



Appendix F

Supporting Technical Reports

F.1 Transportation Technical Report



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Transportation Technical Report

Effects on Transit, Freight Rail Conditions, Pedestrians and Bicyclists, Parking, and Aviation

June 2016

Blue Line Extension Project Technical Report



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1 Purpose of Technical Memorandum

The METRO Blue Line Light Rail Transit (BLRT) Extension project is proposed to be a light rail transit (LRT) line of about 13 miles with 11 new stations operating from downtown Minneapolis through the cities of Golden Valley, Robbinsdale, Crystal, and Brooklyn Park. The proposed BLRT Extension project would be an extension of the METRO Blue Line (Hiawatha Corridor) and would also connect to the METRO Green Line in downtown Minneapolis (**Figure 1-1**).

This technical memorandum documents the effects of the No-Build Alternative and the proposed BLRT Extension project on transit conditions (**Section 2**), freight rail conditions (**Section 3**), pedestrians and bicyclists (**Section 4**), parking (**Section 5**), and aviation systems (**Section 6**). Vehicular traffic operations are documented in the *BLRT Traffic Operations Technical Memorandum* that is a separate report.

This technical memorandum focuses on the Draft Environmental Impact Statement (Draft EIS) LRT Alternative B-C-D1, as modified through the proposed BLRT Extension project development process. This alternative is identified as the proposed BLRT Extension project in the Final Environmental Impact Statement (Final EIS). For additional information about previous transportation analyses, see the *Bottineau Transitway Draft Environmental Impact Statement* (March 2014) and associated technical memoranda.

2 Transit Technical Analysis

This section documents the travel demand modeling and preparation of 2040 ridership forecasts for both the No-Build Alternative and the proposed BLRT Extension project, as defined in the Final EIS for the proposed BLRT Extension project.

2.1 Methodology

The Metropolitan Council (Council) used its regional travel demand forecasting model to develop the transit ridership forecasts for the proposed BLRT Extension project. This model was developed using known travel behavior characteristics and assumptions about expected development, redevelopment, and transportation system changes. Detailed documentation regarding the model is available from the Council.

The Council compared the travel demand model to several key known travel measures to determine whether the model appropriately estimated travel changes caused by the transit alternatives. Validation data sources included the Council's 2010 On Board Transit Rider Survey and 2010 Household Interview Survey as well as transit ridership counts provided by Metro Transit.



Figure 1-1. Proposed BLRT Extension Project





2.2 Study Area

The study area for transit conditions is defined as the Metro Transit service area as defined in the travel demand model.

The travel demand 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 at different levels of geographic detail. The travel demand model incorporates the entire region, which includes the seven-county Council planning area plus parts of 13 surrounding counties in Minnesota and western Wisconsin.

The Council expects the Twin Cities region to continue to develop between now and the proposed BLRT Extension project's horizon year of 2040. The travel demand model used development forecasts from the *Thrive MSP 2040* regional planning process of the Council. This process forecasts future population, households, and employment for the region, then allocates growth to local communities. Each local community allocates expected development patterns to smaller geographic units of the model known as Transportation Analysis Zones (TAZs).

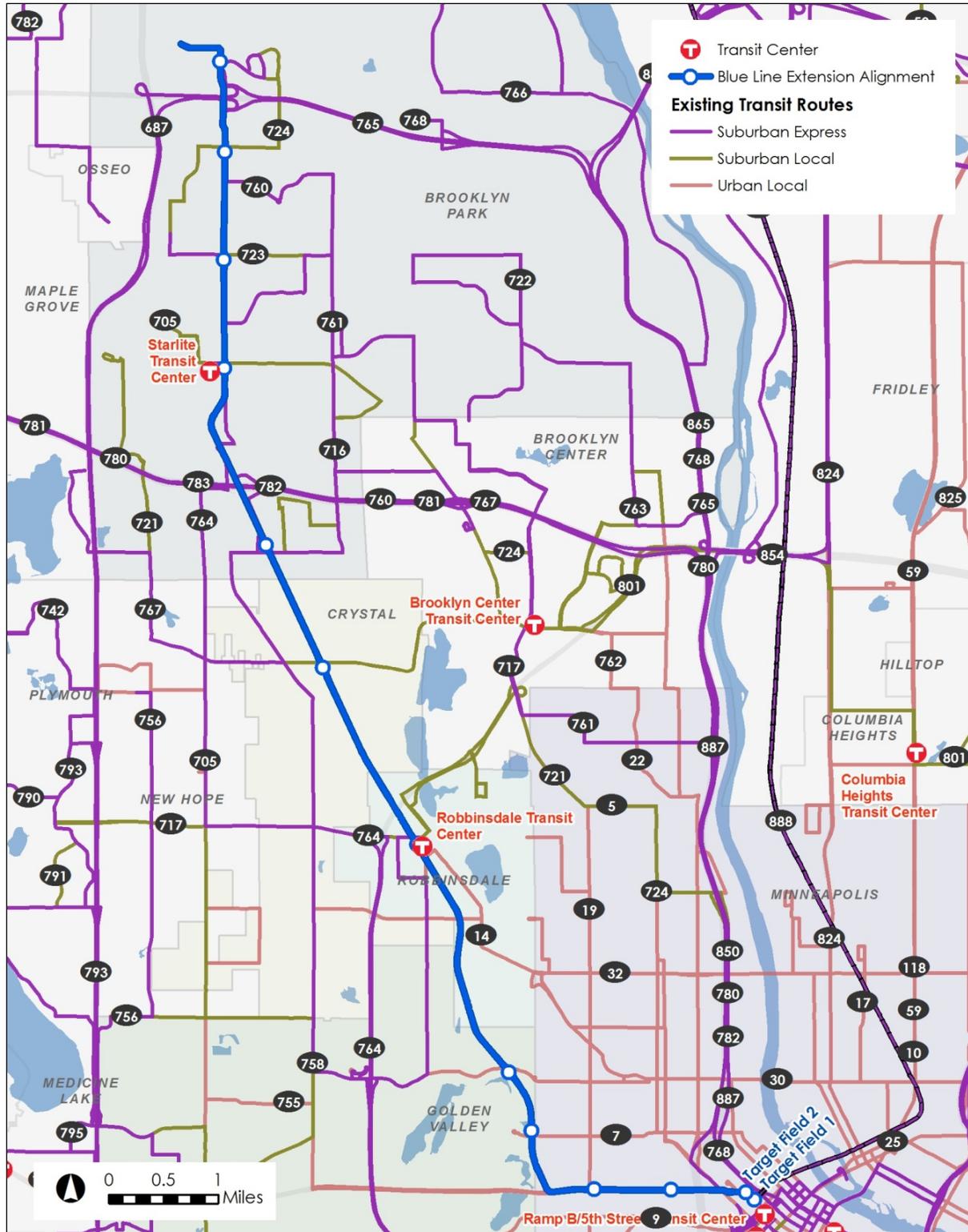
The regional development and policy planning process is an ongoing effort. The development assumptions for the proposed BLRT Extension project reflect the *Thrive MSP 2040* forecasts as adopted by the Council on October 14, 2014.

2.3 Affected Environment

The transit service area for the proposed BLRT Extension project is generally defined by the Mississippi River to the north and east, Olson Memorial Highway (Trunk Highway [TH] 55) to the south, and US Highway 169 (US 169) to the west. The area is served by a network of urban and suburban local routes that make timed connections at three transit centers in the study area (Robbinsdale Transit Center, Brooklyn Center Transit Center, and Starlite Transit Center) as well as downtown Minneapolis (Target Field Station). 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 depicted in [Figure 2-1](#).



Figure 2-1. Existing Transit Service





2.3.1 Transportation System Assumptions (2040)

Besides future development, transit ridership forecasts reflect planned and programmed transportation system investments. Background assumptions are made as part of the No-Build Alternative, with specific changes made to reflect the proposed BLRT Extension project.

2.3.2 Regional Roadway System Assumptions

The 2040 regional travel demand model incorporates roadway system improvements identified in the fiscally constrained (current revenue) scenario of the Council's regional *Transportation Policy Plan (TPP)* adopted in January, 2015. In addition, programmed local or county roadway system improvements in the study area are also reflected in the model. Specific to the study area, the 2040 roadway system is assumed to include:

- Interstate Highway 494 (I-494) expansion to six lanes from Interstate Highway 394 (I-394) to Interstate Highway 94 (I-94)/Interstate Highway 694 (I-694)
- TH 610 extension to I-94 in Maple Grove
- Expansion of West Broadway Avenue (County State-Aid Highway [CSAH] 103) to four lanes between 85th Avenue North and 93rd Avenue North
- CSAH 81 reconstruction/expansion from north of 63rd Avenue North to north of CSAH 8 in Brooklyn Park
- I-94 auxiliary lane construction between the cities of St. Michael and Rogers

2.3.3 Regional Transit System Assumptions

The proposed BLRT Extension project would operate within the Twin Cities regional transit system. The adopted regional *2040 TPP* includes several improvements in its fully funded transit scenario (**Figure 2-2**). Near the proposed BLRT Extension project alignment, this includes the Green Line Extension, the Penn Avenue Arterial Bus Rapid Transit line (C Line), and the Chicago-Emerson-Fremont Avenue Arterial Bus Rapid Transit line (D Line).

The alternatives analyzed in the travel demand forecast model use the existing service as a base and include specific network modifications, beyond the regional transit system improvements referenced previously in **Section 2.3.2**, 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 “feeder” bus network to connect people to proposed BLRT Extension project stations. Bus networks and transit plans will continue to be refined as the proposed BLRT Extension project progresses; final bus network changes will be subject to a robust public involvement process in accordance with Title VI requirements.¹

¹ Title VI of the Civil Rights Act of 1964 requires that “no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.”



Figure 2-2. 2040 Regional Transitway System

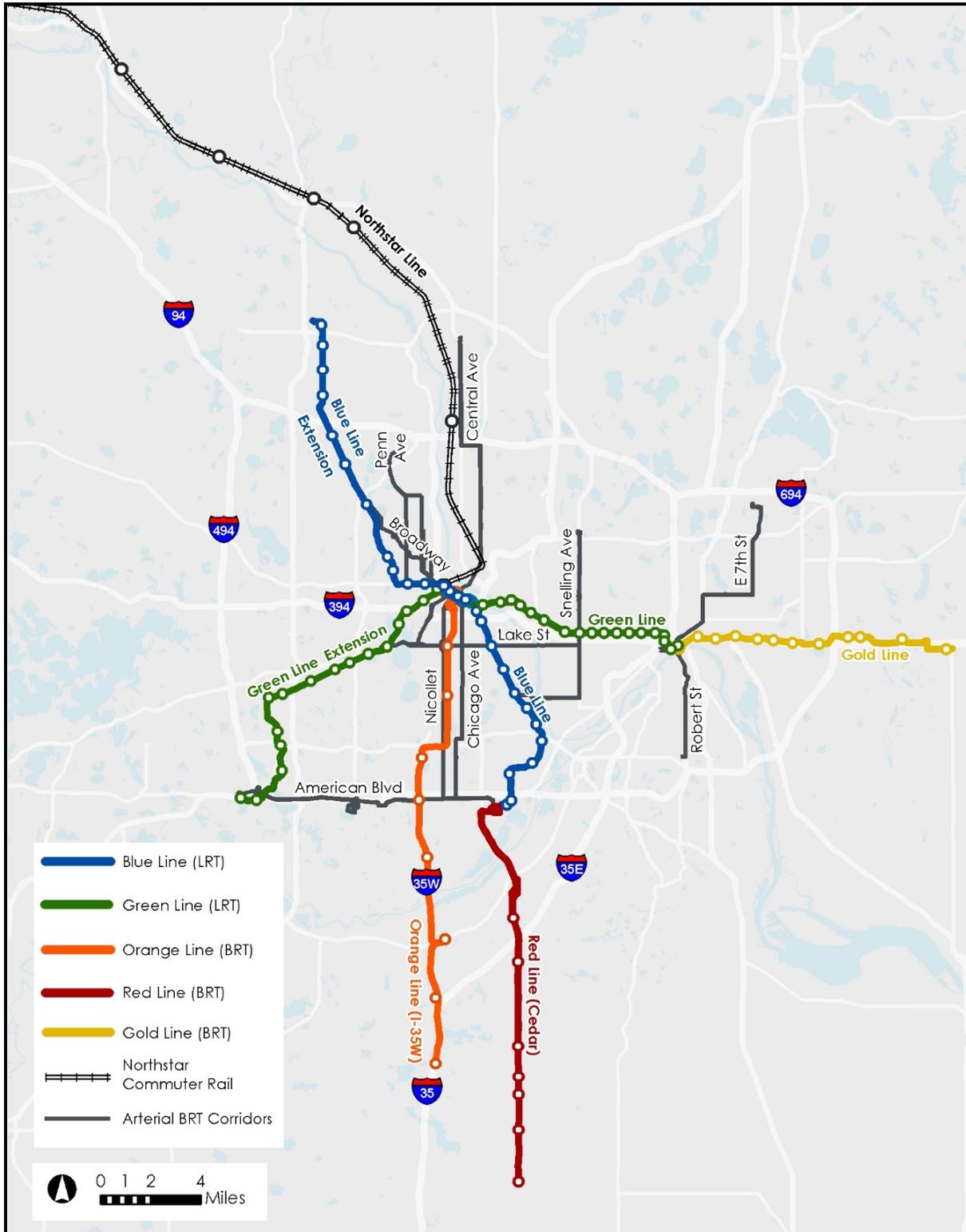




Table 2-1 identifies the bus and park-and-ride connections provided at each station. In addition, all stations are planned to have pedestrian and bicycle connections.

Table 2-1. Station Access Characteristics Using 2040 Bus Feeder Plan

LRT Station	Park-and-Ride	Transfer Routes
Van White Boulevard	No	19, 26, C-Line
Penn Avenue	No	19, 26, 755, C-Line
Plymouth Avenue	No	7
Golden Valley Road	Yes (100 spaces)	7, 30
Robbinsdale	Yes (550 spaces)	7, 14, 19, 30, 32, 56, 712, 716, 717, 746
Bass Lake Road	Yes (170 spaces)	721, 745
63rd Avenue	Yes (565 spaces)	716, 719
Brooklyn Boulevard	No	705, 720, 723, 724
85th Avenue	No	723, 724, 725
93rd Avenue	No	724
Oak Grove Parkway	Yes (850 spaces)	729, 765

Source: Blue Line Extension Travel Demand Model Estimates (September 2015)

2.3.4 No-Build Alternative Assumptions

The No-Build Alternative includes all funded regional transit improvements. In addition, local and express bus service in the study area reflects changes determined by Metro Transit in its *Regional 2015–2030 Service Improvement Plan* adopted by the Council in April 2015. In general, the plan assumes modest changes to transit service in the study area. The travel time differential between the Van White Boulevard and Penn Avenue stations reflects the anticipated bus service included in the Metro Transit *Regional 2015–2030 Service Improvement Plan*.

2.3.5 Proposed BLRT Extension Project Assumptions

The proposed BLRT Extension project includes the proposed BLRT Extension project LRT service plus modifications to the bus system to provide connecting service. The proposed BLRT Extension project includes 11 stations over the 13-mile proposed BLRT Extension project corridor.

Proposed BLRT Extension project service is assumed at 10-minute frequencies in the peak and off-peak periods. The estimated run time for the proposed BLRT Extension project is about 31 minutes, which reflects station dwell times, estimated signal delay, acceleration/deceleration, and estimated travel speeds. The forecasts are based on the run times in **Table 2-2**.



Table 2-2. End-to-End Travel Times for the No-Build Alternative and the Proposed BLRT Extension Project

BLRT Station	Transit Travel Times to Target Field Station in Minutes (Peak/Off-Peak)	
	No-Build Alternative	Proposed BLRT Extension Project
Van White Boulevard	12.8 / 17.7	4.3 / 4.3
Penn Avenue	11.8 / 11.8	6.5 / 6.5
Plymouth Avenue	38.1 / 38.1	8.8 / 8.8
Golden Valley Road	36.9 / 36.9	10.3 / 10.3
Robbinsdale	35.2 / 36.4	13.7 / 13.7
Bass Lake Road	46.8 / 58.1	16.6 / 16.6
63rd Avenue	64.1 / 65.3	18.8 / 18.8
Brooklyn Boulevard	63.6 / 63.4	23.7 / 23.7
85th Avenue	70.1 / 68.2	26.3 / 26.3
93rd Avenue	Not applicable ¹	29.0 / 29.0
Oak Grove Parkway	Not applicable ¹	31.0 / 31.0

Sources: Blue Line Extension Travel Demand Model Estimates (October 2015); METRO Blue Line Light Rail Extension LRT Travel Time Estimates (February 2015)

¹ No existing transit routes serve this station.

2.4 Environmental Consequences

2.4.1 Operating-Phase (Long-Term) Impacts

The Council estimated the transit trips forecasted for the No-Build Alternative and the proposed BLRT Extension project in terms of linked and unlinked passenger trips. A linked passenger trip includes segments of travel from point of origin to point of final destination as a single trip, regardless of transfers or intermediate stops. Because of this, the number of linked passenger trips provides an estimate of the number of people using the transit system. In contrast, an unlinked passenger trip counts each segment of an overall trip as a separate unlinked trip. Unlinked passenger trips represent the activity experienced by each route segment and travel mode. Therefore, the number of unlinked trips is greater than the number of linked trips. In presenting the analysis of transit patronage, both linked and unlinked passenger trips are reported to provide a comprehensive assessment of each alternative.



Table 2-3 summarizes the commonly used daily performance measures projected for year 2040 for both the No-Build Alternative and the proposed BLRT Extension project. Although the Council presumes that the proposed BLRT Extension project would be through-routed with the Blue Line (Hiawatha Light Rail Line), the ridership reported includes only those trips attributable to the new service, not existing Blue Line passengers. This includes those patrons boarding and/or alighting at Van White Boulevard and stations to the north and west (including those continuing on the Hiawatha segment of the line).

Table 2-3. Projected Transit System Performance Measures for the No-Build Alternative and Proposed BLRT Extension Project in 2040

Alternative	Performance Measure							
	Unlinked Transit Trips (Daily)					Linked Transit Trips (Daily)	Daily Passenger	
	Local Bus	Express Bus	Commuter Rail	LRT	Total		Miles	Hours
No-Build	367,800	78,400	Combined with Express Bus	124,400	570,600	351,700	2,878,400	153,000
Proposed BLRT Extension project	373,900	73,100	Combined with Express Bus	149,700	596,700	363,900	3,002,500	158,900

Source: Blue Line Extension Travel Demand Model Estimates (2015)

For the proposed BLRT Extension project, the total system-wide passenger miles are estimated to increase from 2,878,400 with the No-Build Alternative to 3,002,500 daily miles. Total system-wide transit ridership for the proposed BLRT Extension project is estimated to increase by 12,200 riders per day for linked trips and 26,100 per day for unlinked trips in comparison to the No-Build Alternative.

As shown in **Table 2-4**, in 2013, the regional vehicle-miles traveled (VMT) on the transportation network was about 81 million daily VMT for the major roadway and transit facilities in the Twin Cities region. The Council expects VMT to increase to about 102.9 million daily VMT by 2040 with the No-Build Alternative. Although VMT is expected to increase about 26 percent between 2013 and 2040, with the proposed BLRT Extension project in place, VMT would decrease slightly to 102.7 million daily VMT.

Likewise, regional vehicle-hours traveled (VHT) are forecasted to increase from about 2.5 million daily in 2013 to nearly 3.5 million hours daily in 2040. The proposed BLRT Extension project and the No-Build Alternative would have essentially the same VHT.

Transit passenger-miles traveled (PMT) are expected to increase from about 474 million annually in 2013 to about 861 million annually with the No-Build Alternative, and to about 898 million annually with the proposed BLRT Extension project. The average daily speeds for the regional roadway system were estimated by the Council based on the VMT and VHT totals (VMT/VHT).



Table 2-4. Regional System Performance Measures

Measure	2013	2040 No-Build Alternative	2040 Proposed BLRT Extension Project	Percent change from 2013 to:	
				2040 No-Build Alternative	2040 Proposed BLRT Extension Project
Daily VMT (in millions)	81.8	102.9	102.7	25.7%	25.6%
Daily VHT (in millions)	2.46	3.45	3.45	40.2%	40.2%
Annual transit PMT (in millions)	473.9	860.6	897.6	81.6%	89.4%
Average system speed (in mph)	33.3	29.8	29.8	-10.4%	-10.4%

Source: Blue Line Extension Travel Demand Model Estimates (2015)

In addition, even without the proposed BLRT Extension project, significant growth in regional transit ridership is forecasted to occur between 2013 and 2040 as a result of planned investment in the regional transit system, including additional LRT and highway and arterial bus rapid transit. These improvements are included in the No-Build Alternative. For the proposed BLRT Extension project, new transit trips are attributable only to those improvements associated with the proposed BLRT Extension project.

Table 2-5 shows the daily boardings for the proposed BLRT Extension project (for 2040) by station and mode of access. Walk mode of access includes trips that access the station by bicycle in addition to walk-up trips. Transfer mode of access includes all trips accessing the station by transferring from a bus route. The data show that over half of the ridership would access the proposed BLRT line via a transfer from another transit mode.

2.4.2 Construction-Phase (Short-Term) Impacts

2.4.2.1 No-Build Alternative

There would be no construction-phase impacts to transit from the No-Build Alternative.

2.4.2.2 Proposed BLRT Extension Project

Construction of the proposed BLRT Extension project would have intermittent impacts to bus operations on routes within the construction area. These impacts could include temporary stop relocations or closures, route detours, or suspensions of service on segments of routes operating on streets where the proposed BLRT Extension project is being constructed.



Table 2-5. Daily Boardings by Station and Mode of Access for the Proposed BLRT Extension Project in 2040

Station	2040 Daily Boardings ²	2040 Productions ¹				2040 Attractions ¹		
		Total	Walk	Drive ³	Transfers	Total	Walk	Transfers
Van White Boulevard	643	634	391	7	236	653	429	224
Penn Avenue	1,007	1,102	685	18	399	912	194	718
Plymouth Avenue	229	333	322	11	—	126	126	—
Golden Valley Road	905	1,305	525	229	551	505	211	294
Robbinsdale	3,517	5,032	986	1,220	2,826	2,001	290	1,711
Bass Lake Road	1,596	2,080	759	399	922	1,112	380	732
63rd Avenue	1,304	2,325	656	1,219	450	282	198	84
Brooklyn Boulevard	2,397	2,943	415	15	2,513	1,850	374	1,476
85th Avenue	2,181	1,862	312	16	1,534	2,500	1,683	817
93rd Avenue	357	243	132	6	105	471	366	105
Oak Grove Parkway	2,331	3,361	452	1,900	1,009	1,301	981	320
BLRT subtotal ⁴	16,467	21,220	5,635	5,040	10,545	11,713	5,232	6,481
Percent by mode of access (based on productions)		100%	26.6%	23.8%	49.7%	100%	44.7%	55.3%
Boardings outside proposed BLRT Extension project area (Downtown and Hiawatha boardings and transfers), alighting within proposed BLRT Extension project area	10,392	5,639				15,146		
Total project boardings⁵	26,859	26,859				26,859		

Source: Blue Line Extension Travel Demand Model Estimates (2015)

¹ Production/attraction format: home trip end station shown for production boardings, non-home trip end station end shown for attractions; no drive access at attraction end of trip.

² True boardings (accessing train) per average weekday.

³ Drive access includes both park-and-ride and passenger.

⁴ Boardings and alightings add up to more than total project rides because some trips board and alight within the proposed BLRT Extension project corridor.

⁵ Southbound boardings plus northbound alightings (production/attraction format).



2.5 Avoidance, Minimization, and/or Mitigation Measures

This section describes the measures that would be implemented to mitigate long-term and short-term transit impacts from the proposed BLRT Extension project. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures would address.

2.5.1 Long-Term Mitigation Measures

No mitigation measures are warranted for long-term impacts to transit because there would be no long-term adverse impacts to transit service because the proposed BLRT Extension project would expand transit service. However, the proposed BLRT Extension project would affect fixed-route bus service. The Council would follow federal and local procedures for route modifications or suspension of transit service, which would include a Title VI analysis to determine how service changes would affect low-income and minority communities. This Title IV process would include community outreach for designing route changes, a public hearing for the proposed service changes, and ongoing outreach efforts to communicate service changes prior to implementation.

2.5.2 Short-Term Mitigation Measures

Specific mitigation measures for short-term impacts to bus service would be identified in the Construction Mitigation Plan, which includes a Construction Communication Plan and construction staging plan (staging plan) for implementation by the Council prior to and during construction. The purpose of the Construction Communication Plan would be to prepare Metro Transit riders, project-area residents, businesses, and commuters for what to expect during construction, listen to their concerns, and develop plans to minimize disruptive effects. Strategies could include:

- Issue construction updates and post them on the website for the proposed BLRT Extension project
- Provide advance notice of roadway closures, driveway closures, and utility shutoffs
- Conduct public meetings
- Establish a 24-hour construction hotline
- Prepare materials with information about construction
- Address property access issues
- Assign staff to serve as liaisons between the public and contractors during construction
- Post information at bus stops and regional transit centers (Robbinsdale Transit Center, Brooklyn Center Transit Center, and Starlite Transit Center) indicating temporary stop closures and/or detour details
- Publish information in advance of bus detours on Metro Transit's website and in its on-board information brochure

In addition, the Council would develop and implement a staging plan, which would be reviewed with the appropriate jurisdictions and railroads, and the contractor would be required to secure the



necessary permits and follow the staging plan, unless otherwise approved. Components of a staging plan include traffic management plans and a detailed construction timeline.

3 Freight Rail Conditions

3.1 Methodology

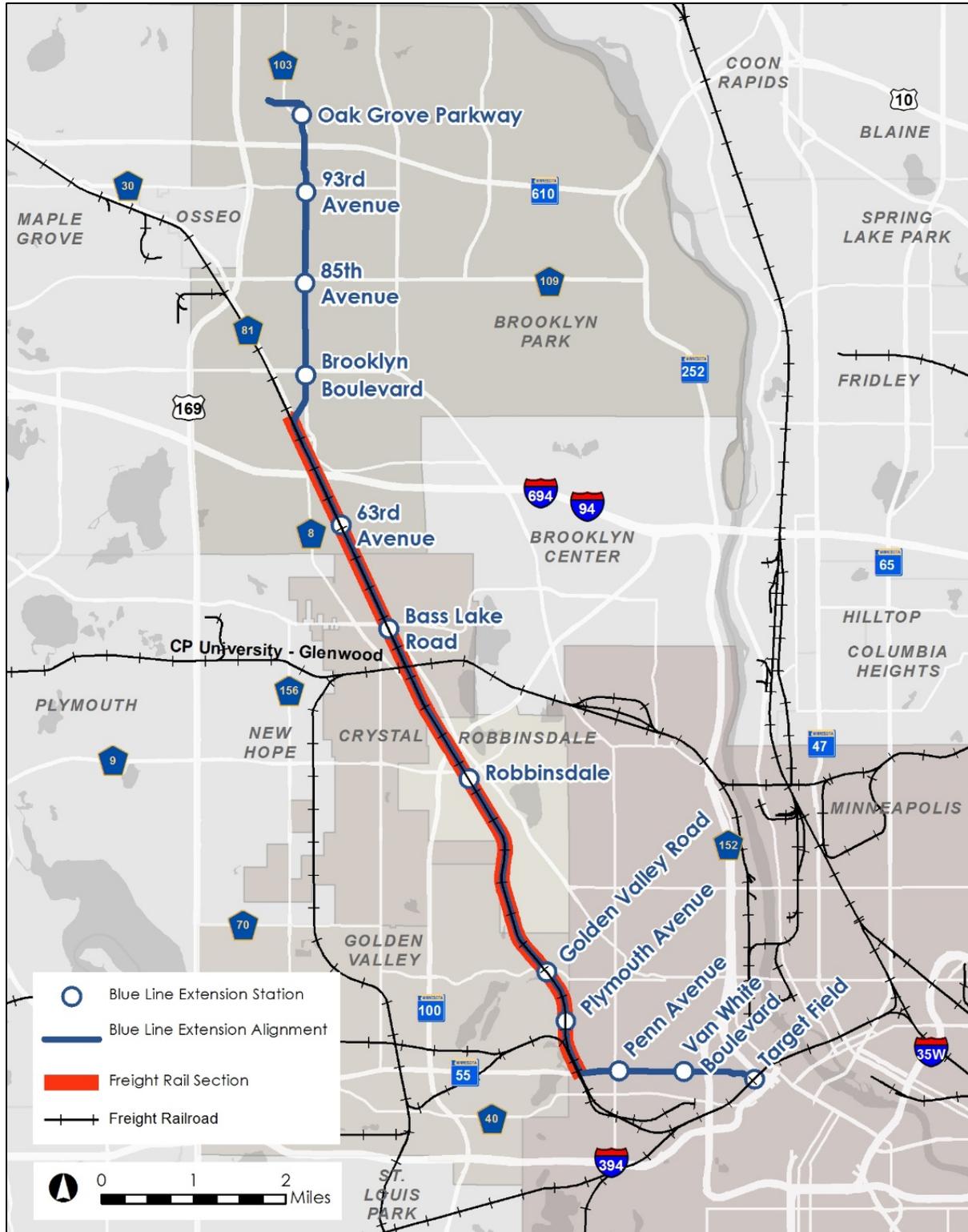
The proposed BLRT Extension project design drawings and existing BNSF Railway (BNSF) track charts were used by the Council to identify the physical impacts of the proposed BLRT Extension project to freight rail infrastructure. The Council reviewed the requirements of Minnesota State Statute 219.46, BNSF, Canadian Pacific Railway (CP), the American Railway Engineering and Maintenance-of-Way Association (AREMA), and the Minnesota Department of Transportation (MnDOT) to determine vertical and horizontal clearance requirements for the freight rail track. Per Minnesota State Statute 219.46, subd. 2, a minimum of 14 feet horizontal separation is required between the rail track centerlines, which is a key issue in understanding where to locate LRT tracks in relation to freight rail tracks. Additional vertical and horizontal clearance requirements are presented in Minnesota Statute 219.46; the proposed BLRT Extension project design is being developed in accordance with these requirements.

3.2 Study Area

The study area for freight impacts is defined as about 7.8 miles of the BNSF right-of-way within the Monticello Subdivision located between Brooklyn Boulevard in Brooklyn Park (Mile Post [MP] 9.39) and Olson Memorial Highway in Minneapolis (MP 1.56). The width of the BNSF-owned right-of-way is generally 100 feet (about 50 feet on either side of the existing freight rail track). **Figure 3-1** illustrates the study area for determining freight rail impacts.



Figure 3-1. Freight Rail Study Area





3.3 Affected Environment

Within the study area, 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. BNSF operates about four to eight freight trains per week on this track. During peak operations in previous years, up to five trains per day operated in the BNSF rail corridor. Future freight operations could increase or decrease based on the 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 segment of the rail 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, two siding tracks allow rail service to the Anchor Block site and the Atlas Cold Storage building. BNSF has not provided service to these sites for several years. Remnants of two other sidings are present in this area but do not appear to be functional.

CP 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 the proposed BLRT Extension project alignment just north of Olson Memorial Highway, where the CP track connects to the BNSF track with a crossover.

Between 36th Avenue North and Olson Memorial Highway, the freight rail track is located in a 100-foot right-of-way within an elevation that is lower than adjacent roadways and other land uses (a “trench”). In these areas are vegetated side slopes on either side of the track and no at-grade crossings. The track crosses under five bridge structures; these structures are located at Olson Memorial Highway, Plymouth Avenue, Theodore Wirth Parkway, Golden Valley Road, and 36th Avenue North.

The track located in the remaining segment of the proposed BLRT Extension project alignment, north of 36th Avenue, is generally at the same elevation as or higher than the adjacent roadways. Within this area are nine at-grade crossings (39½ Avenue, 41st Avenue, 42nd Avenue, 45½ Avenue, West Broadway Avenue, Corvallis Avenue, Bass Lake Road, 63rd Avenue, and 71st Avenue) with active warning devices provided at eight of them. Passive warning devices are provided at the 39½ Avenue at-grade crossing.²

² Under the proposed BLRT Extension project build condition, the 39½ Avenue at-grade crossing would be closed.



3.4 Environmental Consequences

3.4.1 Operating-Phase (Long-Term) Impacts

3.4.1.1 No-Build Alternative

There would be no operating-phase impacts to the freight rail corridor from the No-Build Alternative.

3.4.1.2 Proposed BLRT Extension Project

The proposed BLRT Extension project includes the construction of proposed LRT guideway in the eastern half of the BNSF right-of-way. In the Draft EIS, the Council proposed that a horizontal separation of at least 14 feet would be wide enough to allow a service road to be constructed between the LRT track and freight rail track, thereby allowing the Council and BNSF to perform maintenance on their respective tracks without affecting service on the other track. However, during preliminary engineering activities, the Council determined through coordination with BNSF that the preferred approach would be to reconstruct the freight rail track adjacent to the southbound (western) LRT track and construct a freight rail access road west of the freight rail track.

With the exception of the LRT crossings of the ponds north of Golden Valley Road and Grimes Pond, the approximate 7.8 mile section in the BNSF right-of-way would be divide to accommodate both the BNSF and LRT tracks. The BNSF track would be relocated about 15 feet to the west, thereby allowing BNSF to operate within the western 50 feet of the right-of-way while providing at least 25 feet of horizontal clearance from the LRT track centerline. The LRT tracks would operate in the eastern 50 feet of the existing right-of-way. The pond crossings would leave the BNSF track in its existing location and new LRT bridges would be constructed east of the freight rail embankment. Proposed BLRT Extension project construction would include a 12-foot-wide access road generally located west of the relocated BNSF track for the majority of the 7.8 miles of the proposed BLRT Extension project in the BNSF rail corridor, with the exception of the pond areas and bridges.

The proposed BLRT Extension project includes modifications to active warning devices and signals for at-grade crossings in order to accommodate the relocated BNSF and new LRT tracks. These modifications would include relocating existing active warning devices, such as gate arms, to accommodate the relocated BNSF and LRT tracks and installing new active warning devices, such as gate arms, where they are not currently provided. In addition, combined freight/LRT at-grade crossings would be designed to be ready for Federal Railroad Administration (FRA) Quiet Zones.³

The proposed BLRT Extension project would include fencing at LRT stations to provide additional separation between pedestrians using the LRT station platform and the freight rail operations.

³ Quiet Zones are locations, at least one-half mile in length, where the routine sounding of horns has been eliminated because of safety improvements at at-grade crossings, including modifications to the streets, raised median barriers, four quadrant gates, and other improvements designed and implemented as a part of the BLRT Extension project and consistent with Quiet Zone readiness. Horns are sounded in emergency situations at these locations. Municipalities must apply to FRA for approval of Quiet Zones.



Although BNSF would be required to operate within the western 50 feet of its right-of-way, incorporating an access road would improve BNSF's overall accessibility to its track. The proposed BLRT Extension project would relocate the existing freight track but would not change the overall freight rail operational context.

Further discussion of the impacts and improvements needed to accommodate the relocated freight rail alignment is provided below. Unless otherwise noted, these impacts would not permanently affect freight rail operations.

Required Freight Rail Modifications

The 36th Avenue bridge, Golden Valley Road bridge, Theodore Wirth Parkway bridge, Plymouth Avenue bridge, and Olson Memorial Highway bridge (westbound lanes) would be reconstructed to accommodate the relocated freight rail track and LRT guideway. See [Table 3-2](#) for proposed modifications. In addition, the crossover connection between the BNSF freight rail alignment and the CP rail spur (just north of the Olson Memorial Highway bridge) would also need to be reconstructed.

The BNSF freight rail track would be relocated about 15 feet west of its current alignment. South of 71st Avenue, part of the BNSF right-of-way is less than 100 feet wide because of the 71st Avenue roadway configuration. This limited right-of-way could require installing a barrier between the existing roadway (back of sidewalk) and the freight rail track. Existing sidings that are located north of I-94 and south of Brooklyn Boulevard are currently out of service and in some cases are not connected to the existing freight track. The relocated freight track might need to reconnect these existing sidings, if BNSF would resume service to these customers would resume. The existing diamond crossing at the BNSF/CP at-grade intersection would require relocation as part of shifting the freight rail track. The segment of the rail corridor between 36th Avenue and Olson Memorial Highway is located within the "trench" described previously in [Section 3.3](#). In some areas, retaining walls would replace the existing vegetated side slopes on either side of the BNSF right-of-way to accommodate the relocated freight rail track while reducing adjacent property impacts.

In three locations, the freight rail tracks would remain on the existing alignment and the LRT tracks would be constructed on a new bridge within the eastern 35 feet of the 100-foot-wide BNSF right-of-way. These three locations are at Grimes Pond adjacent to Sochacki Park south of 36th Avenue, at the ponds immediately north of Golden Valley Road, and at TH 100.



Table 3-1. Proposed BLRT Extension Project Bridge Modifications

Bridge Location	Proposed Improvements
Olson Memorial Highway	<p>The north half of the Olson Memorial Highway bridge (westbound lanes) would be reconstructed to accommodate the transition of the LRT guideway out of the BNSF right-of-way into the median of Olson Memorial Highway. These bridge reconstruction impacts are not associated with relocating the freight rail track.</p> <p>No change to BNSF operations or maintenance requirements.</p>
Plymouth Avenue	<p>The bridge deck, piers, and abutments would be removed, and a new bridge would be constructed in the same location. Bridge piers would be spaced to allow the LRT tracks to pass through on the eastern half of the BNSF rail corridor, the reconstructed freight rail track and new access road to pass through on the western half of the BNSF rail corridor, and the reconstructed Theodore Wirth Regional Park (TWRP) trail and associated Bassett Creek channel reconstruction. The pier locations would need to accommodate a wider spacing between northbound and southbound LRT tracks to allow the Plymouth Avenue Station to be built in a center platform configuration.</p> <p>Bridge piers would be constructed to provide adequate crash protection based on current MnDOT and AREMA standards.</p> <p>No change to BNSF operations or maintenance requirements.</p>
Theodore Wirth Parkway	<p>The bridge deck, piers, and abutments would be removed, and a new bridge would be constructed in the same location. Bridge piers would be spaced to allow the LRT tracks to pass through on the eastern half of the BNSF rail corridor and the reconstructed freight rail track to pass through on the western half of the BNSF rail corridor. The pier locations would need to accommodate a wider spacing between northbound and southbound LRT tracks to allow the Golden Valley Road Station, which would be located directly north of the Theodore Wirth Parkway bridge, to be built in a center platform configuration.</p> <p>Bridge piers would be constructed to provide adequate crash protection based on current MnDOT and AREMA standards.</p> <p>No change to BNSF operations or maintenance requirements.</p>
Golden Valley Road	<p>The bridge deck, piers, and abutments would be removed, and a new bridge would be constructed in the same location. Bridge piers would be spaced to allow the LRT tracks to pass through on the eastern half of the BNSF rail corridor and the reconstructed freight rail track to pass through on the western half of the BNSF rail corridor. The pier locations would need to accommodate a wider spacing between northbound and southbound LRT tracks to allow the Golden Valley Road Station to be built in a center platform configuration. A portal would be created for a proposed trail connection between TWRP and Sochacki Park.</p> <p>Bridge piers would be constructed to provide adequate crash protection based on current MnDOT and AREMA standards.</p> <p>No change to BNSF operations or maintenance requirements.</p>
36th Avenue	<p>The bridge deck, piers, and abutments would be removed, and a new bridge would be constructed in the same location. Bridge piers would be spaced to allow the LRT tracks to pass through one portal on the eastern half of the BNSF rail corridor and the reconstructed freight rail track and access road to pass through another portal on the western half of the BNSF rail corridor.</p> <p>Bridge piers would be constructed to provide adequate crash protection based on current MnDOT and AREMA standards.</p> <p>No change to BNSF operations or maintenance requirements.</p>



Corridor Protection

The proposed BLRT Extension project was examined by the Council to reduce risks in the event of a freight or LRT derailment. This review included examining technical reports, research papers, and treatments used on other corridors where freight rail and LRT operate jointly. LRT and freight rail located in a shared corridor is not an unusual occurrence in the United States. These are known as “Common Corridor Operations.” The Council collected and documented information on these locations, including mitigation measures in place. Based on this research the following Light Rail Operators have Common Corridor Operations on portions of their lines: Port Authority Transit Corp (PATCO), Charlotte NC LYNX, Greater Cleveland Regional Transit Authority Blue and Green Lines, Dallas DART, Denver RTD, Jersey City NJT Hudson-Bergen LRT, Los Angeles LACMTA Green and Gold Lines, Sacramento CA, Sacramento RTD, St. Louis, Bi-State Development Agency, San Jose, VTA, Maryland Counties, Purple Line and Portland MAX Orange Line.

The Council contacted staff associated with these projects to identify the following common methods currently used or planned to be used after system build-out. Some of these projects and methods are still in development, but the following is a summary of these measures:

- Reliance on direct communication by internal radio systems and emergency telephone contact with the adjacent railway’s dispatch center and vice-versa for notification of an accident that interferes with the other’s operation
- Have established incident response protocols with the adjacent railway and first responders as part of their emergency preparedness programs
- Conduct emergency response exercises and drills as part of their training requirements. Many properties actively support “Operation Lifesaver” to reduce trespasser/transit rail accidents.
- Construct corridor-protection walls between freight and light rail
- Install intrusion detection devices in areas between freight and light rail

These methods are also planned to be used on the proposed BLRT Extension project and will be incorporated into the construction and management documents, as applicable.

The Metro Transit Light Rail Transit Design Criteria (Council, 2015), which includes design standards and specifications to provide security and/or enhance safety, includes safeguards to prevent LRT operational derailments including guardrails (i.e., a rail or other structure laid parallel with the running rails of the track to keep derailed wheels adjacent to the running rails of the track to keep derailed wheels adjacent to the running rails). In addition, the proposed BLRT Extension project includes a combination of horizontal separation, vertical separation, and physical means to provide safe operations. Three specific corridor-protection treatments are proposed:

- A ditch (used where the corridor width permits)
- A retained fill option where the LRT tracks would be at a higher grade than freight rail tracks
- A wall

Typical sections representing these corridor-protection options are shown in **Figures 3-2a through 3-2c**. In addition, where clearance between the centerline of the light rail tracks and the



centerline of the freight tracks is less than 50 feet, intrusion detection for possible freight derailment will be installed, where appropriate. These corridor-protection treatments were closely coordinated with BNSF.

Further, the design of the proposed BLRT Extension project will include safeguards in the catenary system to help minimize the possibility of sparking occurring in the overhead catenary wires. Electrical sparks, or arcing, occurs when there is a gap between the overhead contact wire and the vehicles pantograph. Numerous safeguards are included in the design of the proposed BLRT Extension project to address and minimize electrical sparking. Ice cutters will be utilized to maintain positive contact between the contact wire and pantograph during winter weather. Additionally, Metro Transit will regularly inspect pantographs for grooves along the pantograph's carbon strip (as it does on its existing light rail lines), which could cause arcing. Included in the design of the proposed BLRT Extension project to minimize arcing are contact wire gradients, which meet or exceed AREMA recommendations, staggering or zig-zags of the contact wire to ensure even wear, and overlaps between power sections. Finally, the design accounts for the Occupational Safety and Health Administration 10-foot zone of influence, and meets or exceeds National Electrical Safety Code requirements along the proposed shared light rail and freight rail corridor.

The Council's *Operations Emergency Management Plan (OEMP)* for light rail was developed to assist in identifying, responding to, and resolving emergency situations in an efficient, controlled and coordinated manner, including those related to the location of LRT and freight rail within the same corridor. The *OEMP* establishes the response process and responsibilities for departments and staff within Metro Transit, as well as outside agencies in the event of a rail emergency.

Figure 3-2a. Typical Railway Section – Ditch Corridor Protection

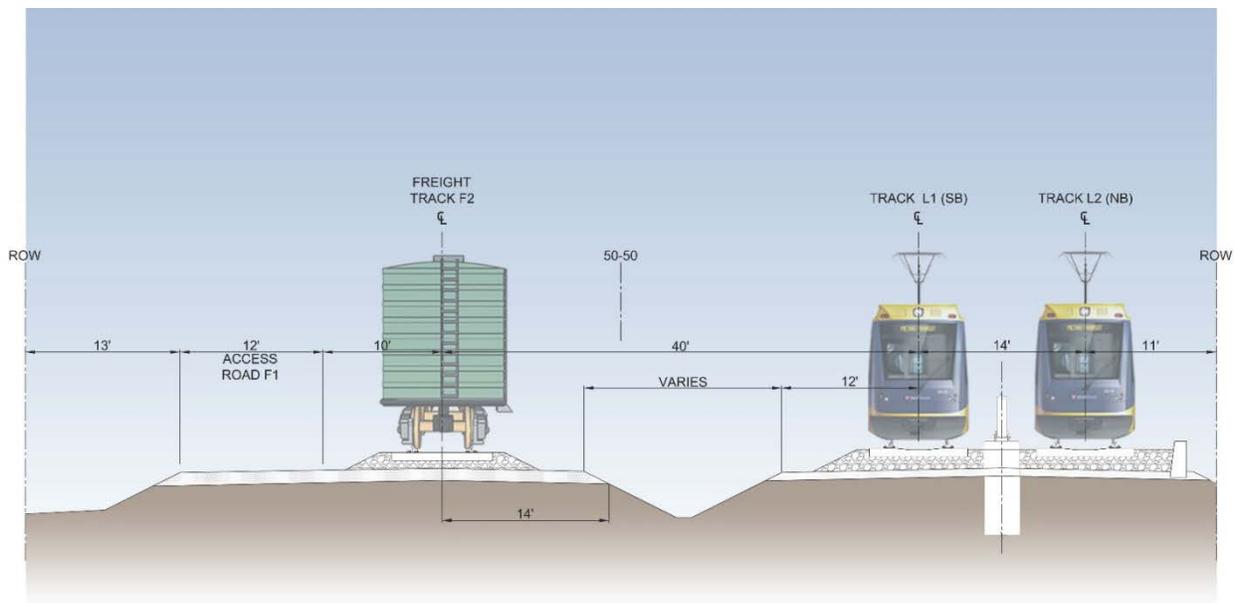


Figure 3-2b. Typical Railway Section – Retained Embankment Corridor Protection

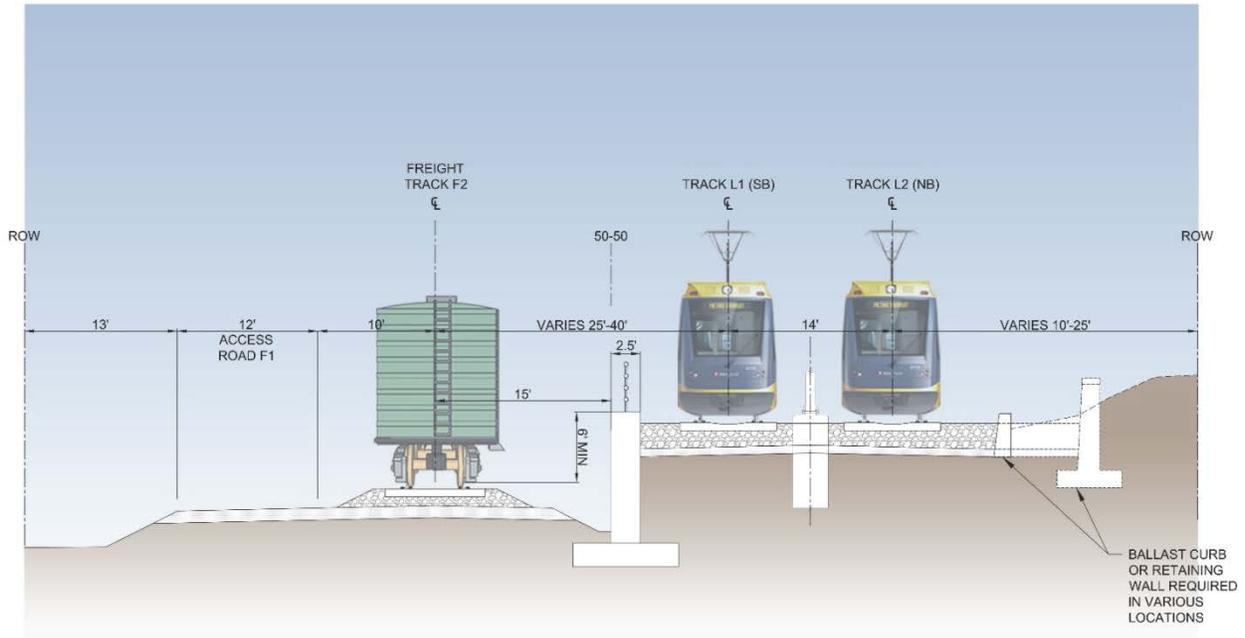
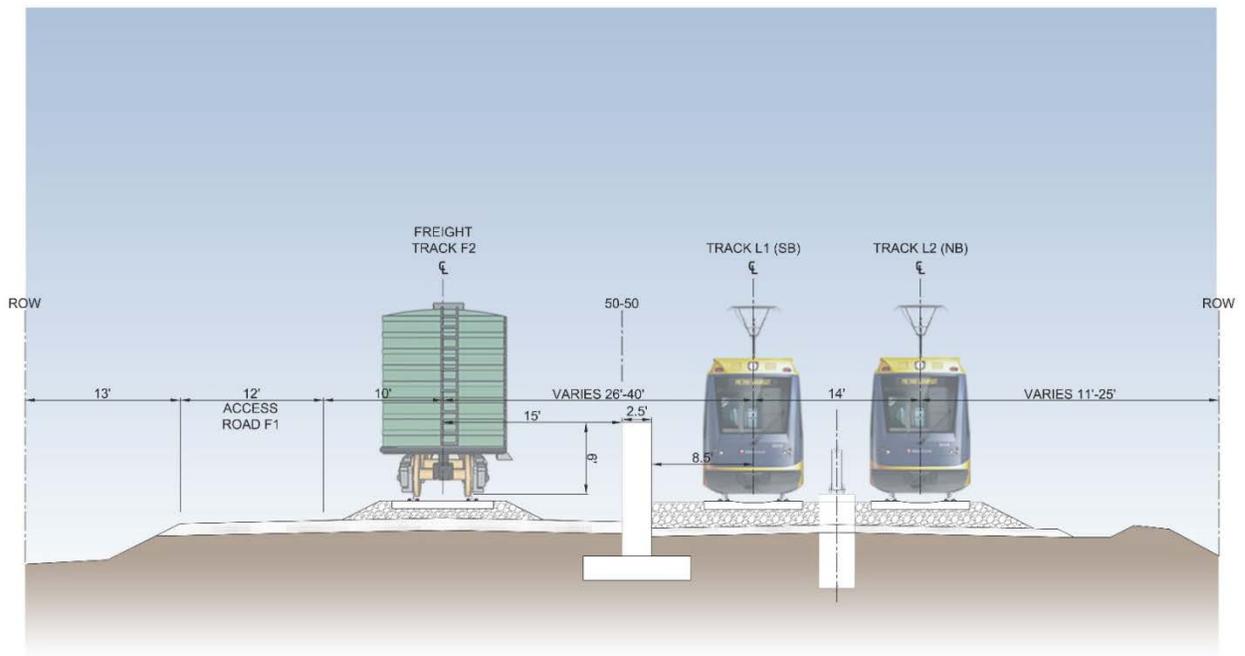


Figure 3-2c. Typical Railway Section – Wall Corridor Protection





In addition, the Council maintains an emergency preparedness exercise plan. The emergency preparedness exercise plan identifies emergency preparedness exercise, which will be carried out by the Fire Life Safety and Security Committee (FLSSC). In advance of operation of the proposed BLRT Extension project, a number of drills will be planned, conducted, and documented in the emergency preparedness exercise plan. Emergency preparedness training exercises will be designed to address areas such as rail equipment familiarization, situational awareness, passenger evacuation, coordination of functions, communications, and hands-on instruction. The FLSSC will coordinate training exercises with the Council and the freight railroad owners and operators, as appropriate. During normal revenue service, the FLSSC will coordinate training exercises to evaluate emergency preparedness. The exact nature of emergency preparedness exercises will be developed in coordination with the FLSSC prior to construction, but could include one tabletop and one full-scale emergency preparedness exercise, annually.

Traction Power Substations (TPSSs)

TPSS sites would generally be located on the east side of the proposed LRT track where possible, with a minimum horizontal clearance between the TPSSs and the LRT track centerline of 8 feet. Greater horizontal clearances, a minimum of 15 feet from the track centerline, would be required if the TPSS is located adjacent to the BNSF freight rail track. In most cases, the TPSS sites could be located on property adjacent to and outside of the existing rail corridor to avoid or reduce impacts to the freight rail tracks. Depending on the location of the TPSS site, utilities such as the Xcel Energy electrical service might need to cross under or over the freight rail tracks. Vertical and horizontal clearances, as required by the BNSF Utility Accommodation Policy (BNSF, May 2011), would be maintained for these utility crossings.

3.4.2 Construction-Phase (Short-Term) Impacts

3.4.2.1 No-Build Alternative

There would be no construction-phase impacts to freight rail are from the No-Build Alternative.

3.4.2.2 Proposed BLRT Extension Project

Construction activities to relocate the freight rail track required as part of constructing the LRT guideway would have limited effects on existing freight service in the BNSF rail corridor. 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 construction of the LRT guideway, thus minimizing disruptions to freight rail operations. Construction work would be done under the guidance of a BNSF flagging crew.

At the BNSF/CP diamond crossing, construction would be coordinated with both railroads to limit freight delays.

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



Construction activities could also cause temporary impacts to sidings if BNSF were to resume service to freight customers between I-94 and Brooklyn Boulevard. 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 in such a way as to minimize impacts to freight rail operations in the rail corridor.

The construction impacts associated with the No-Build Alternative and the proposed BLRT Extension project are summarized in **Table 3-3**.

Table 3-3. Construction Impacts on Freight Rail

Alternative	Total Freight Rail Impact ¹
No-Build Alternative	<ul style="list-style-type: none"> ■ No impact
Proposed BLRT Extension project	<ul style="list-style-type: none"> ■ Temporary impacts to freight rail customer sidings (if BNSF were to resume service within the rail corridor) resulting from constructing temporary crossovers between existing and relocated freight rail tracks ■ Temporary impacts due to reconstructing diamond crossover at CP/BNSF intersection north of Corvallis Avenue ■ Temporary impacts due to reconstructing CP/BNSF crossover connection north of Olson Memorial Highway

¹ No anticipated freight rail construction impacts are associated with the proposed park-and-rides or Operations and Maintenance Facility (OMF).

3.5 Avoidance, Minimization, and/or Mitigation Measures

This section describes the measures that would be implemented to mitigate the long-term and short-term impacts on freight transportation from the proposed BLRT Extension project. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures would address.

3.5.1 Long-Term Mitigation Measures

No mitigation measures are warranted for long-term impacts to freight rail because the identified avoidance measures would prevent any adverse impacts. These measures include reconstructing the BNSF rail corridor including a service road that would provide BNSF with better access to its rail line. In addition, the existing freight rail track is jointed; this type of track generates noise and vibration as freight trains pass over the joints. The new freight rail track that would be constructed in the rail corridor would be continuously welded rail, which would eliminate the track joint-related noise and vibration.

In addition, as discussed in **Section 3.4.2.2**, corridor-protection elements would be included in the proposed BLRT Extension project design to reduce risks in the event of a freight or LRT derailment. Additional information regarding mitigation measures for long-term impacts to other environmental resources associated with freight rail is included in **Section 4.3 – Acquisitions and Displacements**; **Section 4.6 – Business Impacts**; and **Section 5.6 – Noise** (including train horn Quiet Zones).



3.5.2 Short-Term Mitigation Measures

Short-term impacts to freight rail operations resulting from construction activities could occur along the BNSF rail corridor and where the CP corridor intersects the proposed BLRT Extension project.

In order to mitigate short-term impacts to freight rail operations related to construction activities, the Council would develop and implement freight rail operation coordination plans. The purpose of these plans is to facilitate coordination between the Council and the affected freight railroads during construction activities affecting freight rail operations. As part of this effort, Council staff would also work with affected freight rail owners and operators to provide provisions in the construction contract to identify how the contractor would interact with the railroads. Further, Council staff would work with affected freight rail owners and operators to sequence construction to reduce effects on freight movements and to identify optimal periods for closing the rail service and reducing speeds. Dates and times for all stoppages would be determined through coordination with the railroad owners and operators.

During construction activities, flaggers would be used to allow freight rail operations to continue. The use of flaggers would require construction activities adjacent to active freight rail to halt while freight trains traverse the construction area.



4 Pedestrians and Bicyclists

4.1 Methodology

This section describes existing bicycle and pedestrian facilities and connections in the study area and the expected impacts of the No-Build Alternative and the proposed BLRT Extension project 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 study area. The Council identified facilities by reviewing trail and comprehensive plan maps, aerial photographs, and Station Area Planning documents; site visits; and discussions with stakeholders. Preliminary engineering drawings and construction limits were used to determine the number and severity of impacts. Physical encroachments onto existing facilities were identified and evaluated to avoid or minimize impacts.

Impacts to pedestrian and/or bicycle routes from the proposed BLRT Extension project crossing restrictions were identified by the Council and alternates were examined, with consideration for reasonable accessibility associated with the Americans with Disabilities Act (ADA) requirements.

The discussion of the proposed BLRT Extension project focuses on:

- Target Field Station connection area, especially the Olson Memorial Highway/7th Street intersection
- Olson Memorial Highway, especially the area between the I-94 bridge and Thomas Avenue and including the Van White Boulevard and Penn Avenue stations
- Plymouth Avenue Station area
- Golden Valley Road Station area
- Robbinsdale Station area
- Bass Lake Road Station area
- 63rd Avenue Station area
- Grade separation at Bottineau Boulevard (County Road 81) and 73rd Avenue, especially changes to Jolly Lane
- West Broadway Avenue, including the Brooklyn Boulevard, 85th Avenue, and 93rd Avenue stations
- Oak Grove Parkway Station area

The discussion includes a summary of effects on bicycle and pedestrian facilities in the study area with a focus on the proposed accessibility improvements at future station areas and on reconstructed intersections or crossings where existing bicycle and pedestrian access would change.



4.2 Study Area

The study area for impacts to pedestrians and bicyclists is defined as the limits of disturbance from the proposed BLRT Extension project, facilities near the proposed BLRT Extension project alignment, and alternate routes in the surrounding area. The study area for alternate routes varies based on the conditions of the surrounding bicycle/pedestrian network but generally includes alternate routes within ½ mile of the transitway and/or affected crossing.

4.3 Affected Environment

The extent and condition of existing pedestrian and bicycle facilities associated with the proposed BLRT Extension project ranges from intermittent facilities in the more suburban areas of the study area to complete sidewalk systems and on-street bicycle facilities in Minneapolis and the other more urban portions of the study area.

4.4 Environmental Consequences

4.4.1 Operating-Phase (Long-Term) Impacts

4.4.1.1 No-Build Alternative

There would be no operating-phase impacts to pedestrians or bicyclists from the No-Build Alternative. However, neither an opportunity to improve existing pedestrian and bicycle connections to other transportation resources in the area nor an opportunity to improve pedestrian and bicycle safety in the immediate study area would be realized.

4.4.1.2 Proposed BLRT Extension Project

The proposed BLRT Extension project would provide several long-term improvements to pedestrian and bicycle accessibility and safety. All LRT stations would provide safe access for pedestrian and bicycle traffic. Bicycle parking would be included at or near stations as space allows, with the type and location of parking to be determined by the Council as station design and site development progress.

The issue-resolution process conducted with Metro Transit, Hennepin County, and staff from the cities along the proposed BLRT Extension project alignment resulted in several modifications to the pedestrian and bicycle environment beyond that presented in the Draft EIS. These modifications are described in detail below and a summary of impacts resulting from these modifications is shown in [Table 4-1](#).



Table 4-1. Summary of Impacts to Pedestrian and Bicycle Facilities

Location	Impact
Target Field Station connection and 7th Street North intersection design	Pedestrian and bicycle needs accommodated in design of Olson Memorial Highway and 7th Street North intersection, which includes dedicated bicycle lanes and enhanced pedestrian crossings
Olson Memorial Highway	Improved pedestrian safety and access to stations along Olson Memorial Highway; addition of traffic signal at Thomas Avenue intersection and three mid-block signalized pedestrian crossings; provisions for a cycle track on north side of Olson Memorial Highway
Plymouth Avenue Station	Improved pedestrian and bicycle access through reconstruction of sidewalks and bicycle lanes on Plymouth Avenue bridge; access to the Plymouth Avenue Station vertical circulation facility, as well as connecting to the existing trail west of the bridge; improvements to sidewalks along Plymouth Avenue to facilitate pedestrian movements between bus stop and passenger drop-off areas and station; existing TWRP trail would be relocated west out of its current location within BNSF right-of-way
Golden Valley Road Station area	Improved pedestrian and bicycle access at reconstructed Theodore Wirth Parkway and Golden Valley Road bridges; Theodore Wirth Parkway bridge trail would be widened to meet current design standards, and vertical circulation facilities to access the Golden Valley Road Station would be added; trailhead would be constructed the at Golden Valley Road Station park-and-ride; new trail connection under Golden Valley Road between TWRP and Sochacki Park
Robbinsdale Station area	Improved pedestrian access and safety through proposed pedestrian crossings at 41st Avenue/Noble Avenue and 42nd Avenue; proposed pedestrian crossings to provide ADA-compliant crossings of the freight rail and LRT tracks; improved pedestrian access through proposed LRT crossing at 45½ Avenue; bicyclists access to station via Crystal Lake Regional Trail; improve pedestrian safety through closing the existing informal (and prohibited) crossings of the BNSF track at Sochacki Park
Bass Lake Road Station area	Improved pedestrian access through proposed pedestrian bridge over Bottineau Boulevard and improved connections from trails and sidewalks to station and park-and-ride lot; bicyclists access to station via Crystal Lake Regional Trail; improved pedestrian crossings of the LRT tracks at West Broadway Avenue
63rd Avenue Station area	Improved pedestrian access and safety through improved connections along 63rd Avenue to reach the proposed station and a proposed grade-separated connection from the parking ramp; improved pedestrian access through at-grade pedestrian crossings of LRT/freight tracks at 71st Avenue; bicyclists access to station via Crystal Lake Regional Trail
Jolly Lane/75th Avenue area	Pedestrian and bicycle access would be maintained through reconstruction and realignment to accommodate proposed BLRT Extension project features



Table 4-1. Summary of Impacts to Pedestrian and Bicycle Facilities

Location	Impact
West Broadway Avenue station areas	Closing pedestrian crossing at West Broadway Avenue at commercial property about 400 feet north of Brooklyn Boulevard/West Broadway Avenue intersection with alternate crossing available within ¼ mile; continuous trail facilities along both sides of West Broadway Avenue with proposed reconstruction of trails south of Candlewood Drive; improved bus stop and a secondary pedestrian access to station areas; pedestrian crossing at 84th Avenue and West Broadway Avenue would be closed with pedestrian crossing facilities provided at new signalized intersection at College Park Drive and West Broadway Avenue; secondary pedestrian access to station area provided by 92nd Avenue crossing; bicycle access to proposed LRT stations would use the same locations as those identified for pedestrians
Oak Grove Parkway Station area	Reconfigured roadway network would accommodate the proposed Oak Grove Parkway Station and park-and-ride; proposed transportation network would include provisions for sidewalks and bicycle trails

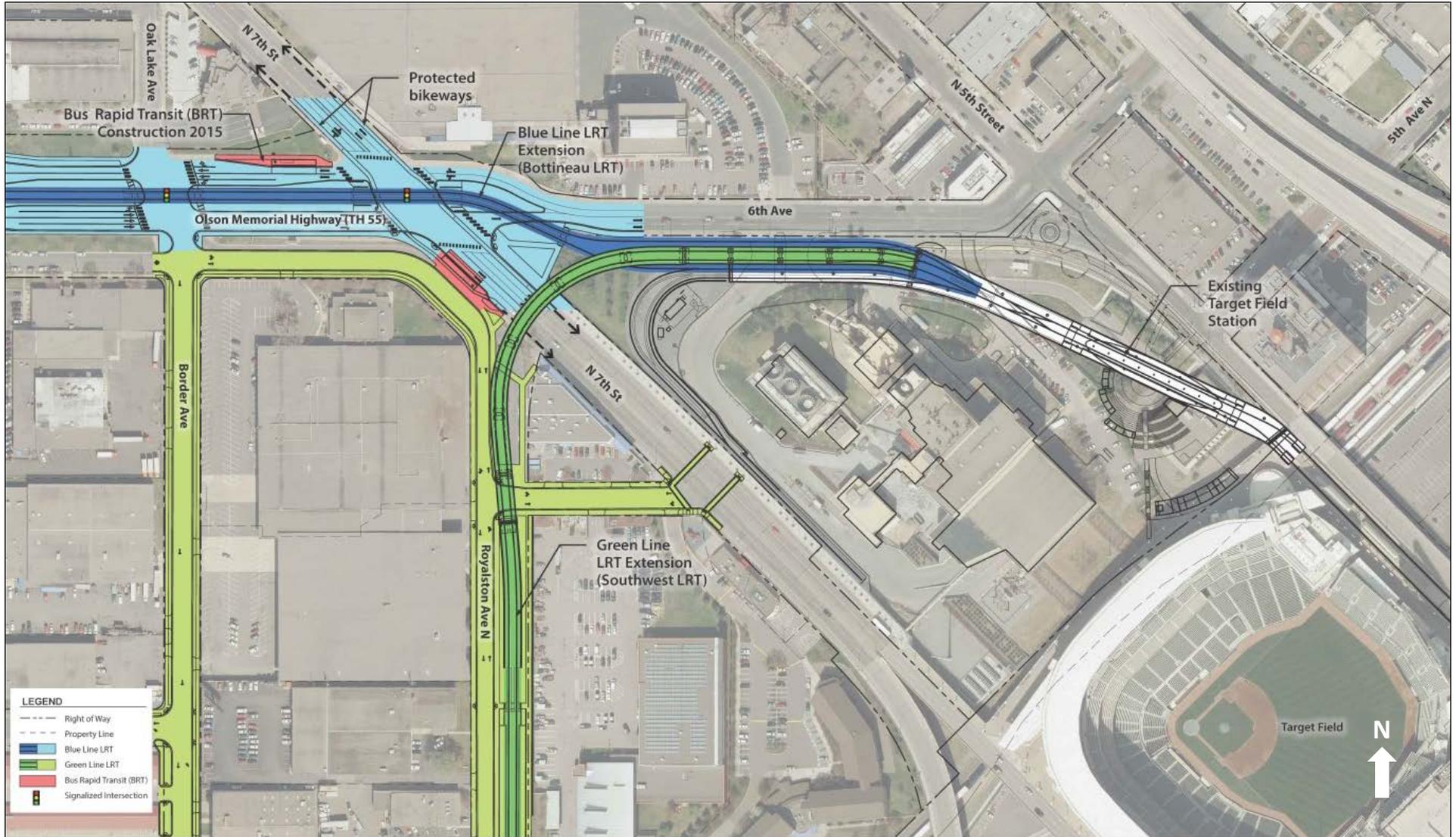
Target Field Station Connection and 7th Street Intersection Design

One of the issues identified for resolution through the early stages of proposed BLRT Extension project development was the LRT connection to the Target Field Station. The challenge was to find a way to address vehicle traffic through the intersection of Olson Memorial Highway and 7th Street North while accommodating pedestrians’ and bicyclists’ needs. Specific components of the pedestrian and bicycle improvements identified through the issues-resolution process include:

- Shortening the pedestrian crossing distance at each leg of the intersection
- Providing pedestrian refuge space at median crossings
- Accommodating northbound and southbound bicycle lanes in 7th Street North (bicycle lanes to be constructed as a component of the Green Line LRT Extension project)
- Creating perpendicular or near-perpendicular crossing paths at LRT tracks for bicycles and wheelchairs to prevent wheels from getting stuck in track channels
- Eliminating the free right-turn movement from northbound (northwest-bound) 7th Street North to eastbound 6th Avenue North

Figure 4-1 depicts the proposed BLRT Extension project’s intersection layout at the Olson Memorial Highway/7th Street North intersection near the Target Field Station.

Figure 4-1. Proposed Olson Memorial Highway / 7th Street North Intersection Layout





Olson Memorial Highway

Concern for pedestrian safety and access to stations along Olson Memorial Highway were key issues identified in multiple comments on the Draft EIS. Currently there are nine unmarked, unsignalized mid-block crossings in addition to six marked crossings at signalized intersections. Several of these crossings are not ADA-compliant. The city of Minneapolis, Hennepin County, MnDOT, and Metro Transit evaluated multiple options for Olson Memorial Highway that would balance the needs of motorists and other users. The results of extensive analysis and discussion were as follows:

- Maintain a six-lane roadway section to accommodate existing and future traffic volumes.
- Reduce lane widths to 11 feet (current widths are 12 feet and greater) to reduce pedestrian crossing length.
- Reduce the design speed and posted speed limit from 40 to 35 mph to provide a safer environment for pedestrians and bicyclists.
- Replace existing sidewalks on the north and south sides of Olson Memorial Highway. The current sidewalks are 5 feet wide and in poor condition with some gaps. New sidewalks would be 6 feet wide and continuous.
- Provide ADA-compliant pedestrian crossings at the following signalized intersections:
 - West Lyndale Avenue
 - Bryant Avenue
 - Van White Memorial Boulevard (also provides station access)
 - Humboldt Avenue
 - Morgan Avenue
 - Penn Avenue
 - Thomas Avenue
- Provide ADA-compliant signalized pedestrian crossings at the following three mid-block locations:
 - East of the Penn Avenue Station (also provides secondary access to the Penn Avenue Station)
 - James Avenue (between Humboldt and Morgan avenues)
 - Russell Avenue (also provides secondary access to the Van White Boulevard Station)
- Provide pedestrian refuge areas in the median.
- Provide space on the north side of Olson Memorial Highway for a 10-foot two-way cycle track (to be constructed by others) between Thomas Avenue and Van White Memorial Boulevard.
- Provide a multi-use trail on the north side of the reconstructed westbound Olson Memorial Highway bridge.

Figures 4-2, 4-3, and 4-4 depict proposed conceptual pedestrian crossing safety treatments and improvements along Olson Memorial Highway at signalized intersections and mid-block crossings and provisions for the proposed cycle track.

Figure 4-2. Conceptual Intersection Pedestrian Safety Improvements





Figure 4-3. Conceptual Mid-block Pedestrian Safety Improvements



Figure 4-4. Provisions for a Cycle Track on the North Side of Olson Memorial Highway





Plymouth Avenue Station

At the Plymouth Avenue Station, the Plymouth Avenue bridge would be reconstructed to accommodate the LRT and relocated freight rail tracks. Reconstruction is required because the existing bridge pier spacing would not allow the necessary freight, LRT, and LRT station configurations.

The Minneapolis Park and Recreation Board (MPRB) has requested that enhanced trail connections providing greater levels of connectivity with the regional trail system and the proposed Plymouth Avenue Station in this area as well, including a connection between Plymouth Avenue and the TWRP trail adjacent to Bassett Creek.

Pedestrian sidewalks and bicycle lanes in the shoulders on the bridge would be reconstructed and would provide access to the Plymouth Avenue Station vertical circulation facility as well as connecting to the existing trail west of the bridge. Additional improvements would be made to the sidewalks along Plymouth Avenue to the east to facilitate pedestrian movements between bus stop and passenger drop-off areas and the station. As part of this bridge reconstruction, the existing TWRP trail that runs parallel to Bassett Creek would be relocated to the west out of its current location within the BNSF right-of-way. (See [Section 5.3.4](#) of the Final EIS for a discussion of impacts to Bassett Creek.) Details of these design improvements have been coordinated with MPRB.

Figure 4-5 illustrates the planned bicycle and pedestrian accommodations at the proposed Plymouth Avenue Station.

Figure 4-5. Plymouth Avenue Station Area





Golden Valley Road Station Area

At the Golden Valley Road Station, both the Theodore Wirth Parkway bridge and the Golden Valley Road bridge would be reconstructed, including the existing pedestrian and bicycle facilities. The trail on the Theodore Wirth Parkway bridge would be widened to meet current design standards, and vertical circulation facilities to access the Golden Valley Road Station would be added to the Golden Valley Road bridge. A trailhead would be constructed at the eastern corner of the proposed Golden Valley Road Station park-and-ride. This trailhead would provide access to the existing Minneapolis Park and Recreation Board trail system and access to the proposed Bassett Creek Regional Trail that would be constructed by the Three Rivers Park District along Golden Valley Road.

The new Golden Valley Road bridge would be designed to accommodate a new trail connection under Golden Valley Road between TWRP and Sohacki Park.

The traffic operations analysis indicates that the Golden Valley Road/Theodore Wirth Parkway intersection would have approximately the same vehicular traffic level of service in 2040 with either the No-Build Alternative or the proposed BLRT Extension project (see the *BLRT Traffic Operations Technical Memorandum*, October 2015). However, the proximity of bicycle and pedestrian facilities and the addition of new trail connections with the proposed BLRT Extension project could require improving the intersection to enhance the safety of pedestrians and bicyclists. The Council will coordinate such improvements with the MPRB, the city of Golden Valley, and Hennepin County, along with other appropriate stakeholders.

Figure 4-6 illustrates the planned bicycle and pedestrian accommodations at the proposed Golden Valley Road Station.

Figure 4-6. Golden Valley Road Station Area





Robbinsdale Station Area

At the Robbinsdale Station, pedestrian crossings at 41st Avenue/Noble Avenue and at 42nd Avenue would be improved to provide safe access from the west side of the proposed BLRT Extension project alignment. A grade-separated crossing at 41st Avenue/Noble Avenue was considered by the Council but was rejected because of impacts to adjacent properties and potential security concerns. Pedestrian crossings would be constructed to provide ADA-compliant crossings of the freight rail and LRT tracks. Improvements to the 42nd Avenue/West Broadway Avenue intersection would maintain the existing pedestrian crossing alignment.

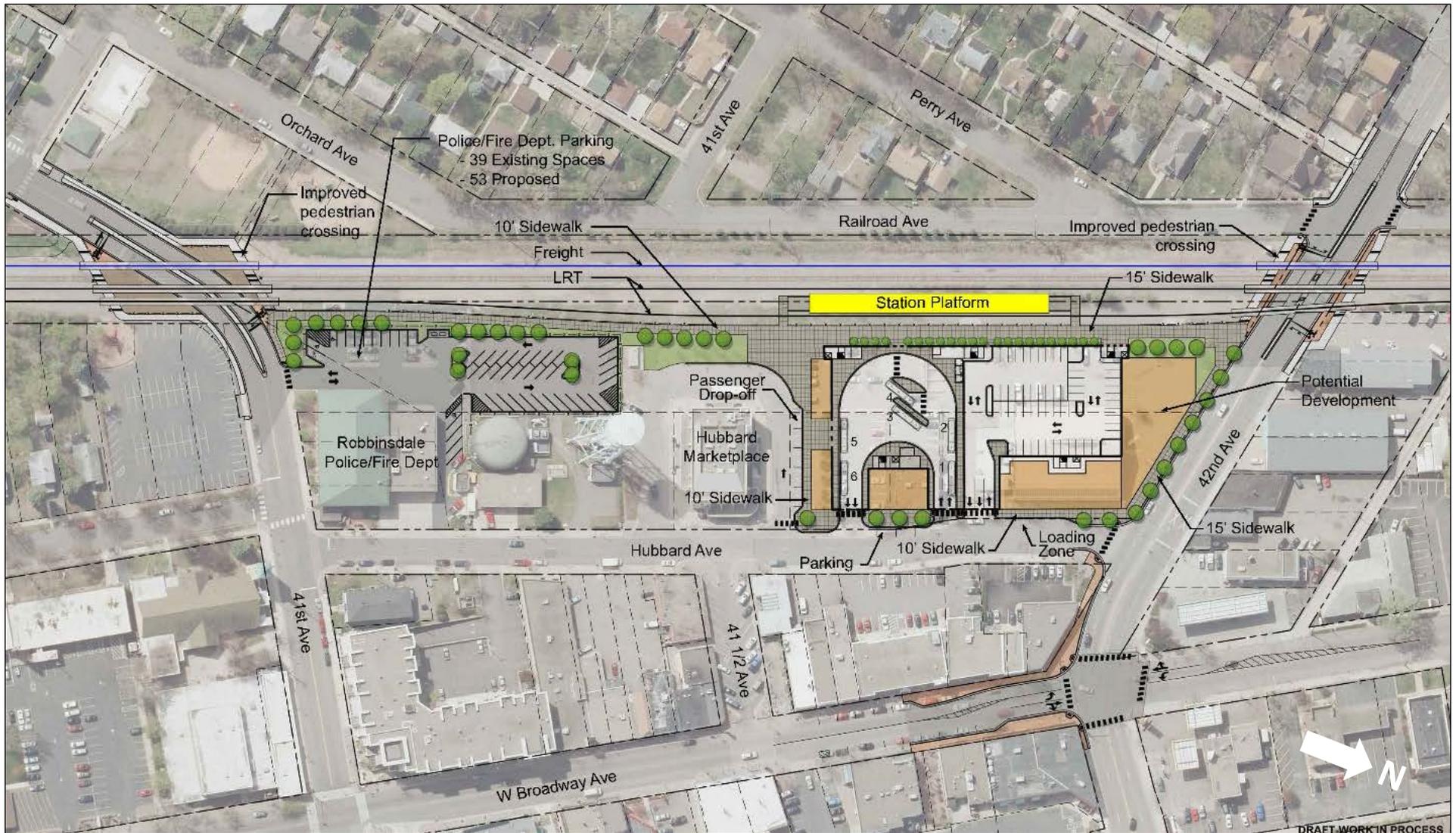
The Crystal Lake Regional Trail is located about 1,500 feet east of the Robbinsdale Station; cyclists would be able to access the station via 41st and 42nd avenues.

Existing pedestrian facilities would be improved at the proposed LRT crossing 45½ Avenue (about 1,300 feet north of TH 100). The proposed BLRT Extension project limits of disturbance would come within 10 feet of the existing trail in Lee Park but would not alter the trail itself.

Construction of the proposed BLRT Extension project would require closing the existing informal (and illegal) crossings of the BNSF track at Sohacki Park. Fences or other barriers to discourage pedestrian crossings would be necessary in these locations to preserve pedestrian safety near the LRT and freight tracks. Reconstructing the 36th Avenue bridge in this area (about ¾ mile south of the Robbinsdale Station) would also include restoring existing bicycle and pedestrian facilities.

Figure 4-7 illustrates the planned pedestrian accommodations at the proposed Robbinsdale Station.

Figure 4-7. Robbinsdale Station Area





Bass Lake Road Station Area

The proposed Bass Lake Road Station area provides a pedestrian bridge over Bottineau Boulevard and improved connections from trails and sidewalks along the south side of Bass Lake Road to reach the station. In addition, sidewalk connections would be provided or improved in the area of the proposed park-and-ride lot, including improved connections to Lakeland Avenue.

The Crystal Lake Regional Trail runs along the east side of Bottineau Boulevard; bicyclists and pedestrians would be able to use the existing crossing facilities at the Bass Lake Road intersection to connect to the Bass Lake Road Station.

South of Bass Lake Road, the proposed BLRT Extension project also includes improved pedestrian crossings of the LRT tracks at West Broadway Avenue (about 1 mile south of the Bass Lake Road Station) and Corvallis Avenue (about $\frac{2}{3}$ mile south of the Bass Lake Road Station).

Figure 4-8 illustrates the planned bicycle and pedestrian accommodations at the proposed Bass Lake Road Station.

63rd Avenue Station Area

The proposed 63rd Avenue Station area provides improved connections along 63rd Avenue area stands to reach the station and a proposed grade-separated connection from the parking ramp to the station to provide a safe means of accessing the station platform directly from the parking ramp.

The Crystal Lake Regional Trail runs along the east side of Bottineau Boulevard; bicyclists would be able to use the existing crossing facilities at the 63rd Avenue intersection to connect to the station.

Improved at-grade pedestrian crossings of the LRT/freight rail alignment would also be provided at 71st Avenue (about $\frac{1}{4}$ mile north of the 63rd Avenue Station).

Figure 4-9 illustrates the planned pedestrian accommodations at the proposed 63rd Avenue Station area.

Jolly Lane/75th Avenue Area

Just south of the Bottineau Boulevard/73rd Avenue intersection, the LRT alignment is proposed to transition from the BNSF rail corridor to a grade-separated crossing. The LRT would pass over both Bottineau Boulevard and 73rd Avenue and then descend to a run at grade in the center of West Broadway Avenue (see **Figure 4-10**). The introduction of the LRT alignment in the Jolly Lane area requires modifying roadway connections; the sidewalks in this area would be modified as well but would maintain pedestrian and bicycle connections to West Broadway Avenue.

The Crystal Lake Regional Trail currently ends at the I-94/I-694 interchange about $\frac{1}{2}$ mile south of 73rd Avenue. Hennepin County is planning to improve Bottineau Boulevard in this area in 2017; the roadway corridor improvements would include extending the trail. At 73rd Avenue, the trail would go under the proposed LRT bridge built over Bottineau Boulevard.

Figure 4-8. Bass Lake Road Station Area

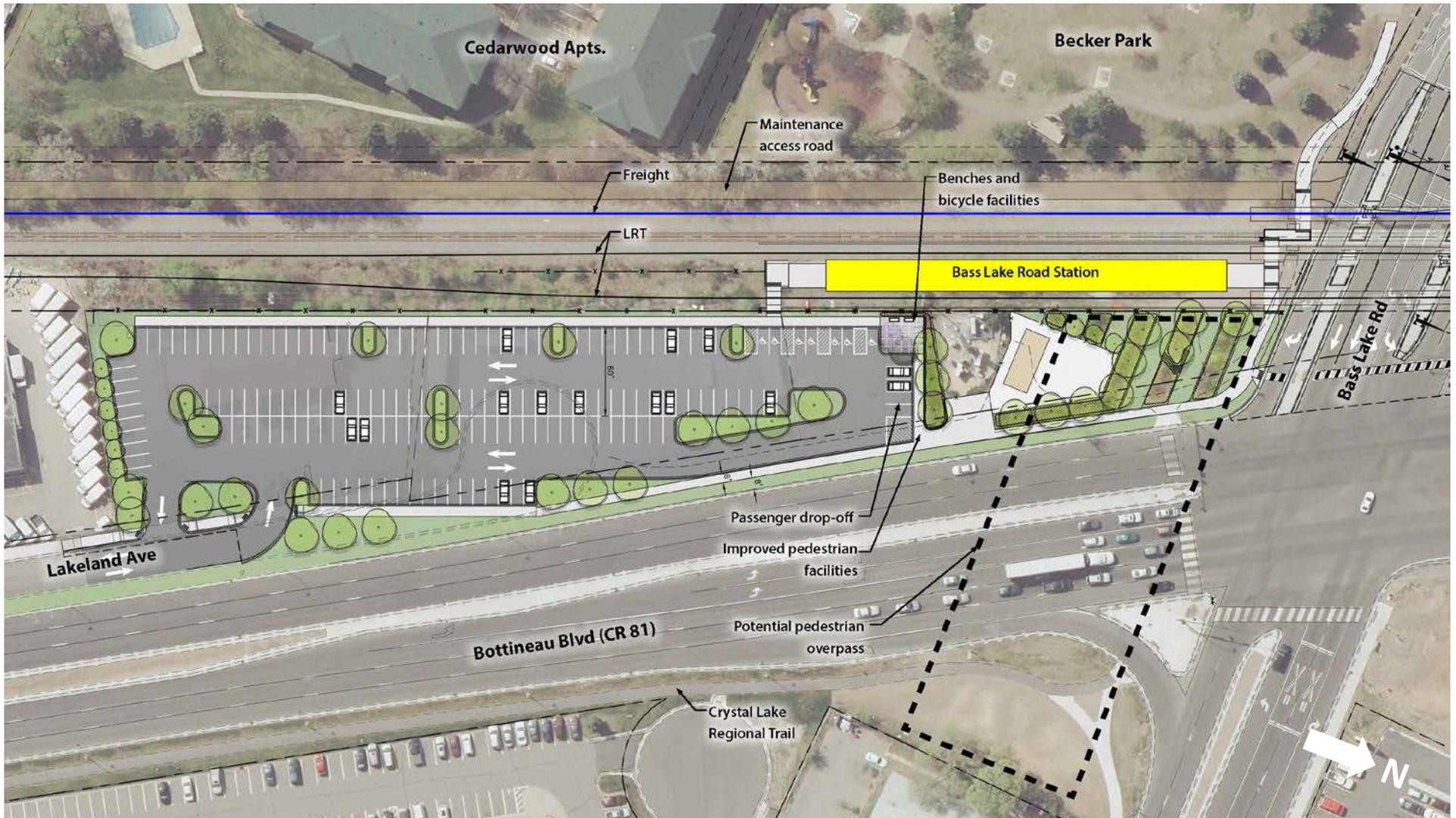




Figure 4-9. 63rd Avenue Station Area



Figure 4-10. Grade-Separated Crossing at 73rd Avenue and Jolly Lane/75th Avenue Area





West Broadway Avenue Station Area (including Brooklyn Boulevard, 85th Avenue, and 93rd Avenue Station Areas)

The proposed BLRT Extension project would require closing one pedestrian crossing of West Broadway Avenue in Brooklyn Park at a commercial property access about 400 feet north of the Brooklyn Boulevard/West Broadway Avenue intersection. An alternate crossing is available within $\frac{1}{8}$ mile of the closed crossing.

The proposed BLRT Extension project and programmed improvements by other agencies would considerably enhance the non-motorized transportation environment in comparison to the No-Build Alternative. A continuous bicycle/pedestrian facility between Candlewood Drive and 93rd Avenue is included in the design plans for the West Broadway Avenue reconstruction project, which has been programmed independently of the proposed BLRT Extension project and would be completed by Hennepin County. 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 the vicinity of 94th Avenue, where the LRT alignment transitions from running alongside the center of West Broadway Avenue to the western side of the street in new right-of-way. Any direct impacts to the trails would be mitigated through trail reconstruction. Trails are proposed to be constructed south of Candlewood Drive along West Broadway to 75th Avenue. A new signalized crossing would be constructed at 75th Avenue.

Reconstruction of the trails south of Candlewood Drive would be completed as a component of the proposed BLRT Extension project, thereby providing continuous facilities along both sides of West Broadway Avenue.

Figures 4-11, 4-12, and 4-13 illustrate the planned bicycle and pedestrian accommodations at the proposed West Broadway Avenue Station areas at Brooklyn Boulevard, 85th Avenue North, and 93rd Avenue North. At the Brooklyn Boulevard Station, the 76th Avenue/West Broadway Avenue intersection would be improved, and would include bus stop access and a secondary access to the station. Improvements to the Brooklyn Boulevard/West Broadway Avenue intersection would provide safer pedestrian crossings by eliminating free right turns and would provide the primary access to the station.

Figure 4-11. Brooklyn Boulevard Station Area





Figure 4-12. 85th Avenue Station Area

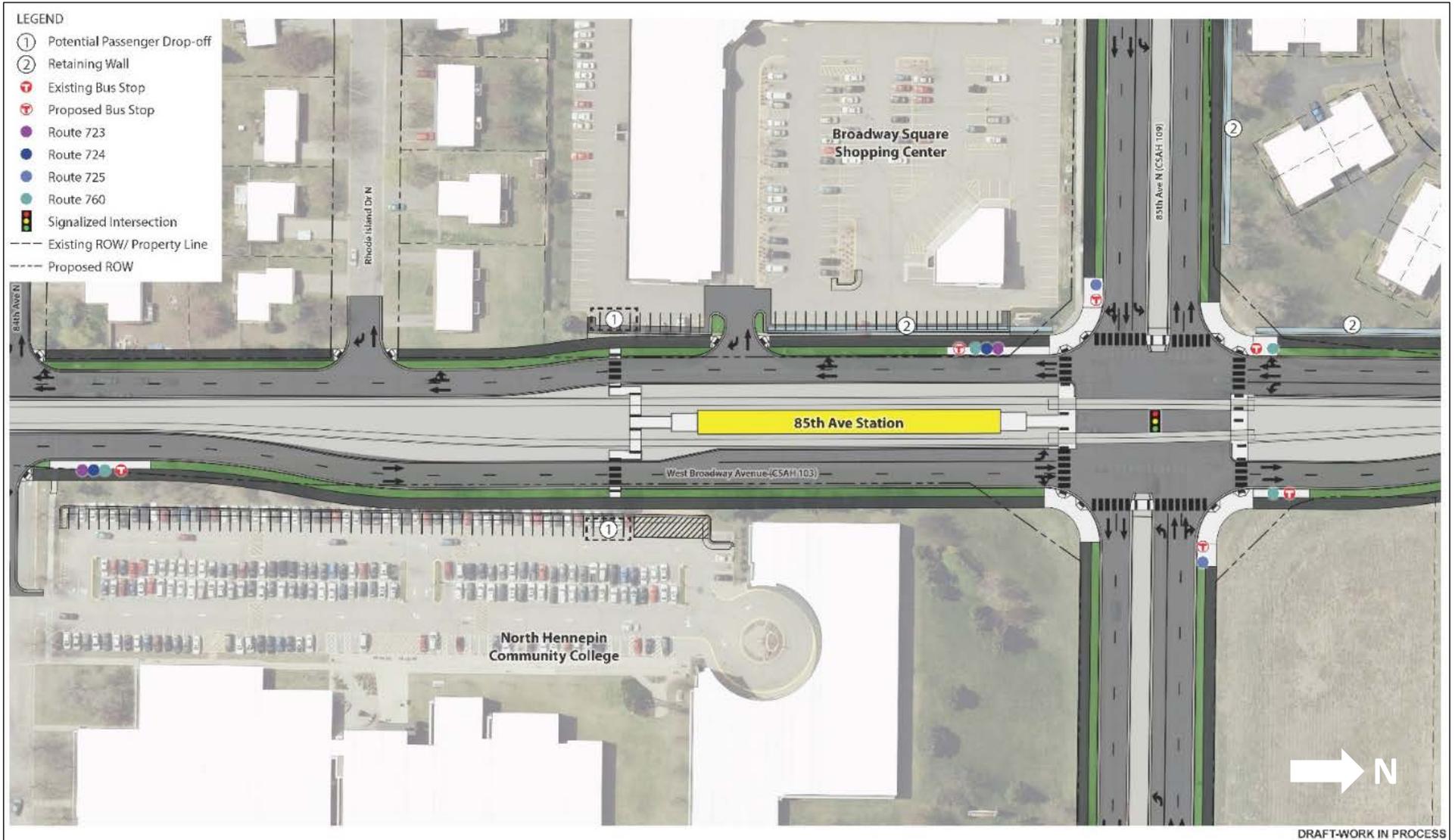
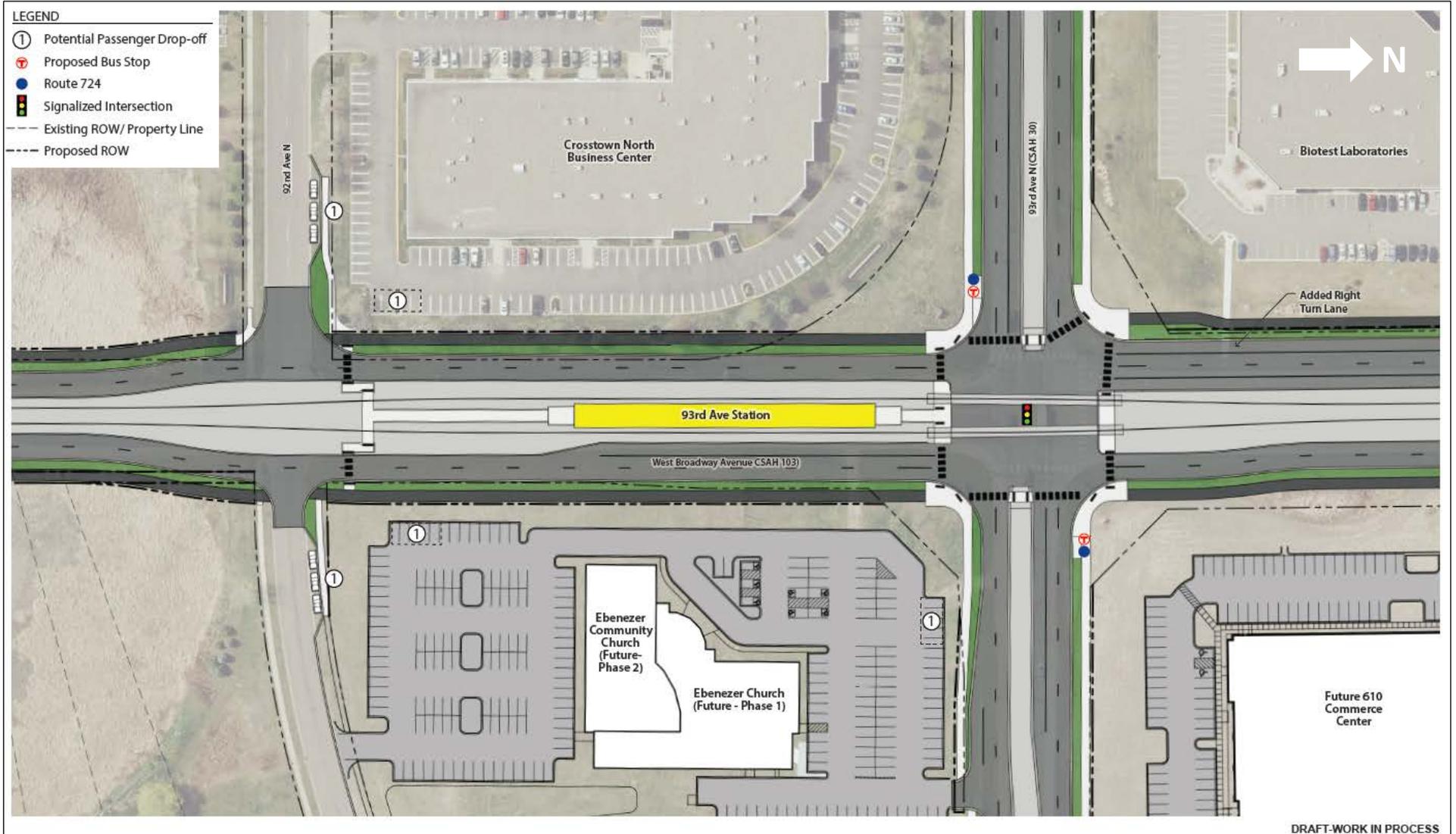


Figure 4-13. 93rd Avenue Station Area





In the area of the 85th Avenue Station, the pedestrian crossing at 84th Avenue and West Broadway Avenue would be closed. Pedestrian crossing facilities would be provided at a new signalized intersection at College Park Drive and West Broadway Avenue; this new intersection would provide full access to the North Hennepin Community College parking lot as well. Pedestrian access to the 85th Avenue Station would be from the 85th Avenue/West Broadway Avenue intersection as well as from a secondary access about 400 feet south of the intersection. The secondary access would also allow pedestrians to cross West Broadway Avenue.

Between the 85th Avenue and 93rd Avenue stations, improved pedestrian crossings of West Broadway Avenue would be located at the Maplebrook Parkway/West Broadway Avenue intersection and also at the Setzler Parkway/West Broadway intersection, where new, full-access signalized intersections would be constructed as part of the Hennepin County West Broadway Avenue reconstruction project.

Access to the 93rd Avenue Station would be provided at the improved 93rd Avenue/West Broadway Avenue intersection (also part of the Hennepin County West Broadway Avenue reconstruction project). Secondary access to the station would be provided by a crossing at 92nd Avenue; this crossing would be constructed as part of the proposed BLRT Extension project.

Bicycle access to LRT stations would use the same locations as those identified for pedestrians; the introduction of bicycle/pedestrian trails on either side of West Broadway Avenue (through the Hennepin County West Broadway Avenue reconstruction project) would further enhance bicycle access to BLRT.

Oak Grove Parkway Station Area

Extensive discussions with the city of Brooklyn Park and Hennepin County resulted in a preliminary layout realigning West Broadway Avenue, Oak Grove Parkway, and 101st Avenue (see **Figure 4-14**). This proposed roadway layout incorporates the Oak Grove Parkway Station and park-and-ride into a transportation network that would accommodate proposed development in the area. The intent of the proposed transportation network is to create a walkable, bicycle-friendly environment; therefore, the appropriate provisions for sidewalks and bicycle trails would be incorporated into the final design for the proposed BLRT Extension project in this area. Provisions for future connections (by others) to the Rush Creek Regional Trail, located just north of the OMF, would be included.

TPSS

TPSS sites associated with the proposed BLRT Extension project would have little to no impact on existing bicycle and pedestrian facilities.

Figure 4-14. Oak Grove Parkway Station Area





4.4.2 Construction-Phase (Short-Term) Impacts

4.4.2.1 No-Build Alternative

There would be no construction-phase impacts to pedestrians or bicyclists from the No-Build Alternative.

4.4.2.2 Proposed BLRT Extension Project

For the proposed BLRT Extension project, the Council anticipates that temporary closures or detours would affect existing bicycle 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 phase would be included by the Council in phasing plans.

4.5 Avoidance, Minimization, and/or Mitigation Measures

This section describes the measures that would be implemented to mitigate the long-term and short-term pedestrian and bicyclist impacts from the proposed BLRT Extension project. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures would address.

4.5.1 Long-Term Mitigation Measures

No mitigation measures are warranted for long-term impacts to pedestrians and bicyclists because the identified avoidance measures would prevent any adverse impacts. As described in [Section 3.4](#), the proposed BLRT Extension project includes a variety of pedestrian and bicyclist enhancements at station locations and at other LRT crossings.



4.5.2 Short-Term Mitigation Measures

The proposed BLRT Extension project would require short-term closures of sidewalks, trails, or roads (typically up to about 3 to 5 days), during which detour routes or facilities might not be provided.

Mitigation strategies to be taken in the event of temporary closures would be identified by the Council in the Construction Communication Plan, which would include a staging plan for implementation by the Council prior to and during construction. The purpose of the Construction Communication Plan is to prepare project-area residents, businesses, and commuters for construction; listen to their concerns; and develop plans to minimize disruptive effects. Strategies could include:

- Issuing and distributing regular construction updates
- Providing advance notice of roadway closures, driveway closures, and utility shutoffs
- Conducting public meetings
- Establishing a 24-hour construction hotline
- Preparing materials with information about construction
- Addressing property access issues
- Assigning staff to serve as liaisons between the public and contractors during construction

5 Parking

5.1 Methodology

This section describes parking in the study area and the effects of the No-Build Alternative and the proposed BLRT Extension project on the number and locations of parking spaces. The construction of LRT and associated modifications to roadway geometry would alter the supply of on-street and off-street parking. These changes could, in turn, reduce convenient access to businesses and residences.

Dedicated park-and-ride facilities have been identified by the Council as part of the proposed BLRT Extension project. All new park-and-ride facilities are not addressed as part of this impact assessment of existing parking conditions. See **Table 2-1** in **Section 2** for a summary of the locations and sizes of the proposed park-and-ride facilities, and see the *BLRT Traffic Operations Technical Report* for information regarding the effects of the proposed park-and-ride facilities on traffic.

The study area is characterized by highway facilities with no parking, arterial roads, local streets, frontage roads with some on-street parking, and off-street parking that serves commercial and institutional facilities.

The analysis in this section focuses on the impacts of the proposed BLRT Extension project on existing on-street and off-street parking. The Council reviewed the existing parking supply in the proposed BLRT Extension project corridor, which included reviewing aerial photographs and field



visits as well as project engineering drawings in order to assess the effects of changes in the parking supply.

5.2 Study Area

The study area for parking is defined as the proposed BLRT Extension project limits of disturbance.

5.3 Affected Environment

Vehicle parking in the study area is a combination of on-street parking and surface parking lots. Local jurisdictions have the authority to regulate parking, including introducing permit parking or other parking restrictions.

Almost all on-street parking is available to the public as either metered or unmetered spaces. There are some on-street parking spaces along certain frontage roads along Olson Memorial Highway and West Broadway at 42nd Avenue.

Off-street parking consists of a mix of public and private lots. Private off-street parking is restricted to authorized people. Off-street public parking spaces are available for commercial and retail businesses as well as park areas and facilities such as the TWRP Chalet parking lot. Other off-street parking facilities include parking lots for restaurants, churches, North Hennepin Community College, other public parks, and medical-related businesses. The public can use these parking lots only when they are using these facilities.

5.4 Environmental Consequences

5.4.1 Operating-Phase (Long-Term) Impacts

5.4.1.1 No-Build Alternative

There would be no operating-phase parking impacts from the No-Build Alternative.

5.4.1.2 Proposed BLRT Extension Project

Impacts to on-street and off-street parking resources were considered; the results of the analysis are shown in **Figure 5-1** and described below.



Olson Memorial Highway

Existing on-street parking would be affected by the proposed BLRT Extension project primarily on the frontage roads along Olson Memorial Highway. This impact would be caused by the configuration of the proposed reconstruction of the highway. As it developed the proposed BLRT Extension project, the Council tried to maintain frontage road connections and minimize the acquisition of right-of-way. Specifically, reconstructing the frontage roads on the north and south sides of Olson Memorial Highway would eliminate about 83 on-street parking spaces, as follows (see [Figure 5-1](#)):

- About 25 spaces along the frontage road on the north side of Olson Memorial Highway between Humboldt Avenue and Van White Memorial Boulevard
- About 50 spaces along the frontage road on the south side of Olson Memorial Highway between Knox Avenue North and the cul-de-sac west of Van White Boulevard
- About eight spaces along the frontage road on the north side of Olson Memorial Highway roughly one-half block east and west of Queen Avenue North

Robbinsdale Station Area

Several on-street parking spaces would also be eliminated on Hubbard Avenue and West Broadway Avenue near the Robbinsdale Station park-and-ride. Specific impacts include:

- About three spaces on the west side of Hubbard Avenue immediately south of 42nd Avenue
- About six spaces on the west side of West Broadway Avenue immediately south of 42nd Avenue
- City of Robbinsdale Police/Fire Department spaces west of the city buildings and east of the proposed BLRT Extension project alignment would be reconfigured. No net loss of spaces is anticipated.
- About 50 parking spaces would be eliminated from a parking lot for local businesses north of Hubbard Marketplace between 41st and 42nd avenues.
- Eleven diagonal parking spaces would be converted to five parallel parking spaces on the north side of the Hubbard Marketplace building.

As discussed in [Chapter 2](#) and shown in [Table 3.3-4](#) of the Final EIS, the proposed BLRT Extension project would include a 550-space park-and-ride facility for transit patrons adjacent to the Robbinsdale Station.



Figure 5-1. Parking Impacts





73rd Avenue/West Broadway Avenue Area

Off-street parking impacts would occur in the area just north of 73rd Avenue and west of West Broadway Avenue in Brooklyn Park. Impacts would include:

- Near 73rd Avenue, about 75 spaces would be eliminated from a retail center (7316 Lakeland Avenue) surface parking lot (about 20 percent of the existing parking lot). This reconfiguration is intended to accommodate the LRT alignment as it transitions from the BNSF rail corridor to West Broadway Avenue.
- At the eastern edge of the Target store (7535 West Broadway Avenue) parking lot, about 80 spaces would be eliminated to accommodate the reconstructed southbound lanes of West Broadway Avenue and the associated multipurpose trail. An additional 15 to 20 spaces would likely be lost at the southern edge of the parking lot as a result of reconfiguring the roadway connection between Jolly Lane and West Broadway Avenue. The total impact at this site would be up to 100 spaces lost out of about 1,200 spaces, or about 8 percent.

Oak Grove Parkway Station Area

Realigning Oak Grove Parkway on the east side of West Broadway Avenue north of TH 610 would require reconfiguring the Target North Campus parking lot. No net loss of spaces is anticipated.

Table 5-1 summarizes the number of parking spaces that would be eliminated by the proposed BLRT Extension project.

Table 5-1. Number of Parking Spaces Eliminated by the Proposed BLRT Extension Project

Alternative	Parking Spaces Eliminated		
	On-Street Spaces	Off-Street Spaces	Total Spaces
No-Build Alternative	0	0	0
Proposed BLRT Extension project	92	231	323

TPSS

The Council anticipates that TPSS sites would be located on available parcels that are adjacent to the guideway and would not directly affect existing on-street or off-street parking.



5.4.2 Construction-Phase (Short-Term) Impacts

5.4.2.1 No-Build Alternative

There would be no construction-phase parking impacts from the No-Build Alternative.

5.4.2.2 Proposed BLRT Extension Project

On-street parking spaces could be temporarily removed at locations to facilitate construction of the proposed BLRT Extension project (for example, to facilitate truck movements or to provide a temporary truck loading zone). These potential temporary removals of on-street parking spaces would be identified as part of a construction staging plan prior to construction. At the Council's direction, the contractor would reduce the loss of parking spaces during construction to the extent possible.

5.5 Avoidance, Minimization, and/or Mitigation Measures

This section describes the measures that would be implemented to mitigate the long-term and short-term parking impacts from the proposed BLRT Extension project. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures would address.

5.5.1 Long-Term Mitigation Measures

Where off-street parking spaces would be lost but buildings and businesses remain, the Council would compensate business owners for the loss of off-street parking spaces, including potential associated losses in business revenues. The Council would compensate property owners based on the terms of the purchase agreement between the Council and the property owner in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act). Refer to [Section 4.3 – Acquisitions and Displacements](#) of the Final EIS for additional information regarding the Uniform Act.

The Council would coordinate mitigation for the loss of on-street parking spaces with local jurisdictions (the cities of Minneapolis and Robbinsdale) to identify whether suitable replacement locations are necessary. In Minneapolis, the character of the proposed Olson Memorial Highway has been designed to facilitate multimodal transportation options with greater emphasis on transit, bicycle, and pedestrian modes. Furthermore, parking would remain on nearby streets and at off-street parking lots associated with the adjacent buildings. As a result, mitigating lost parking spaces might not be necessary. Similarly, the city of Robbinsdale is exploring transit-oriented development in the Robbinsdale Station area. This could preclude the need for parking mitigation or provide the opportunity for parking that is better integrated into planned development.

5.5.2 Short-Term Mitigation Measures

During construction, some on-street parking spaces could be removed to facilitate construction of the proposed BLRT Extension project and associated roadway and freight rail modifications (for example, to facilitate truck movement or provide a temporary truck loading zone). To address these



impacts, the Council would develop a Construction Mitigation Plan to address temporary parking loss during the construction of the proposed BLRT Extension project. Construction activities would be phased; therefore, many of the spaces lost during construction would be lost for only part of the construction phase.

6 Aviation

6.1 Methodology

According to the Federal Aviation Administration's (FAA) *Advisory Circular (AC 150/5300-13A)*, a Runway Protection Zone (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 airport 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 two-thirds of the total runway length; State Safety Zone B is typically one-third of the total runway length and extends from State Safety Zone A. The Metropolitan Airports Commission (MAC) adopted an airport zoning ordinance applicable to Crystal Airport on August 25, 1952. This ordinance provides additional guidance on the use of property near Crystal Airport.

The FAA Office of Airports issued a memorandum on September 27, 2012, that presents interim guidance on land uses within RPZs. This memorandum clarifies what constitutes a compatible land use within an RPZ, as identified in *FAA Advisory Circular 150/5300-Change 17 (Airport Design)*. The memorandum states that "it is desirable to clear all objects from the RPZ," but the memorandum also acknowledges that "some uses are permitted" with conditions while other "land uses are prohibited." The memorandum also provides guidance on how to evaluate proposed land uses within an RPZ. The proposed BLRT Extension project is considered by FAA to be a local development (transportation facility) proposed in the RPZ (either new or reconfigured).

In accordance with the September 27, 2012, FAA policy guidance, FAA requested that the Council prepare an RPZ Alternatives Analysis (AA) specific to the proposed BLRT Extension project alignment that would encroach on the Crystal Airport RPZ for Runway 6L-24R. A small segment of the existing BNSF track currently passes through the corner of the Runway 6R-24L RPZ. Runway 6R-24L is a 2,102-foot turf runway and is scheduled to be decommissioned by MAC in the next 3 to 7 years. Because of the scheduled closure of Runway 6R-24L, the RPZ AA focuses on the Runway 6L-24R (Runway 6L) RPZ only.

On October 18, 2013, the Federal Transit Administration (FTA) submitted to FAA a Draft RPZ AA for its initial review and consideration. FAA provided written comments on November 12, 2013, and these comments were discussed at a coordination meeting among MAC, FAA, Hennepin County, and the Council. FTA updated the Draft RPZ AA to address FAA's initial comments and resubmitted the draft to FAA for its review on January 24, 2014. Someone held a subsequent meeting with FAA on February 4, 2014, to review the revised Draft RPZ AA with FAA. Based on the direction provided at the February 4 meeting, FTA submitted a revised RPZ AA 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 LRT alignment vertically and horizontally, both within and outside the Runway 6L RPZ; modifications that shift the location of the RPZ; and operational alternatives that address the coexistence of aircraft and LRT simultaneously in the RPZ.

6.2 Study Area

The only aviation facility within the limits of disturbance of the proposed BLRT Extension project is Crystal Airport. The study area for aviation is defined as the area that is within the proposed BLRT Extension project limits of disturbance and within the Runway 6L RPZ and State Safety Zone A for Runway 6L but outside the Crystal Airport property boundary.

The size of the RPZ for Runway 6L is based on the design aircraft of the runway, which is a B-1 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.

6.3 Affected Environment

Crystal Airport is one of seven airports owned and operated by MAC. The airport is designed for B-1 small aircraft. Based on FAA control tower counts, the total number of operations at Crystal Airport in 2014 was 49,550. The BNSF rail corridor, which runs parallel to Bottineau Boulevard and is about 3 to 4 feet higher in elevation than the adjacent ground west and east of the BNSF rail corridor, passes through the existing Runway 6L RPZ. The approximate length of the existing freight rail track within the RPZ is 435 feet. 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 the BNSF right-of-way and outside the proposed BLRT Extension project's identified limits of disturbance.



6.4 Environmental Consequences

6.4.1 Operating-Phase (Long-Term) Impacts

6.4.1.1 No-Build Alternative

The No-Build Alternative would not include any improvements within the RPZ; therefore, there would be no operating-phase aviation impacts from the No-Build Alternative.

6.4.1.2 Proposed BLRT Extension Project

With the proposed BLRT Extension project, the existing BNSF tracks would be relocated about 15 feet west of the current location, and two LRT tracks would be constructed immediately east of the BNSF tracks. 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 would be about 425 feet each.

The proposed speed of the LRT at this location is about 55 mph. Therefore, the train would be in the RPZ for about 5 seconds per operation. The Council anticipates that trains would operate in this area about every 10 minutes throughout the day.

Airports define runways as having several imaginary surfaces, one of which is the approach surface, which is used as a boundary to determine whether an object would extend upward into navigable airspace. The height of the proposed BLRT Extension project's LRT vehicle is about 16 feet, or about 16.5 feet below Runway 6L's approach surface.

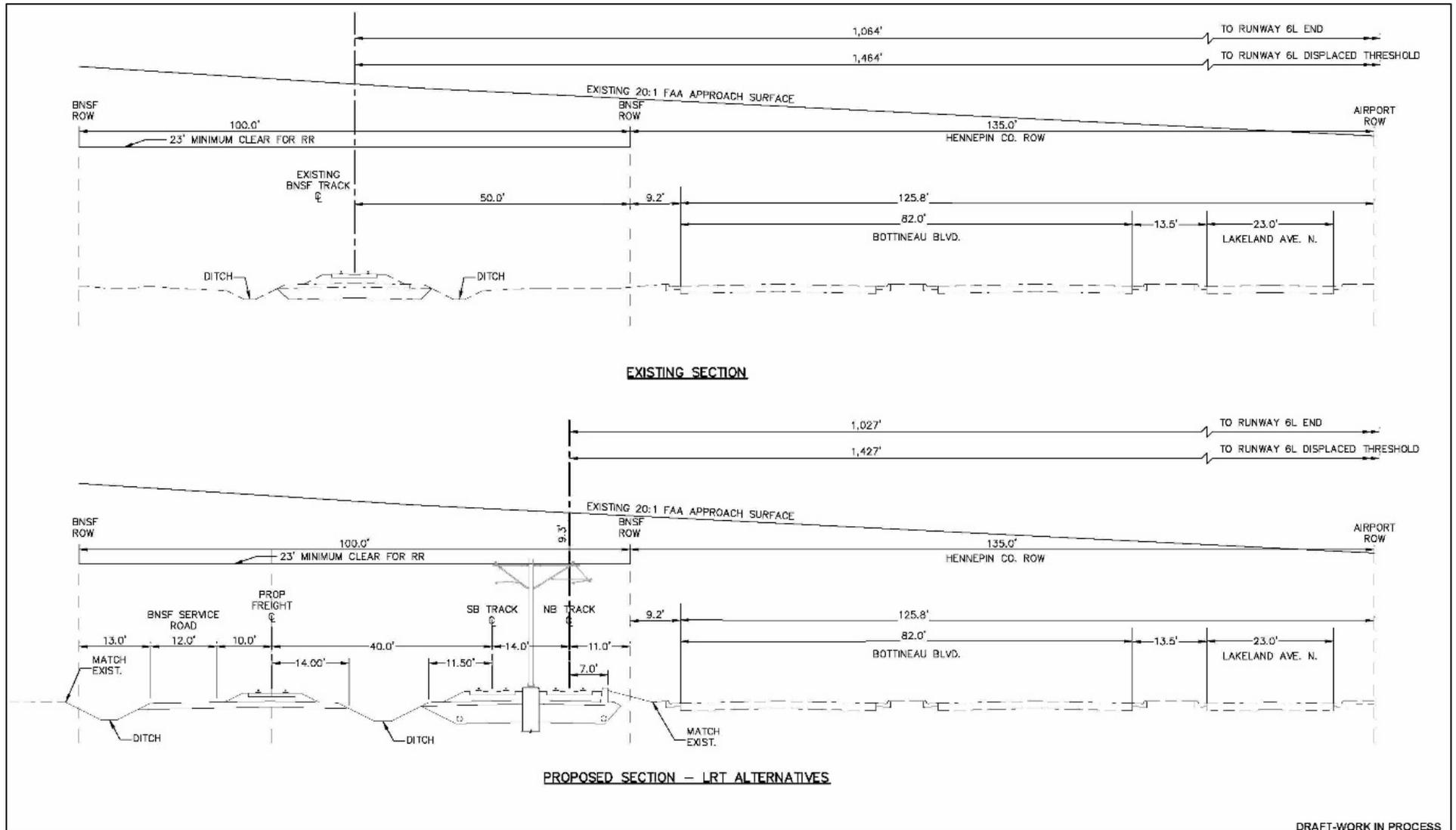
Overhead catenary system (OCS) poles about 23 feet 4 inches high would be located about 200 feet apart. The poles would be located to maximize the distance from the poles to the RPZ centerline. The Council anticipates that the poles could be located about 100 feet left and right of the extended runway centerline. Final OCS pole spacing and locations would be determined during the final design of the proposed BLRT Extension project.

The proposed BLRT Extension project would affect areas within the controlled activity area and the central portion of the RPZ.⁴ 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). During development of the proposed BLRT Extension project, the Council shifted the LRT alignment 10 feet to the east—still within the BNSF right-of-way, but slightly closer to the airport. **Figure 6-1** illustrates the impacts to the RPZ.

⁴ The RPZ includes two areas: (1) the central portion, which is a rectangular area centered on the runway centerline, and (2) the controlled activity areas, which are triangular areas extending from the central portion that are narrower near the runway and wider farther from the runway.



Figure 6-1. Crystal Airport Runway Protection Zone and State Safety Zone Effects





6.4.2 Construction-Phase (Short-Term) Impacts

6.4.2.1 No-Build Alternative

The No-Build Alternative would not involve any improvements within the RPZ; therefore, there would be no construction-phase impacts on the aviation from the No-Build Alternative.

6.4.2.2 Proposed BLRT Extension Project

Construction of the proposed BLRT Extension project, including the overhead catenary system, would occur within the Runway 6L RPZ. Construction operations and phasing in the RPZ would be coordinated with MAC and FAA during the proposed BLRT Extension project's final design phase to mitigate these impacts. The Council would complete FAA's *Form 7460 – Notice of Proposed Construction or Alteration* during final design. The Council would consider the Form 7460 process complete if FAA were to issue a statement of no objection to the proposed activity.

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

6.5 Avoidance, Minimization, and/or Mitigation Measures

This section describes the measures that would be implemented to mitigate the long-term and short-term aviation impacts from the proposed BLRT Extension project. For each mitigation measure or set of associated mitigation measures, this section generally notes the anticipated impact or associated impacts that the mitigation measures would address.

As discussed in [Section 6.1](#), an RPZ AA was performed, in conformance with the FAA memorandum *Interim Guidance on Land Uses within a Runway Protection Zone*, to identify the full range of alternatives that could avoid and/or minimize the effects of the proposed BLRT Extension project on the land use within the RPZ as well as mitigate the risks to people and property on the ground. The RPZ AA reviewed several alternatives to minimize impacts to the RPZ. The recommendation identified in the RPZ AA was that Alignment C, as defined in the Draft EIS locally preferred alternative, was the Preferred Alternative. FAA reviewed the findings and recommendations of the RPZ AA and stated in a letter dated November 24, 2014, that it concurred with the RPZ AA findings.

Because of the shift in the LRT alignment noted above in [Section 6.4.1.2](#), the Metropolitan Council provided updated information regarding the position of the LRT catenary system to FAA on November 20, 2015, along with the Council's opinion that the shift in alignment would not alter the RPZ AA; FAA concurred with the Council's analysis in a letter dated December 28, 2015.



MAC is in the process of updating the Crystal Airport Layout Plan. An Airport Layout Plan is a planning tool that aviation authorities use to depict both existing facilities and planned development for an airport. The Crystal Airport Layout Plan identifies the boundaries and proposed additions that are owned or controlled by the Airport and planned to be used 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 proposed BLRT Extension project would modify the existing conditions within the RPZ.

Based on the decisions rendered by FAA through the RPZ AA and confirmed through FAA's issuance of a letter of no objection (Form 7460 application), the proposed BLRT Extension project would be included in the updated Crystal Airport Layout Plan.

7 References

Blue Line Extension Travel Demand Model Estimates (SRF Consulting Group, 2015)

METRO Blue Line Light Rail Extension LRT Travel Time Estimates (Feb 2015)

Americans with Disabilities Act (ADA) in www.ada.gov/2010ADASTandards_index.htm