface lots. On-street parking is almost entirely available to the public, either as metered or unmetered spaces. The only potentially affected on-street parking within the study area is located within Alignment D2 along 34th Avenue, West Broadway Avenue, and Penn Avenue.

Alignment D2 (A-C-D2 and B-C-D2)

- 34th Avenue between the BNSF right-of-way and France Avenue contains approximately 40 on-street parking spaces.
- West Broadway Avenue between Victory Memorial Parkway and Penn Avenue contains approximately 123 time-restricted on-street parking spaces. Parking restrictions include peak hour parking restrictions on both sides of the roadway.
- Penn Avenue between West Broadway Avenue and TH 55 contains approximately 392 on-street parking spaces, 32 of which are time-restricted. Parking restrictions include peak hour parking restrictions between West Broadway Avenue and 23rd Avenue. Parking is restricted on Penn Avenue at bus stops, which are generally located at the near side of intersections, or before the intersection cross-street. All other on-street parking is unrestricted.

Off-street parking is a mix of public and private. Private off-street parking is located within Alignments A, B, C, and D2 and is restricted to authorized individuals. Alignments B, C, and D2 include off-street public parking spaces for commercial and retail facilities, which are only accessible to the public when they are using these facilities. These facilities include retail centers, restaurants, churches, North Hennepin Community College in Alignment B, and retail centers, medical centers, and a funeral home at the

intersection of Penn Avenue and Plymouth Avenue. Off-street parking impacts are discussed in more detail within the property impacts portion of the Draft EIS.

3.5.4 Environmental Consequences

3.5.4.1 Operating Phase (Long-Term) Impacts

No-Build Alternative

No operating phase (long-term) parking impacts would be associated with the No-Build alternative.

Enhanced Bus/TSM Alternative

No operating phase (long-term) parking impacts would be associated with the Enhanced Bus/TSM alternative.

Build Alternatives

Existing on-street parking is primarily impacted on Alignment D2, along West Broadway and Penn Avenue. No other alignments would be anticipated to experience impacts to on-street parking. The impacts are summarized by alternative in Table 3.5-1.

Table 3.5-1. Operating Phase (Long-Term) Parking Impacts by Alternative

Alternative	Alignment/Station Impact (parking spaces eliminated)	Park-and-Ride Impact	OMF Impact	Total Impact (parking spaces eliminated)
No-Build	0	0	0	**0**
Enhanced Bus/ TSM	0	0	0	**0**
A-C-D1	0[1]	0	0	**0**
A-C-D2	270	0	0	**270**
B-C-D1 (Preferred Alternative)	0[1]	0	0[2]	**0**
B-C-D2	270	0	0[2]	**270**

[1] There is no discernible difference in impact between the Golden Valley Road and Plymouth Avenue/Theodore Wirth Regional Park station options.
[2] Park-and-Ride Impacts are the same as the 93rd Avenue OMF impacts; therefore, they were only counted once in the total impact

Parking impacts associated with Alignment D2 include the removal of on-street parking spaces along 34th Avenue (Figure 3.5-1), West Broadway Avenue (Figure 3.5-2), and Penn Avenue (Figures 3.5-3 and 3.5-4) to accommodate the proposed guideway while minimizing property impacts. Along 34th Avenue, all on-street parking spaces on the three blocks between Indiana Avenue and France Avenue would be eliminated. This would result in a loss of approximately 40 on-street parking spaces. Along West Broadway Avenue, 100 percent of the existing on-street parking spaces would be removed in the 0.8 mile stretch between Victory Memorial Parkway and Penn Avenue. This would result in a loss of approximately 120 on-street parking spaces. Along Penn Avenue, all of the existing on-street parking spaces (390 in total) would be removed from both sides of Penn Avenue, and approximately 280 new on-street parking spaces could be provided with the proposed Penn Avenue cross section. This would result in 28 percent of existing on-street parking, approximately 110 spaces, in the area between West Broadway Avenue and TH 55 on Penn Avenue being eliminated with this alignment.

TPSS

TPSS sites are anticipated to be located on available parcels that are adjacent to the guideway and would not directly impact existing on-street parking.

Figure 3.5-1. Alignment D2: 34th Avenue Parking Impacts

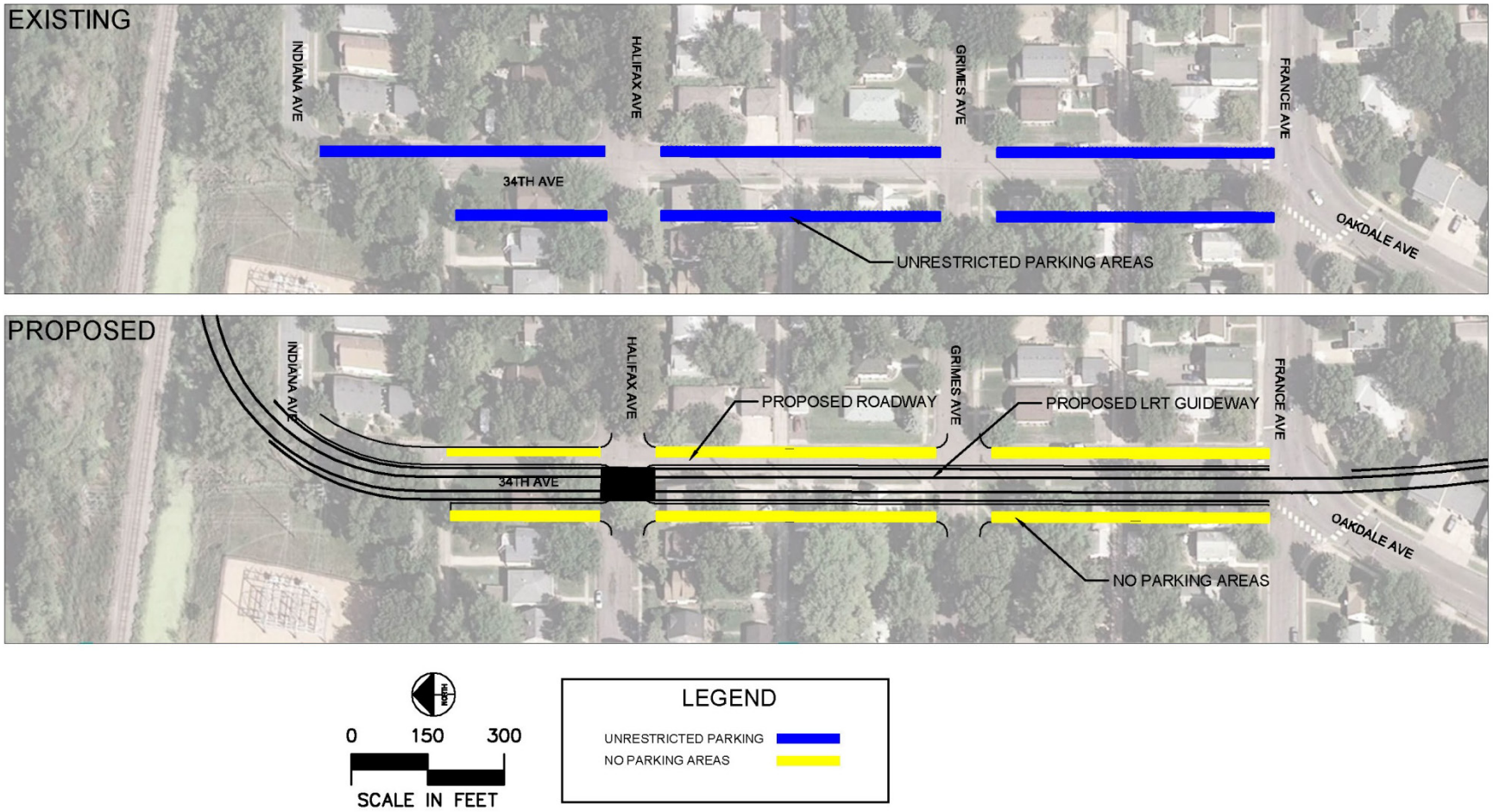


Figure 3.5-2. Alignment D2: West Broadway Parking Impact

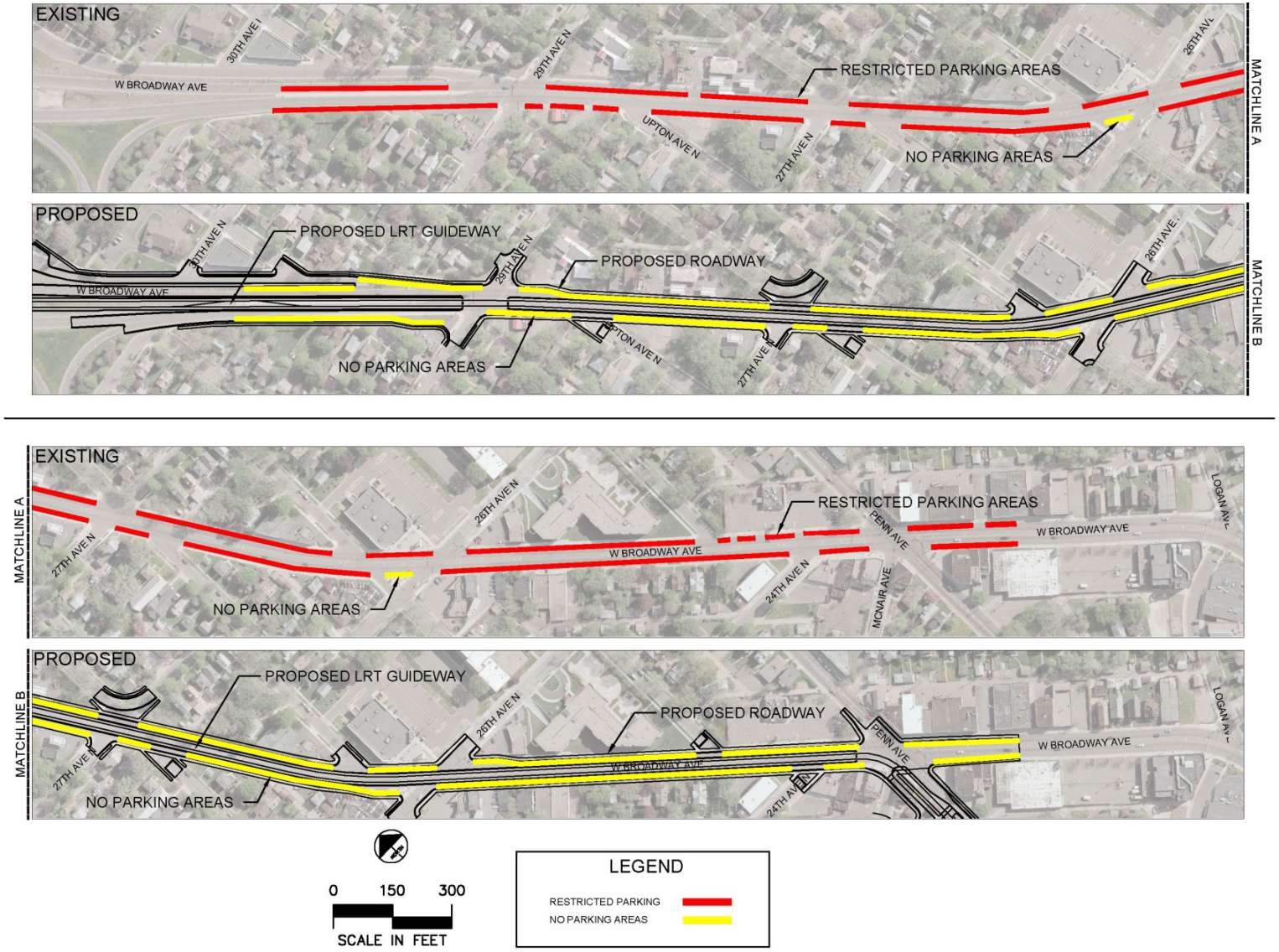


Figure 3.5-3. Alignment D2: Penn Avenue Parking Impacts (1)

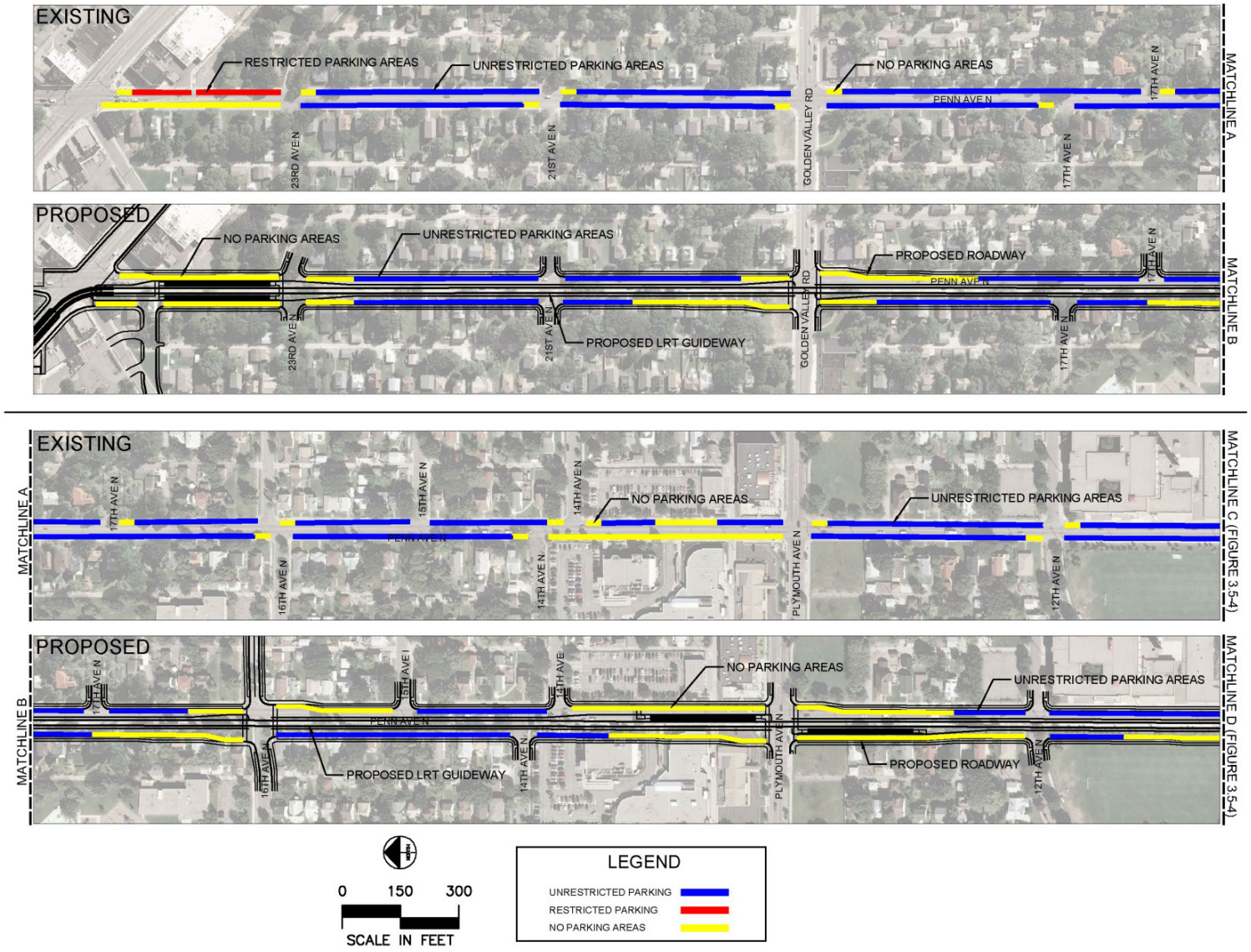
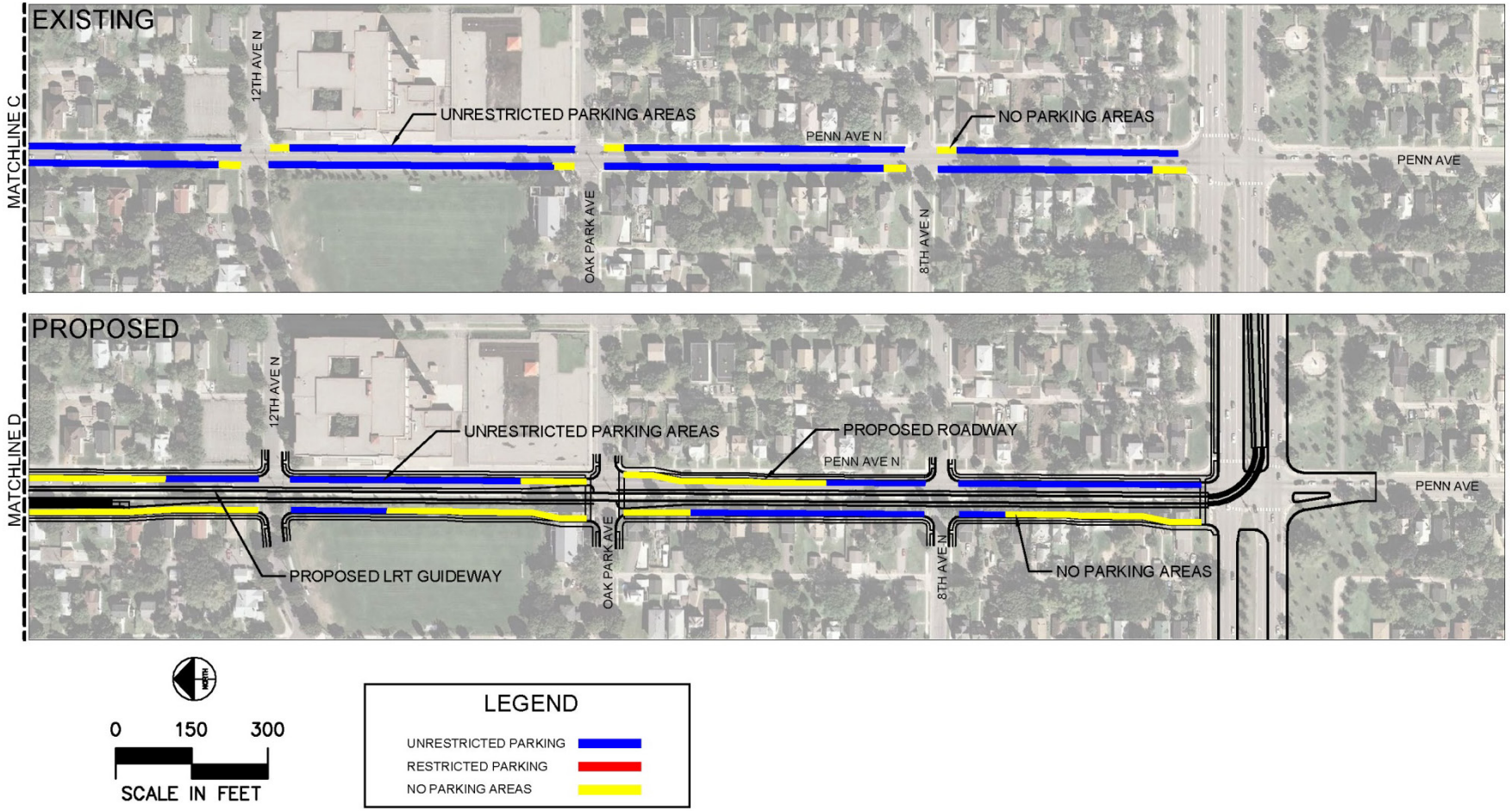


Figure 3.5-4. Alignment D2: Penn Avenue Parking Impacts (2)



3.5.4.2 Construction Phase Impacts

No-Build Alternative

No construction phase parking impacts would be associated with the No-Build alternative.

Enhanced Bus/TSM Alternative

No construction phase parking impacts would be associated with the Enhanced Bus/TSM alternative.

Build Alternatives

Parking impacts during construction are summarized in Table 3.5-2. The only significant impacts are those associated with Alignment D2. Depending on the construction phasing that is implemented, all existing on-street parking provided on 34th Avenue, West Broadway Avenue, and Penn Avenue would be restricted or closed during construction of the D2 alignment (as part of A-C-D2 and B-C-D2). Opportunities to reduce parking loss during construction would be considered during final design.

3.5.5 Avoidance, Minimization, and/or Mitigation Measures

No mitigation is required for Alignments A, B, C, D1, or the Alignment D Common Section.

Specific mitigation for the loss of on-street parking for the Alignment D2 Build alternatives (A-C-D2 and B-C-D2), specifically on West Broadway Avenue was not quantified as part of the Bottineau Transitway Project. Potential mitigation measures could include creation of small off-street parking facilities proximate to retail businesses. The City of Minneapolis Zoning Ordinance generally requires one parking space per 500 square feet of gross floor area in excess of 4,000 square feet for commercial properties. The specific identification and implementation of parking mitigation measures would involve the City of Minneapolis, to facilitate making long-term parking policy decisions in the best interest of the city and the community. These policy decisions would be intended to make the best of available parking or develop other arrangements to provide additional parking in heavy impact areas. Such measures could result in additional property impacts.

To reduce short-term parking impacts, construction phasing would be implemented throughout construction.

The Penn Avenue and 34th Avenue roadway designs would be further developed to maximize the use of the proposed right-of-way and provide on-street parking to mitigate the loss of parking on Penn Avenue and 34th Avenue to the extent feasible.

Table 3.5-2. Construction Impacts By Alternative – Parking

Alternative	Alignment/Station Impact (parking spaces)	Park-and-Ride Impact	OMF Impact	Total Impact
No-Build	0	0	0	**0**
Enhanced Bus/ TSM	0	0	0	**0**
A-C-D1	0[1]	0	0	**0**
A-C-D2	All on-street parking restricted or closed on Alignment D2	0	0	**All on-street parking restricted or closed on Alignment D2.**
B-C-D1 (Preferred Alternative)	0[1]	0	0[2]	**0**
B-C-D2	All on-street parking restricted or closed on Alignment D2	0	0[2]	**All on-street parking restricted or closed on Alignment D2.**

[1] There is no discernible difference in impact between the Golden Valley Road and Plymouth Avenue/Theodore Wirth Regional Park station options.
[2] Park-and-Ride Impacts are the same as the 93rd Avenue OMF impacts; therefore, they were only counted once in the total impact.

3.6 Aviation

This section describes the aviation environment in the Bottineau Transitway and the potential impacts of the No-Build, Enhanced Bus/TSM, and Build alternatives on aviation facilities. Information in this section is based on the information provided in the Transportation Technical Report (Kimley-Horn and Associates & SRF Consulting Group, 2012).

Coordination with the Federal Aviation Administration (FAA), Metropolitan Airports Commission (MAC), and MnDOT is ongoing. Coordination meetings to discuss potential impacts of the proposed Bottineau Transitway to the Crystal Airport runway protection zone (RPZ) and Minnesota State Safety Zones began back in August 2012 and have continued through February 2014.

The FAA initially accepted the FTA's invitation to serve as a participating agency for the Bottineau Transitway project. In October 2013, the FTA invited the FAA to change their status from a participating to a cooperating agency for the project, as a segment of the proposed Bottineau Transitway, within existing BNSF right-of-way, traverses through the RPZ for Runway 6L-24R (Runway 6L) of the Crystal Airport. The FAA accepted the invitation on November 20, 2013 (Appendix A).

3.6.1 Regulatory Context and Methodology

According to *FAA Advisory Circular (AC 150/5300-13A*), the RPZ is "an area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground." RPZs are located at the end of each runway and land use is typically controlled by the airport owner. Minnesota State Safety Zone areas overlay and extend beyond the federal RPZs. The most restrictive areas created by MnDOT regulations are called State Safety Zones A and B. The length of State Safety Zone A is typically $^2/_3$ of the total runway length; State Safety Zone B is typically $^1/_3$ of the total runway length and extends from State Safety Zone A. The MAC adopted an airport zoning ordinance applicable to the Crystal Airport on August 25, 1952. This ordinance provides additional guidance on the use of property within the vicinity of the Crystal Airport.

The FAA Office of Airports (ARP) issued a memorandum on September 27, 2012, that presents interim guidance on land uses within RPZs. This memorandum is intended to clarify what constitutes a

compatible land use within an RPZ, as identified in *FAA Advisory Circular 150/5300-Change 17 (Airport Design)*. This circular identifies that "it is desirable to clear all objects from the RPZ," but it also acknowledges that "some uses are permitted" with conditions and other "land uses are prohibited." This memorandum also provides guidance on how to evaluate proposed land uses that would reside within an RPZ. The Bottineau Transitway project is considered a local development (transportation facilities) proposed in the RPZ (either new or reconfigured).

In accordance with the September 27, 2012 FAA policy guidance, the FAA requested that an RPZ Alternatives Analysis (AA) be prepared, specific to the proposed LRT alignment that encroaches on the Crystal Airport RPZ for Runway 6L-24R. A small portion of the existing BNSF track currently passes through the corner of the Runway 6R-24L (Runway 6R) RPZ. Runway 6R is a 2,102-foot turf runway and is scheduled to be decommissioned by MAC in the next three to seven years. Due to the scheduled closure of Runway 6R, the RPZ AA focuses on the Runway 6L RPZ only.

On October 18, 2013, FTA submitted to FAA a Draft RPZ AA for initial review and consideration. Written comments were provided on November 12 by FAA and discussed at the coordination meeting with MAC, FAA, Hennepin County, and the Metropolitan Council. The Draft RPZ AA was updated to address FAA's initial comments and submitted back to FAA for review on January 24, 2014. A subsequent meeting was held with FAA on February 4, 2014 to review the revised Draft RPZ AA with FAA. Based on direction provided at the February 4th meeting, a revised RPZ AA was submitted back to FAA on February 10, 2014.

The RPZ AA defines and evaluates several alternatives that address eliminating or minimizing the effect of the proposed LRT alignment on the Runway 6L RPZ. These alternatives include modifications to the transitway alignment vertically and horizontally, both within and outside Runway 6L RPZ; modifications that shift the location of the RPZ; and operational alternatives that address coexistence of aircraft and LRT simultaneously in the RPZ.

3.6.2 Study Area

The only aviation facility in the proposed Bottineau Transitway is the Crystal Airport, which is near Alignment C. The study area for impacts to the Crystal Airport includes preliminary construction limits that are outside the Crystal Airport property boundaries but within the Runway 6L RPZ and State Safety Zone A for Runway 6L (Figure 3.6-1). The size of the RPZ for Runway 6L is based on the design aircraft of the runway, which is a B-I Small Aircraft. The RPZ, which is trapezoidal in shape with a 250-foot inner dimension and 450-foot outer dimension, is 1,000 feet long and contains 8.0 acres, 3.1 of which are not on airport property. State Safety Zone A contains 10.3 acres, 3.1 of which are not on airport property. State Safety Zone B contains 8.3 acres, none of which are on airport property or within the study area of the project.

3.6.3 Affected Environment

Crystal Airport is one of seven airports owned and operated by the MAC and is designed for B-1 small aircraft. The total number of operations at Crystal Airport in 2012 was 49,995 based on FAA control tower counts. The BNSF railroad, which runs parallel to CSAH 81 (Bottineau Boulevard) and is approximately three to four feet higher in elevation than adjacent ground that is located west and east of the BNSF railroad corridor, passes through the existing Runway 6L RPZ. The approximate length of existing freight rail track within the RPZ is 435 feet. (Figure 3.6-1). The land use in the portion of State Safety Zone A that is beyond Crystal Airport's property boundary is residential. State Safety Zone B is located beyond the limits of State Safety Zone A, outside of the BNSF right-of-way and outside of the project's identified construction limits.

3.6.4 Environmental Consequences

3.6.4.1 Operating Phase (Long-Term) Impacts

No-Build Alternative

The No-Build alternative would not include any improvements within the RPZ; therefore, no operating phase (long-term) aviation impacts would be associated with the No-Build alternative.

Enhanced Bus/TSM Alternative

The Enhanced Bus/TSM alternative would include running additional bus service on the existing Bottineau Boulevard, located adjacent to the Crystal Airport. The Bottineau Boulevard right-of-way is within approximately 1.25 acres of the RPZ and 1.25 acres of State Safety Zone A of Runway 6L. The Enhanced Bus/TSM alternative will not result in new transportation facilities being introduced within these areas.

Build Alternatives

Under each of the proposed LRT alternatives (Alignment C), the existing BNSF tracks would be relocated approximately 25 feet west of the current location and two LRT tracks would be constructed immediately east of the BNSF track. All three tracks would be located within the existing 100 foot-wide BNSF right-of-way through the RPZ. The length of the northbound and southbound LRT tracks within the RPZ is approximately 425 feet each.

The proposed speed of the LRT at this location is estimated at approximately 55 miles per hour. Therefore, the train would be in the RPZ for approximately 5 seconds per operation. It is anticipated that trains would operate in this area about every 7.5 minutes during the morning and afternoon peak periods, and 15 minutes during daytime and evening hours.

The approach surface is an imaginary surface that exists primarily to prevent objects from extending upward into navigable airspace The height of the LRT vehicle is approximately 16 feet, or about 16.5 feet below the FAA 20:1 Runway 6L approach surface (Figure 3.6-2). Overhead catenary system (OCS) poles, approximately 23 feet – 4 inches in height, would be located 200 feet on center along this section. The pole location would be established to maximize the distance from polies to the extended runway centerline. It is anticipate that the poles could be located approximately 100 feet left and right of the extended runway centerline. Final OCS pole spacing and locations will be determined during final design.

The proposed LRT alignment would impact areas within the controlled activity area and the central portion of the RPZ. As noted above, the proposed LRT alignment would be within the existing 100 foot BNSF right-of-way, which is currently within the controlled activity area (17,860 square feet) and the central portion of the RPZ (25,470 square feet).

3.6.4.2 Construction Phase Impacts

No-Build Alternative

The No-Build alternative would not include any improvements within the RPZ; therefore, the No-Build alternative is not expected to have any construction phase impacts on the aviation environment in the study area.

Enhanced Bus/TSM Alternative

The Enhanced Bus/TSM alternative would not include any improvements within the RPZ; therefore, the Enhanced Bus/TSM alternative is not expected to have any construction phase impacts on the aviation environment in the study area.

Build Alternatives

Construction of Alignment C, including the overhead contact system, would impact the Runway 6L RPZ. Construction operations and phasing in the RPZ would be coordinated with the MAC and FAA during the project's final design phase to mitigate impacts. The FAA's *Form 7460 – Notice of Proposed Construction or Alteration* would be completed during final design. The FAA's *Form 7460* process would be considered complete upon their issuance of a statement of no objection to the proposed activity.

Construction equipment height would be restricted within the runway approach surface. No open water would be allowed in the RPZ during construction to discourage bird nesting.

3.6.5 Avoidance, Minimization, and/or Mitigation Measures

As outlined in Section 3.6.1, an RPZ Alternatives Analysis (AA) has been performed, in conformance with FAA Interim Guidance on Land Uses within an RPZ, to identify the full range of alternatives that could avoid and/or minimize the impact of the land use within the RPZ as well as mitigate the risk to people and property on the ground. The AA reviews several different alternatives to minimize impacts to the RPZ, including depressing the transitway in a tunnel; realigning the transitway around the RPZ; shortening, shifting, realigning, or closing Runway 6L-24R; operational alternatives such as stopping the LRT to obtain clearance prior to proceeding through the RPZ; and bus bridging across the RPZ. The recommendation identified in the RPZ AA prepared by Hennepin County in cooperation with the Metropolitan Council and MAC was that Alignment C, as defined in the LPA, is the preferred alternative. The FAA is currently reviewing the findings and recommendations of the RPZ AA. The local (Minneapolis) Airports District Office of the FAA will advance preliminary recommendation(s) to the FAA Regional Office and FAA Headquarters for concurrence.

The MAC is in the process of updating the Crystal Airport Layout Plan (ALP), which is a planning tool that airports use to depict both existing facilities and planned development for an airport. The ALP identifies the boundaries and proposed additions that are owned or controlled by the airport and planned to be utilized for airport purposes, existing and proposed airport facilities and structures, and the location of existing and proposed non-aviation areas within the airport boundaries. The Bottineau Transitway Project would modify the existing conditions within the RPZ. Based on the decisions rendered by the FAA through the RPZ AA, and confirmed through issuance of a letter of no objection (Form 7460 application); the Bottineau Transitway would be included in the updated Crystal Airport ALP.

Figure 3.6-1. Crystal Airport Study Area

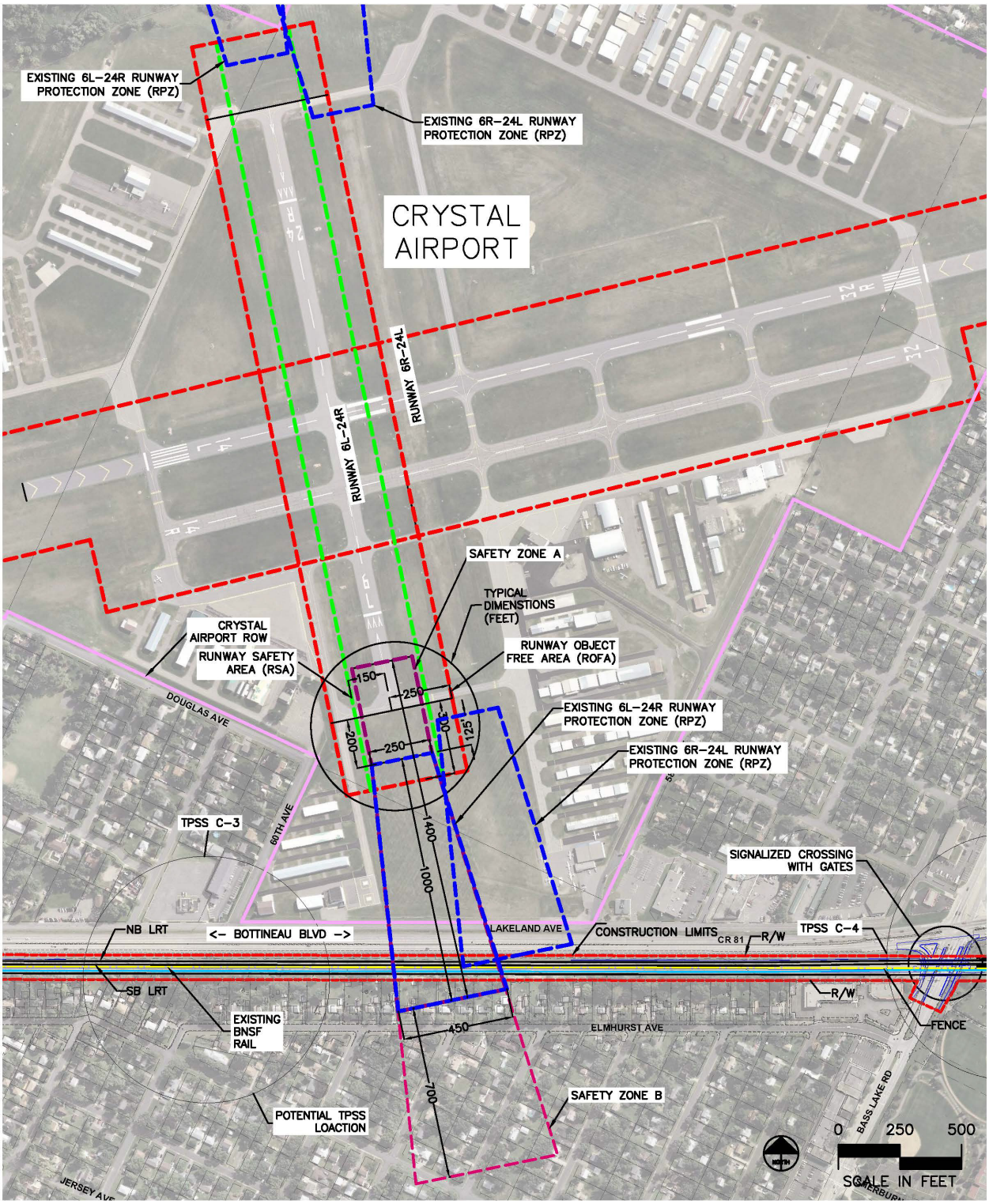


Figure 3.6-2. RPZ Typical Sections