



MIDTOWN GREENWAY

APPENDIX D

Planning and Conceptual Design, Phase II Technical Memorandum

Planning and Conceptual Design: Phase II Technical Memo

This memo summarizes the planning and conceptual design used in Phase II of the Midtown Greenway Bicycle and Pedestrian Trail Expansion Planning Study. Building on prior planning, this Phase II memo presents the underlying design philosophy used to develop the corridor alternatives, and presents the alignment alternatives, trail cross-sections, and segment-level layouts. The purpose of this phase was to provide a clear, comparative framework to inform future decision making, and allow for the development of comparative analysis, as presented in the full report.

DESIGN PHILOSOPHY

For the purposes of this study a hierarchy of design standards were considered to evaluate the feasibility of constructing trail facilities commensurate with the existing Midtown Greenway Trail facility that the community has grown accustomed to and embraced.

Existing Midtown Greenway Facilities

Cross Section: Most of the existing Midtown Greenway between its western terminus at the Kenilworth Trail and eastern terminus at the Mississippi River includes a minimum 16-foot-wide bituminous paved surface delineated with 5-foot directional bike lanes and a six-foot-wide pedestrian path. In locations where available ROW allows primarily between Humboldt Avenue and Hiawatha Avenue, the paved surface expands to 20 feet allowing the bike lanes to expand to 7 feet in each direction. The pedestrian and bikeway elements of the trail are typically contiguous with a few exceptions where greenspace separates the two modes.

Amenities: The existing Midtown Greenway includes pedestrian scale lighting, security call boxes, wayfinding signage, benches, interpretive signage and access paths to intersecting streets, park spaces and other points of interest. As the Midtown Greenway has matured and adjoining parcels have been redeveloped, the private property edges have been planted with trees, shrubs, gardens, native grasses and pollinator plants enhancing the experience of trail users.

Planned Midtown Greenway Trail Extension Facilities

The following outlines the design criteria utilized for development of alignment alternatives included with this study. Where available space allows, the planned trail facility would be the preferred section. Other cross sections are assumed for locations based on the level of spatial constraints anticipated.

Preferred Combined Bike and Pedestrian Trail Section (unconstrained):

- 16-foot-wide paved trail delineated with two 5-foot directional bike lanes and a 6-foot pedestrian walk (note 1).

Combined bike and pedestrian trail section (constrained):

- 12-foot-wide paved trail delineated with two 4-foot directional bike lanes and 4-foot pedestrian walk.

Independent Bike Trail (unconstrained):

- 12-foot-wide paved trail delineated with two 6-foot directional bike lanes (note 2).

Independent Bike Trail (constrained):

- 10-foot-wide paved trail delineated with two 4-foot directional bike lanes (note 2).

Notes:

1. Where possible, the pedestrian trail and bicycle trail would be separated by a turf boulevard of at least 4 feet in width.
2. The independent bike trail sections assume either no pedestrian facilities due to space constraints or pedestrians are accommodated by existing sidewalks on the opposite side of the street from the bike trail facility.

Amenities: The Midtown Greenway extension construction cost estimates include the following amenities/elements:

- Pedestrian scale lighting (approximately 150 ft spacing)
- Security call boxes (approximate 1,000 foot spacing)
- Wayfinding signage
- Benches (1/4 mile to ½ mile intervals)
- Interpretive signage (as determined by community engagement)
- Boulevard Trees - locations outside of CPKC ROW that include at least 5-foot wide boulevard(s) would be considered eligible for tree plantings.

CORRIDOR ALIGNMENT ALTERNATIVES

Conceptual Alignment Alternatives were developed to follow the design parameters described above and in consultation with the Technical Working Group. These alignment alternatives are defined below and presented in the series of graphics that follow.

Corridor Alternative 1, Short Line Bridge/On-Rail Corridor: this alignment concept would use the existing Short Line rail bridge crossing the Mississippi River and would follow along and within rail ROW east of the river to Cleveland Avenue in Saint Paul. Short Line Bridge design considerations are described in the “Mississippi River Bridge Crossings” section. East of Cleveland Avenue, all alternative alignments converge and are detailed under “Segments and Elements Common to All Alternatives” and would run within city street ROW along Gilbert Avenue, and along Prior Avenue, Saint Anthony Avenue, Pierce Street, and Shields Avenue to the trail terminus at Allianz Field.

Alignment Alternative 2, New River Bridge with Partial Use of Rail Corridor: This concept would require building a new trail-only bridge crossing of the Mississippi River and would follow along and within rail ROW between the river and Cleveland Avenue, wherever a minimum track-to-trail separation of 50 feet could be achieved. East of Cleveland Avenue all alternative alignments converge and are detailed in the “Segments and

Elements Common to All Alternatives” section below. This alternative was studied as a contingency to Corridor Alternative 1 and would provide the full 50-foot trail separation required by the CPKC (and as noted under “Railroad Coordination”).

Alignment Alternative 3, *New River Bridge/Off-Rail Corridor*: This concept would also require building a new trail-only bridge crossing of the Mississippi River similar to Corridor Alternative 2. From there, Corridor Alternative 3 would follow within city street or MnDOT ROW along Saint Anthony Avenue south of I-94 to Cleveland Avenue. The alternative would use the existing Cleveland Avenue bridge over I-94 to connect to Gilbert Avenue on the north side of the freeway. East of Cleveland Avenue all alternative alignments converge and are detailed under the “Segments and Elements Common to All Alternatives” section. An optional alignment for Corridor Alternative 3 would continue easterly along S. Saint Anthony Avenue through Merriam Park to Prior Avenue. This optional alignment would utilize the Prior Avenue bridge over I-94 to connect to N. Saint Anthony Avenue.

The map below also presents planned and existing trails and bikeways in the vicinity and intersecting with the alignment alternatives. These bikeways are categorized into protected and unprotected facilities and include both planned and existing facilities. In Saint Paul, protected was defined as “Separated Bikeways & Paths” as presented in the Saint Paul Planned Bicycle Network. Bicycle boulevards and shared lanes are not depicted. In Minneapolis, protected was defined as a “Low-Stress Bikeway” as presented in the Minneapolis All Ages and Abilities Network.

Prospect Park Connector: The Prospect Park trail would run to the northwest along the southwest edge of railroad ROW and would terminate at 27th Avenue SE, which is the planned route for the Grand Rounds Missing Link Regional Trail. This trail segment would improve connections to the University of Minnesota Main Campus from Saint Paul and Minneapolis neighborhoods via the main route of the future Midtown Greenway trail extension. The trail would also include convenient connections to Cecil Street, Seymour Place, the existing Seymour Place pedestrian bridge, and Franklin Avenue.



Figure 1: Map of Trail Segments and Alternatives

CORRIDOR ALTERNATIVE LAYOUTS

The following series of layout exhibits provides a more detailed illustration of the alignment alternatives described above, the relationships with railroad right of way, streets, and other topographical elements. Segment identification (1A, 2 etc.) is included to help correlate to the alignment alternatives. The exhibits are organized in seven views beginning at the river crossing and moving east toward the trail terminus at Allianz Field.

Exhibits are also labeled with cross-section views (1A-1, 2-2, etc.) that correspond to cross-section diagrams on the following page, which demonstrate the widths and typical layouts across the corridor. Each diagram represents a snapshot of the corridor within each segment but does not represent the entirety of conditions across each segment. In cases where segments have distinct variations, more than one typical cross-section is provided.

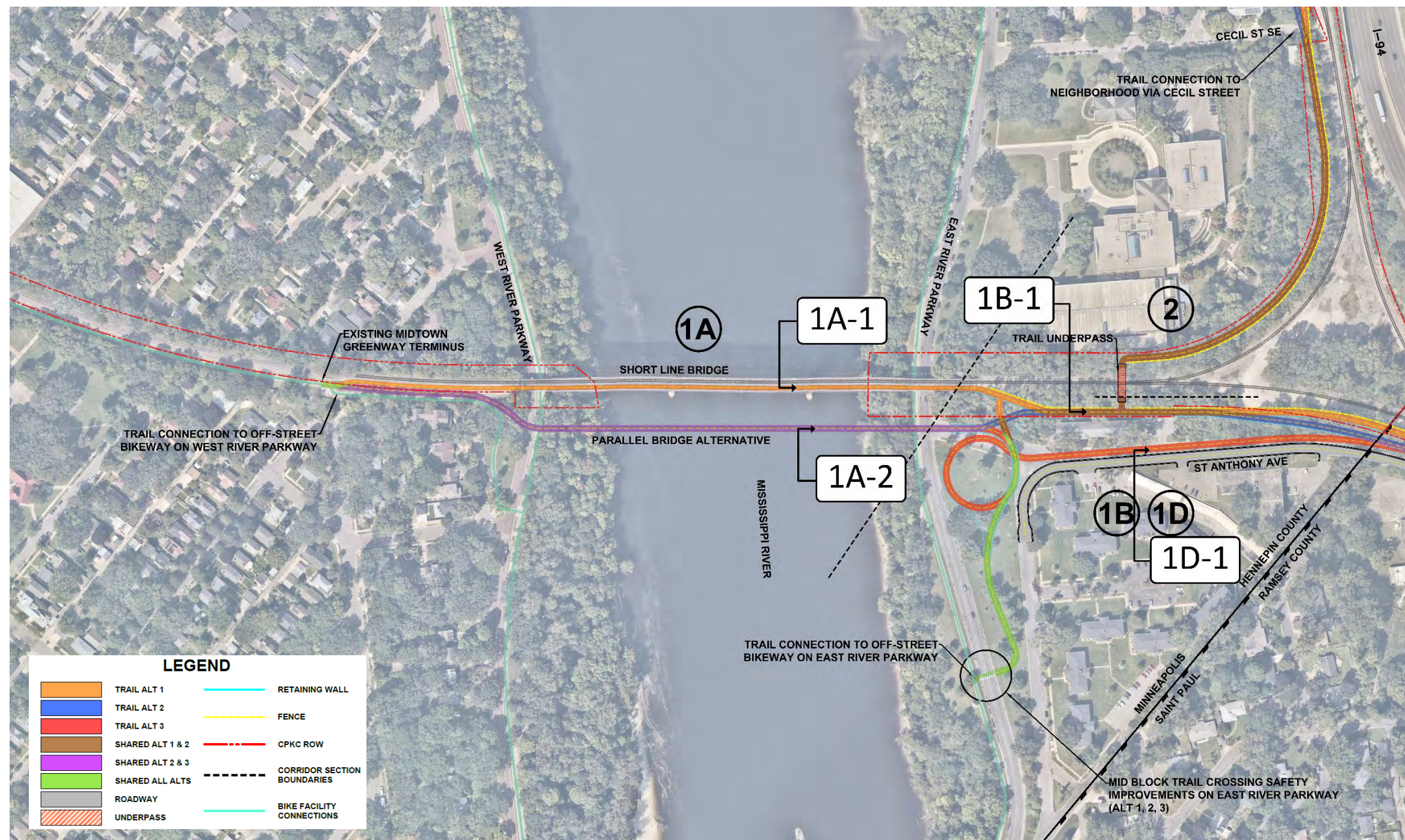


Figure 2: Mississippi River Crossing

Corridor Alternative 1 is depicted above in gold and includes segment 1A (Short Line Bridge), 1B (east bank approach and 2 (Prospect Park Connector). Corridor Alternatives 2 and 3 utilize a new parallel river bridge depicted in purple. All trails would connect to the East River Parkway Grand Rounds Trail via the segment of trail depicted in green. Corridor Alternatives 1 and 2 merge east of the bridge and intersect with the Prospect Park Connector (segment 2) via the track underpass. East of the river crossing Corridor Alternative 3, depicted in red, utilizes a helix ramp to descend from bridge level to street level (approximately 40 foot elevation drop). Corridor Alternatives 1 and 2 follow the edge of railroad right of way easterly at elevation approximately 10-15 feet below river bridge level.

SEGMENT 1A: MISSISSIPPI RIVER CROSSING

ALIGNMENT ALTERNATIVE 1

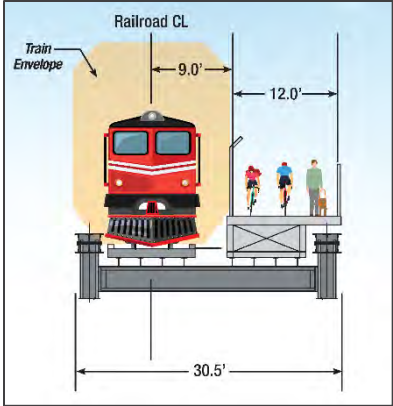


Figure 3: Segment 1A-Alternative 1 (View 1A-1)

SEGMENT 1B/1D: RAIL ROW FROM EAST RIVER PARKWAY TO PELHAM

ALIGNMENT ALTERNATIVES 1 & 2

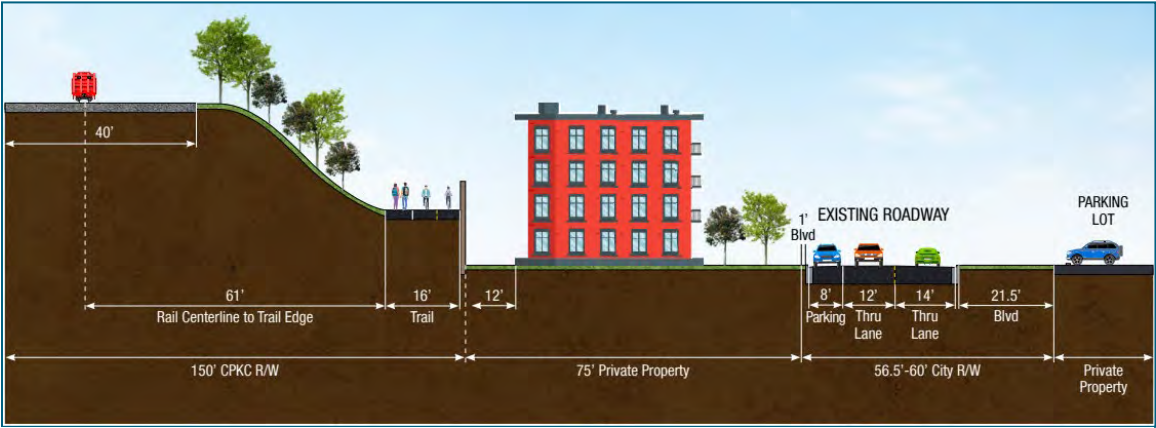


Figure 5: Segment 1B-Alternative 1 & 2 (View 1B-1)

ALIGNMENT ALTERNATIVES 2 & 3

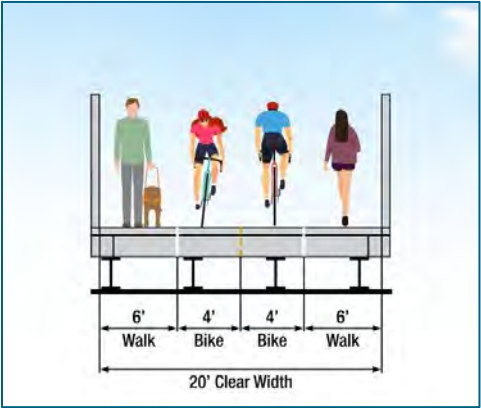


Figure 4: Segment 1A-Alternative 2 & 3 (View 1A-2)

ALIGNMENT ALTERNATIVE 3

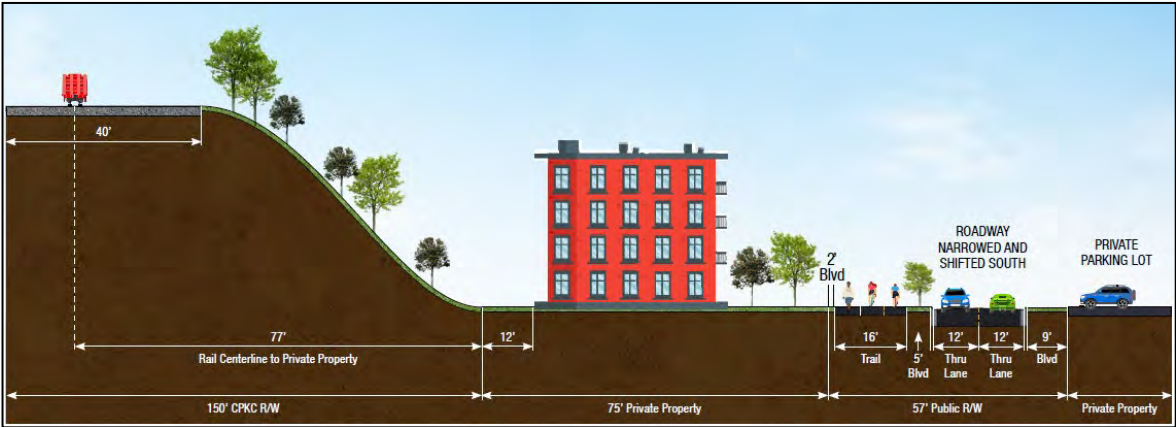


Figure 6: Segment 1D-Alternative 3 (View 1D-1)

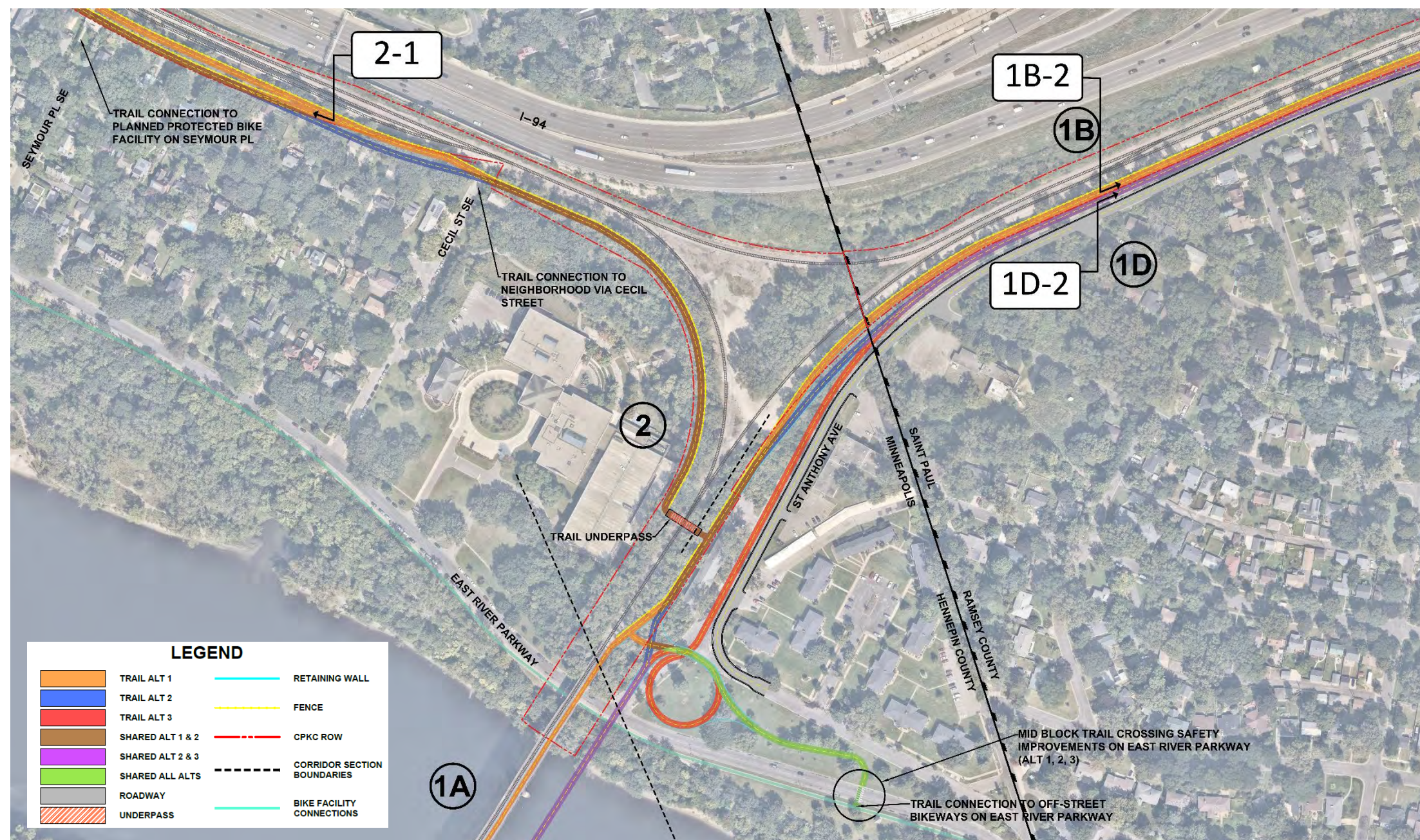


Figure 7: Prospect Park Connector Trail Connection

This layout depicts the Prospect Park Connector (Segment 2) included in Corridor Alternatives 1 and 2 in brown color. The right of way is sufficient to provide 50-foot offset around the track wye to Cecil Street. Northwest of Cecil Street the rail right of way narrows – this is the location of the residential parcels that would be impacted by permanent trail easements to accommodate the 25 foot or 50 foot offsets required by the CPKC. The trail would provide convenient connection to Cecil Street, Seymour Place and the existing Seymour Place pedestrian bridge depicted in the upper left portion of **Figure 8**.

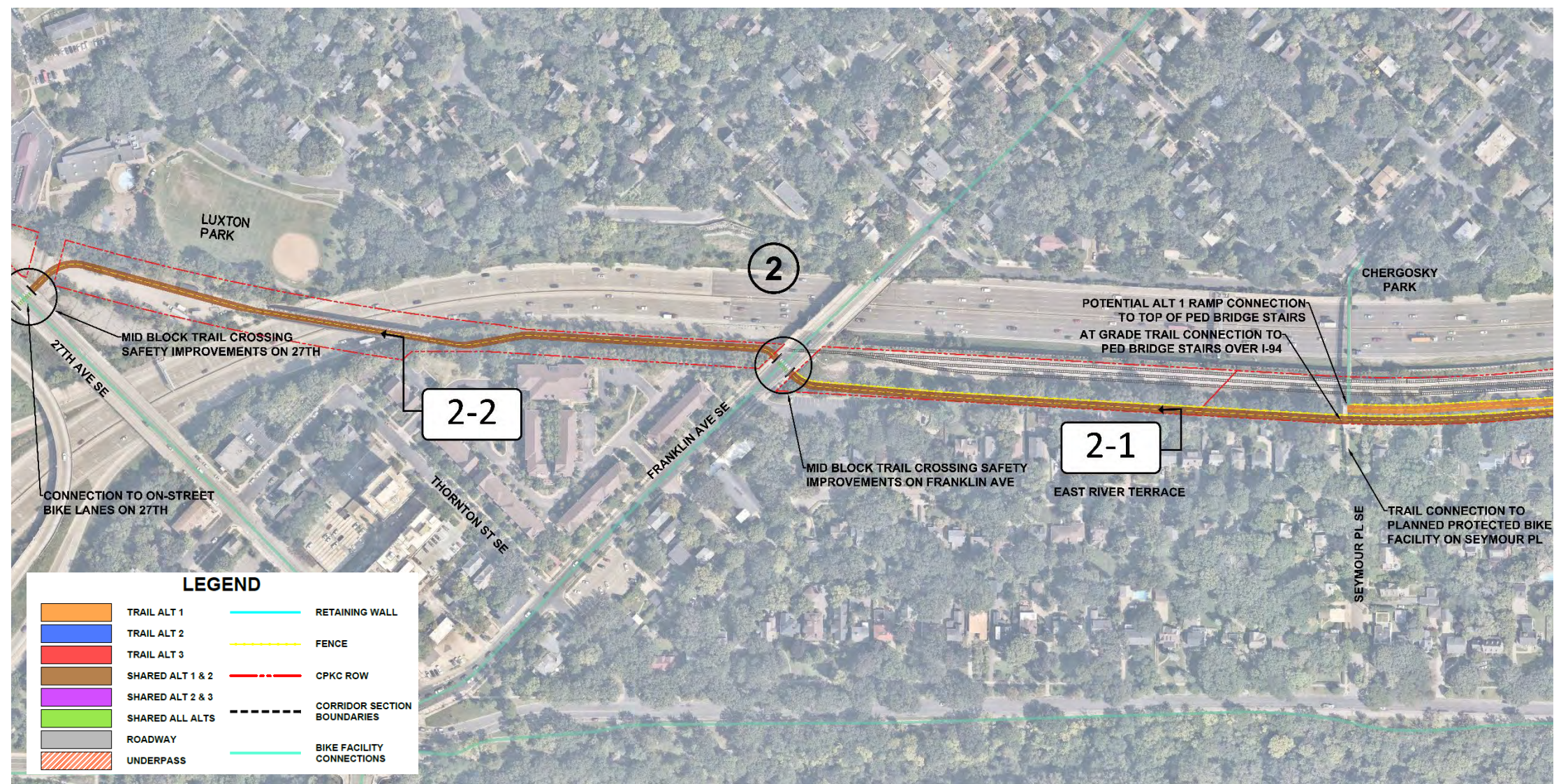


Figure 8: Prospect Park Connector

Figure 8 depicts the northern terminus of the Prospect Park Connector (segment 2) at 27th Avenue SE. This portion of the trail runs within rail right of way adjacent to private property parcels but is not anticipated to require permanent easements. Trail proximity to existing privacy fences and overhead power will need to be reviewed in detail design to identify whether any adjustments to those elements are required. The trail connects to existing on-street bike lanes on Franklin Avenue and continues north within the vacant section of rail ROW between Franklin Avenue and 27th Avenue SE. North of I-94, the trail alignment will need to be coordinated with MPRB's planned expansion of Luxton Park. Crossing design at Franklin Avenue and 27th Avenue will consider safety enhancements appropriate for mid-block crossings including bump outs and RRFB systems.

SEGMENT 2: PROSPECT PARK CONNECTOR

ALIGNMENT ALTERNATIVE 1 & 2

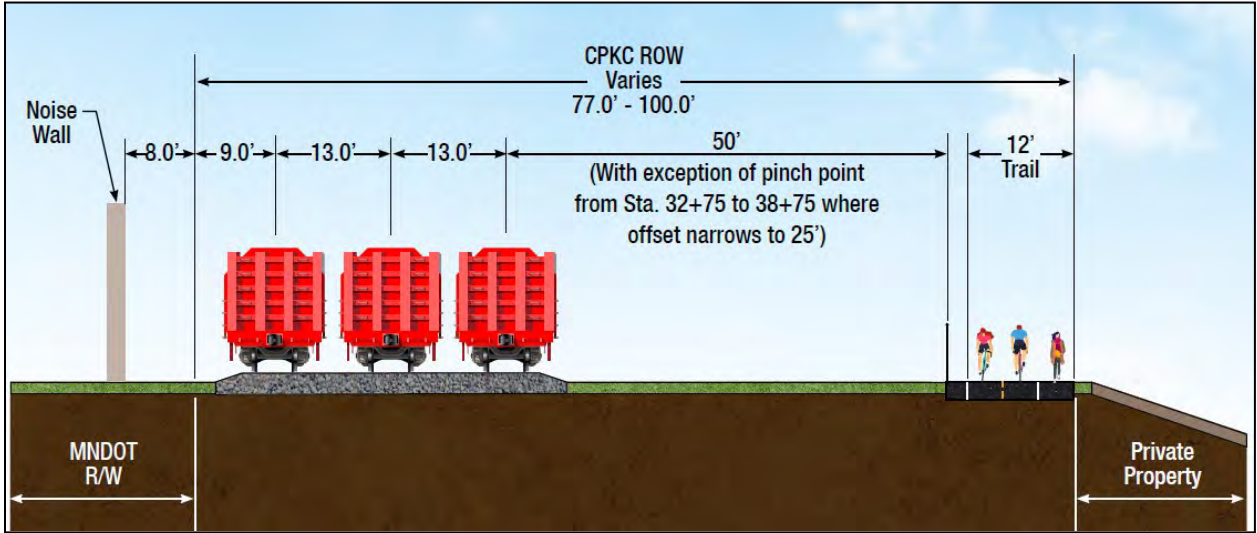


Figure 9: Segment 2- Alternative 1 & 2 (View 2-1)

ALIGNMENT ALTERNATIVE 1 & 2: EXISTING RAIL BRIDGE OVER I-94

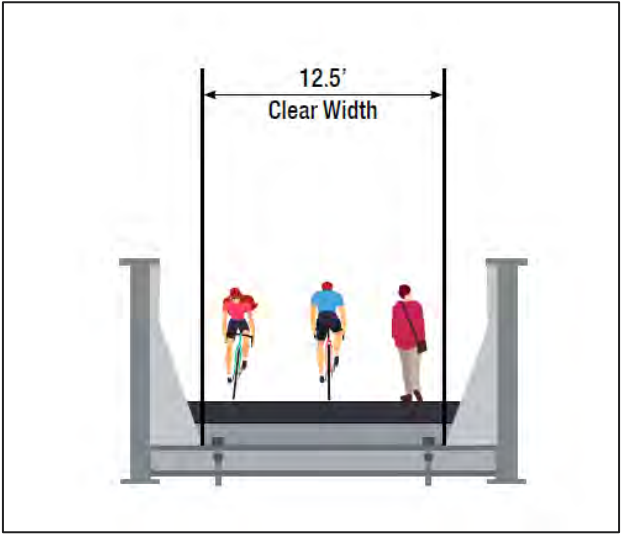


Figure 10: Segment 2-Alternative 1 & 2 (View 2-2)

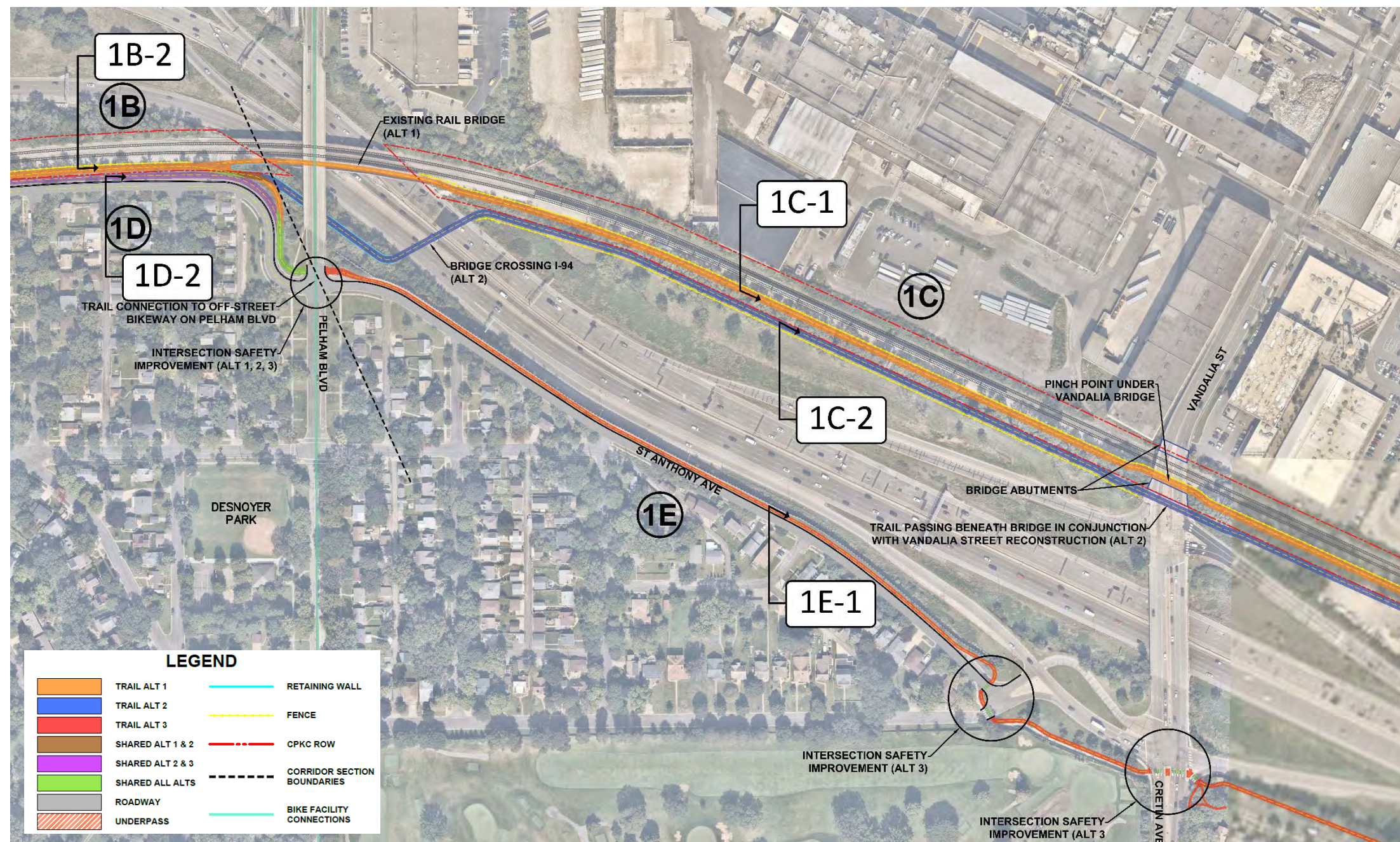


Figure 11: Alignment Alternatives - Pelham Blvd to Cretin Ave-Vandalia Street

Figure 11 depicts Segments 1C and 1E between Pelham Boulevard and Cretin Avenue/Vandalia Street. All corridor alternatives include a connection to the Saint Paul Grand Round trail along Pelham Boulevard. Corridor Alternative 1 (depicted in gold) utilizes the rail bridge over I-94 and runs east and under Vandalia Street utilizing the existing bridge although only an 18-foot offset is achievable under the bridge. Corridor Alternative 2 (depicted in blue) runs under the Pelham Boulevard Bridge, across I-94 on a new structure and crosses under Vandalia Street in conjunction with the reconstruction of Vandalia Street bridge. Corridor Alternative 3 (depicted in red) utilizes the north side of Saint Anthony Avenue ROW and includes narrowing of Saint Anthony Avenue to accommodate a 10-foot bike trail between the freeway noise wall and new roadway curb. Pedestrians would utilize the existing sidewalk on the south side of Saint Anthony Avenue in this segment. Saint Anthony Avenue would be 16 feet wide and could be configured as a one-way street with parking bays depending on community preference.

SEGMENT 1B: RAIL ROW FROM EAST RIVER PARKWAY TO PELHAM

ALIGNMENT ALTERNATIVE 1 & 2 (WESTERN END OF SEGMENT)

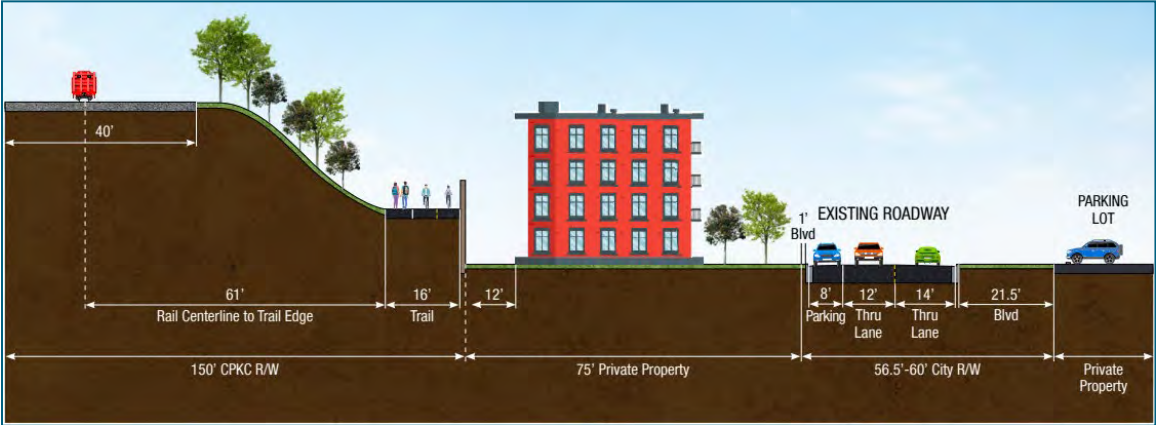


Figure 12: Segment 1B-Alternative 1 & 2 (Western End) (View 1B-1)

ALIGNMENT ALTERNATIVE 1 & 2 (EASTERN END OF SEGMENT)

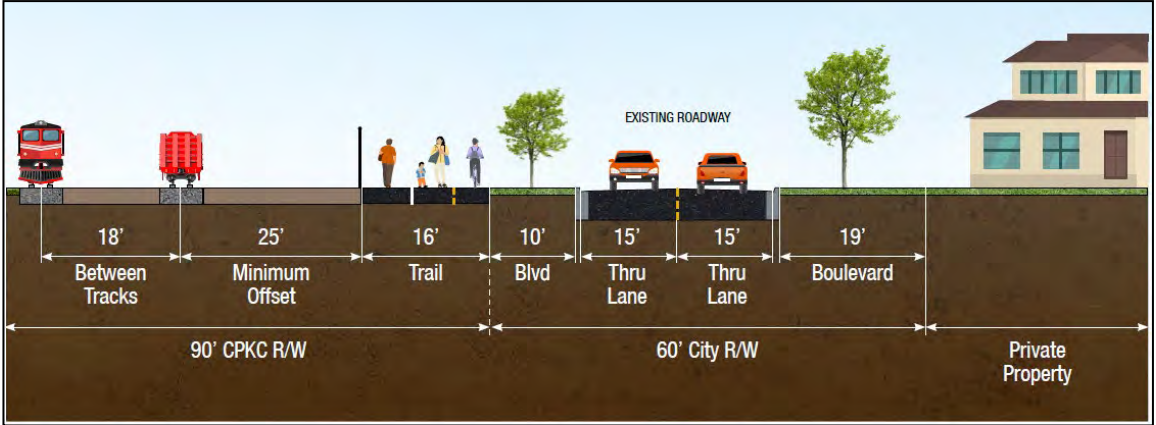


Figure 13: Segment 1B-Alternative 1 & 2 (Eastern End) (View 1B-2)

SEGMENT 1D: SAINT ANTHONY AVE FROM EAST RIVER PARKWAY TO PELHAM

ALIGNMENT ALTERNATIVE 3 (WESTERN END OF SEGMENT)

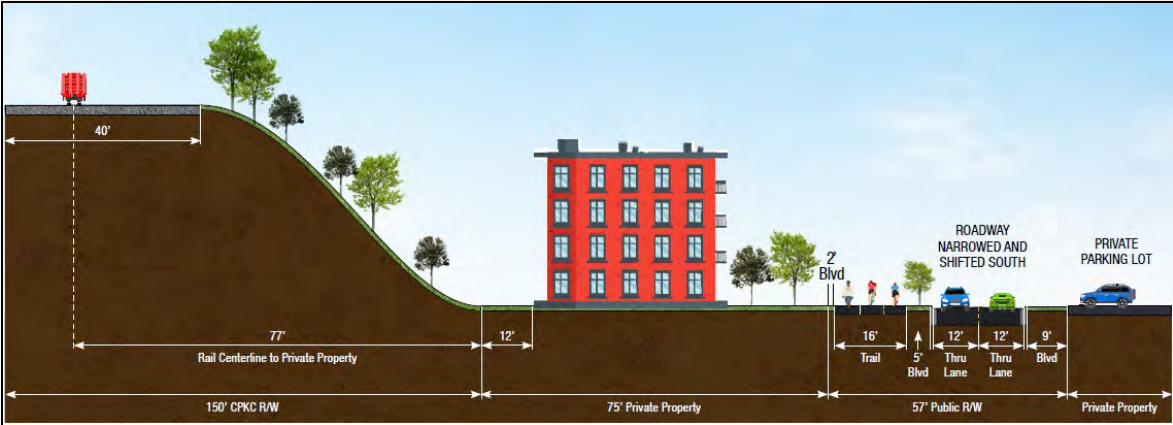


Figure 14: Segment 1D-Alternative 3 (View 1D-1)

ALIGNMENT ALTERNATIVE 2 & 3 (EASTERN END OF SEGMENT)

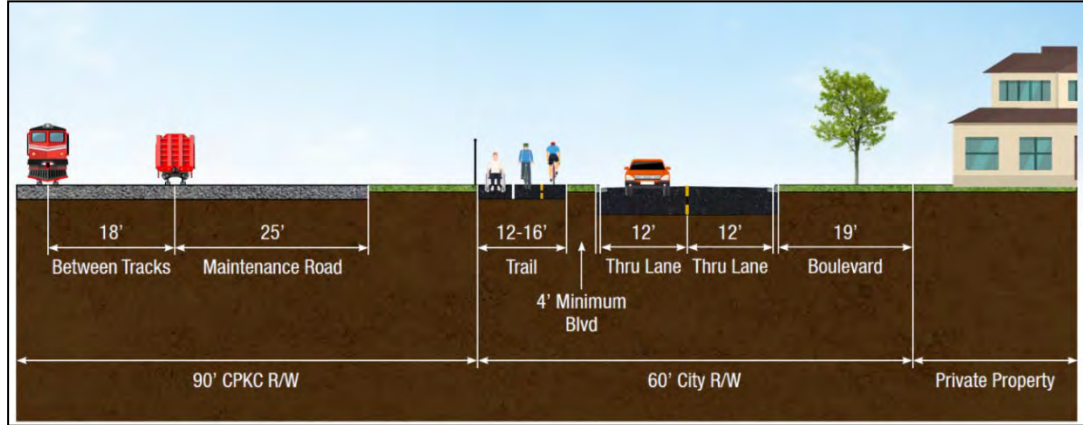


Figure 15: Segment 1D-Alternative 2 & 3 (View 1D-2)

SEGMENT 1C: RAIL ROW FROM PELHAM TO CLEVELAND

ALIGNMENT ALTERNATIVE 1

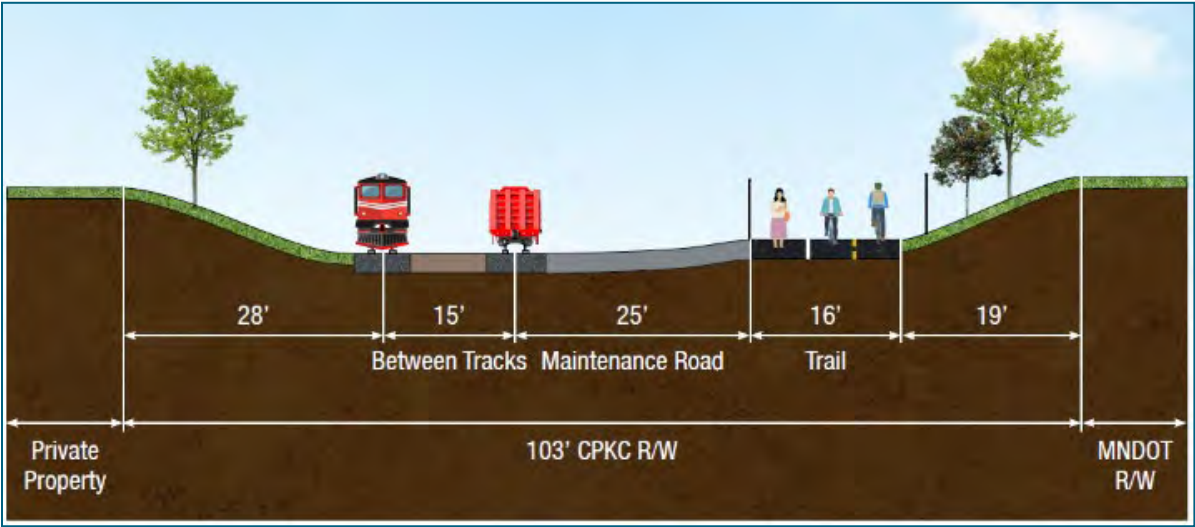


Figure 16: Segment 1C-Alternative 1 (View 1C-1)

ALIGNMENT ALTERNATIVE 2

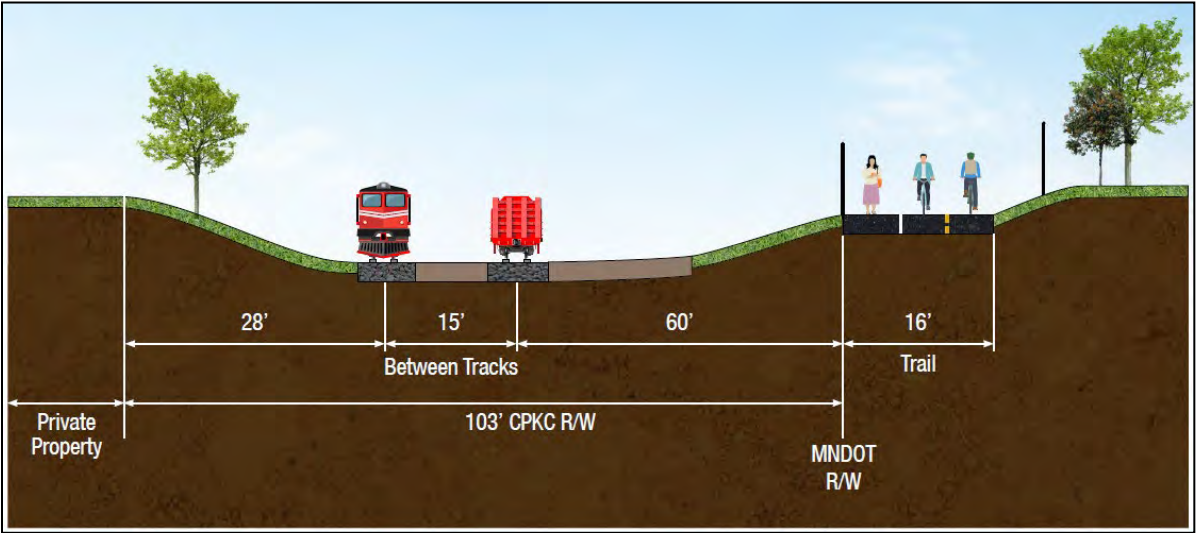


Figure 17: Segment 1C-Alternative 2 (View 1C-2)

SEGMENT 1E: SAINT ANTHONY AVE S FROM PELHAM TO CLEVELAND

ALIGNMENT ALTERNATIVE 3

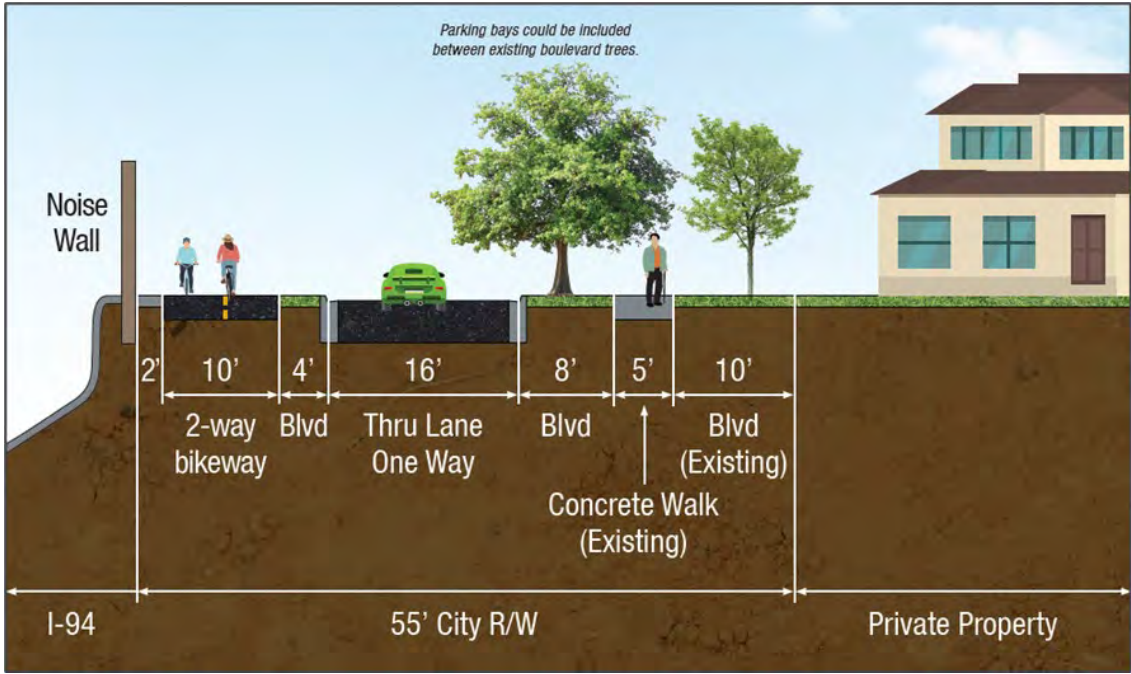


Figure 18: Segment 1E-Alternative 3 (View 1E-1)

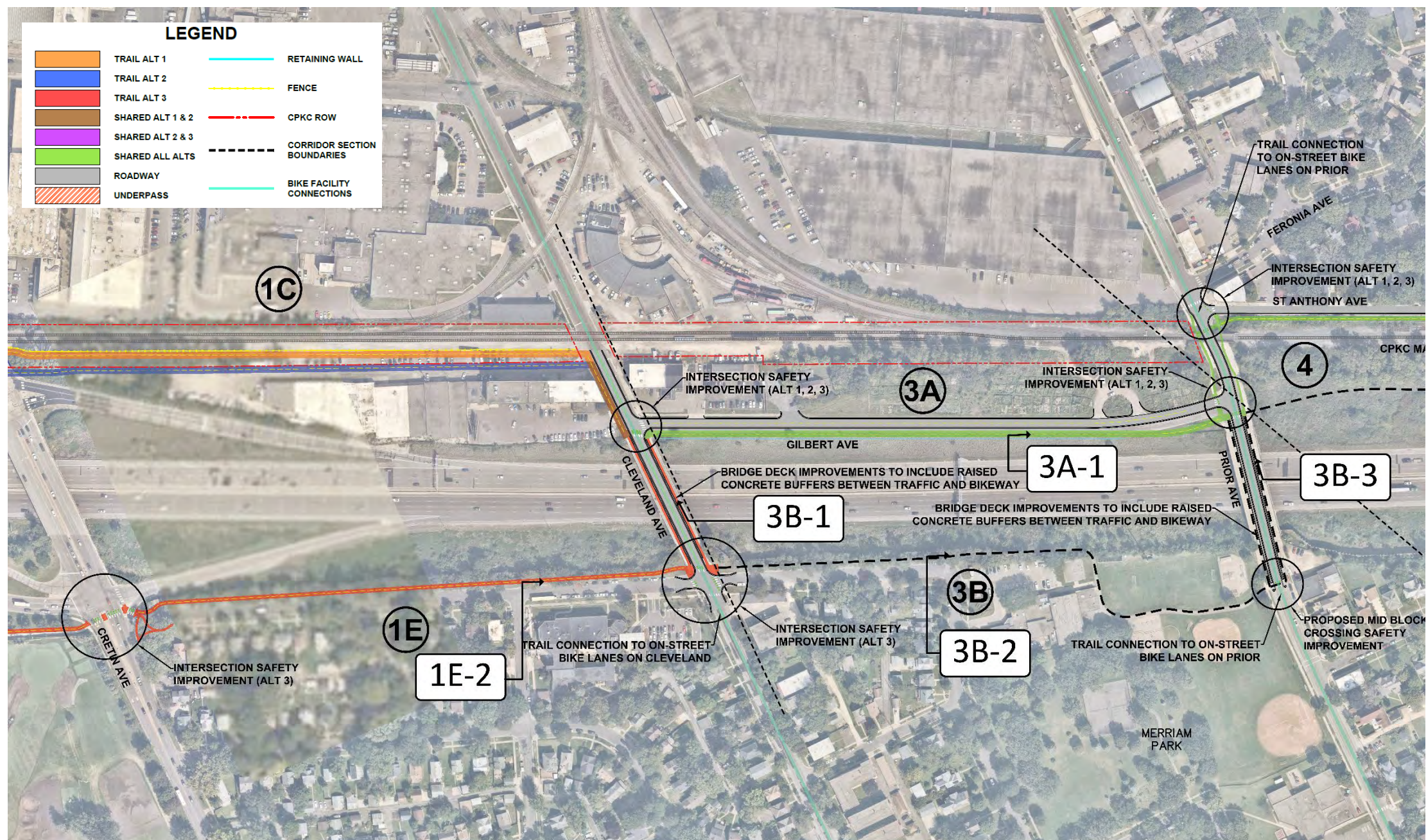


Figure 19: Trail Alternatives from Cretin Ave to Prior Ave

Figure 19 depicts trail Segments 1C and 1E between Cretin Avenue/Vandalia Street and Cleveland Avenue as well as Segments 3A and 3B extending to Prior Avenue. Corridor Alternative 1 (gold) and Corridor Alternative 2 (blue) merge together at Cleveland Avenue and run easterly along the south side of Gilbert Avenue (depicted in brown). Corridor Alternative 3 (depicted in red) utilizes the north side of Saint Anthony Avenue ROW between Cretin Avenue and Cleveland Avenue and includes a 10-foot bike trail between the freeway noise wall and existing roadway curb without any roadway narrowing. Pedestrians would utilize the existing sidewalk on the south side of Saint Anthony Avenue in this segment. Corridor Alternative 3 may cross I-94 and connect to Corridor Alternatives 1 and 2 at Gilbert Avenue using the Cleveland Avenue Bridge or continue easterly (Segment 3B) along Saint Anthony Avenue and through Merriam Park utilizing Prior Avenue to cross I-94. All corridor alternatives utilize Prior Avenue under the CPKC mainline bridge then continue easterly on the south side of Saint Anthony Avenue. This optional element would provide a more direct and potentially safer trail alignment (by not having to cross Prior Avenue at grade) and a future direct connection to the Ayd Mill Road corridor trail running parallel to and southwest of the mainline track. Intersection safety enhancements including curb bump outs, lighting, signage, and striping and RRFBs should be evaluated at the major street crossings noted on **Figure 19**.

SEGMENT 1E: SAINT ANTHONY AVE S FROM PELHAM TO CLEVELAND

ALIGNMENT ALTERNATIVE 3

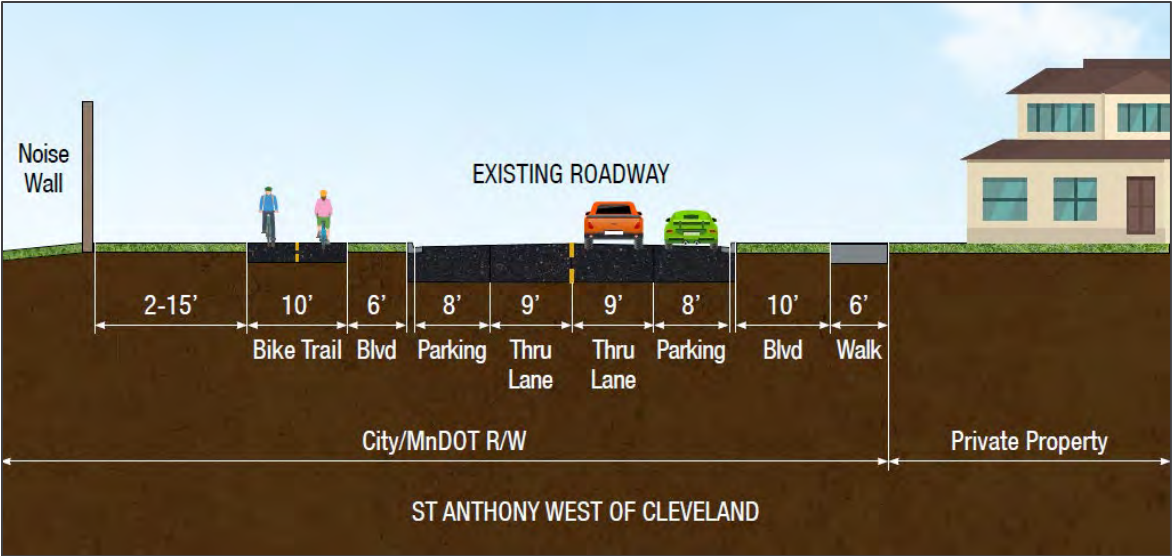


Figure 20: Segment 1E-Alternative 3 (View 1E-2)

SEGMENT 3A: GILBERT AVE/ST ANTHONY AVE N FROM CLEVELAND TO PRIOR

ALIGNMENT ALTERNATIVE 1 & 2

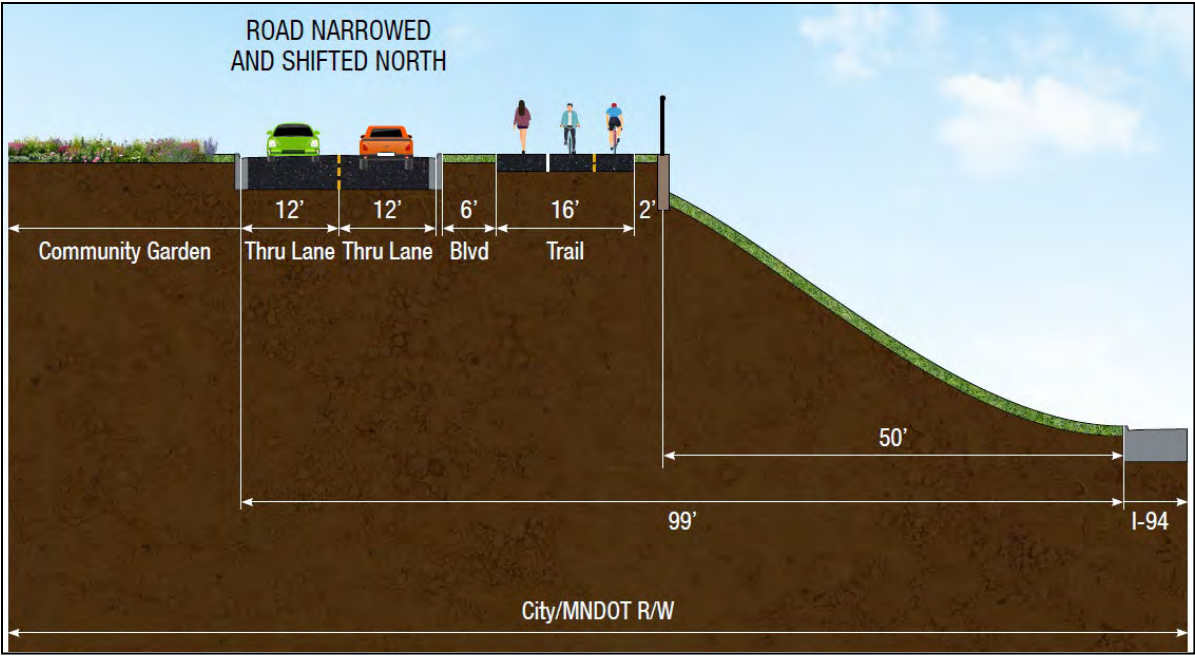


Figure 21: Segment 3A-Alternative 1 & 2 (View 3A-1)

ALIGNMENT ALTERNATIVE 3

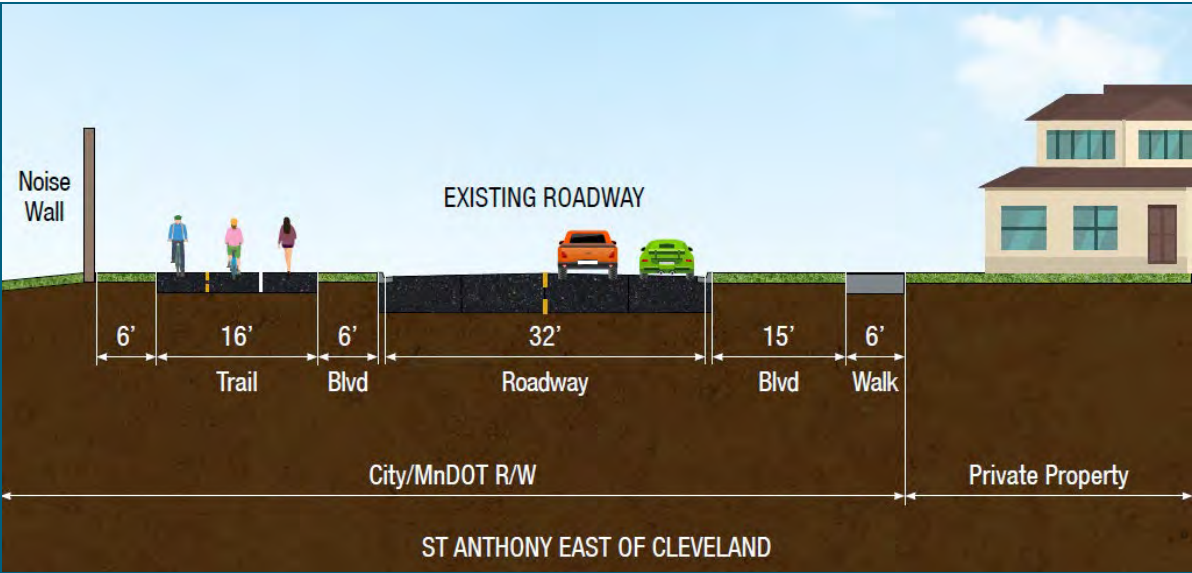


Figure 22: Segment 3B-Alternative 3 (View 3B-2)

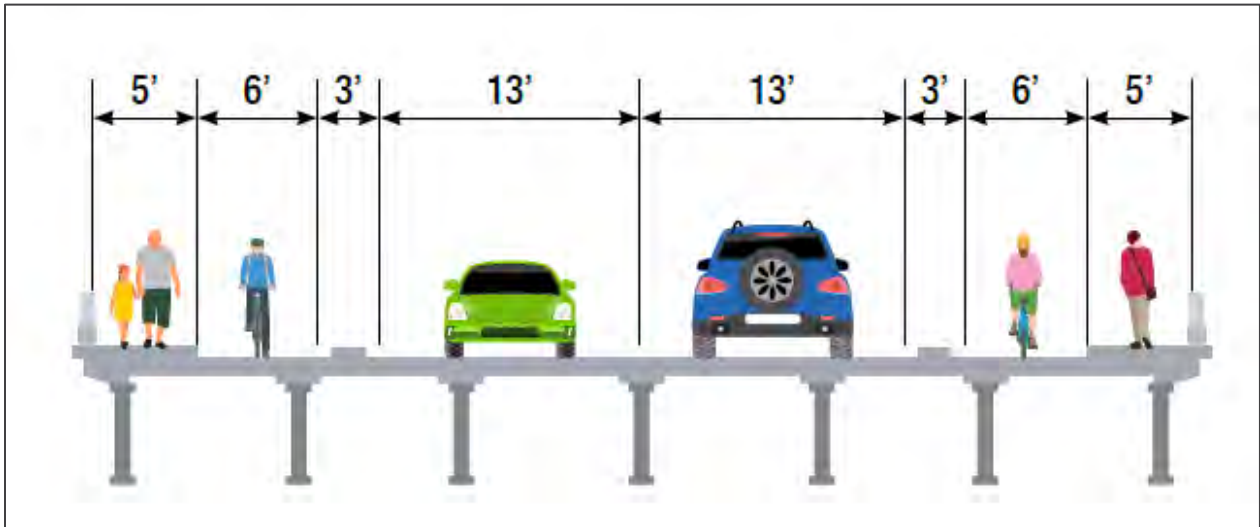


Figure 23: Segment 4-All Alternatives, Cleveland Avenue Bridge over I-94 (View 3B-1)

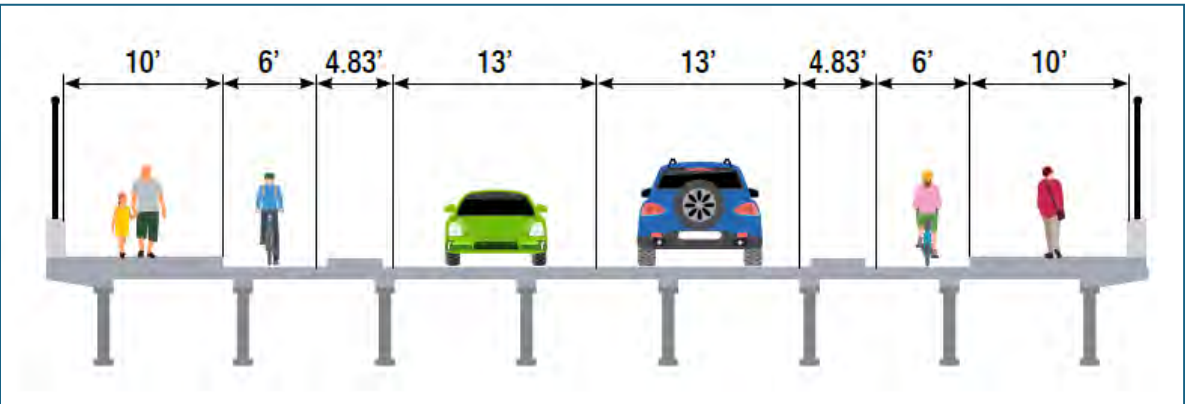


Figure 24: Segment 4-Optional Prior Avenue Bridge over I-94 (View 3B-3)

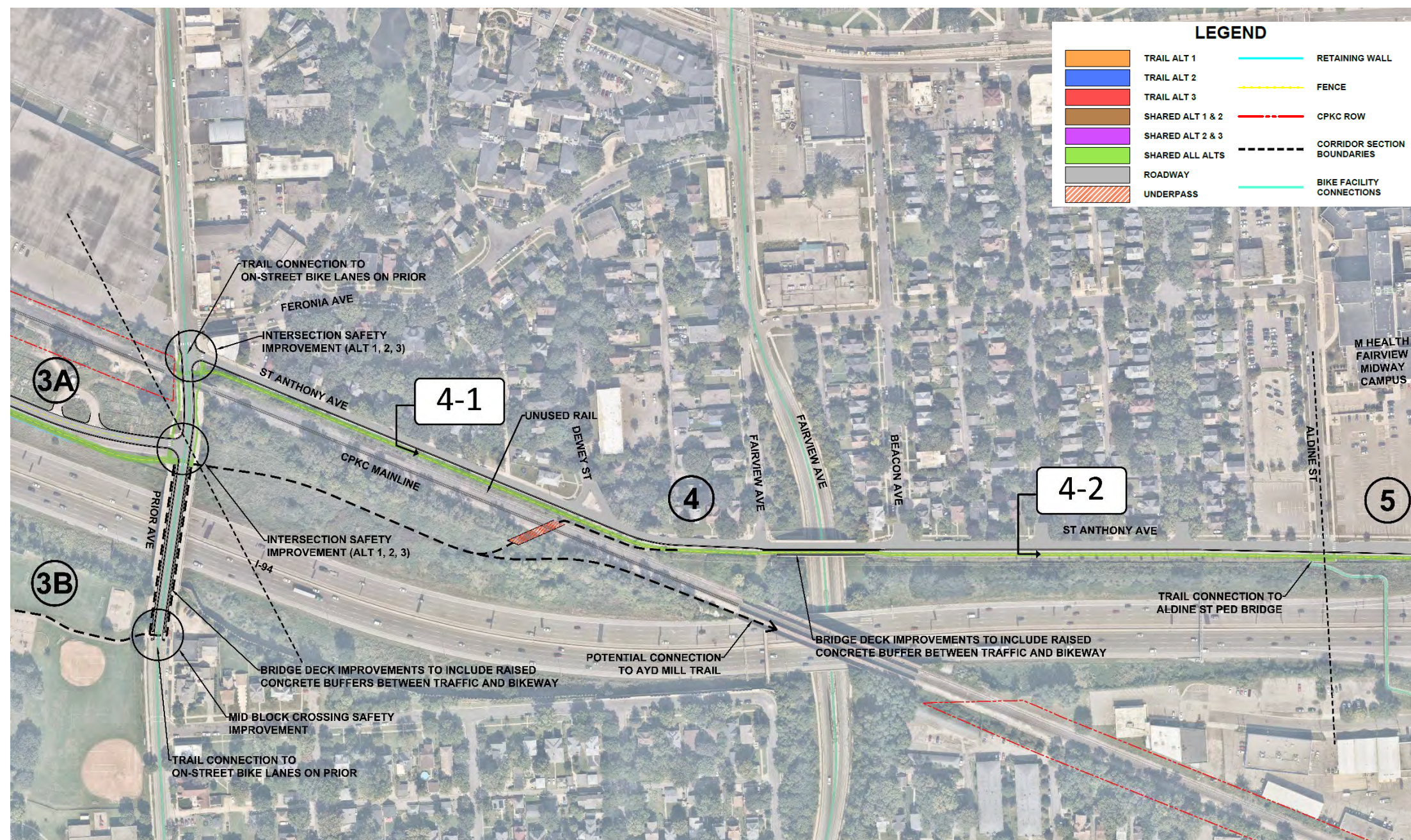


Figure 25: Trail Alternatives from Prior Ave to Aldine St

Figure 25 depicts trail Segment 4 between Prior Avenue and Aldine Street pedestrian bridge. All three corridor alternatives follow the same alignment along the south boulevard of Saint Anthony Avenue. West of Dewey Street the 10-foot bike trail would be constrained by transmission poles and the proximity of the railroad grade. East of Dewey Street the bike trail is not constrained by transmission poles. The south curbline of Saint Anthony would shift north to correlate to the existing buffer striping. Pedestrians would utilize the existing sidewalks along the north side of Saint Anthony Avenue in Segment 4. The existing bridge over Fairview Avenue would include raised concrete median to provide additional protection of cyclists from vehicular traffic. **Figure 25** also depicts a potential connection between the Midtown Greenway trail and a potential future Ayd Mill trail via a trail extension from Prior Avenue within the MnDOT I-94 ROW (black dashed line).

ALL ALIGNMENT ALTERNATIVES

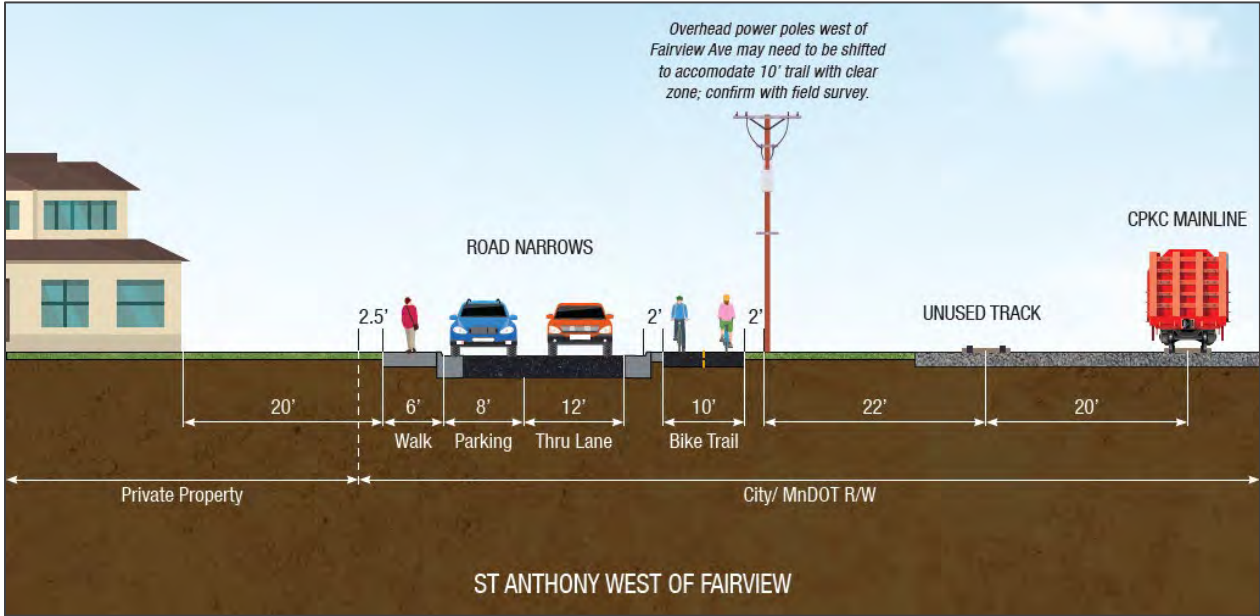


Figure 26: Segment 4-All Alternative (View 4-1)

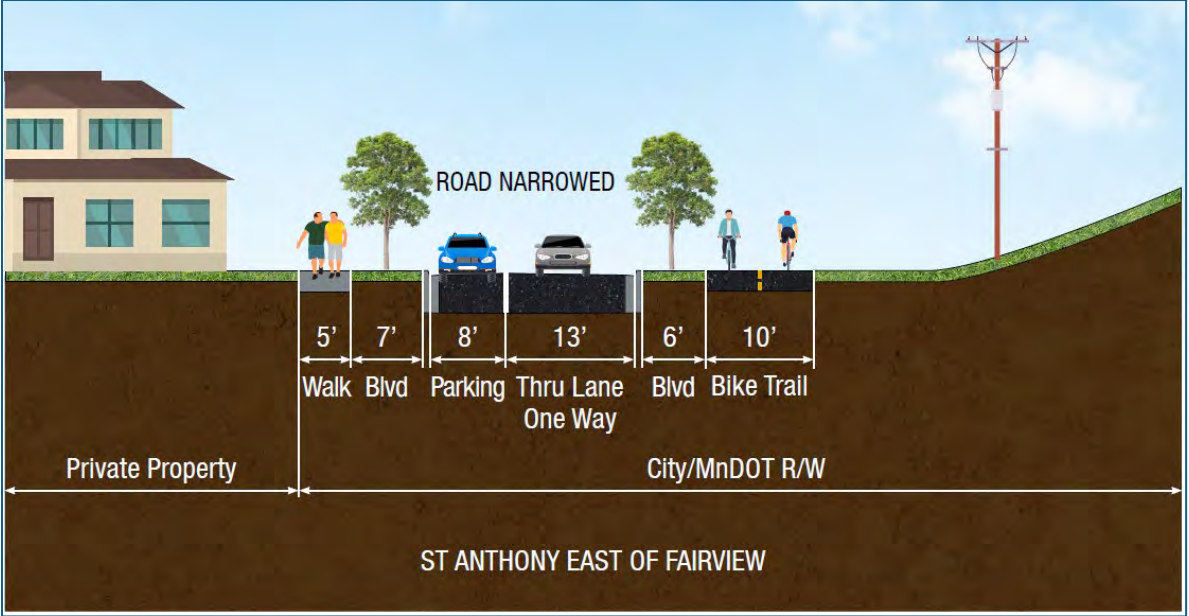


Figure 27: Segment 4-All Alternatives (View 4-2)

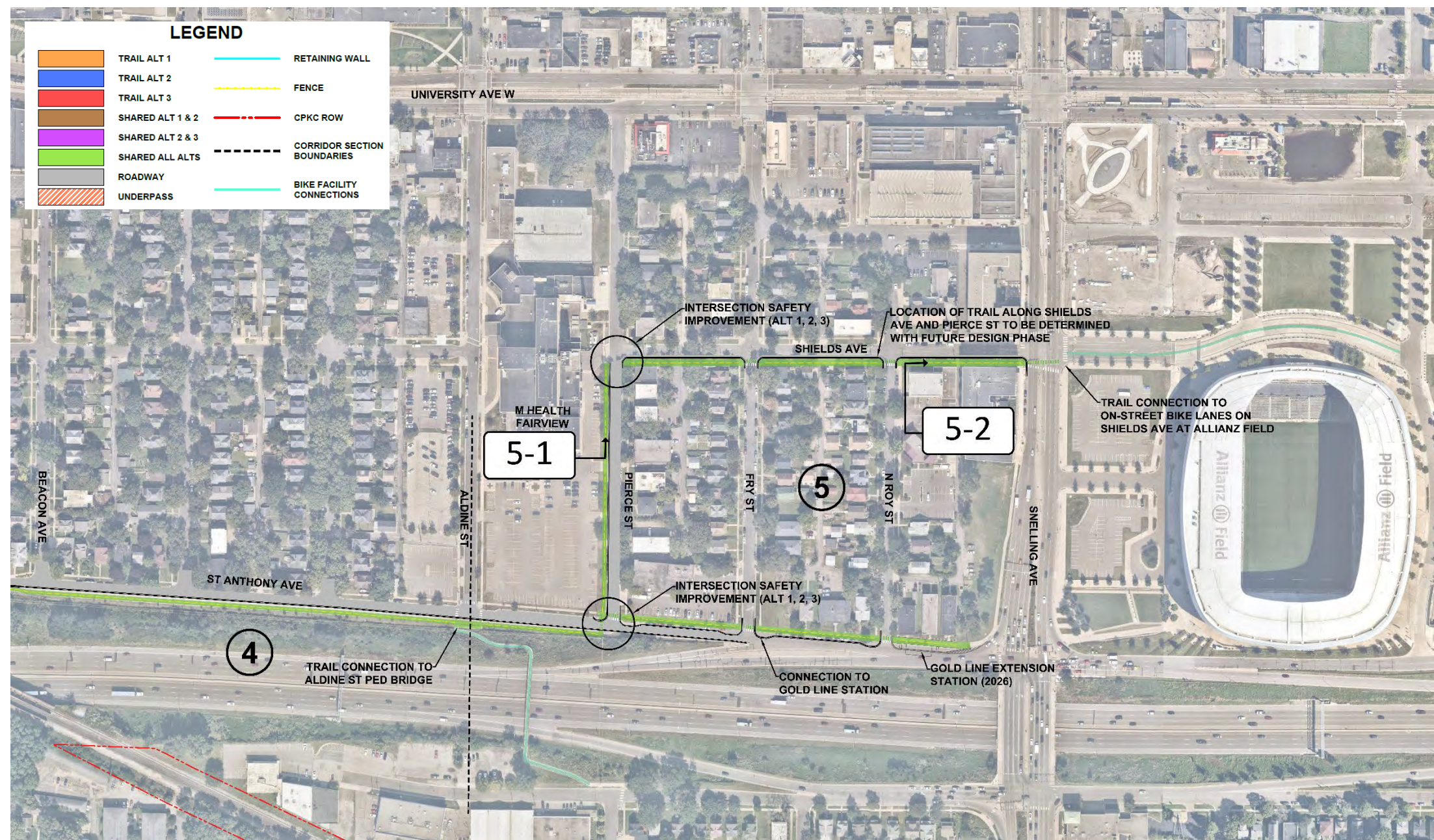


Figure 28: Trail Connection to Allianz Field

Figure 28 depicts Segment 5 between the Aldine Street pedestrian bridge and eastern terminus at the northwest corner of Allianz Field. All three corridor alternatives follow the same alignment in this segment and include a 10 foot bike trail along the west boulevard of Pierce Street and a 16 foot mixed use trail along the south boulevard of Shields Avenue. Pedestrians would utilize the existing sidewalk along the east side of Pierce Street. Curblines on Pierce Street and Shields Avenue would be shifted to optimize space for trail, vehicles, and boulevard widths. Intersection safety enhancements including curb bump outs, lighting, signage, and striping and RRFs should be evaluated at the trail crossing of Saint Anthony Avenue at Pierce Street and the crossing of Pierce Street at Shields Avenue.

ALL ALIGNMENT ALTERNATIVES

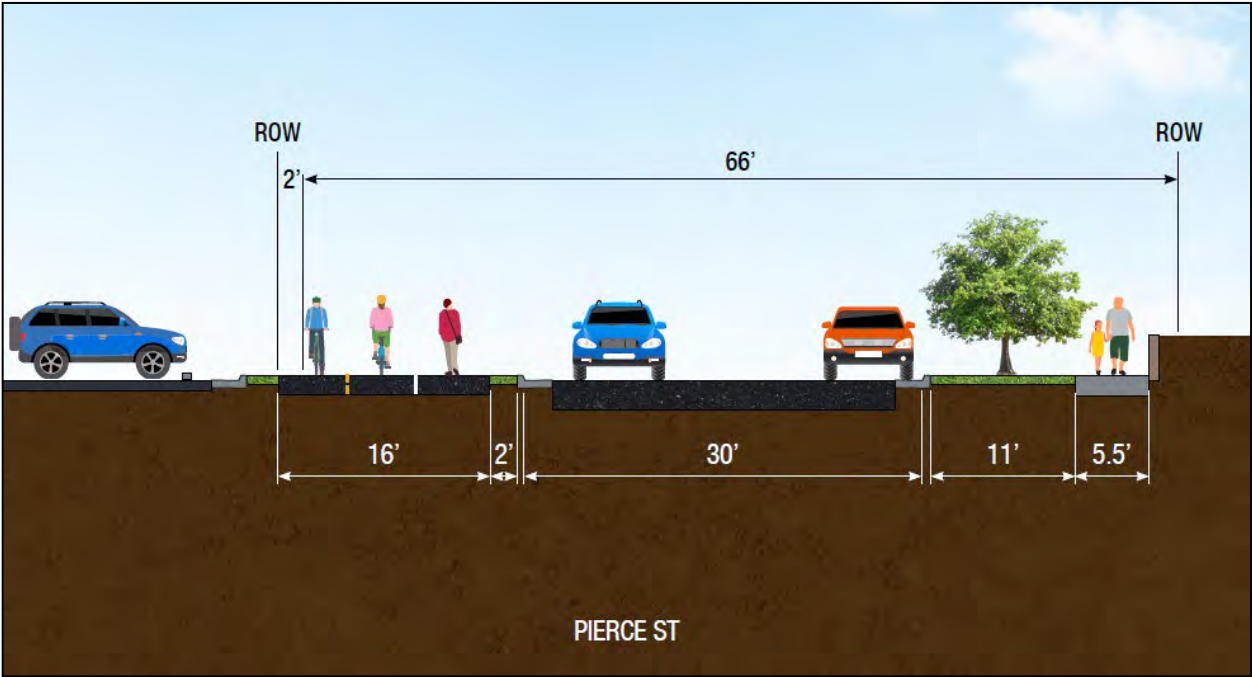


Figure 29: Segment 5-All Alternatives (View 5-1)

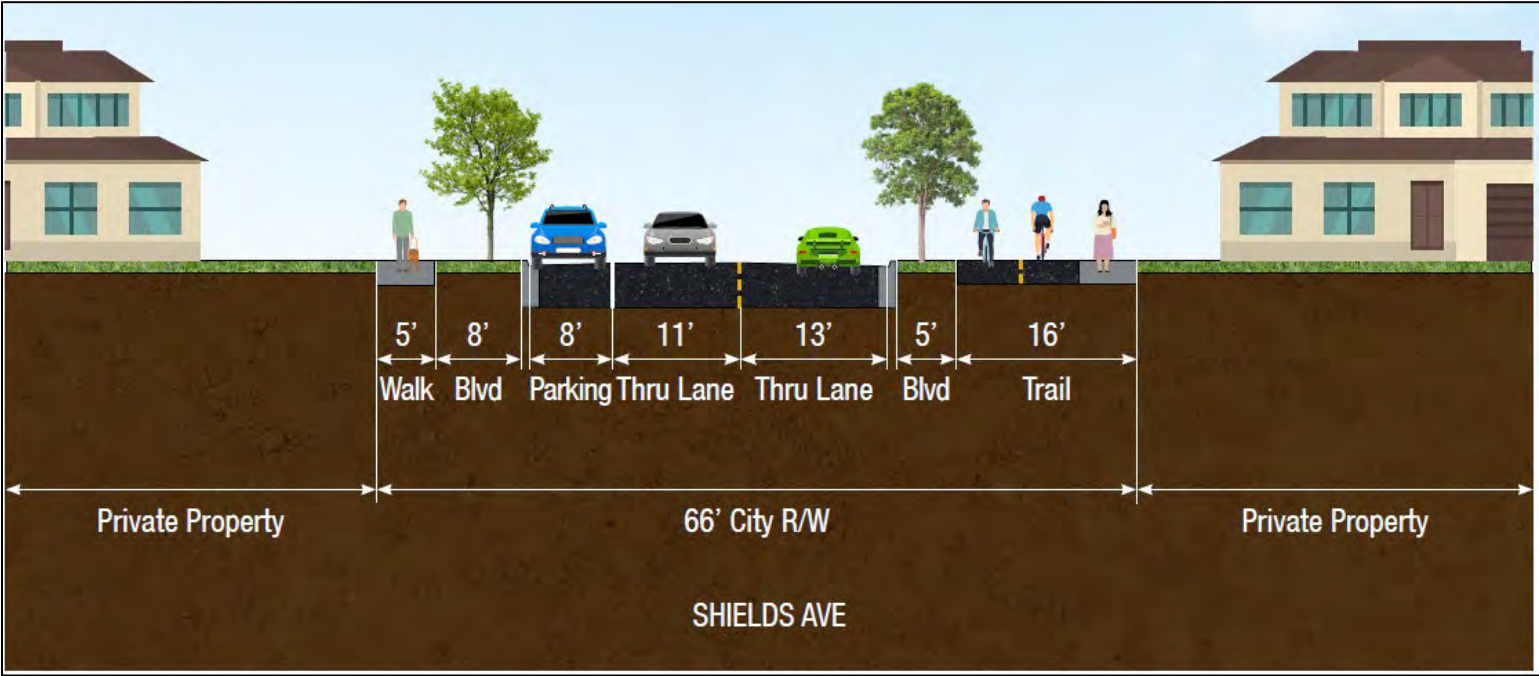


Figure 30: Segment 5-All Alternatives (View 5-2)