Chapter 2
Alternatives Considered

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Acronyms / Abbreviations

BRT ..... Bus Rapid Transit
DEIS ..... Draft Environmental Impact Statement
EIS ..... Environmental Impact Statement
FTA ..... Federal Transit Administration
GBNRTC ..... Greater Buffalo-Niagara Regional Transportation Council
LPA ..... Locally Preferred Alternative
LRT ..... Light Rail Transit
Metro ..... Niagara Frontier Transit Metro System, Inc.
Metro Rail ..... Metro Light Rail Transit Line
NEPA ..... National Environmental Policy Act
NFTA ..... Niagara Frontier Transportation Authority
Project ..... Buffalo-Amherst-Tonawanda Corridor Transit Expansion
ROD ..... Record of Decision
STOPS ..... Simplified Trips-on-Project Software
TSP ..... Traffic Signal Priority
UB ..... University at Buffalo

2. Alternatives Considered

This chapter describes the alternatives considered for the Buffalo-Amherst-Tonawanda Corridor Transit Expansion (the Project) in this Draft Environmental Impact Statement (EIS). Two build alternatives are considered – the Light Rail Transit (LRT) Build Alternative and the Bus Rapid Transit (BRT) Build Alternative compared to the No Build Alternative.

2.1 ALTERNATIVES DEVELOPMENT PROCESS

In 2012 the Niagara Frontier Transit Metro System, Inc. (Metro) and Greater Buffalo-Niagara Regional Transportation Council (GBNRTC) initiated an Alternatives Analysis process to evaluate high-quality public transit service alternatives between Downtown Buffalo, Buffalo's Main Street Metro Rail Corridor, and the Town of Amherst. GBNRTC is the Metropolitan Planning Organization for Erie and Niagara Counties. The goal of the Alternatives Analysis effort was to improve public transit access between key activity centers in Buffalo and Amherst, to provide enough information to support the recommendation of a Locally Preferred Alternative (LPA), and to provide the information necessary for GBNRTC to adopt the LPA as part of the region's fiscally constrained long-range transportation plan. A detailed description of the development and identification of alternatives are documented in Appendix B1, "LRT Build Alternative and BRT Build Alternative Supplemental Information." Additional information on the Project's background and the alternatives evaluated as part of the Alternatives Analysis process entitled "Transit Options Amherst-Buffalo,"[1] can be found Appendix A2, "Alternatives Considered."

2.2 ALTERNATIVES EVALUATED IN THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

2.2.1 No Build Alternative

The No Build Alternative is a required alternative as part of the NEPA environmental analysis and is used for comparison purposes to assess the relative benefits and impacts of implementing the proposed Project Build Alternatives.

The No Build Alternative represents the future conditions of transportation facilities and services in 2040 without the Project being built. Metro would continue to operate the existing Metro Rail system between University Station and Canalside Station, including the new DL&W Station. Metro will continue to operate Metro Bus service in the study area, and UB will continue operation of the Stampede bus service between the North and South Campuses.

The No Build Alternative would include projects that are already committed to and planned by other agencies and entities. For example, the GBNRTC Transportation Improvement Program

[1] *https://www.nftametrotransitexpansion.com/document_library*

includes a roadway improvement project within the study area along North Forest Road in Amherst between Route 263 (Millersport Highway) and Dodge Road. The project entails pavement resurfacing for a 1.67-mile stretch of North Forest Road. The Town of Amherst is considering converting John James Audubon Parkway to a two-lane roadway utilizing the southbound lanes and abandoning the northbound lanes between the traffic circle at Lee Road and Dodge Road.

2.2.2 LRT Build Alternative

The LRT Build Alternative is an approximately 7-mile extension of Metro Rail, Metro's existing electric-powered LRT system. The LRT extension would be primarily at grade, except for two segments. One is a 0.8-mile underground segment from the existing Metro Rail University Station (which is currently underground) to Niagara Falls Boulevard where the LRT Build Alternative would exit the tunnel and operate at grade level. The other is a 0.3-mile underground segment at the intersection of Maple Road and Sweet Home Road. At this location, the LRT Build Alternative would operate under the Maple Road and Sweet Home Road intersection then continue adjacent to Sweet Home Road under the I-290 Interstate overpass. Ten stations are proposed (two with park-and-ride facilities) and an overnight storage and light maintenance facility located near the proposed I-990 Station.

2.2.3 BRT Build Alternative

The BRT Build Alternative would provide electric-powered transit service north from the existing Metro Rail University Station for approximately seven miles along the same at-grade alignment as the LRT Build Alternative, except for the underground portions from University Station along Kenmore Avenue and onto Niagara Falls Boulevard and the segment at the intersection of Maple and Sweet Home Roads. The BRT Build Alternative would have the same number of stations in the same locations; however, a transfer would be required between the existing Metro Rail University Station to the BRT service. A new BRT vehicle storage and maintenance facility would also be required at the proposed I-990 Station and northern terminus or end of the line.

2.3 BUILD ALTERNATIVES ALIGNMENTS

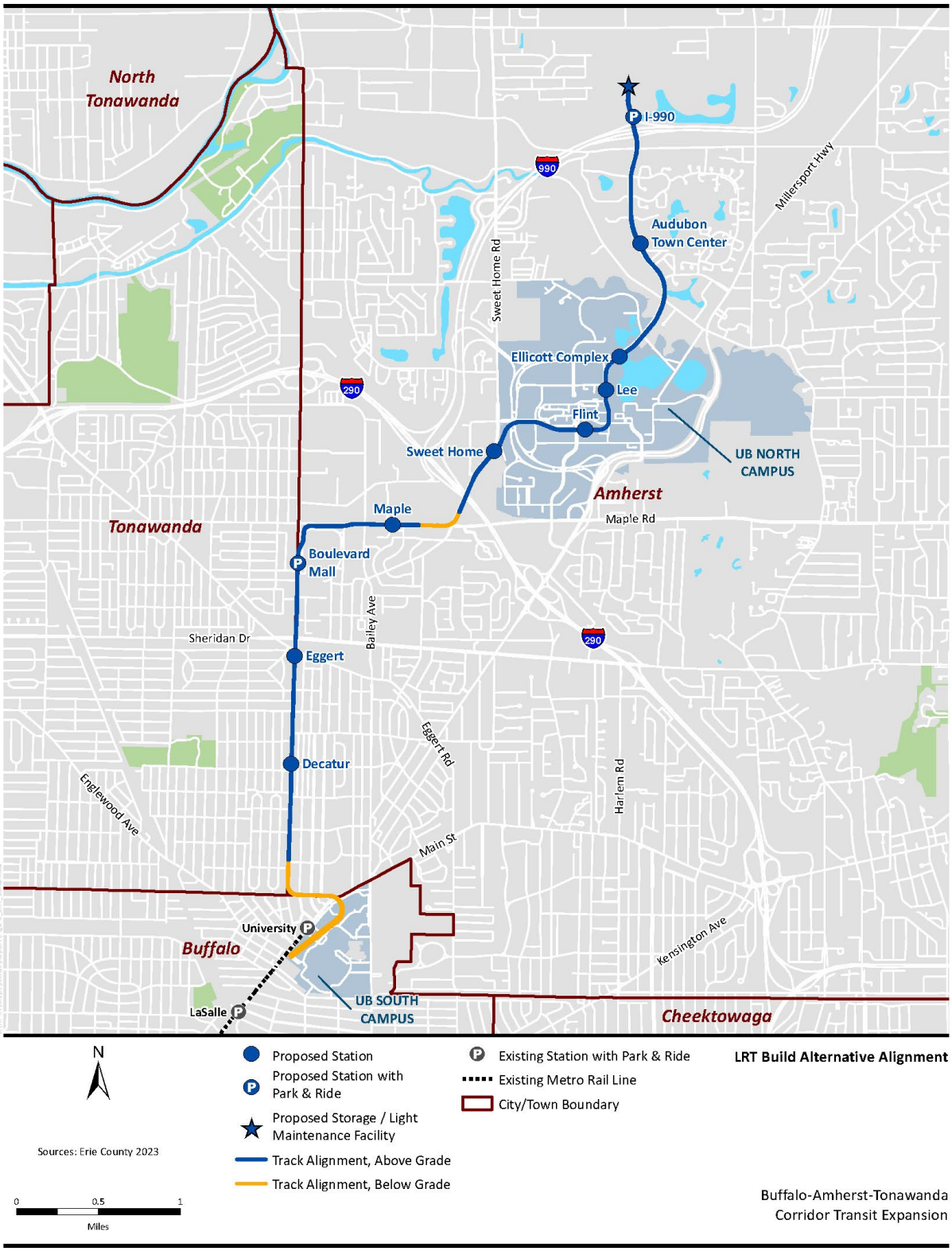
2.3.1 LRT Build Alternative

Figure 2-1 presents the LRT Build Alternative alignment, and the conceptual design plans are included in Appendix B2, "Conceptual Design Plans," of this DEIS. The LRT Build Alternative would be constructed primarily within existing transportation right-of-way. However, portions of the LRT Build Alternative, along Niagara Falls Boulevard, would be constructed in areas where there is insufficient right-of-way width. Section 4.1 describes the property acquisitions and displacements that could result from the LRT Build Alternative.

Portions of the LRT Build Alternative track would be built on top of ballast. Ballast is defined as gravel or coarse stone used to form the bed of a railroad track. LRT track with ballast cannot be safely traversed by automobile traffic, therefore left-turn movements from crossing streets at unsignalized intersections will not be permitted. It is anticipated that either one or a combination of the following measures will be used to restrict these left-turn movements: physical separation (i.e., a curb), rail crossing gates, and/or warning signals.

Portions of the LRT Build Alternative alignment (Niagara Falls Boulevard between Princeton Road and Treadwell Road and Maple Road between Alberta Drive and Sweet Home Road) would be unballasted or embedded track. Embedded track is defined as track that is set within a medium (concrete slab or other) and is level with the roadway. This embedded track is commonly found at railway crossings. As a result of being flush with the roadway, automobile traffic can safely traverse the tracks.

Figure 2-1. LRT Build Alternative Alignment



University Station

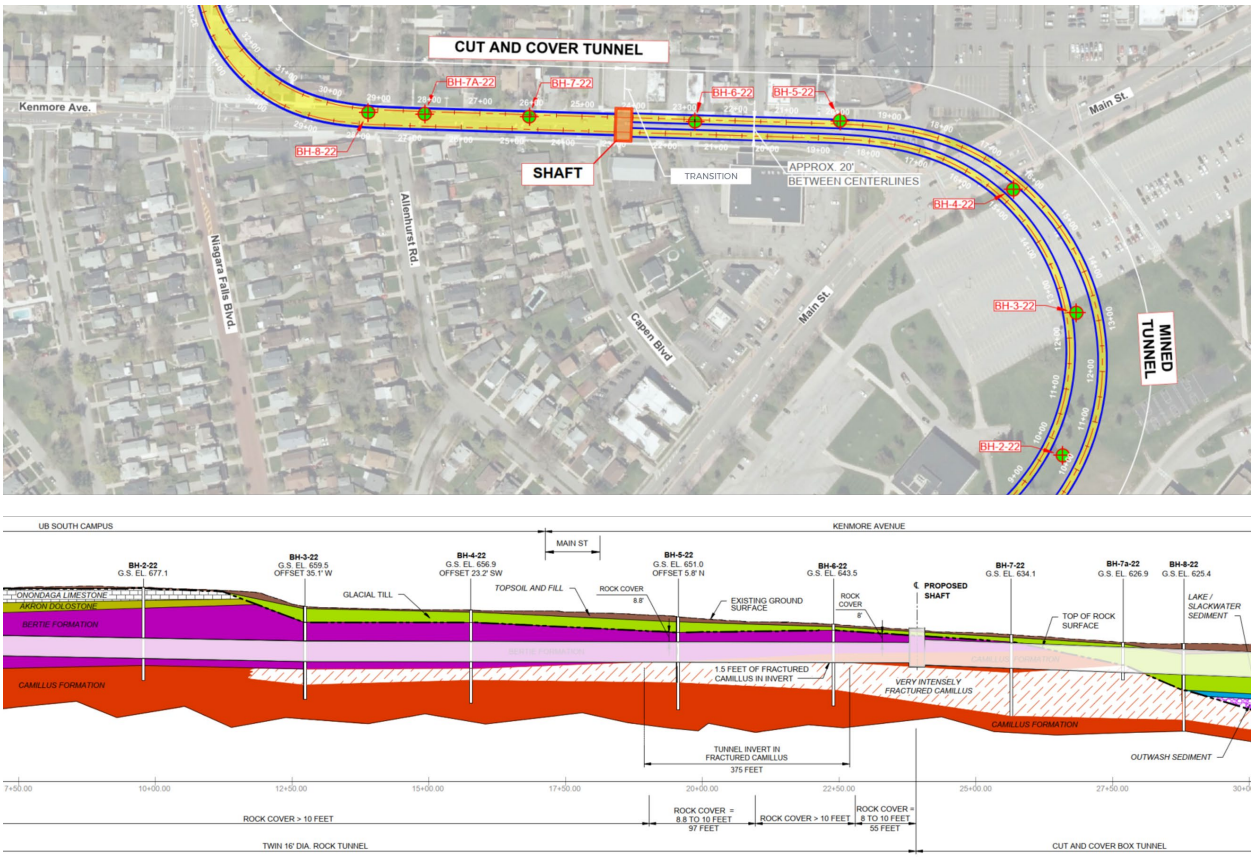
The LRT Build Alternative would travel from University Station underground in two independent 16-foot single-track tunnels that would use the existing rail track and tunnel segments located at University Station (Figure 2-2).

Figure 2-2. LRT Build Alternative Alignment at University Station

The tunnels would cross Main Street and travel west within the existing right-of-way of Kenmore Avenue using two types of construction methods; mined tunnel and cut and cover construction. The transition from a mined tunnel, extending from the University Station, to cut

and cover would occur immediately east of Kenmore Avenue and Capen Boulevard, resulting in approximately 1,750 feet of mined tunnel and 1,750 feet of cut and cover tunnel construction (Figure 2-2). The mined tunnel would be at a depth of greater than 10 feet for approximately 1,445 feet and between 8-10 feet of depth for approximately 305 feet. The mined tunnel construction would require minimal blasting given the strength of the Bertie Rock Formation within which the tunnel would be constructed.

Figure 2-3. University Tunnel Construction Methods (Top) and Tunnel Profile (Bottom)



Kenmore Avenue

The LRT Build Alternative alignment would continue underground along Kenmore Avenue between Main Street and Niagara Falls Boulevard. At the intersection of Kenmore Avenue and Niagara Falls Boulevard the tunnel would then head north under two parcels and mostly within the existing right-of-way of Niagara Falls Boulevard.

Niagara Falls Boulevard

The LRT Build Alternative alignment would continue underground on Niagara Falls Boulevard until emerging from a portal near the intersection of Kenilworth Avenue, where the alignment would be at grade in the median of Niagara Falls Boulevard, as summarized in Table 2-1and Table 2-2 and Figure 2-4 through Figure 2-6.

Figure 2-4. Existing and LRT Build Alternative Typical Cross Sections along Niagara Falls Boulevard near Ford Avenue

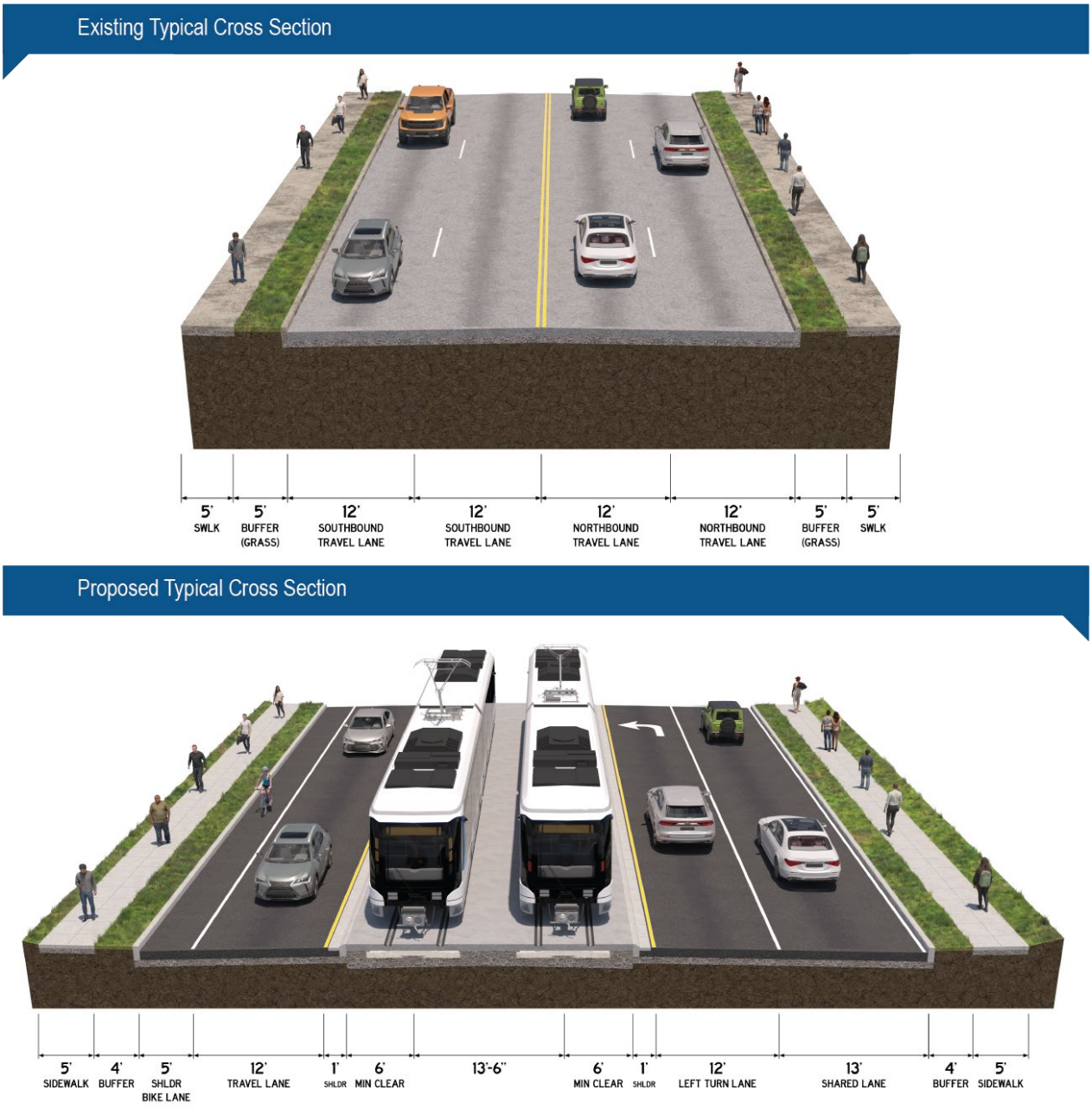


Table 2-1. Typical Cross Sections along Niagara Falls Boulevard near Ford Avenue

Cross Section Element	Existing Typical	LRT Build Alternative Typical
Number of Travel Lanes (per direction)	2	1
Width of Southbound Travel Lanes (feet)	12 each	12
Width of Northbound Travel Lanes (feet)	12 each	-
Width of Northbound Shared Travel Lane and Bike Lane (feet)	-	13
Northbound Left Turn Lane (feet)	-	12
Transit Alignment Cross Section (feet)	-	27.5
Transit Station Width (per direction in feet)	-	-
Southbound Paved Shoulder and Bike Lane Width (feet)	-	5
Outside Buffer (snow removal storage, per direction in feet)	5	4
Sidewalk Width (per direction in feet)	5	5
Subtotal (feet)	**68**	**87.5**

Figure 2-5. LRT Build Alternative Alignment at Niagara Falls Boulevard and Maple Road

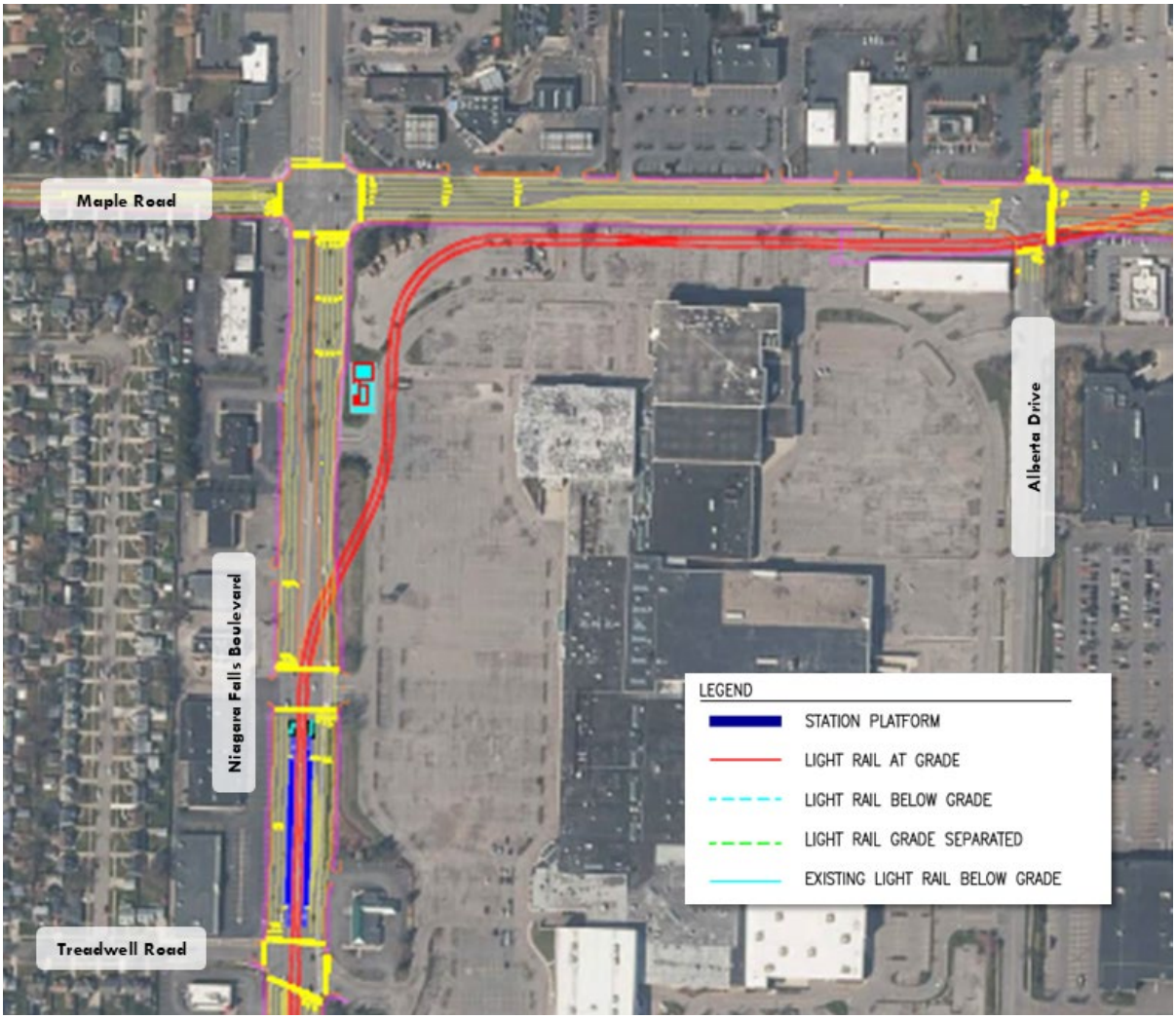


Figure 2-6. Existing and LRT Build Alternative Typical Cross Section along Niagara Falls Boulevard at Treadwell Road (Boulevard Mall Station)

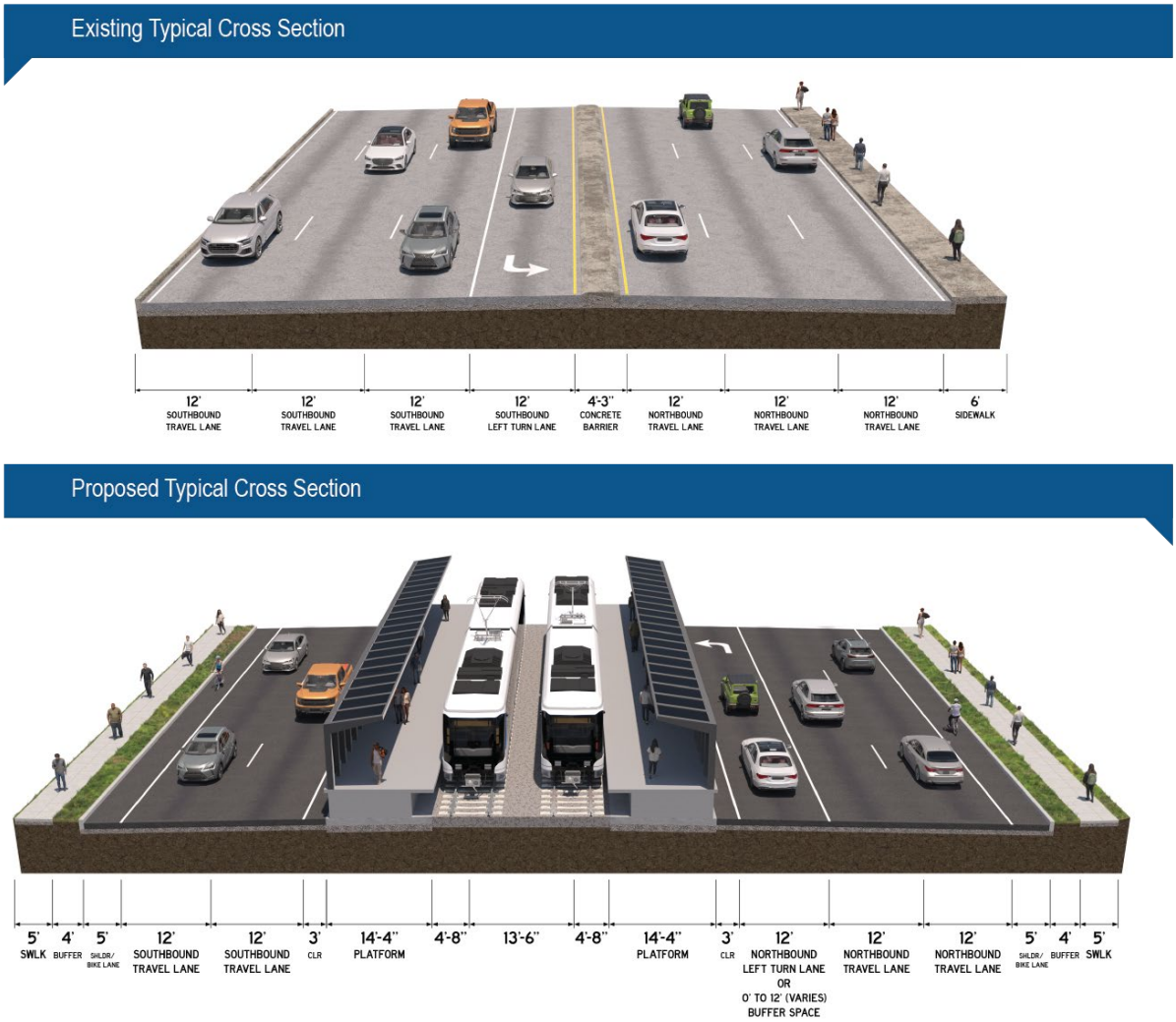


Table 2-2. Typical Cross Sections along Niagara Falls Boulevard at Treadwell Road (Boulevard Mall Station)

Cross Section Element	Existing Typical	LRT Build Alternative Typical
Number of Travel Lanes (per direction)	3	2
Width of Travel Lanes (per direction in feet)	12	12
Width of Southbound Left Turn Lane (feet)	12	-
Width of Northbound Left Turn Lane or Buffer (feet)	-	0 - 12
Center Median (feet)	4.25	-
Transit Alignment Cross Section (feet)	-	22.83
Transit Station Width (per direction in feet)	-	17.3
Paved Shoulder and Bike Lane Width (per direction in feet)	-	5
Outside Buffer (snow removal storage, per direction in feet)	-	4
Sidewalk Width (per direction in feet)	6 (northbound only)	5
Subtotal (feet)	**94.25**	**133.43 - 145.43**

Maple Road

The LRT Build Alternative would continue within the Boulevard Mall property, adjacent to Maple Road. At the intersection of Maple Road and Alberta Drive, the LRT Build Alternative alignment would traverse the intersection back into the median of Maple Road (as shown in Figure 2-5). The LRT Build Alternative alignment would continue to operate in the median of Maple Road until and just after the proposed Maple Station. Figure 2-7 compares the existing to the proposed cross section along Maple Road at the proposed Maple Station (Table 2-3 summarizes this comparison). The LRT Build Alternative alignment would then transition to a 0.3-mile underground grade-separated segment beneath the intersection of Maple Road and Sweet Home Road and emerge on the east side of Sweet Home Road.

This grade-separated segment would minimize the transportation impacts at the intersection of Maple Road and Sweet Home Road by not introducing LRT into the signal phasing. See Chapter 3, "Transportation," for the traffic analysis conducted for the alternatives.

Figure 2-7. Existing and LRT Build Alternative Typical Cross Section at Maple Station

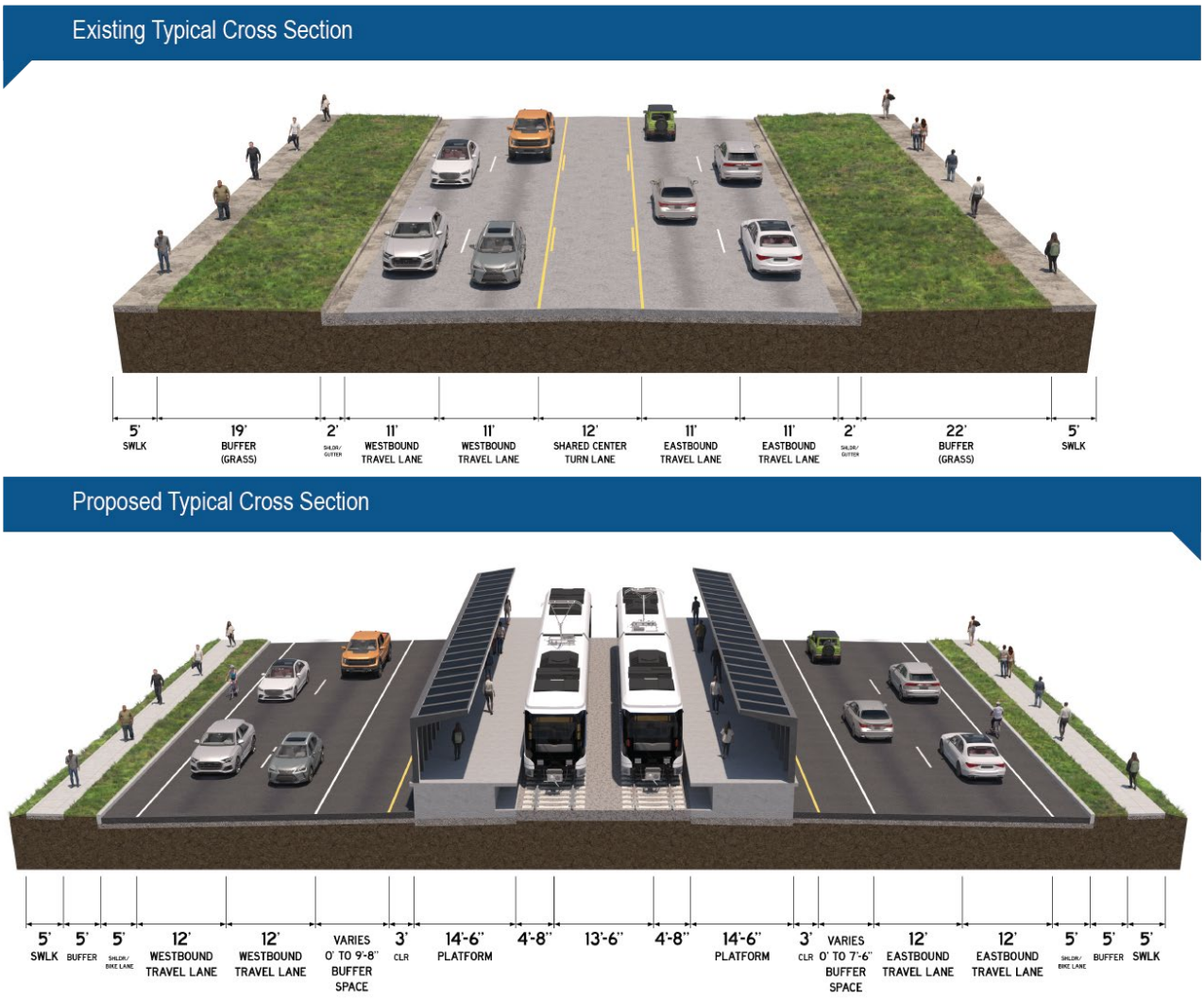


Table 2-3. Typical Cross Sections along Niagara Falls Boulevard at Maple Station

Cross Section Element	Existing Typical	LRT Build Alternative Typical
Number of Travel Lanes (per direction)	2	2
Width of Travel Lanes (per direction in feet)	11 each	12 each
Width of Shared Center Turn Lane (feet)	12	-
Inside Buffer Between Travel Lanes and Transit Alignment (per direction in feet)	-	0 – 9.67
Transit Alignment Cross Section (feet)	-	22.83
Transit Station Width (per direction in feet)	-	17.5
Paved Shoulder and Bike Lane Width (per direction in feet)	-	5
Westbound / Eastbound Outside Buffer (snow removal storage, feet)	21 / 24	5 / 5
Sidewalk Width (per direction in feet)	5	5
Subtotal (feet)	**111**	**135.83 – 145.5**

Sweet Home Road

As the LRT Build Alternative alignment travels under the intersection of Maple Road, the alignment would exit a portal on the east side of Sweet Home Road just north of the intersection and would continue along the eastern side of Sweet Home Road in a dedicated LRT side-running alignment, passing under the I-290 Sweet Home Road overpass (Figure 2-8). The proposed Sweet Home Station would be located on the east side of Sweet Home Road. Figure 2-9 compares the existing to the proposed cross section at the proposed Sweet Home Station north of I-290 to the existing cross section (Table 2-4 summarizes this comparison). The alignment would continue along the shoulder of the northbound travel lanes of Sweet Home Road until turning east approximately 500 feet south of Rensch Road across Bizer Creek, as shown in Figure 2-10.

Figure 2-8. LRT Build Alternative Alignment at the Maple Road and Sweet Home Road Intersection

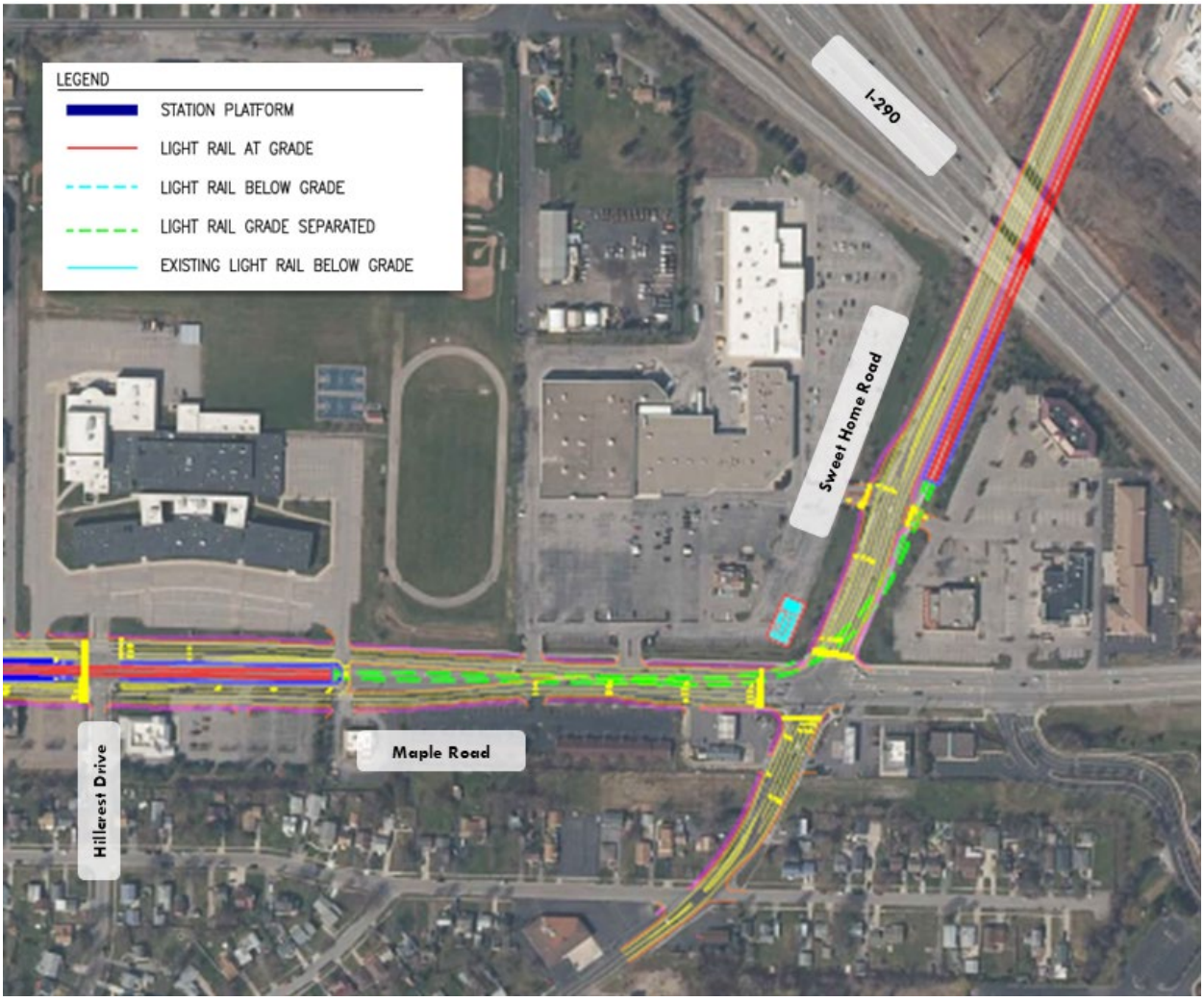


Figure 2-9. Existing and LRT Build Alternative Typical Cross Section along Sweet Home Road North of I-290 Overpass

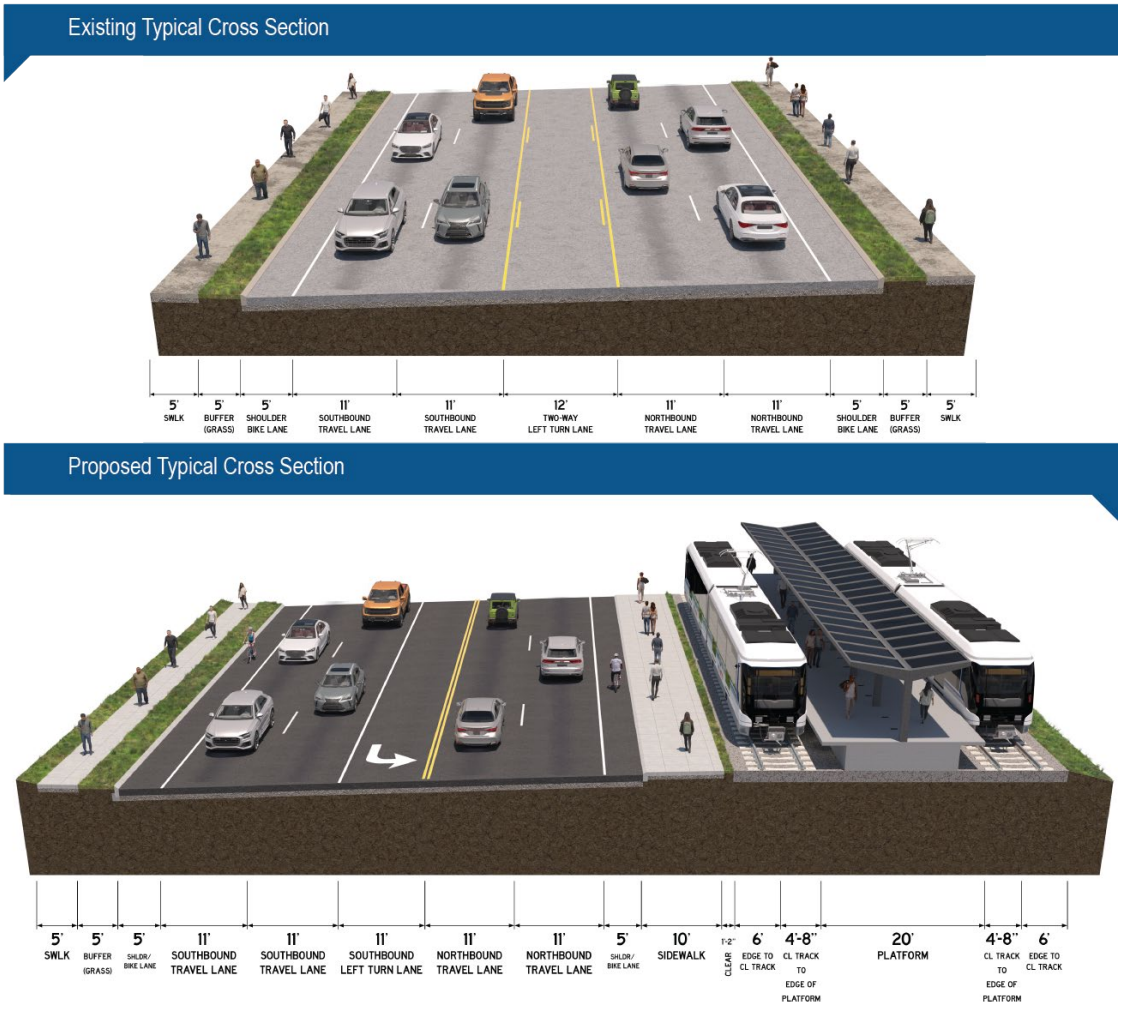
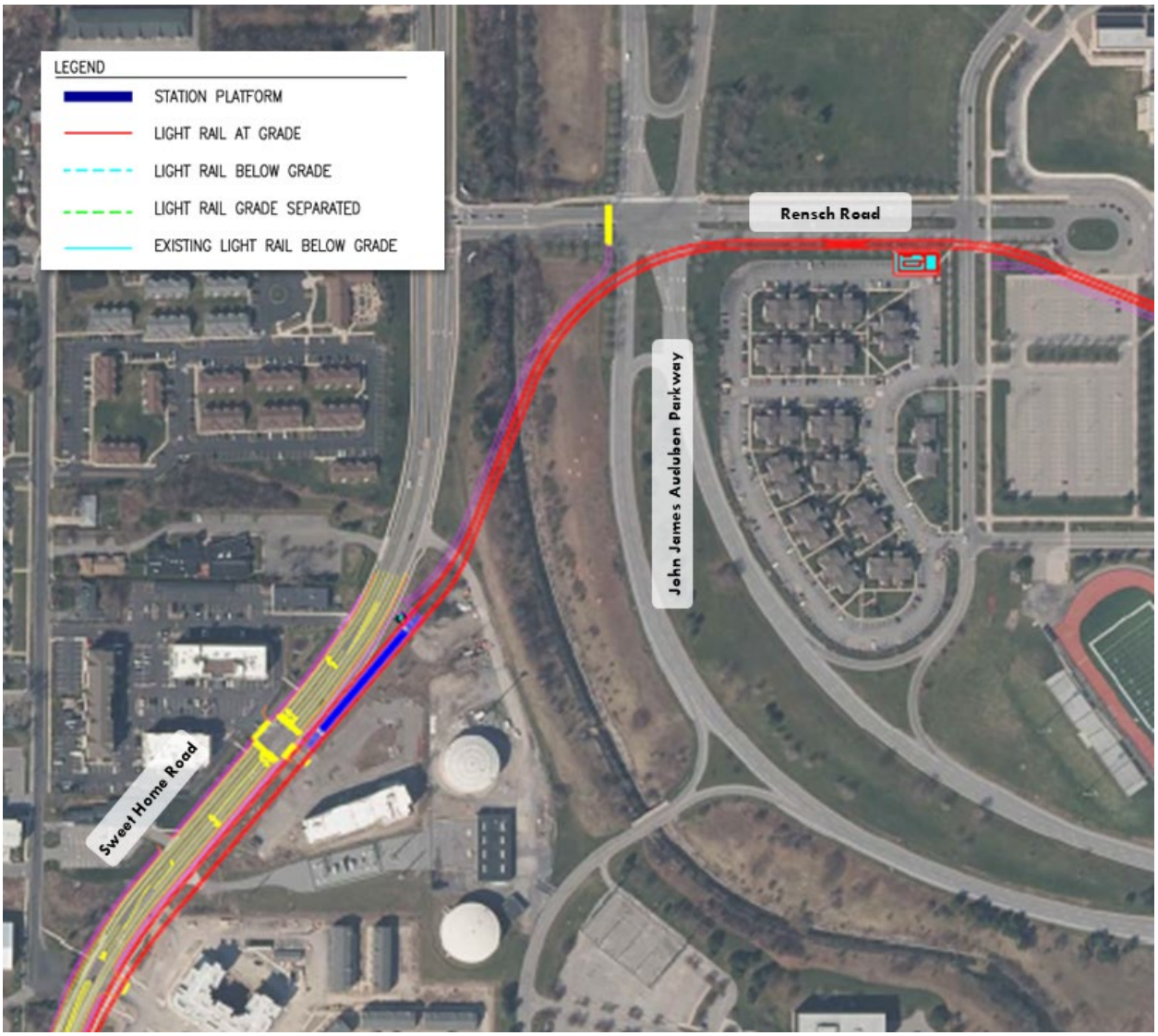


Table 2-4. Typical Cross Sections along Sweet Home Road North of I-290 Overpass

Cross Section Element	Existing Typical	LRT Build Alternative Typical
Number of Travel Lanes (per direction)	2	2
Width of Travel Lanes (per direction in feet)	11 each	11 each
Width of Shared Center Turn Lane (feet)	12	-
Width of Southbound Left-turn Lane (feet)	-	11
Inside Buffer Between Travel Lanes and Transit Alignment (per direction in feet)	-	1 - 22
Transit Alignment Cross Section (feet)	-	21.3
Transit Station Width (feet)	-	20
Paved Shoulder and Bike Lane Width (per direction in feet)	5	5
Southbound / Northbound Outside Buffer (snow storage in feet)	5 / 5	5 / -
Southbound / Northbound Sidewalk Width (feet)	5 / 5	5 / 10
Subtotal (feet)	**86**	**117.3 - 138.3**

Figure 2-10. LRT Build Alternative Alignment along Sweet Home Road and Rensch Road



UB North Campus

The LRT Build Alternative alignment would enter UB North Campus south of the eastbound portion of Rensch Road. The alignment would turn southeast at the Rensch Road entrance loop and run east between Mary Talbert Way (formerly Putnam Way) and the Hochstetter parking lots, as shown in Figure 2-11. The proposed Flint Station would be located on Mary Talbert Way between Mary Talbert Way and the Hochstetter parking lots. The alignment would continue east between the Jacobs parking lots and Jacobs Management Center and Park Hall. The alignment would turn north and run within the existing portion of Mary Talbert Way and onto Lee Road. The proposed Lee Station would be located immediately east of the northbound travel lane of Lee Road, adjacent to the University Book Store. Figure 2-12 illustrates the alignment continuing along the east side of Lee Road, then turning toward John James Audubon

Parkway. The proposed Ellicott Complex Station would be located adjacent and southeast of John James Audubon Parkway and Lee Road traffic circle. The alignment would turn northeast, just south of Lee Circle, exiting the campus adjacent to and southeast of John James Audubon Parkway.

Figure 2-11. LRT Build Alternative Alignment at UB North Campus

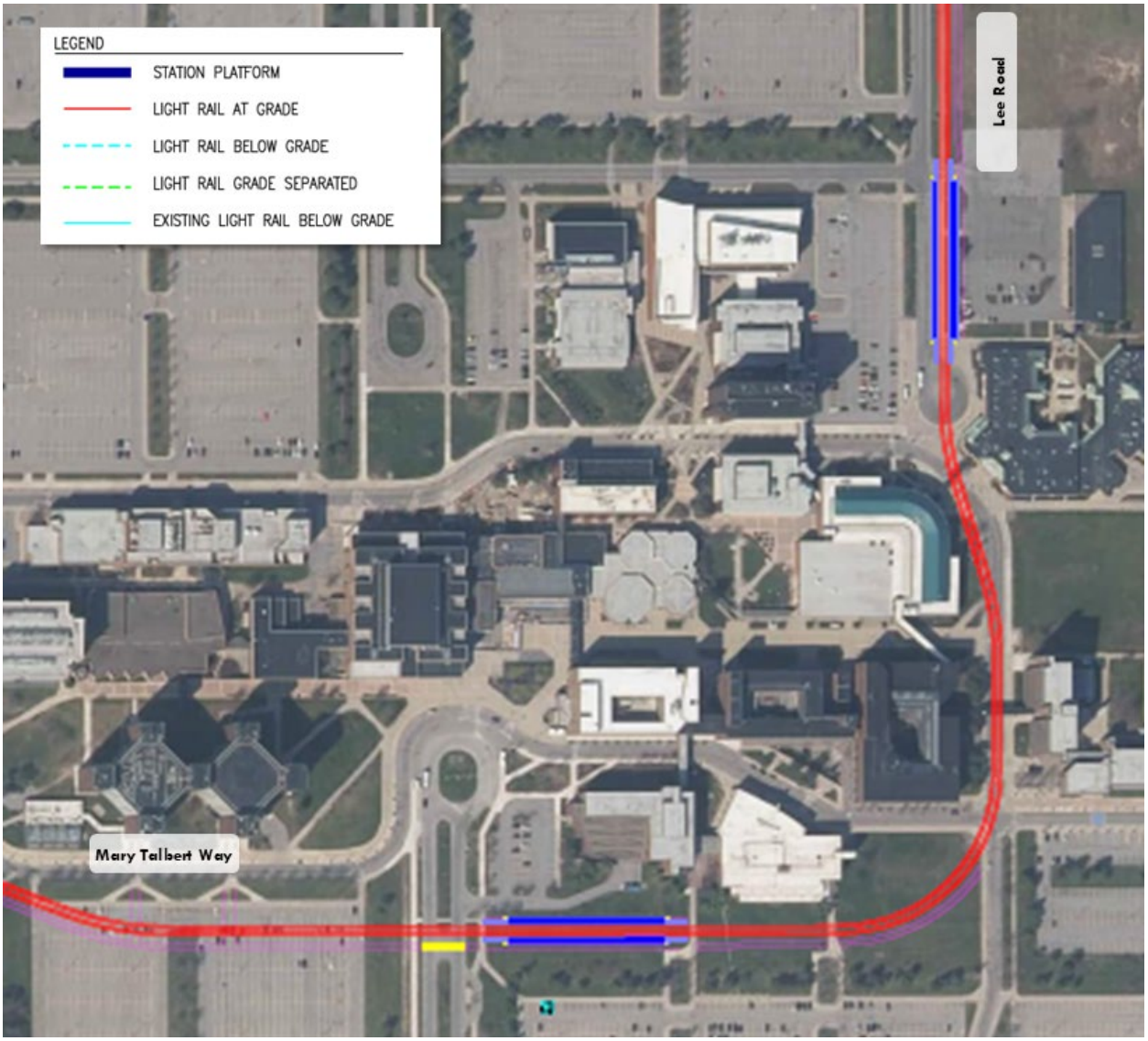
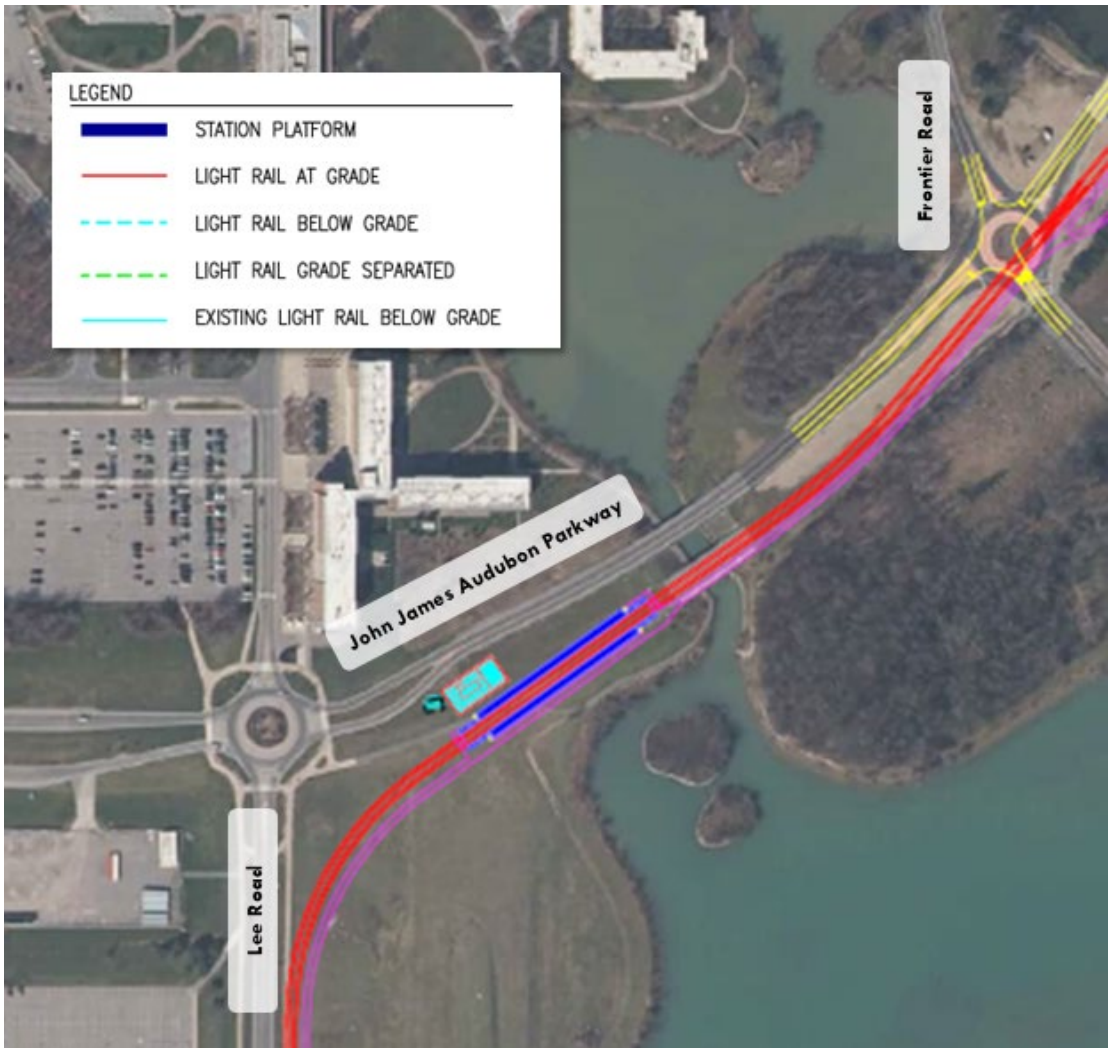


Figure 2-12. LRT Build Alternative Alignment near Ellicott Complex Station



John James Audubon Parkway

The LRT Build Alternative alignment would continue along the vacated northbound travel lanes of John James Audubon Parkway. Figure 2-13 illustrates the alignment continuing on the proposed vacated northbound travel lanes along John James Audubon Parkway.

Figure 2-14 compares the existing to the proposed cross section along John James Audubon Parkway to the existing cross section (Table 2-5 summarizes this comparison). The proposed Audubon Station would be located near the entrance of the Amherst Town Complex. The alignment would continue within the existing right-of-way on the vacated northbound travel lanes of John James Audubon Parkway until terminating at the proposed I-990 Station, which would be located just north of I-990 within the Muir Woods development.

Figure 2-13. LRT Build Alternative Alignment along John James Audubon Parkway

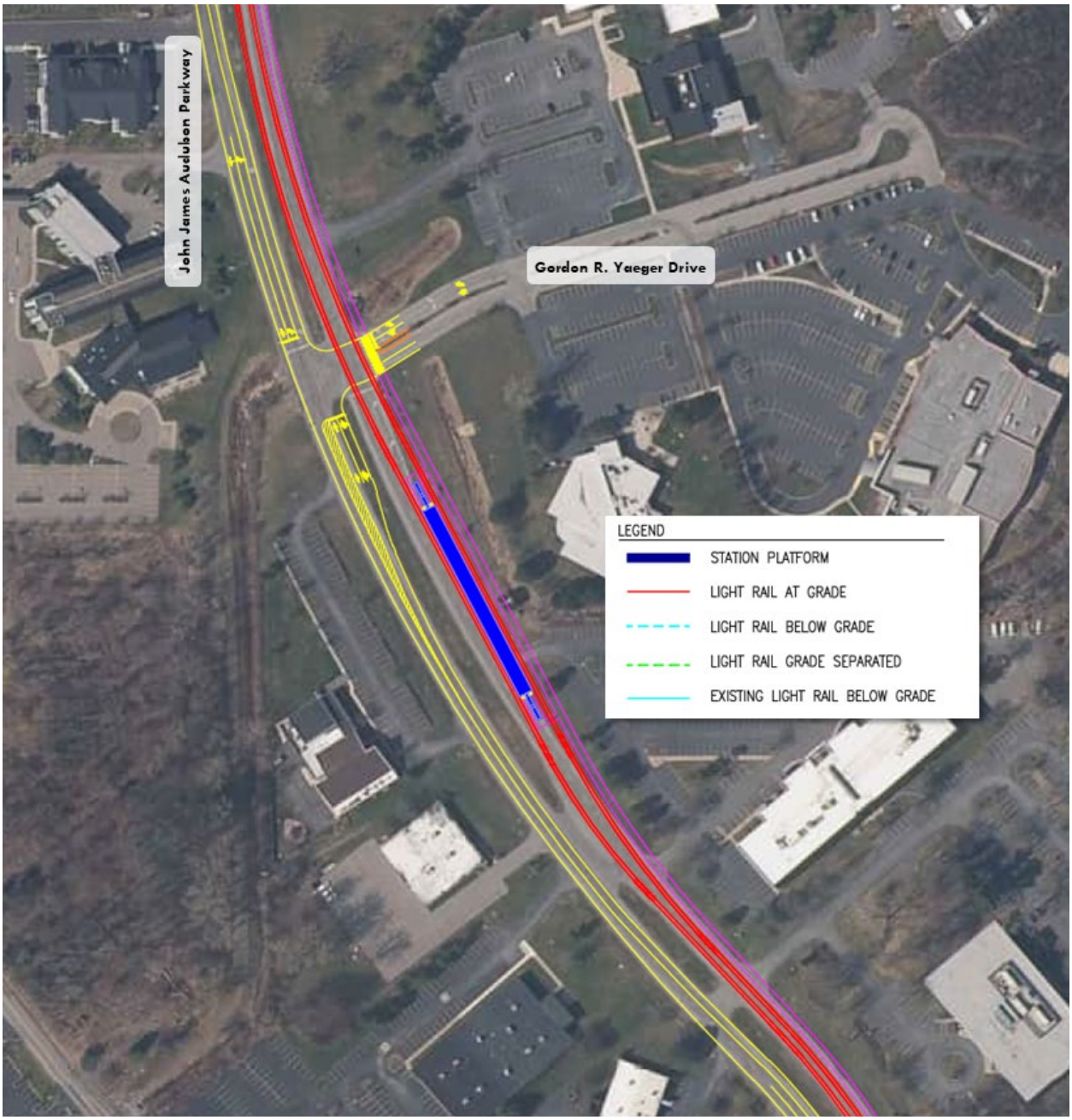


Figure 2-14. Existing and Proposed LRT Build Alternative Typical Cross Section along John James Audubon Parkway Near Bryant Woods

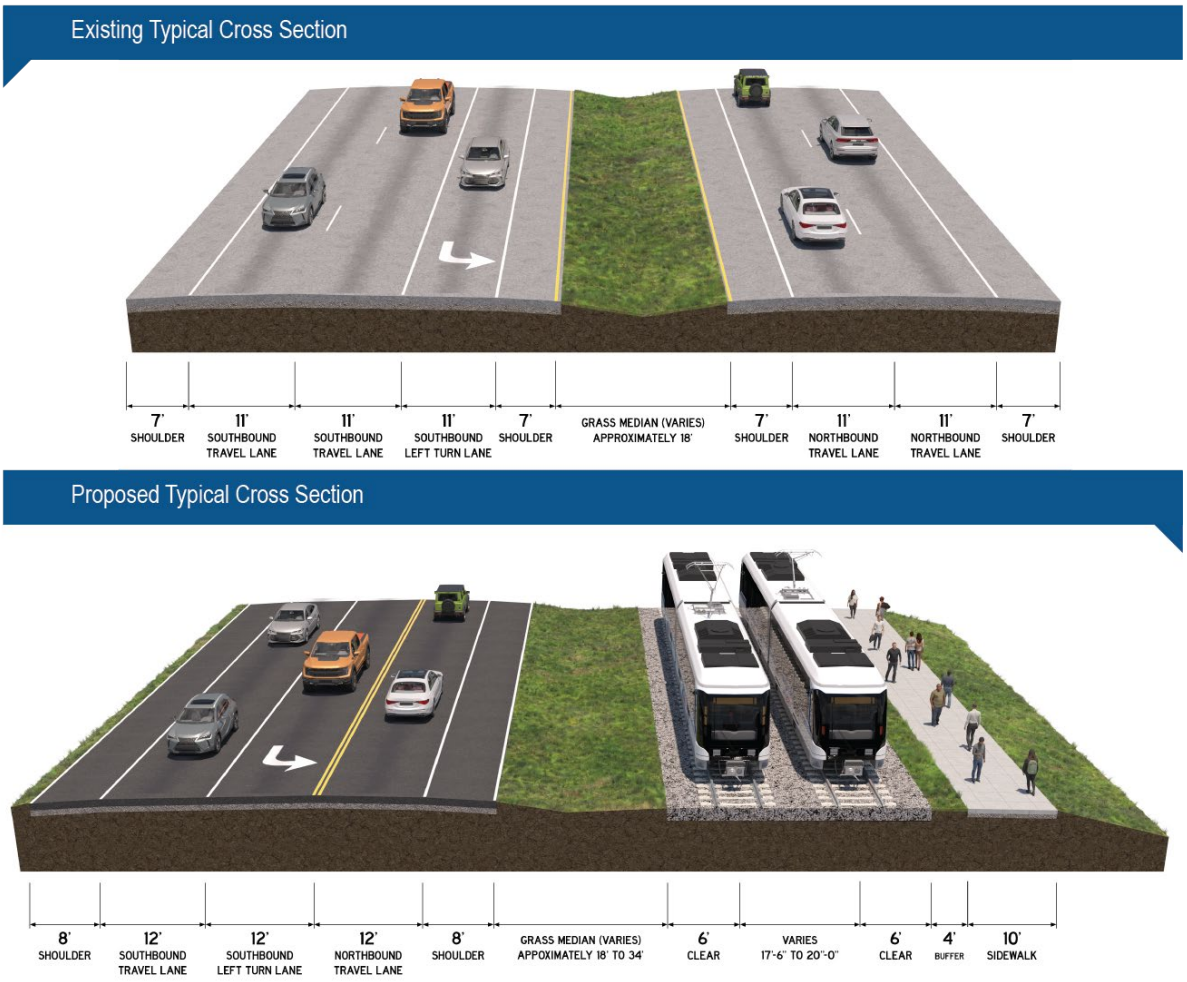


Table 2-5. Typical Cross Sections along John James Audubon Parkway Near Bryant Woods

Cross Section Element	Existing Typical	LRT Build Alternative Typical
Number of Travel Lanes (per direction)	2	1
Width of Travel Lanes (per direction in feet)	11 each	12 each
Width of Southbound Left Turn Lane (feet)	11	12
Width of Center Median (varies, in feet)	18	18 - 34
Southbound Outside Shoulder Width (feet)	7	8
Southbound Inside Shoulder Width (feet)	7	-
Northbound Outside Shoulder Width (feet)	7	8
Northbound Inside Shoulder Width (feet)	7	-
Transit Alignment Cross Section (feet)	-	29.5 - 32
Northbound Transit alignment Outside Shoulder Width (feet)		4
Northbound Multi-use Trail Width (feet)	-	10
Subtotal (feet)	**101** (median varies)	**113.5 - 132**

2.3.2 BRT Build Alternative

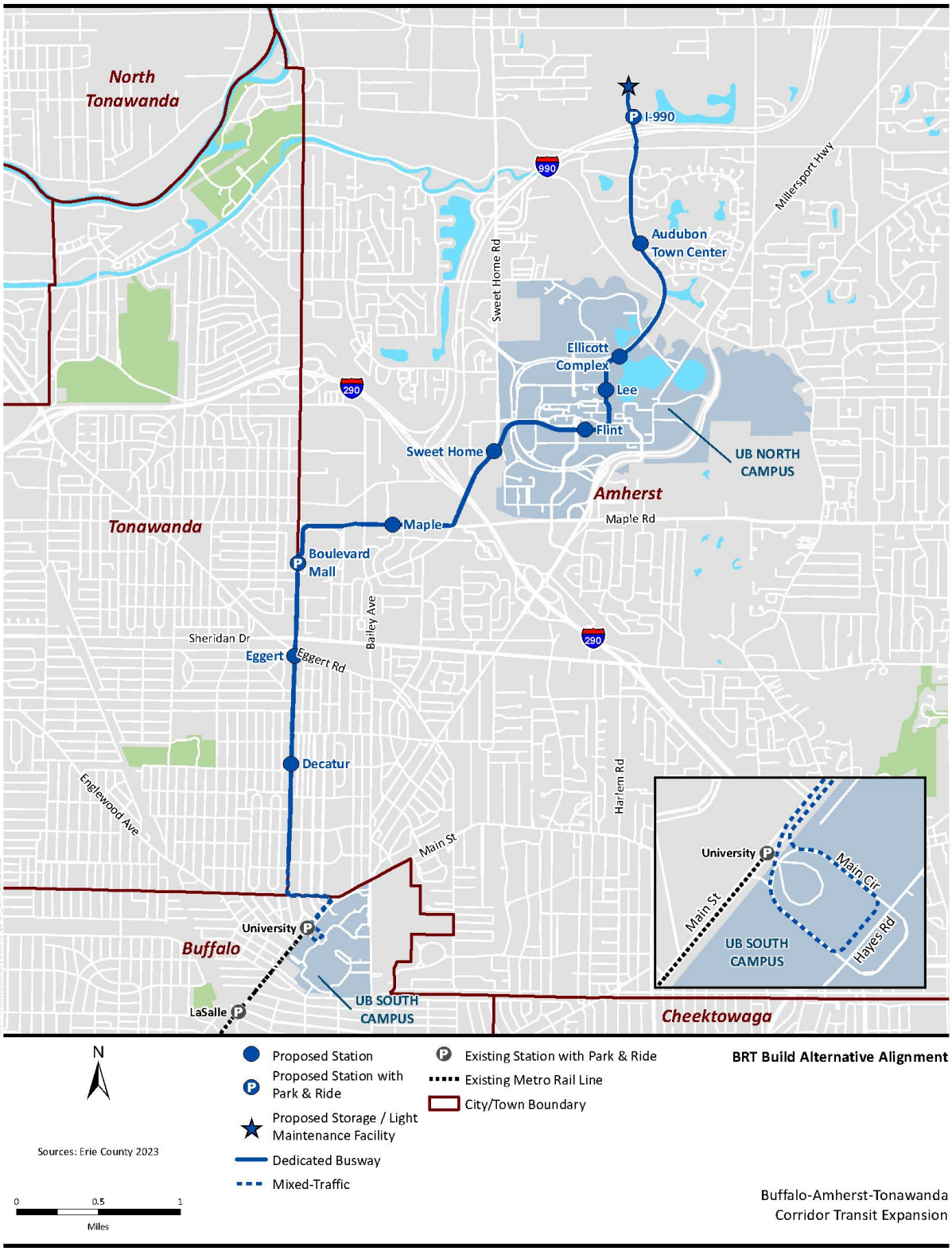
Figure 2-15 presents the BRT Build Alternative alignment. The BRT Build Alternative conceptual plan is included in Appendix B2, "Conceptual Design Plans," of this DEIS. The BRT Build Alternative would provide electric-powered transit service north from the existing Metro Rail University Station for approximately seven miles along the same alignment as described for the LRT Build Alternative. The BRT Build Alternative would operate within a dedicated BRT busway and travel through intersections using Traffic Signal Priority[2] (TSP) technology. This BRT busway is proposed on Niagara Falls Boulevard, between Kenilworth Avenue and Ford Avenue, to I-990 and John James Audubon Parkway. For the entire length of the median-dedicated busway, general purpose left turns would be prohibited except at signalized intersections. The median-dedicated busway would include a separation between the BRT lanes and the general purpose lanes to prohibit encroachment onto the busway.

The BRT Build Alternative would be constructed primarily within existing transportation right-of-way. However, portions of the BRT Build Alternative, along Niagara Falls Boulevard, would be constructed in areas where there is insufficient right-of-way width. Section 4.1 describes the property acquisitions and displacements that could result from the BRT Build Alternative.

There are two variations when comparing the BRT Build Alternative to the LRT Build Alternative. The first variation is that the BRT Build Alternative would not propose a tunnel to connect with University Station but operate in mixed traffic from University Station along Main Street, Kenmore Avenue, and Niagara Falls Boulevard before transitioning into the median alignment or busway near the intersection of Kenilworth Avenue. The second variation is that the BRT Build Alternative would not propose an underground segment at the Maple Road and Sweet Home Road intersection, but travel through the intersection at grade using TSP signal technology.

[2] Traffic Signal Priority technology gives special treatment to transit vehicles at signalized intersections. Because transit vehicles can hold many people, giving priority to transit can potentially increase the person throughput of an intersection.

Figure 2-15. BRT Build Alternative Alignment



The BRT Build Alternative would have the same number of stations in the same locations as the LRT Build Alternative. Also, as with the LRT Build Alternative, a new vehicle storage and maintenance facility would be required at the end of the line just north of the I-990 Station.

University Station

The BRT Build Alternative would construct a BRT platform at the existing University Station at the upper level of the UB Main Circle near the designated passenger pick-up and drop-off ("kiss-and-ride") lot. The BRT Build Alternative alignment would use Main Circle as a drop-off, layover, and pickup location (Figure 2-16), rather than the existing bus loop because the bus loop is at capacity and cannot accommodate the added BRT traffic and layovers. BRT buses would enter Main Circle from Main Street and stop at a new BRT station platform opposite the upper-level entrance. Metro riders desiring to travel beyond the University Station would be required to transfer from the existing Metro Rail service to the BRT Build Alternative. This would require a Metro rider to exit the Metro Rail vehicle, travel vertically via stairs, elevator, or escalator to exit the Metro Rail station, and walk across Main Circle to board a BRT vehicle, an approximate 3-minute walk. When departing, buses would leave the station by turning right on Main Street. The BRT Build Alternative would include TSP at the intersection of Main Street and Main Circle to improve BRT operations through the intersection.

Kenmore Avenue

The BRT vehicles would operate in mixed traffic along Main Street and Kenmore Avenue, with TSP at all intersections. This alignment would turn right when exiting University Station onto Main Street, then left onto Kenmore Avenue. The alignment would then turn north (right) from Kenmore Avenue onto Niagara Falls Boulevard.

Figure 2-16. BRT Build Alternative Alignment: University Station (connection to existing underground LRT platform)

Niagara Falls Boulevard

The BRT Build Alternative would operate in mixed traffic along Niagara Falls Boulevard after turning to/from Kenmore Avenue. At the intersection of Niagara Falls Boulevard and Ford Avenue, the BRT Build Alternative would transition to a median-dedicated busway on Niagara Falls Boulevard. Niagara Falls Boulevard would operate as a two-lane facility with a median BRT alignment that prohibits left turns except at signalized intersections from Ford Avenue to north of Treadwell Road. Figure 2-17 compares the existing to the proposed cross section along Niagara Falls Boulevard north of Ford Avenue (Table 2-6 summarizes this comparison). The BRT Build Alternative transitions to/from the median-dedicated busway at the Ford Avenue intersection (near the same location as the LRT Build Alternative portal location). The following describes the BRT Build Alternative's transition from mixed traffic to the dedicated median BRT busway:

- The BRT Build Alternative's southbound operations will utilize a signal proposed to be located at the exit of the dedicated busway to facilitate a seamless transition to mixed traffic operations along Niagara Falls Boulevard south of Ford Avenue. This proposed signal will provide BRT vehicles access into the inside southbound general-purpose travel lane from the median at the intersection of Niagara Falls Boulevard and Ford Avenue. The new signal would include TSP for the BRT vehicles.
- The BRT Build Alternative's northbound operations would use the existing inside northbound travel lane of Niagara Falls Boulevard and merge into the dedicated median busway between Kenilworth and Ford Avenues. The existing outside travel lane would continue to operate as a general-purpose travel lane. The northbound inside travel lane would include pavement markings and signage, or other traffic control measures, to note that the busway is for BRT use only and to prohibit general vehicles from encroaching into the busway.

Figure 2-17. Existing and Proposed BRT Build Alternative Typical Cross Section along Niagara Falls Boulevard near Ford Avenue

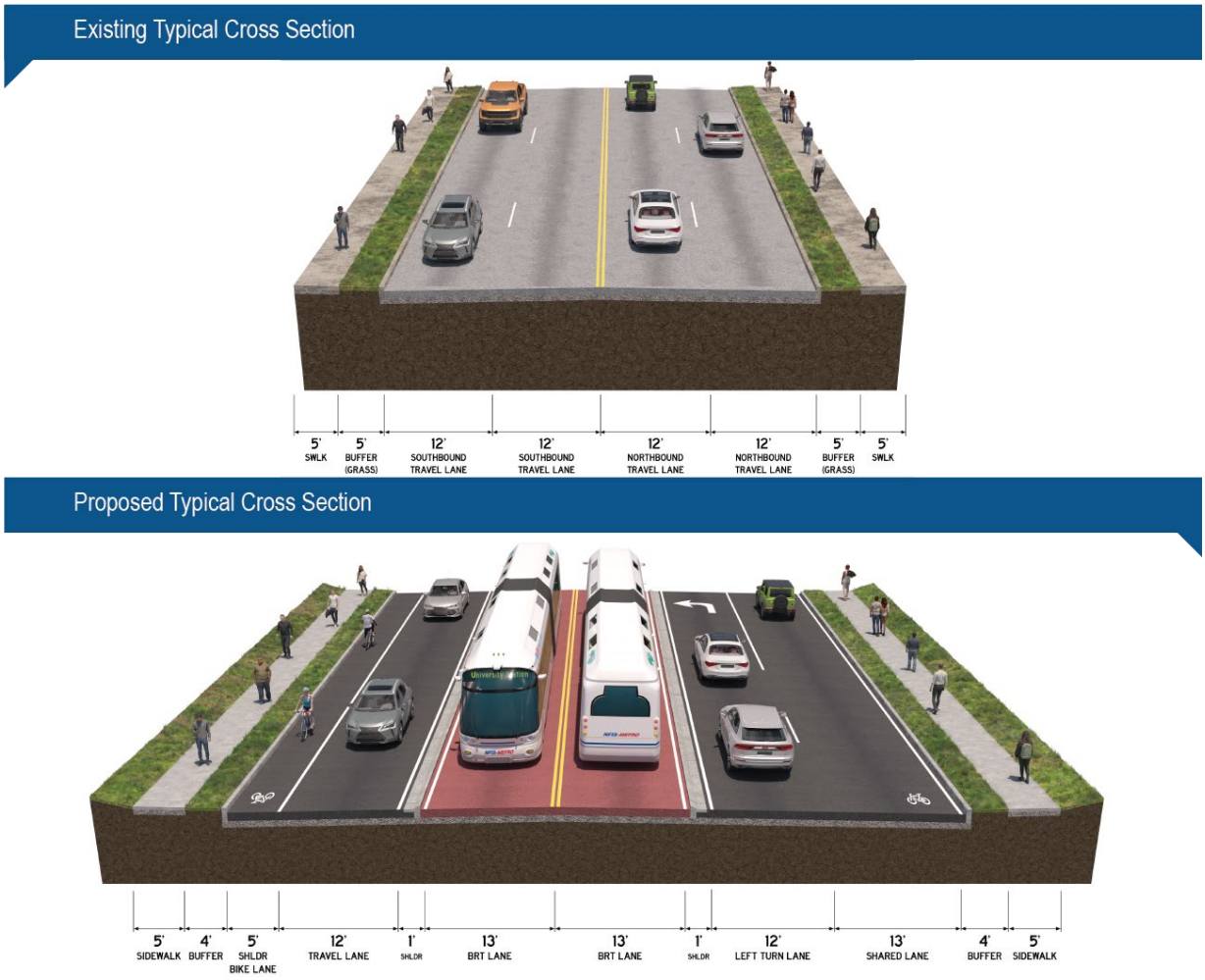


Table 2-6. Typical Cross Sections along Niagara Falls Boulevard near Ford Avenue

Cross Section Element	Existing Typical	BRT Build Alternative Typical
Number of Travel Lanes (per direction)	2	1
Width of Southbound Travel Lanes (feet)	12 each	12
Width of Northbound Travel Lanes (feet)	12 each	-
Width of Northbound Shared Travel Lane and Bike Lane (feet)	-	13
Northbound Left Turn Lane (feet)	-	12
Transit Alignment Cross Section (feet)	-	28
Southbound Paved Shoulder and Bike Lane Width (feet)	-	5
Outside Buffer (snow removal storage, per direction in feet)	5	4
Sidewalk Width (per direction in feet)	5	5
Subtotal (feet)	**68**	**88**

Figure 2-18. BRT Build Alternative Alignment at Niagara Falls Boulevard and Maple Road

Figure 2-19. Existing and Proposed BRT Build Alternative Typical Section along Niagara Falls Boulevard at Treadwell Road (Boulevard Mall Station)

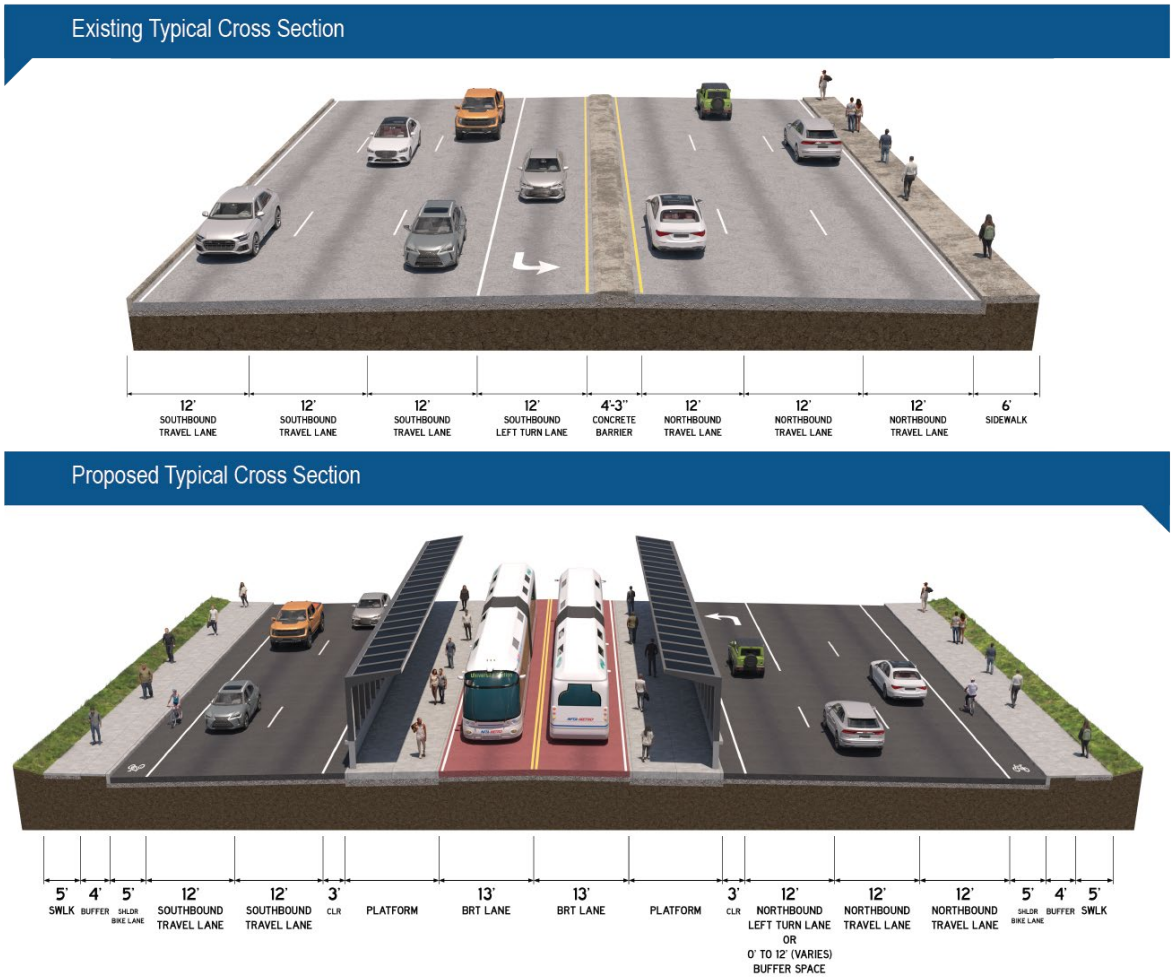


Table 2-7. Typical Cross Sections along Niagara Falls Boulevard at Treadwell Road (Boulevard Mall Station)

Cross Section Element	Existing Typical	BRT Build Alternative Typical
Number of Travel Lanes (per direction)	3	2
Width of Travel Lanes (per direction in feet)	12	12
Width of Southbound Left Turn Lane (feet)	12	-
Width of Northbound Left Turn Lane (feet)	-	12
Center Median (feet)	4.25	-
Transit Alignment Cross Section (feet)	-	26
Transit Station Width (per direction in feet)	-	17.3
Paved Shoulder and Bike Lane Width (per direction in feet)	-	5
Outside Buffer (snow removal storage, per direction in feet)	-	4
Sidewalk Width (per direction in feet)	6 (northbound only)	5
Subtotal (feet)	**94.25**	**148.6**

Maple Road

Figure 2-20 compares the existing to the proposed cross section along Maple Road and at the proposed Maple Station (Table 2-8 summarizes this comparison). On Maple Road, the dedicated busway would run along the southern shoulder of Maple Road and the most northern portion of the Boulevard Mall property until entering the median busway using the Alberta Drive and Maple Road intersection. The proposed Maple Station would be in the median of Maple Road between Bowmart Parkway and Hillcrest Drive. The BRT Build Alternative busway would travel down the median of Maple Road until crossing the intersection of Maple Road and Sweet Home Road. The intersection of Maple Road and Sweet Home Road would be modified to include TSP to minimize disruptions to BRT bus operations. As the BRT Build Alternative busway travels northbound along Sweet Home Road, it operates adjacent to the northbound Sweet Home Road travel lanes.

In contrast to the LRT Build Alternative, the BRT Build Alternative travels through the Maple Road and Sweet Home Road intersection at-grade (Figure 2-21).

Sweet Home Road

The BRT Build Alternative alignment would travel adjacent to the northbound side of Sweet Home Road. The proposed Sweet Home Station would be located on the east side of Sweet Home Road across from University Place Plaza. Figure 2-22 compares the existing to the proposed cross section along Sweet Home Road and at the proposed Sweet Home Station to the existing cross section (Table 2-9 summarizes this comparison). The alignment would continue along the northbound shoulder of Sweet Home Road until turning east south of the eastbound travel lanes of Rensch Road.

Figure 2-20. Existing and Proposed BRT Build Alternative Typical Section along Maple Road

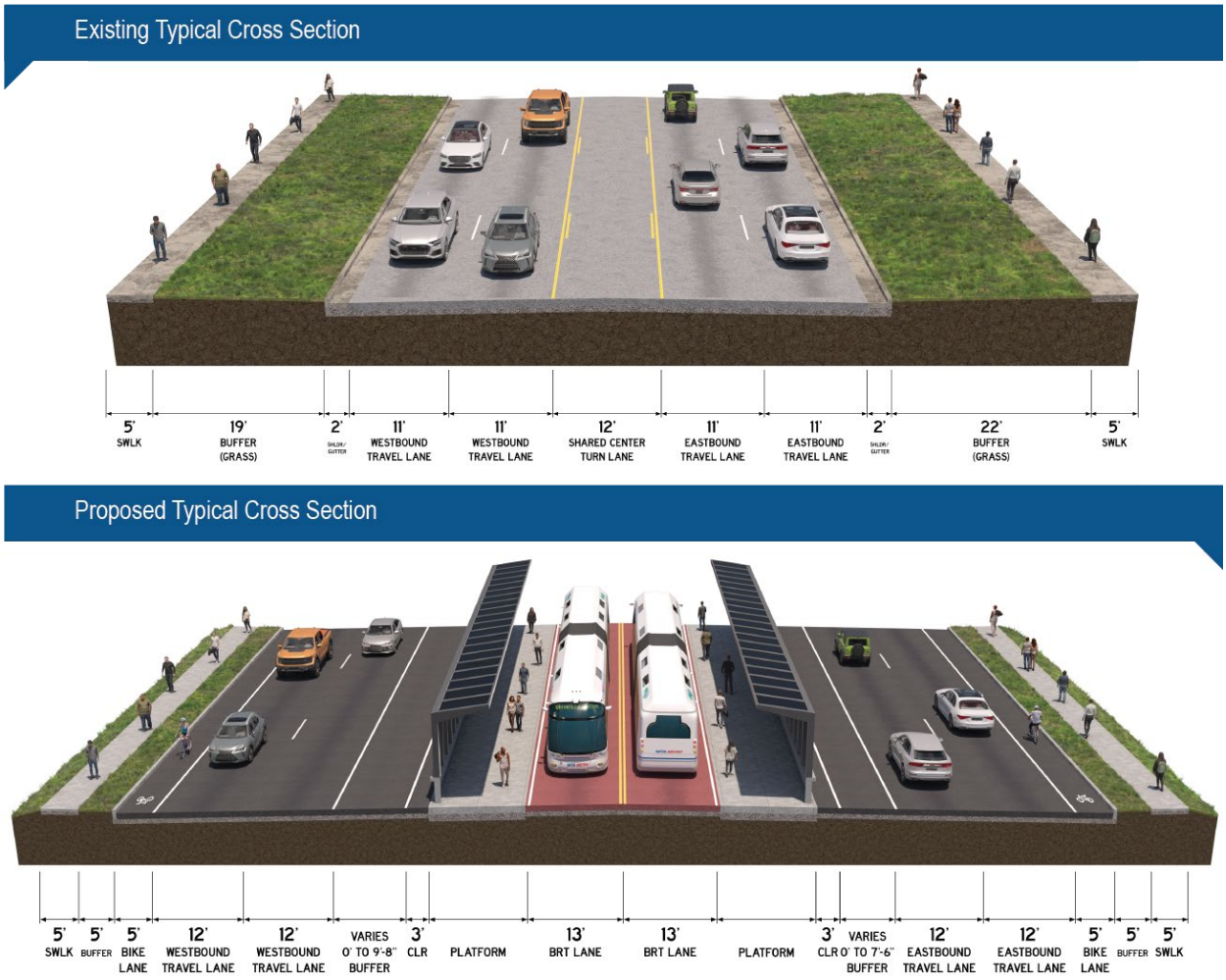


Table 2-8. Typical Cross Sections along Niagara Falls Boulevard at Maple Station

Cross Section Element	Existing Typical	BRT Build Alternative Typical
Number of Travel Lanes (per direction)	2	2
Width of Travel Lanes (per direction in feet)	11 each	12 each
Width of Shared Center Turn Lane (feet)	12	-
Inside Buffer Between Travel Lanes and Transit Alignment (per direction in feet)	-	0 – 9.67
Transit Alignment Cross Section (feet)	-	26
Transit Station Width (per direction in feet)	-	17.3
Paved Shoulder and Bike Lane Width (per direction in feet)	-	5
Westbound / Eastbound Outside Buffer (snow removal storage, feet)	21 / 24	5 / 5
Sidewalk Width (per direction in feet)	5	5
Subtotal (feet)	**111**	**138.6 - 148.27**

Figure 2-21. BRT Build Alternative Alignment at the Maple Road and Sweet Home Road Intersection

Figure 2-22. Existing and Proposed BRT Build Alternative Typical Section: Sweet Home Road North of I-290 Overpass

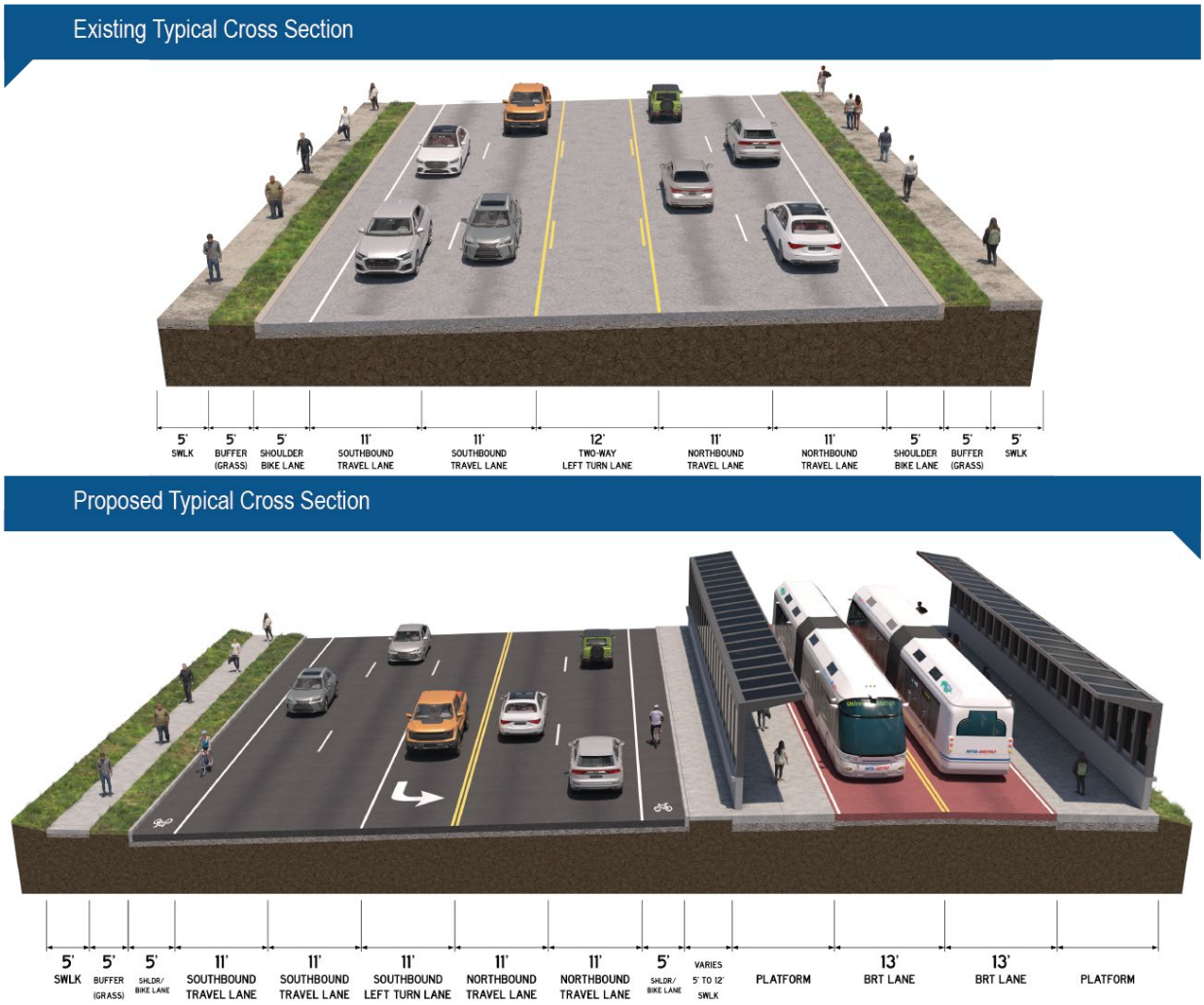


Table 2-9. Typical Cross Sections along Sweet Home Road North of I-290 Overpass

Cross Section Element	Existing Typical	BRT Build Alternative Typical
Number of Travel Lanes (per direction)	2	2
Width of Travel Lanes (per direction in feet)	11 each	11 each
Width of Shared Center Turn Lane (feet)	12	-
Width of Southbound Left Turn Lane (feet)	-	11
Transit Alignment Cross Section (feet)	-	26
Transit Station Width (per direction in feet)	-	17.3
Paved Shoulder and Bike Lane Width (per direction in feet)	5	5
Southbound / Northbound Outside Buffer (snow removal storage in feet)	5 / 5	5 / -
Southbound / Northbound Sidewalk Width (feet)	5 / 5	5 / 5 -12
Subtotal (feet)	**86**	**140.6 – 147.6**

UB North Campus

The BRT Build Alternative alignment would enter the UB North Campus south of the eastbound lanes of Rensch Road. The alignment would turn southeast at the Rensch Entrance loop and run east, paralleling Mary Talbert Way and the Hochstetter parking lots, shown in Figure 2-23. The proposed Flint Station would be east of Flint Road between Flint Road and Mary Talbert Way. The alignment would continue east between the Jacobs parking lots and Jacobs Management Center and Park Hall. The BRT Build Alternative alignment would then turn north along Mary Talbert Way onto Lee Road. The proposed Lee Station would be east of the northbound lane of Lee Road, adjacent to the University Bookstore.

Figure 2-24 illustrates the alignment continuing along the east side of Lee Road, then turn toward John James Audubon Parkway. The proposed Ellicott Complex Station would be adjacent to the northbound lane of John James Audubon Parkway and southeast of the John James Audubon Parkway and Lee Road traffic circle. As shown in Figure 2-25, the alignment would turn northeast (just south of Lee Circle), exiting the campus on the vacated northbound travel lanes of John James Audubon Parkway.

John James Audubon Parkway

Figure 2-26 compares the existing to the proposed cross section along John James Audubon Parkway to the existing cross section (Table 2-10 summarizes this comparison). John James Audubon Parkway would be converted from a four-lane divided facility to a two-lane facility utilizing the existing southbound travel lanes. The BRT Build Alternative alignment would continue along the vacated northbound lanes of the John James Audubon Parkway. The proposed Audubon Station would be near the entrance of the Amherst Town Complex. The alignment would continue north on the vacated northbound travel lanes of the John James Audubon Parkway until terminating at the proposed I-990 Station, which would be just north of the John James Audubon Parkway and I-990 interchange.

Figure 2-23. BRT Build Alternative Alignment along Sweet Home Road and Rensch Road

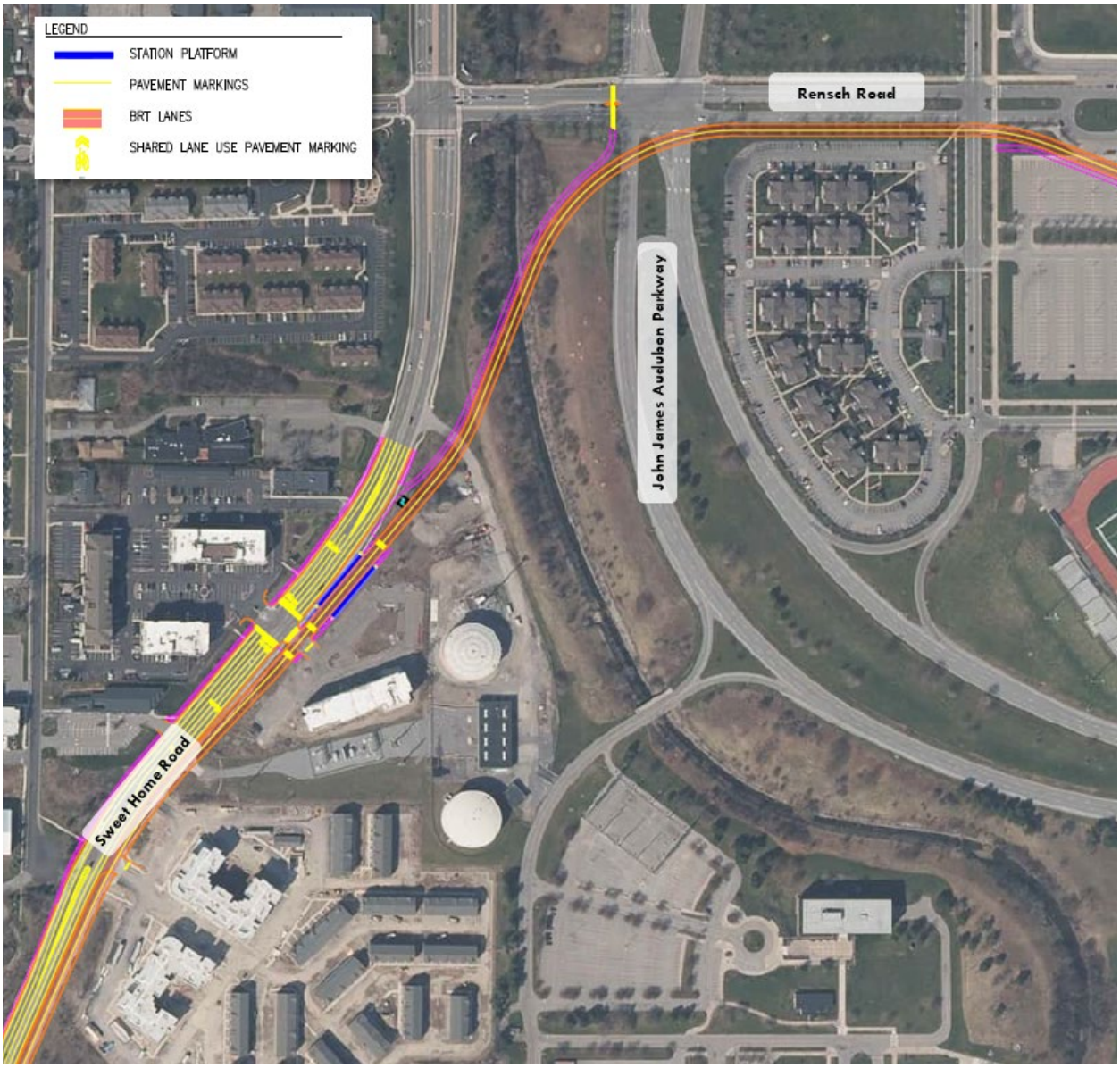


Figure 2-24. BRT Build Alternative at UB North Campus

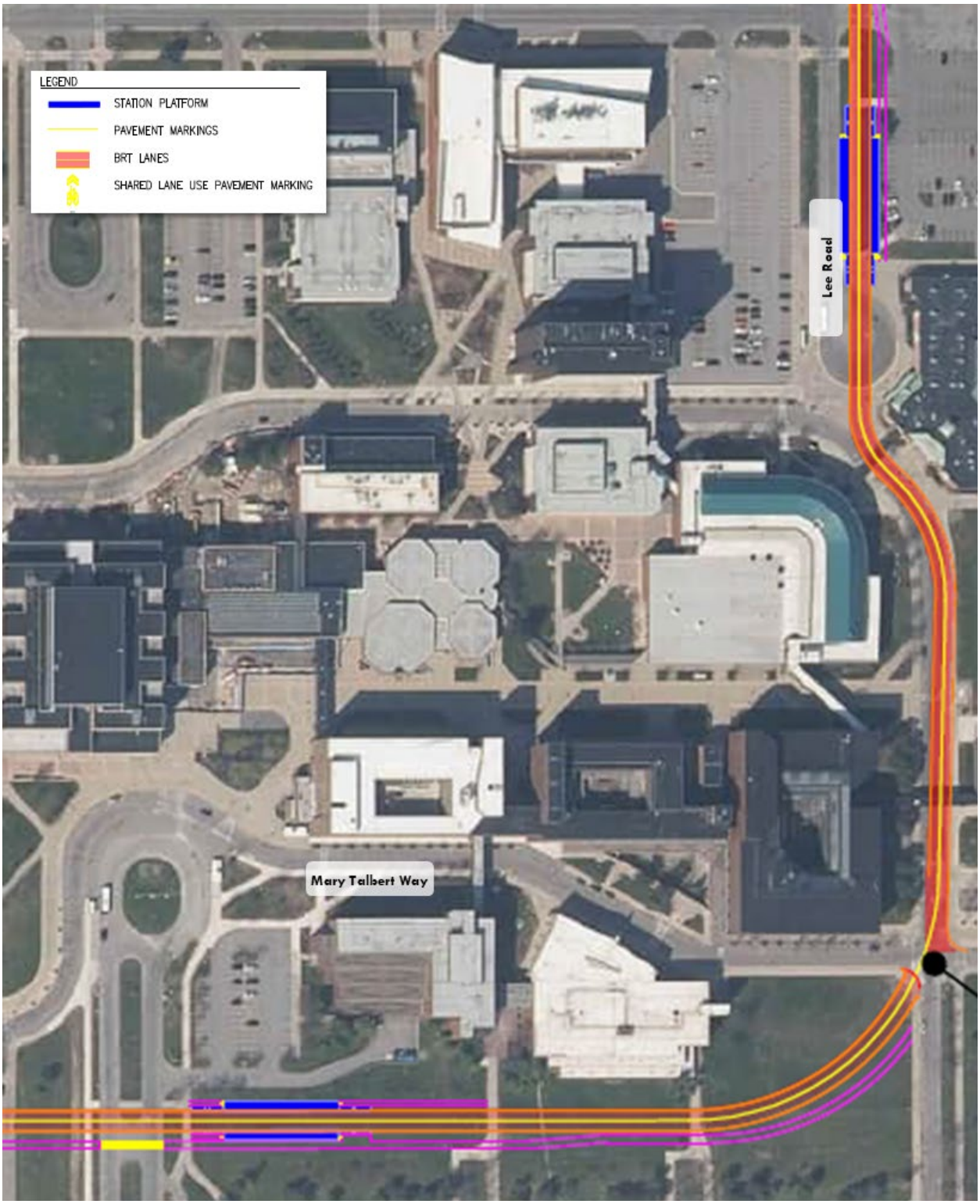


Figure 2-25. BRT Build Alternative Alignment near Ellicott Complex Station

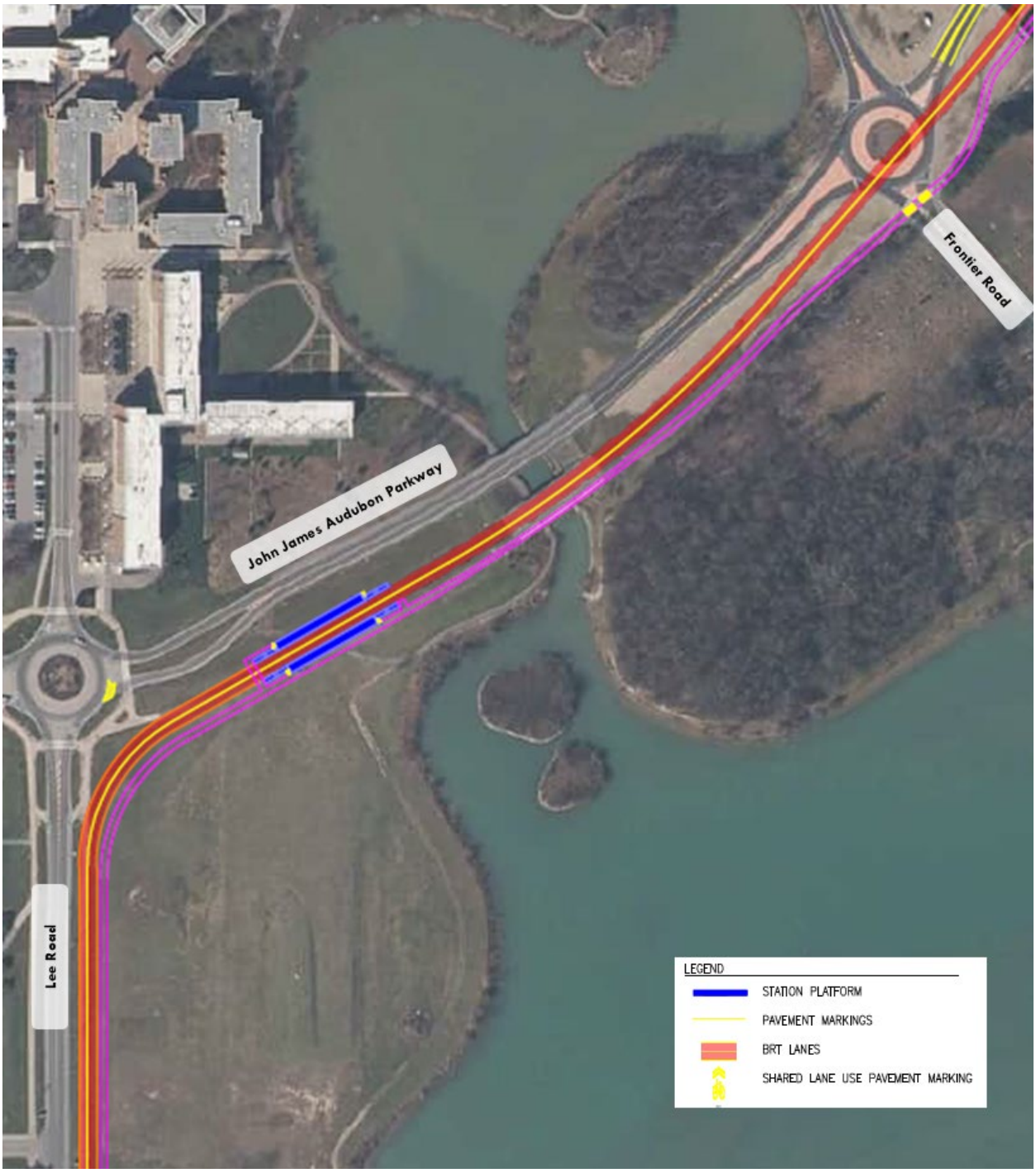


Figure 2-26. Existing and Proposed BRT Build Alternative Typical Section: John James Audubon Parkway near Bryant Woods

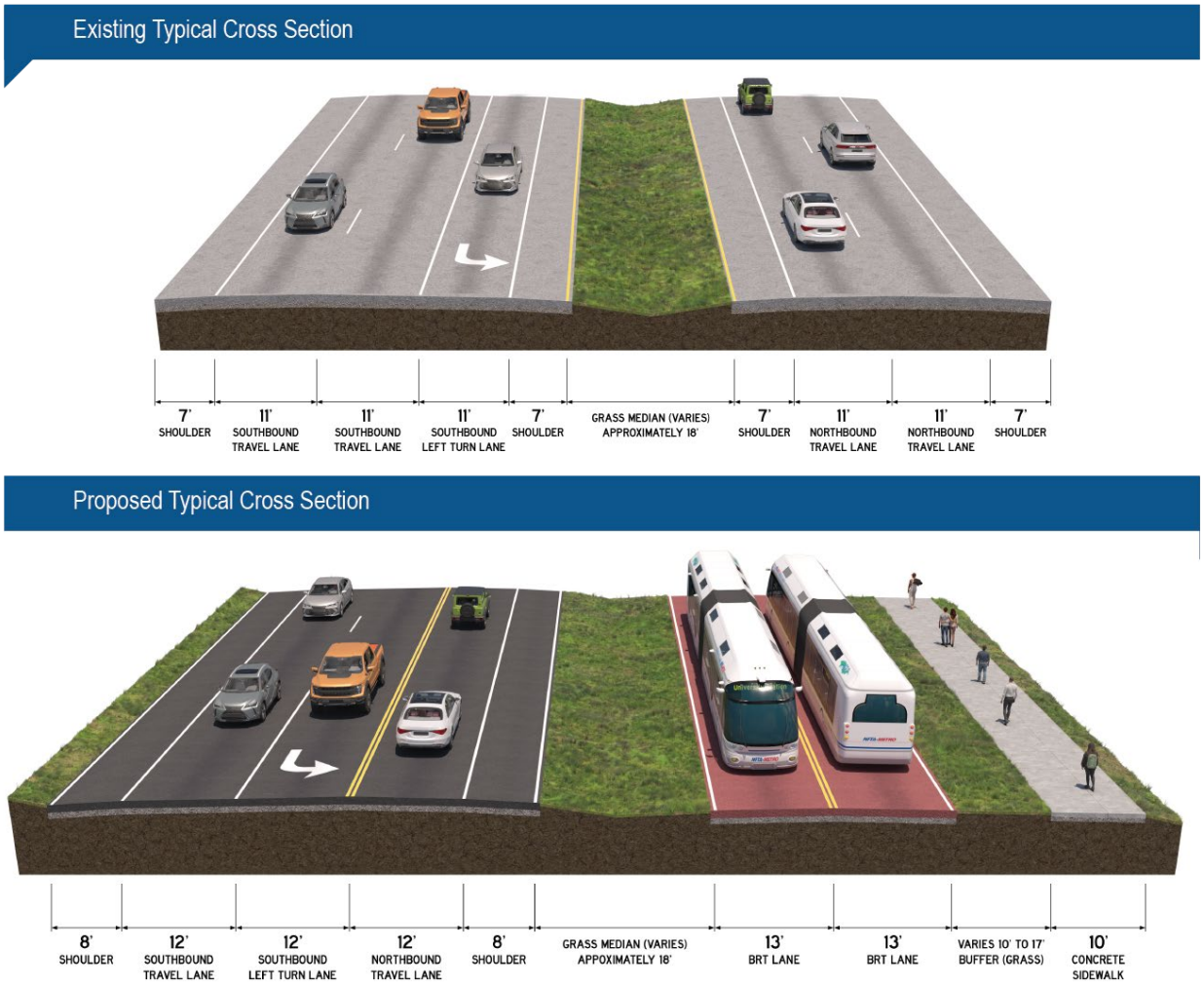


Table 2-10. Typical Cross Sections along John James Audubon Parkway Near Bryant Woods

Cross Section Element	Existing Typical	BRT Build Alternative Typical
Number of Travel Lanes (per direction)	2	1
Width of Travel Lanes (per direction in feet)	11 each	12 each
Width of Southbound Left Turn Lane (feet)	11	12
Width of Center Median (varies, in feet)	18	18
Southbound Outside Shoulder Width (feet)	7	8
Northbound Outside Shoulder Width (feet)	7	10 - 17
Southbound Inside Shoulder Width (feet)	7	-
Northbound Inside Shoulder Width (feet)	7	8
Transit Alignment Cross Section (feet)	-	26
Northbound Multi-use Trail Width (feet)	-	10
Subtotal (feet)	**101** (median varies)	**116 - 123**

2.4 BUILD ALTERNATIVE STATIONS, FACILITIES, AND OPERATIONS

This section describes the station design, vehicle and maintenance facilities, operating hours, headways, and travel times for the LRT Build Alternative and BRT Build Alternative.

2.4.1 Station Design

The proposed stations for both the LRT Build Alternative and BRT Build Alternative would have level boarding and all other features required to be compliant with the Americans with Disabilities Act. LRT Build Alternative station platforms would be approximately 300 feet long to accommodate a three-car LRT vehicle. BRT Build Alternative station platforms would be approximately 150 feet long and accommodate up to two articulated 60-foot-long BRT vehicles. Two proposed stations, Boulevard Mall and I-990, would each include a park-and-ride facility with approximately 350 total spaces: 300 at the Boulevard Mall and 50 at I-990.

2.4.2 Substations

The LRT Build Alternative vehicles would be electrically powered by an overhead catenary system with substations, which is compatible with the existing Metro Rail system. Substations are typically located every 5,000 feet, depending on power source connections and available sites. A typical substation size is 58 feet by 38 feet. The proposed locations of substations along the LRT Build Alternative are shown in Appendix B2, "Conceptual Design Plans." During final design, the location of substations could change. Substations could be located and designed within a station platform area to minimize visual Project impacts. Similarly, substations could be incorporated into existing or new development and designed to blend in with their surroundings.

2.4.3 Vehicles and Maintenance Facilities

Metro would acquire 24 additional LRT vehicles in order to operate the LRT Build Alternative. The LRT Build Alternative would also require the construction of a light maintenance/storage facility with a substation to accommodate the expanded LRT vehicle fleet. The preferred site identified for the LRT Build Alternative light maintenance/storage facility would be at the end of the proposed alignment, north of the I-990 and John James Audubon Parkway interchange. This location was identified due to the available space and proximity to the revenue-service portion of the operation, which reduces non-revenue operations (when a transit vehicle is out of service and running without passengers) and is therefore more cost-effective.

For the BRT Build Alternative, Metro would acquire 17 60-foot articulated battery-electric buses to operate the BRT Build Alternative. The BRT Build Alternative would also require the construction of a light maintenance/storage facility to accommodate the fleet of articulated battery-electric buses. The BRT Build Alternative would use the same location as the LRT Build Alternative for a light maintenance/storage facility. However, it is anticipated that the BRT Build Alternative would require a larger footprint than the LRT Build Alternative facility due to

the BRT Build Alternative's need for storage, recharging, and internal circulation for 17 buses within a light maintenance/storage facility.

2.4.4 Operating Plan

Metro developed conceptual operating plans, including headways and hours of operations for both the LRT Build Alternative and the BRT Build Alternative to forecast and evaluate ridership projections, operations and maintenance costs, capital costs, and travel times. Final service planning for the Project will be determined during Project design.

With the LRT Build Alternative, light rail service would operate between the DL&W Station at the southern terminus of the existing Metro Rail line and the proposed I-990 Station. With the BRT Build Alternative, the existing Metro Rail would operate between the DL&W Station and University Station and BRT would operate between University Station and the proposed I-990 Station. A transfer would be required between modes. Metro riders would exit the Metro Rail vehicle and traverse vertically (e.g., stairs, elevator, and/or escalator) to exit University station and walk across Main Circle to board a BRT vehicle.

During final design the need and feasibility of providing express operations or operations that skips stations will be considered for both Build Alternatives.

Headways and Operating Hours

To determine the appropriate headways (the amount of time between transit vehicle arrivals at a given point, such as a proposed station) for the LRT Build Alternative and the BRT Build Alternative, ridership forecasts and forecasted Project peak load points were compared to transit vehicles' carrying capacity (e.g., number of seated and standing patrons each vehicle can accommodate). The carrying capacity of each Build Alternative is described below:

- LRT Build Alternative trains would include three transit vehicles accommodating 140 passengers, standing and seated[3] per transit vehicle, for a carrying capacity of 420 passengers per train.
- BRT Build Alternative transit vehicles would include a 60-foot articulated electric vehicle accommodating a carrying capacity of 90 passengers, both standing and seated.

Metro developed ridership forecasts using FTA Simplified Trips-on-Project Software (STOPS). The STOPS model was developed using data on Metro's current ridership, projected growth in population and employment per the GBNRTC regional travel demand model, Metro and UB North onboard surveys, as well as UB Stampede[4] ridership. Appendix C2, "Transportation:

[3] Buffalo's Light Rail Vehicle, Transportation Research Board, onlinepubs.trb.org

[4] The UB bus and shuttle transportation system serves the UB student, faculty, and staff community by providing free transportation on campus, between UB campuses, and to off-campus locations.

Travel Demand Forecasting," contains further information relating to the development and results for preliminary ridership estimates.

Forecasted ridership was a variable used in determining the appropriate headway for the Build Alternatives. If forecasted ridership exceeded the vehicle carrying capacity, headways were decreased. Headways for the LRT Build Alternative would be the same as Metro's existing service (every 10-minutes during peak times). The forecasted ridership exceeds the volume of riders the BRT Build Alternative can serve with a headway of 10-minutes. Therefore, the BRT Build Alternative would operate with a headway of every five minutes during peak times, increasing the number of transit vehicles needed to operate the service. Table 2-11 shows the service hours and headway assumptions developed for the LRT Build Alternative and the BRT Build Alternative.

Table 2-11. LRT Build Alternative and BRT Build Alternative Service Hours and Headways (Minutes)

Service Hours	Headways (Minutes)	
	LRT Build Alternative	BRT Build Alternative
Peak High (6:30 a.m. to 9:30 a.m. and 4:00 p.m. to 6:00 p.m.)	10	5
Peak Low (2:00 p.m. to 4:00 p.m.)	12	6
Off-Peak High (9:30 a.m. to 2:00 p.m. and 6:00 p.m. to 7:00 p.m.)	12	12
Off-Peak Low (5:00 a.m. to 6:30 a.m. and 7:00 p.m. to 1:00 a.m.)	15	15
Saturday (7:00 a.m. to 1:00 a.m.)	15	15
Sunday (8:00 a.m. to Midnight)	20	20

Travel Times

The end-to-end (University Station to I-990 Station) running time for the LRT Build Alternative was estimated at 23 minutes. The LRT Build Alternative would include full prioritization, meaning that trains would have priority at all signalized intersections and would pass through intersections without slowing or stopping for traffic signals.

The running time for the BRT Build Alternative was estimated to be 25.8 minutes. The BRT Build Alternative would use TSP technology, which would sometimes give BRT vehicles an advantage at signals but at other times would require the BRT vehicles to stop due to the signal phase timing at any specific intersection. The additional delay and additional acceleration and deceleration times at each traffic signal are estimated to be between 18 and 20 seconds, on average. As compared to the LRT Build Alternative, which uses signal preemption, this intersection delay would result in longer travel times for the BRT Build Alternative.

2.5 ENVIRONMENTAL PROCESS

Metro will comply with applicable environmental regulations and will responsibly and reasonably mitigate adverse environmental impacts resulting from the Buffalo-Amherst-Tonawanda Corridor Transit Expansion Project to the extent feasible in accordance with NEPA and FTA guidance.

2.5.1 Draft Environmental Impact Statement Review and Comment Period

FTA and Metro will distribute this Draft EIS to affected federal, state, and local agencies; tribes; community groups; interested individuals; and other interested parties. The document will be made available at NFTA headquarters, public libraries along the Project corridor, and in electronic format on the Project website (*www.nftametrotransitexpansion.com*). A formal public comment period will be initiated after release of this Draft EIS. Metro will hold a public hearing(s) during the comment period to provide information and receive comments about this Draft EIS and the NEPA Preferred Alternative. This public hearing(s) will be held in-person. The DEIS and FEIS will be made available in a format for blind and visually impaired individuals. Specifically, Section 508 of the Rehabilitation Act of 1973 requires that federal agencies make certain documents available in a format that the visually impaired can review. Comments may also be submitted by mail or e-mail.

2.5.2 Final Environmental Impact Statement and Record of Decision

After public review of the Draft EIS, Metro and FTA will complete any additional analyses required and prepare the Final EIS. The Final EIS will include and address all the comments received during the Draft EIS public comment period. The Final EIS will document the results of the Draft EIS process, confirm whether the LRT Build Alternative or BRT Build Alternative is the selected alternative, and include a list of committed final mitigation measures.

In accordance with 49 U.S.C. 304a and 23 U.S.C. 139(n)1, Accelerated Decision-making in Environmental Reviews, FTA intends to issue a single document that consists of the Final EIS and ROD unless it is determined that circumstances, such as changes to the proposed action, anticipated impacts, or other new information, preclude issuance of such a combined document. The ROD must identify: (1) all alternatives considered by FTA; (2) the NEPA selected alternative; and (3) the environmentally preferable alternative(s) (40 CFR 1505.2). If the selected alternative is also an environmentally preferable alternative, both aspects must be noted in the ROD. The ROD will include the alternatives and options that FTA considered and Metro's commitments to mitigate the adverse impacts of the Buffalo-Amherst-Tonawanda Corridor Transit Expansion Project. Additionally, in accordance with 42 U.S.C. 4321 of NEPA, the ROD will include an identification of the environmentally preferable alternative. Finally, the ROD will include a list of mitigation commitments that must be implemented when the Project is initiated. FTA's issuance of the ROD concludes the NEPA environmental process and is required for federal funding and approvals to proceed.

2.6 COMPARISON OF ALTERNATIVES

Table 2-12 provides a "side-by-side" comparison of the proposed Project Alternatives. Differences between each Build Alternative are highlighted in bold font.

Table 2-12. Project Alternatives Comparison

Alternative Comparison	No Build Alternative	LRT Build Alternative	BRT Build Alternative
Adoption in the GBNRTC's Long Range Plan	N/A	**Included**	**Not Included**
Service to Existing Metro Rail University Station	No service	**Direct connection/extension of below grade Metro Rail service**	**Requires a transfer from existing below grade Metro Rail station by ascending to a proposed at-grade BRT station.**
Proposed Length of Each Alternative	N/A	7 miles	7 miles
Proposed Number of Stations	N/A	10 (park-n-ride facilities at Boulevard Mall and I-990 stations)	10 (park-n-ride facilities at Boulevard Mall and I-990 stations)
Typical Cross Sections (Proposed Transit Alignment)			
▪ Niagara Falls Boulevard near Ford Avenue	N/A	28-feet	28-feet
▪ **Niagara Falls Boulevard at Treadwell Road (alignment and station)**	N/A	**40-feet**	**43-feet**
▪ **Maple Road Alignment and Station (near Hillcrest Drive)**	N/A	**40-feet**	**43-feet**
▪ **Sweet Home Road North of I-290 (alignment and station)**	N/A	**41-feet**	**43-feet**
▪ **John James Audubon Parkway near Bryant Woods**	N/A	**30 to 32-feet**	**26-feet**
Project Alignment Considerations			
• **Metro Rail University Station**	N/A	**Mined underground tunnel to Niagara Falls Boulevard**	**Operates in traffic along Main Street and Kenmore Avenue with connection to Niagara Falls Boulevard**
• Niagara Falls Boulevard	N/A	Repurposes one lane of travel for transit service	Repurposes one lane of travel for transit service
• Niagara Falls Boulevard at Maple Road	N/A	Bypasses intersection with a proposed alignment within the Boulevard Mall property	Bypasses intersection with a proposed alignment within the Boulevard Mall property
• **Maple Road at Sweet Home Road**	N/A	**Bypasses intersection with underground structure**	**Operates through intersection at-grade**
• John James Audubon Parkway	N/A	Service along proposed vacated northbound roadway	Service along proposed vacated northbound roadway

Alternative Comparison	No Build Alternative	LRT Build Alternative	BRT Build Alternative
Traffic Signals and Traffic Operations	No investment in new signals or increased operational improvements	**Investments in new signals and use of signal pre-emption for service.*** Investments in increased operational improvements.	**Investments in new signals and use of signal TSP.*** Investments in increased operational improvements.
Proposed Project Stations			
• Pedestrian and Bicycle Facilities	No new investments	Includes new facilities such as sidewalks and bicycle lanes	Includes new facilities such as sidewalks and bicycle lanes
• Shelter	No new investments	Included shelter with enclosure	Included shelter with enclosure
• Rider Amenities	No new investments	Included	Included
• Rider Information	No new investments	Included	Included
• Safety and Security	No new investments	Included	Included
Proposed Project Power and Systems			
• **Propulsion**	N/A	**Electric**	**Battery Electric**
• **System Requirements**	N/A	**Substations required**	**None**
Proposed Storage Facility	N/A	**North I-990, storing up to two to four trains overnight**	**North I-990, storing up to 17 buses overnight**
Proposed Service Frequencies	No new investments in increased service	**Every 10-minutes during peak hours, 12-15 minutes during off-peak hours, and every 20-minutes on Sunday**	**Every 5 to 6-minutes during peak hours, 12-15 minutes during off-peak hours, and every 20-minutes on Sunday**
Anticipated Travel Times	N/A	**23-minute trip from University Station to I-990 station**	**26-minute trip from University Station to I-990 station**

*For more detailed information regarding traffic operations, please refer to Chapter 3 Transportation