Kenilworth Corridor

Analysis of
Freight Rail/Light Rail Transit Co-Existence

Prepared For:

Hennepin County Regional Rail Authority

Prepared By:

R.L. Banks & Associates

December 2010

NOTE TO READER: This document has been modified from the original published version dated November 2010. Modifications were made to correct for an error concerning available publicly held right-of-way. Corrected replacement text is highlighted in yellow.

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December 3, 2010

Ms. Katie Walker, Transit Project Manager
Housing, Community Works, & Transit
Hennepin County Public Works
417 North Fifth Street, Suite 320
Minneapolis, MN 55401

Subject: Kenilworth Corridor; Analysis of Freight Rail / LRT Coexistence

Dear Katie:

Since the presentation to the St. Louis Park City Council and School Board on November 29th, RLBA has determined that the widths shown in Table 1 of our report, *Kenilworth Corridor: Analysis of Freight Rail / LRT Coexistence*, were in fact the construction limits at those locations rather than the actual current right-of-way (ROW) limits.

Application of the corrected right-of-way does not affect our analysis with the exception of Scenario 2, which anticipated the removal of the Kenilworth bike trail from the corridor with the freight rail track installed in its place on the east side of the corridor. The intent of Scenario 2 was to determine if the removal of the commuter bicycle trail would provide sufficient room to co-locate freight rail and light rail transit (LRT). Our initial conclusion that freight rail and LRT could fit within the available ROW if the proposed LRT alignment was shifted was inaccurate. This is also the case in Scenario 3.

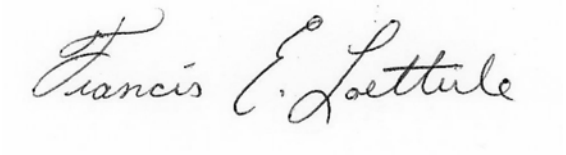
The absolute minimum space requirement of only freight rail and LRT operating side by side is 76 feet. This is composed of the following elements.

1) The freight rail alignment needs 25 feet from the center of track to the ROW line;
2) The center of the nearest LRT track can be no less than 25 feet from the center of the freight track;
3) The two LRT tracks utilize 14 feet track centers and
4) The LRT track opposite the freight track needs to be twelve feet from the center of track to the ROW line.

The above elements total 76 feet (minimum). The ROW width between West Lake Street and Cedar Lake Parkway is 62 feet at its most narrow.

Therefore, there is insufficient space within the existing ROW to accommodate both freight and LRT at grade in the Kenilworth Corridor. To have freight rail and LRT co-locate at grade, it would be necessary to take property on either the west side or the east side of the existing ROW even if the LRT alignment is shifted from its planned location.

Sincerely,



Francis E Loetterle, PhD, AICP

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Introduction

On behalf of the Hennepin County Regional Rail Authority (HCRRA), R.L. Banks & Associates, Inc. (RLBA) has evaluated a variety of options involving the potential coexistence of light rail transit (LRT), freight rail and a commuter bicycle trail in the Kenilworth Corridor. HCRRA commissioned this evaluation at the request of the City of St. Louis Park (Appendix A). According to a St. Louis Park Position Statement adopted in 2001, the City of St. Louis Park agreed to accept the relocation of the temporary freight rail service from the Kenilworth Corridor if it were not reasonable to have LRT and freight rail co-exist in the corridor (Appendix A). This report outlines the overall methodology and the results of this evaluation.

Background

The Kenilworth Corridor is the accepted designation of the area surrounding the former Chicago and Northwestern railroad alignment between West Lake Street and I-394 along an isthmus separating Lake of the Isles and Cedar Lake in the City of Minneapolis (Figure 1). On May 26, 2010, the Metropolitan Council approved the implementation of light rail transit in the 15-mile Southwest Corridor between downtown Minneapolis and Eden Prairie and confirmed the selection of a route that includes the use of the Kenilworth Corridor as the Locally Preferred Alternative (LPA) (Appendix A). At the same time, the Council approved the LPA, it amended the region's 2030 Transportation Policy Plan to include LRT as the mode of choice in the corridor, making the project eligible to receive federal funding. The Southwest LRT alignment, which is projected to carry 29,600 riders in 2030, is estimated to cost $1.2 billion and has a projected Cost Effectiveness Index (CEI) of $30.24. The Conceptual Engineering Drawings prepared by HDR for the section between Louisiana Avenue and I-394 are provided in Appendix B.

Currently, the Kenilworth Corridor hosts a single track freight line and a commuter bicycle trail. When first developed, the Minneapolis and St. Louis Railroad owned and operated the track through the corridor and operated a railroad yard on the north end of the corridor. That company was later absorbed into the Chicago & Northwestern Railway Company from which HCRRA purchased the property. In recent years, all of the yard tracks have been removed and any industry that had been served by the railroad is no longer serviced by freight rail. Today, the freight line in the Kenilworth Corridor is used by the Twin Cities and Western Railroad (TC&W), which leases the track from the HCRRA, to access the BNSF Railway at Cedar Lake Junction and serves to facilitate interchange with several railroads that serve the Twin Cities terminal area. There are currently no businesses along the aforementioned part of the line that ship or receive goods by rail.

When HCRRA initially purchased the right-of-way for future transit use, the freight operation in the corridor was intended to be temporary. Plans to implement LRT in the Kenilworth Corridor have assumed the removal of the freight rail tracks and the relocation of freight rail service. HCRRA is proposing that a new connection between the TC&W and BNSF Railway be provided in the City of St Louis Park via the north-south Canadian Pacific line once operated by the Minneapolis, Northfield and Southern (MNS alignment) to replace the Kenilworth Corridor connection. Issues related to environmental contamination prevented the immediate implementation of a direct freight track connection but the contaminated site that was the cause of concern has since been cleaned up.

Past studies concluded that there is insufficient right-of-way width in the Kenilworth Corridor to accommodate both freight and LRT traffic along with the trail. ~~The right-of-way width at several points along the Kenilworth Corridor is shown in Table 1. The location of these points is shown in Figure 1. The stationing values refer to the stationing shown in the HDR prepared Conceptual Engineering Drawings.~~

Summary of Conclusions

This study has examined the potential impacts of reintroducing freight rail tracks and associated rail service to the Kenilworth Corridor following the construction of LRT according to the Conceptual Engineering Documents prepared by HDR. Seven scenarios were examined.

In Scenario 1, adding the freight track back to the Kenilworth Corridor following the construction of LRT would require the acquisition of between 33 and 57 housing units and the disruption of an entire townhouse community.

In Scenario 2, re-routing the Kenilworth Trail outside the Kenilworth Corridor eliminates a link in the commuter bicycle trail system and would require the acquisition of up to 117 housing units.

In Scenario 3, an aerial bicycle structure would impair the full functionality of the existing trail and invite continuing maintenance, safety and security problems.

In Scenario 4, an aerial LRT structure would cross the West Lake Street Bridge at an unacceptably high elevation, be vastly more expensive than other available alternatives, create noise and aesthetic impacts that could not be mitigated, produce other unpredictable environmental impacts and invite continuing maintenance, safety and security problems.

In Scenario 5, a tunnel through the Kenilworth Corridor would be vastly more expensive than other available alternatives, produce unpredictable environmental impacts and invite continuing maintenance, safety and security problems.

In Scenario 6, sharing track between the Twin Cities and Western railroad and the LRT line is an unworkable solution because the freight service would be restricted to a time period insufficient to operate the TC&W in a profitable manner.

In Scenario 7, requiring the LRT service to operate on a single track through the Kenilworth Corridor would subject the LRT line to operating restrictions that would prevent the line from achieving its forecast ridership and therefore is inconsistent with the stated Purpose and Need of the project.

For all of the above scenarios the noise and vibration associated with passing freight trains, expected to be eliminated under the current proposal, would remain.

In order to continue operating through the Kenilworth Corridor, freight tracks also will need to be replaced between Louisiana Avenue and West Lake Street. This will require the construction of an additional LRT flyover bridge either on the west end or east end depending upon which side of the LRT tracks the freight track is reconstructed. In addition, to prevent lengthy freight trains from blocking pedestrian access to five proposed LRT stations at the busiest times of the day, considerable redesign of these LRT stations will be necessary to ensure that transit patrons experience safe and secure access to the station platforms from both sides of the LRT tracks even when a freight train is passing.

Table 1 removed

Methodology

The analysis presented here is approached from the perspective that the existing freight track will be removed and Southwest LRT constructed through the corridor along the route selected as the Locally Preferred Alternative (LPA) through an Alternatives Analysis (AA). Seven scenarios have been defined that describe ways in which freight service could be returned to the corridor following construction of the LRT line.

The seven scenarios are evaluated according to the following criteria:

1) Sound engineering;
2) Freight rail operations;
3) LRT operations;
4) Impacts on other transportation systems;
5) Property acquisitions/displacements and
6) Potential cultural and environmental impacts

Proposed LRT Alignment

The Conceptual Engineering Drawings prepared by HDR for Segments A-1 and 4-3 of the Southwest Transitway are included in Appendix B for reference as Figures B-1 through B-10. Segment A-1 includes the primary study area between West Lake Street and I-394. Segment 4-3 includes the portion of the alignment between Louisiana Avenue and West Lake Street. Some descriptions of locations and segments in this report refer to the stationing used in these drawings in order to identify locations more precisely. Segment 4-3 includes the alignment between Stations 800+00 and 937+89. Segment A-1 includes the alignment between Stations 938+00 and 1057+00.[1]

The primary study area includes the segment of the Southwest Transitway alignment that extends between Station 938+00 near the West Lake Street overhead bridge structure and Station 1027+00 where the TC&W joins the BNSF main track at Cedar Lake Junction. This distance is approximately 8,900 feet. As noted above, it has been assumed that the freight track would be removed entirely from this segment prior to the construction of LRT.

Between Station 825+00, just east of Louisiana Avenue, and Station 938+00 at West Lake Street, the freight rail track also would be removed so potential conflicts between the existing freight alignment and the proposed LRT alignment must also be considered in this segment. Between Station 825+00 and Station 835+00, the existing freight track is on a separate alignment south of the proposed LRT alignment. But beginning at Station 835+00, the proposed LRT alignment would follow the existing freight tracks through Station 906+00. This segment includes both the Wooddale Station and the Belt Line Station. Between Station 906+00 and Station 938+00, the existing freight track and proposed LRT track do not conflict.

Scenarios

Seven scenarios were developed, with input from St Louis Park City staff, that incorporate citizen suggestions while considering the disposition of all three transportation alignments, LRT, commuter bicycle trail and freight rail. The seven scenarios examined are as follows:

Scenario 1 – **All three alignments at-grade** (Freight Rail, LRT and Bicycle Trail)

- Light Rail Transit – Constructed through corridor along the LPA alignment
- Freight Railroad – Constructed at-grade
- Bicycle Trail – Remains along existing alignment with adjustments noted in the LPA plans

Scenario 2 -- Freight and LRT at-grade; **trail moved to another location**

- Light Rail Transit – Constructed through corridor along the LPA alignment
- Freight Railroad – Constructed at-grade
- Bicycle Trail – Relocated out of corridor

Scenario 3 -- Freight and LRT at-grade; **Bicycle Trail on structure**

- Light Rail Transit – Constructed through corridor along the LPA alignment
- Freight Railroad – Constructed at-grade
- Bicycle Trail – Placed on structure through the corridor

[1] Station 937+89 and Station 938+00 represent the same location.

Scenario 4 -- Freight and Bicycle Trail at-grade; **LRT on structure**

- Light Rail Transit – Constructed through corridor along the LPA horizontal alignment but placed on aerial structure through the corridor above freight rail
- Freight Railroad – Constructed at-grade
- Bicycle Trail – Remains along existing alignment with adjustments noted in the LPA plans

Scenario 5 -- Freight and Bicycle Trail at-grade; **LRT in tunnel**

- Light Rail Transit – Constructed through corridor along the LPA horizontal alignment but placed in tunnel through (under) the corridor
- Freight Railroad – Constructed at-grade over LRT alignment
- Bicycle Trail – Remains along existing alignment with adjustments noted in the LPA plans

Scenario 6 -- **Freight and LRT share track**; Bicycle Trail at-grade

- Light Rail Transit – Constructed through corridor along the LPA alignment
- Freight Railroad – Shares track with the LRT alignment through the corridor
- Bicycle Trail – Remains along existing alignment with adjustments noted in the LPA plans

Scenario 7 -- Freight, LRT and Bicycle Trail at-grade; **LRT single track**

- Light Rail Transit – Constructed through corridor along the LPA alignment but with only one track through the corridor
- Freight Railroad – Constructed at-grade
- Bicycle Trail – Remains along existing alignment with adjustments noted in the LPA plans

Evaluation Criteria

The scenarios defined above were evaluated using the following criteria:

- Sound engineering principles – This criterion assesses the reasonableness of the alternative from the standpoint of engineering complexity and impacts.
- Freight rail operations – This criterion assesses the ability of the TC&W to continue to function as an efficient freight transportation service and a viable privately held economic enterprise with a safe, efficient and economical connection to St. Paul.;
- LRT operations – This criterion assesses the ability of the LRT line to function as it is intended and as it functions elsewhere in the country;
- Transportation system impacts – This is a review of other transportation systems, primarily the commuter bicycle trail system;
- Property acquisitions/displacements – This criterion assesses the potential number and value of adjacent housing units that would need to be acquired to accommodate the scenario;
- Potential environmental risk – This criterion assesses the risk for adverse impacts to the environment caused by the scenario and

Sound Engineering Judgment

For purposes of this study, the term 'sound engineering judgment' is consistent with U.S. Department of Transportation (USDOT) - issued guidance that considers an alternative not feasible or prudent from the standpoint of sound engineering judgment if one of the following conditions exists:

- It compromises the project to a degree that it is unreasonable to proceed in light of its stated Purpose and Need;
- It results in severe safety or operation problems;
- After reasonable mitigation, it still causes severe social, economic, or environmental impacts, disruption to established communities, disproportionate impacts to minority or low income populations or severe impacts to environmental resources protected under other Federal statutes;
- It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
- It causes other unique problems or unusual factors or
- It involves multiple factors in paragraphs described above, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude. (23 USC §771.135).

The final evaluation of each scenario was based on the correlation of identified impacts with the criteria identified above.

Freight Rail Operations

The Twin Cities and Western Railroad (TC&W) provides freight service to agriculture and industries in Southern Minnesota. The TC&W connects to the national railroad network in the Twin Cities and interchanges traffic with all other railroads in the metropolitan area, directly or indirectly. The evaluation of the scenarios with respect to freight operations considered whether the TC&W could continue to interchange effectively with the national railroad network and therefore continue to function as an efficient freight transportation service and a viable private enterprise.

LRT Operations

The Southwest LRT line will become part of a regional LRT system that will include the existing Hiawatha line and the Central Corridor line, now under construction, as well as other potential future alignments, such as the Bottineau Corridor. The evaluation of the scenarios with respect to LRT operations considered whether the Southwest LRT line could operate as part of the regional LRT system, which requires operating at the same frequency and the same service span as the rest of the system and do so in a reliable and safe manner.

Transportation System Impacts

The Twin Cities Metropolitan Area enjoys an extensive system of commuter bicycle trails. The Kenilworth Trail is a heavily used link in this system, providing access between downtown Minneapolis and the southwest suburbs. This criterion specifically focused on the impact of the scenario on the commuter bicycle trail and the commuter bicycle trail system.[2]

[2] Traffic impact studies were not prepared for this study.

Property Acquisitions/Displacements

The construction of the freight track on either the north/west side of the LRT alignment or on the south/east side of the LRT alignment will produce impacts on adjacent property. Based upon industry practice and information provided by the Twin Cities & Western Railroad and the Canadian Pacific Railway (CP), the freight rail alignment space requirement is assumed to be 25 feet wide, 12½ feet from centerline in either direction. Private properties that would need to be acquired to accommodate the freight rail construction were identified.

Potential Cultural and Environmental Impacts

During the LPA selection process, seven environmental issues were identified as "critical" because the presence of these critical issues or resources, as well as the potential impacts to each one, could substantially alter the ability of the project sponsor to implement the project in a timely manner and within the financial resources available.

Four environmental resource areas; historic properties, natural resources, water resources and Section 4(f) properties; are protected by federal and/or state laws and regulations. These regulations provide one or more agencies the authority to protect each resource. The remaining three critical environmental issues; hazardous/contaminated materials, geological conditions and noise/vibration, have the potential to increase project costs substantially and result in project delays.

The evaluation of the scenarios involving the Kenilworth Corridor identified the potential for increased impacts or increased mitigation relative to those impacts already identified during the LPA process. The environmental analysis prepared in connection with the Locally Preferred Alternative (LPA) selection process is outlined in *Southwest LRT Technical Memorandum No. 9 – Environmental Evaluation*, which was referenced in developing this study.

Historic Properties

Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires federal agencies or their designees to consider the effects of their actions on historic properties before undertaking a project. Table 2 lists information provided by the Minnesota State Historic Preservation Office (MN SHPO) regarding the existing historic properties, either listed in the National Register or determined eligible for listing in the National Register by MN SHPO in conjunction with previous Section 106 undertakings, located within the recommended Area of Potential Impact (APE) of Segments A and 4-3. No archaeological sites are known to exist within Segments A and 4-3.

Table 2

Existing Historic Property within the Recommended APE of Segments A and 4-3 (need to replace)

Inventory	Property Name	Property Address	Status
HE-SLC-009	Peavy-Haglin Experimental Concrete Grain Elevator	Minn. Highways 7 and 11, St. Louis Park	Listed
HE-SLC-008	Chicago, Milwaukee, St. Paul & Pacific Depot	37th Street and Brunswick, St. Louis Park	Listed
HE-SLC-017	Lilac Park (formerly St. Louis Park Roadside Parking Area)	SE corner of TH 100 and TH7 intersection	Eligible
HE-MPC-0441	Minneapolis Warehouse Historic District	1st Avenue N., 1st Street N., 10th Avenue N., 6th Street N.	Listed
HE-MPC-8125	Northwestern Knitting Company Factory	718 Glenwood Avenue	Listed
N/A	Cedar Lake Parkway, Cedar Lake Park, channel and Kenilworth Lagoon Leading to Lake of the Isles	Part of the proposed Grand Rounds Historic District	Eligible
HE-MPC-6068	Frieda and Henry Neils House	2801 Burnham Boulevard	Listed
HE-MPC-9295	Northside Garbage Barge Dock	N/A	Eligible

Source: *Southwest LRT Technical Memorandum No. 9 – Environmental Evaluation, September 9, 2009*, page 9, 13.

In the evaluation of scenarios, the potential for increased impacts on the historic properties identified in Table 3 were based on the following types of potential impacts:

- Right of Way (ROW) acquisitions;
- Changes in access to properties;
- Noticeable traffic volume increases or alterations in traffic patterns;
- Perceptible increases in noise;
- Visual effects from changes in grade;
- Increases in vibrations;
- Changes in air quality and
- Impacts to land use and a property's setting.

Water and Natural Resources

Ecosystems are protected by federal, state and local laws including the Clean Water Act, the Endangered Species Act, the Migratory Bird Treaty and the Rivers and Harbors Act. The LPA process examined potential impacts to riparian ecosystems such as lakes, wetlands and streams, endangered species habitat and other sensitive natural areas.

There are two potential areas of concern along the Kenilworth Corridor. The alignment crosses the Cedar-Isles channel between Cedar Lake and Lake of the Isles. This channel is an integral part of the Chain of Lakes surface water system (Figure 2). There is also an area of prairie restoration on the north end of the study area. The evaluation of scenarios considered the potential impact on these two features.

Section 4(f) Properties

Section 4(f) of the Department of Transportation Act of 1966 is a federal law intended to prevent the conversion of specific categories of property to transportation use. Section 4(f) permits the Secretary of Transportation to approve a project that requires the use of any publicly-owned land from a park, recreation area, wildlife refuge, or historic property only where it is shown that:

- There is no feasible or prudent alternative to the use of the land and
- The action includes all possible planning to minimize harm to the property resulting from such use.

Potential Section 4(f) properties found in the project area, illustrated in Figure 3 and listed in Table 3, include publicly owned parks and recreation areas, conservation areas and historic properties. The evaluation of scenarios considered the potential impact on these areas.

Table 3

4(f) Properties in the Kenilworth Corridor

Property Name	Property Description	Direct 4(f) Use
Bryn Mawr Park	50.84 acre park; 2 baseball fields, biking path, 2 broomball rinks, cricket field, ice rink, 10-table picnic area, restroom facilities, soccer fields, sports facility, tennis court, tot lot/playground, wading pool and walking path.	Possible use, property is adjacent to project corridor
Kenwood Parkway	Parkway	Use unlikely due to distance from project corridor
Cedar Lake & Cedar Lake Parkway	Three supervised beaches, biking path, cross country skiing, fishing dock, picnic area, walking path and parkway	Possible use, property is adjacent to project corridor and project must cross Cedar Lake Parkway
Lake of the Isles Parkway	Parkway	Possible Use, property is adjacent to project corridor
Park Siding	Park-owned property, not described on the MPRB website	Use unlikely due to distance from project corridor
Alcott	Park-owned property, not described on the MPRB website	Use unlikely due to distance from project corridor
Jorvig Park	Relocated historic depot building, horseshoes, play structure, rest shelter	Possible use, property is adjacent to project corridor
Meadowbrook Manor Park	Open space	Use unlikely due to distance from project corridor
Edgebrook Park	Playground, basketball, skating.	Use unlikely due to distance from project corridor

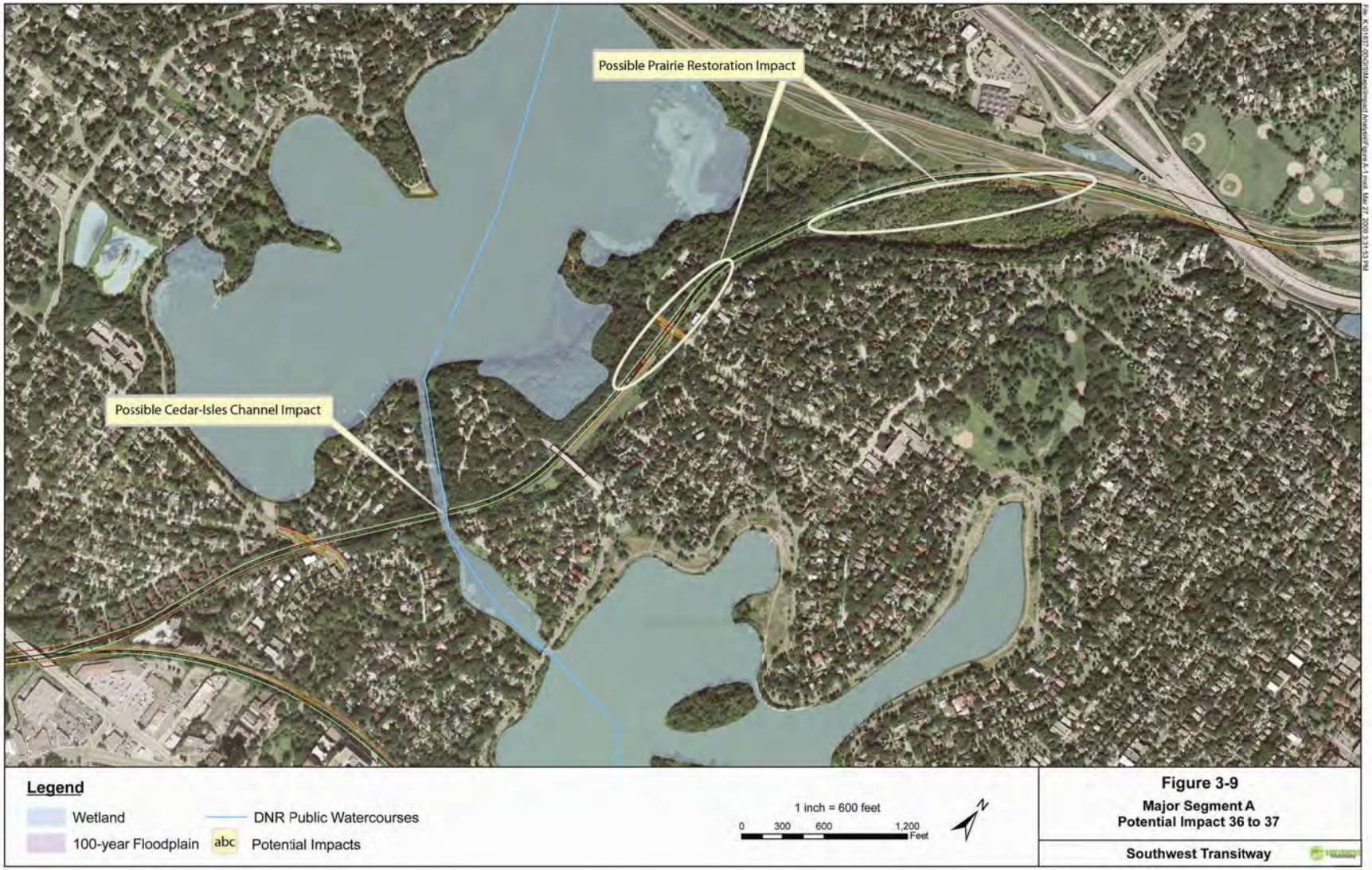

Figure 2

Potential Environmental Impacts

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

SOURCE: SWT Conceptual Design Studies

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Figure 3

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Source: Southwest LRT Technical Memorandum No. 9 - Environmental Evaluation, 10/09/09

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Hazardous/Contaminated Materials

Contamination that would be disturbed by construction of a transportation facility needs to be removed and disposed of under procedures approved and monitored by the Minnesota Pollution Control Agency (MPCA). The LPA study process developed a preliminary assessment of the presence of known contaminated sites. However a Phase 1 Environmental Site Assessment (ESA) has not been performed. Instead the LPA study compared alternatives according to a probabilistic cost model to estimate the cost of remediation. Therefore no evaluation of the scenarios relative to hazardous/contaminated materials was performed.

Geological Conditions

Of those issues associated with geologic or geo-technical conditions, the issue with the most potential long term implications is the presence of shallow groundwater near proposed deep excavations (cuts) or tunnels that would require permanent de-watering. Detailed hydrologic studies of the Kenilworth Corridor have not been conducted. Therefore, evaluation of scenarios related to permanent de-watering is based on a qualitative assessment.

Noise/Vibration

A detailed noise/vibration assessment was not conducted during the LPA study process but will be completed as part of the DEIS. Evaluation of scenarios related to noise/vibration is based on a qualitative assessment.

Aesthetics

Although not listed in TM #9 as a critical environmental resource, consideration of aesthetics and visual impacts are discussed in the evaluation of scenarios.

Design Criteria

Selected design criteria and the sources of this information for freight rail, LRT and commuter bicycle trails are listed below.

Freight Railroad Design Criteria

Criteria regarding freight railroad track design are drawn from the following sources:

- Federal Railroad Administration, Title 49, Code of federal Regulation, Part 213 Track Safety Standards and
- American Railway Engineering and Maintenance-of-Way Association (AREMA), Manual for Railway Engineering.

Specific criteria of particular relevance to this evaluation are as follows:

- Turnout size (BNSF/TC&W Junction) – minimum #12 lateral with 22’-0” points;
- FRA Class 2 speeds of up to 25 mph (freight) using three inch, unbalanced curves;

- Distance between freight railroad and LRT (centerline to centerline) – 25 feet;
- Minimum horizontal clearance – 10 feet;
  - Where track goes under an overhead structure that incorporates pillars or piles with less than 25 feet clearance from the track centerline, a crash barrier is required;
- Minimum vertical clearance between top of rail and overhead structure – 23½ feet and
- Maximum gradient – 1.0 percent.

Light Rail Transit Design Criteria

Criteria regarding light rail transit design are drawn from the following sources:

- Track design Handbook for Light Rail Transit, Transit Cooperative Research Program Report 57, Transportation Research Board, 2000 and
- Central Corridor Light Rail Transit Design Guidelines.

Specific criteria of particular relevance to this evaluation are as follows:

- Distance between track centers – 14 feet;
- Minimum unprotected vertical clearance between top of catenary and overhead structure – 18 inches;
- Maximum gradient – 6.0 percent;
- Minimum horizontal clearance – 8 feet;
- Station platforms:
  - Should be located in tangent track (including a vehicle's length of tangent on each end of platform of 45 foot absolute minimum and 75 foot desired minimum);
  - Tracks through the station should be level at the platform (i.e. zero percent grade on the track adjacent to the platform for a distance of 40 feet beyond the platform ends) and
- Catenary poles are located between LRT tracks.

Commuter Bicycle Trail Design Criteria

Criteria regarding commuter bicycle trail design are drawn from the following source:

- Minnesota Department of Transportation, Minnesota Administrative Rules, 8820.9995 – Minimum Bicycle Path Standards and 8810.6600 – Minimum Design Standards.

Specific criteria of particular relevance to this evaluation are as follows:

- Minimum surface width (two lanes) –16 feet;
- Shoulder clear zone – 2 feet;
- Design speed – 20 mph;
- Vertical clearance between path surface and overhead structure – 10 feet and
- Maximum gradient – 5.0 percent.

Placement of Freight Track in Corridor

In the scenarios being analyzed as part of this study, it is assumed that the freight track is reconstructed in the corridor following the placement of the LRT alignment. In these scenarios, the LRT track is constructed in one of the following three configurations:

- **At-grade** – If the LRT tracks are constructed at-grade as part of the scenario, it is assumed that the alignment follows the exact design depicted in the Conceptual Engineering Drawings (see Appendix B, Figures B-1 through B-10);
- **Tunnel** – If the LRT tracks are constructed in tunnel, it is assumed that the horizontal alignment is the same as the design shown in the Conceptual Engineering Drawings but the vertical alignment changes only as long as necessary to clear the narrowest part of the Kenilworth Corridor and
- **Elevated** – If the LRT tracks are constructed on an aerial structure, it is assumed that the horizontal alignment is the same as the design shown in the Conceptual Engineering Drawings but the vertical alignment changes only as long as necessary to clear the narrowest part of the Kenilworth Corridor.

In those scenarios where the LRT track remains at grade and the freight track is constructed adjacent to it, there are two possible alignments of the freight track:

- **North/West** – On the north side of the LRT alignment between Louisiana and West Lake Street and on the west side of the LRT alignment between West Lake Street and Cedar Lake Junction or
- **South/East** – On the south side of the LRT alignment between Louisiana and West Lake Street and on the east side of the LRT alignment between West Lake Street and Cedar Lake Junction.

In this study, it was assumed that where the freight and LRT alignments needed to cross, that the alignments would be grade separated rather than crossing at-grade. In these instances, a bridge would be constructed to carry the LRT alignment over the freight railroad rather than the other way around.

North/West of LRT Alignment

Appendix C shows the likely location of a freight railroad alignment were it to be built on the north/west side of the LRT alignment. These illustrations are based upon the Conceptual Engineering Drawings provided by HDR and include Segments A-1 and 4-3 between Louisiana Avenue and I-394.

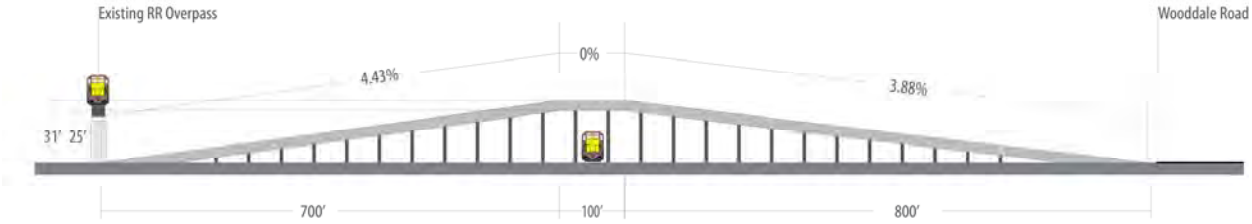
Although this study is focused on the Kenilworth Corridor, there are significant impacts west of West Lake Street because if the freight tracks are reconstructed through the Kenilworth Corridor, they must also be reconstructed along the Southwest LRT alignment between Station 825+00 (the MNS alignment) and Station 938+00 (West Lake Street) on the South side of the corridor. Between these two locations, the existing freight track and the proposed LRT alignment are in direct conflict over approximately 7,100 feet, including through the proposed Wooddale and Belt Line Stations.

- To reconstruct freight track on the west side of the Kenilworth corridor also would require the reconstruction of freight track on the north side of LRT tracks between the Louisiana Avenue Station and the West Lake Station.

It is also important to note that west of Station 825+00 the freight tracks are south of the LRT alignment and east of Station 906+00 the freight tracks are on the north side of the LRT alignment. This suggests that if the freight track is to be reconstructed through Kenilworth on the north/west side of LRT, the freight track must transition from the south side to the north side of the LRT alignment east of Louisiana Avenue Station and west of West Lake Street Station. The most likely location of this bridge would be east of the MNS alignment and west of Wooddale Station and is shown in Figure C-1. A potential profile of this bridge is shown in Figure 4. Assuming a maximum gradient of 4.43% and the necessity of clearing the freight tracks by a minimum of 23.5 feet, such a bridge is expected to be 1,600 feet long.

Figure 4

Profile of LRT Bridge between MNS Alignment and Wooddale Avenue



Construction of this bridge would place the LRT alignment on the south side of the right-of-way, on property currently owned by CP, and the freight track on the north side of the right-of-way, on property currently owned by the HCRRA, between Wooddale Avenue and West Lake Street. The primary reason to do this is to place the LRT in closer proximity to future economic development opportunities in St. Louis Park at the proposed Wooddale and Belt Line stations.

On the south end of the Kenilworth Corridor, between West Lake Street and 700 feet north of the West Lake Street Bridge, the freight track and the proposed LRT alignment are not in conflict. On the north end of the corridor, the last 1,200 feet of the freight track stays north of the proposed LRT alignment before joining the BNSF track at Cedar Lake Junction. Between these two points, the existing freight track and proposed LRT tracks occupy the same alignment. In those scenarios where the freight track is reconstructed on the north/west side of the proposed LRT alignment, there would be potential right-of-way acquisition between Station 945+00 and Station 1015+00, a distance of 7,000 feet, on the north side of the Kenilworth Corridor.

There would need to be an additional bridge over the Cedar-Isles Channel to carry the freight railroad.

South/East of LRT Alignment

Appendix D shows the location of a freight railroad alignment were it to be built on the south/east side of the LRT alignment. These illustrations are based upon the Conceptual Engineering Drawings provided by HDR and include Segments A-1 and 4-3 between Louisiana Avenue and I-394.

If the freight track is reconstructed on the east side of the LRT track through the Kenilworth Corridor, there is also additional impact to the west of the West Lake Street Station. West of Station 825+00, the

freight tracks are already on the south side of the proposed LRT alignment and presumably could stay on the south side until reaching West Lake Street. However, between Wooddale Station and West Lake Station, the south side of the available right-of-way is occupied by the proposed parallel commuter bicycle trail. Locating the freight tracks on the south side of the proposed LRT alignment would require shifting the commuter bicycle trail to the north side of the right-of-way. It appears that the best place to accomplish this shift would be north of the West Lake Street Bridge near where the Midtown Greenway and Kenilworth trails intersect. A bicycle bridge at this location would ensure that the connection between the two trails is maintained and would take advantage of the extra space available under the west end of the West Lake Street Bridge.

> Were the freight railroad to be reconstructed and occupy the Kenilworth Corridor on the east side of the proposed LRT alignment, the proposed commuter bicycle trail would need to cross both the freight tracks and the LRT tracks north of the West Lake Street Bridge and the proposed commuter bicycle trail placed north of the LRT tracks between West Lake Street and Wooddale Station.

To be constructed on the east side of the proposed LRT alignment through the Kenilworth Corridor, the freight track would need to occupy the space now occupied by the commuter bicycle trail. Although the removal of the commuter bicycle trail would make space available, the clearance requirements of freight rail are significantly larger than those of a commuter bicycle trail and therefore there is potential right-of-way impact along the corridor between Station 938+00 and Station 1015+00.

There would need to be an additional bridge over the Cedar Isles Channel to carry the freight railroad.

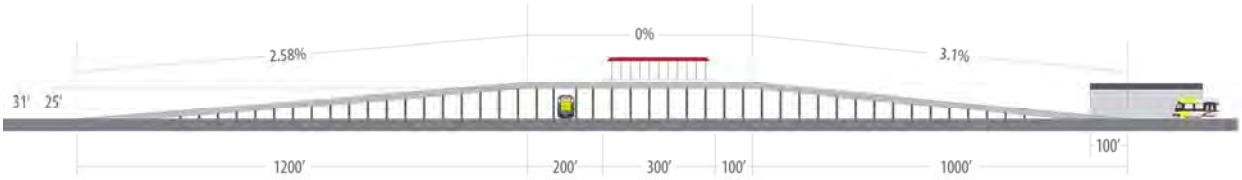
The placement of freight tracks on the east side of the LRT tracks through the Kenilworth Corridor also requires a new LRT structure. In this case, the freight tracks need to transition from the east side to the northwest side of the LRT tracks in order to connect with the BNSF mainline. An LRT bridge at this location would need to begin after the tracks cross underneath the I-394 bridge (southbound), rise over the freight tracks and descend, curving south in order to enter the Kenilworth Corridor. Because of the limited space between the I-394 overpass and the beginning of the corridor, the Penn Avenue Station would need to be constructed as part of this bridge. The assumed location of this bridge is shown in Figures D-9 and D-10 in Appendix D.

> If the freight railroad were to remain and occupy the Kenilworth Corridor on the south/east side of the proposed LRT alignment, the LRT alignment would need to cross from the north side of the freight track to the south side of the freight track in the vicinity of and including the Penn Avenue Station.

A potential profile of this bridge is shown in Figure 5. Assuming a maximum gradient of 3.1% and the necessity of clearing the freight tracks by a minimum of 23.5 feet, such a bridge would be expected to be 2,800 feet long.

Figure 5

Profile of LRT Bridge in the vicinity of Penn Avenue



Construction of the new LRT bridge would place the LRT alignment to the north of the freight rail tracks on right-of way owned by the HCRRA. The freight track would be located to the south of LRT on right-of-way owned by the CP between Wooddale Avenue and West Lake Street.

Cross-Sections

Figures 6, 7, 8 and 9 illustrate cross sections of the four locations identified in Figure 1. Each of these figures depicts four situations:

- The existing condition which includes the current location of the freight tracks and the commuter bicycle trail;
- The future condition which includes the expected location of the LRT tracks and the commuter bicycle trail;
- Scenarios where the freight rail tracks are reconstructed north/west of the LRT tracks and
- Scenarios where the freight tracks are reconstructed south/east of the LRT tracks.

Each figure also identifies the approximate location of the right-of-way limits and the relative location of each transportation element within, or in some cases beyond, the right-of-way.

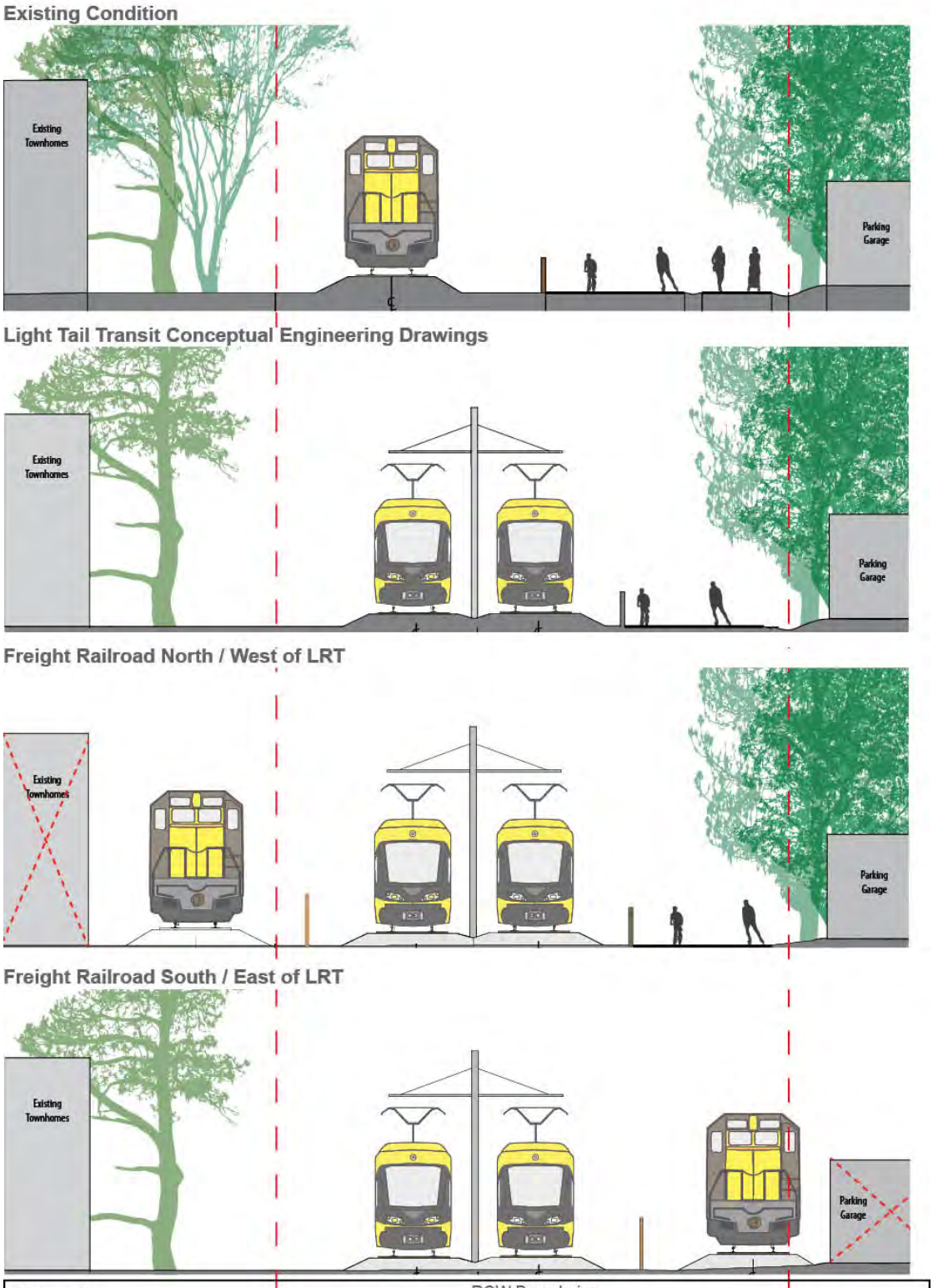


Figure 6
Existing and Alternative Cross Sections at Location 1
ROW Boundaries are APPROXIMATE
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

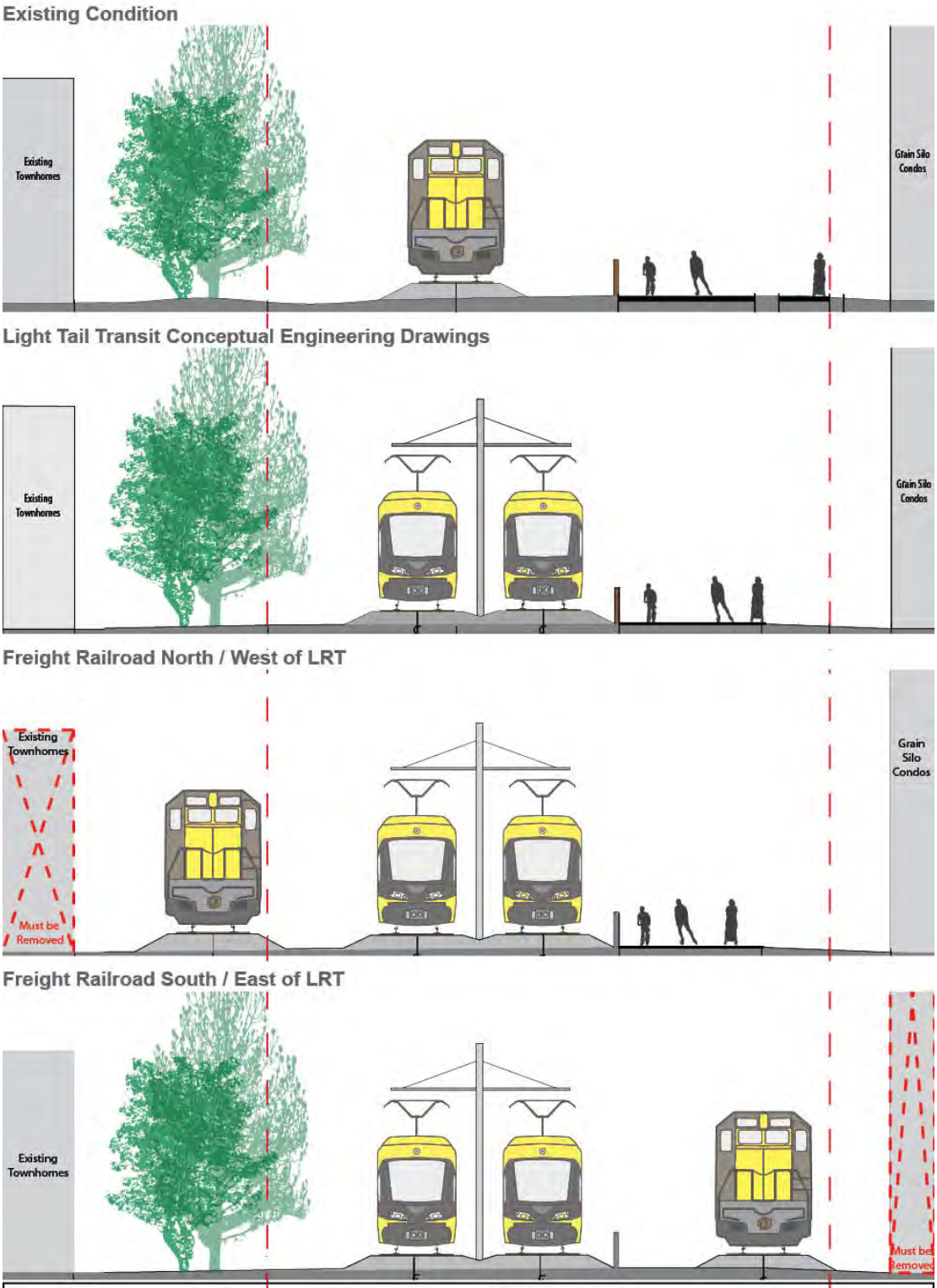


Figure 7
Existing and Alternative Cross Sections at Location 2
ROW Boundaries are APPROXIMATE
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

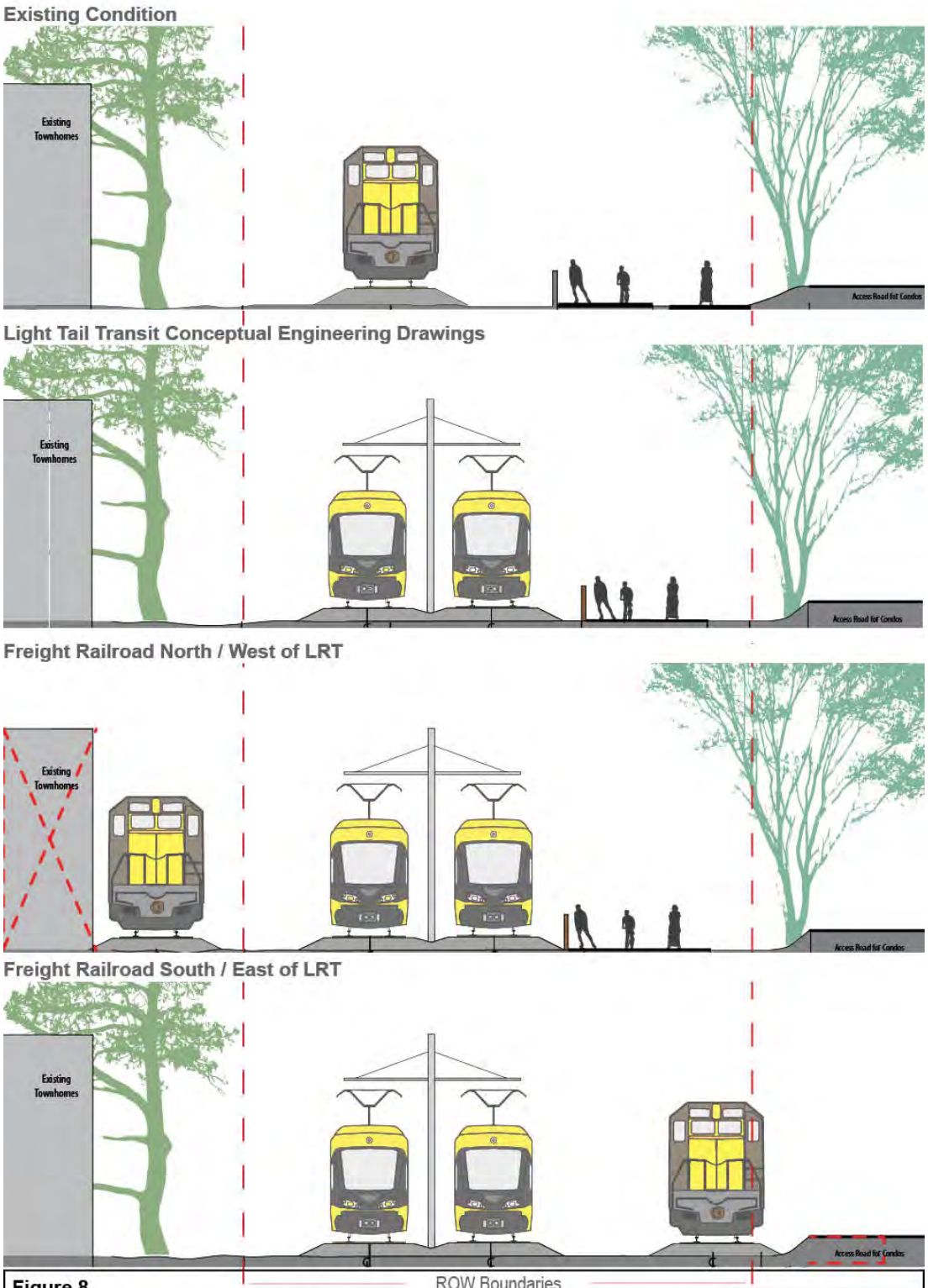


Figure 8
Existing and Alternative Cross Sections at Location 3
ROW Boundaries are APPROXIMATE
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

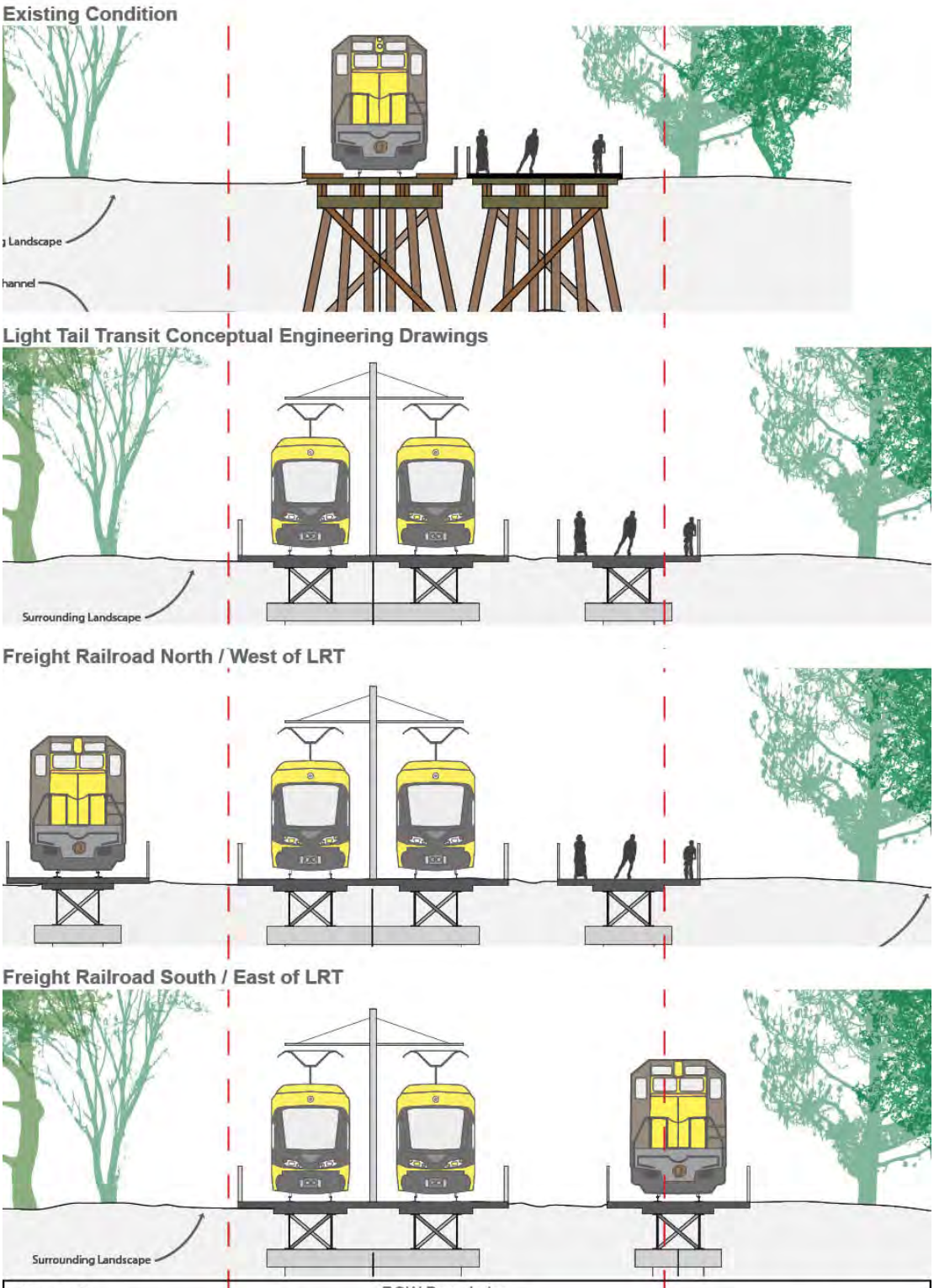


Figure 9
Existing and Alternative Cross Sections at Location 4a
ROW Boundaries are APPROXIMATE
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Scenario 1 – All three alignments at-grade

Scenario 1 assumes that all three facilities are at-grade and adjacent to each other through the Kenilworth Corridor. Freight rail is to the north of LRT, east of Louisiana Avenue and west of LRT from West Lake Street to Penn Avenue. The trail is south of LRT from Louisiana Avenue to West Lake Street and east of LRT from West Lake Street to Penn Avenue. For purposes of this analysis, it is assumed that the capital costs for LRT structures caused by the coexistence of freight rail and LRT are borne by the freight rail project not the Southwest LRT project.

Description

This scenario assumes that the Southwest LRT line and the existing bike trail would be constructed as shown in the Conceptual Engineering Drawings created as part of the LPA selection process through the Kenilworth Corridor. The freight track would be constructed to the west of the LRT alignment.

As described above, constructing a freight rail track on the west side of the corridor between West Lake Street and Penn Avenue also will require constructing freight track between the MNS alignment and West Lake Street and the construction of an additional LRT bridge west of Wooddale Avenue. North of the West Lake Street Bridge, additional right-of-way on the west side of the corridor would be required to accommodate the freight track.

To remain consistent with current Southwest LRT project assumptions, the existing timber trestle bridge at Cedar Isles Channel would have to be reconstructed to accommodate two LRT tracks and the commuter bicycle trail. An additional bridge to host the freight rail track also would need to be constructed. On the north end of the corridor, the freight track would continue to be connected to the BNSF railroad in approximately the same location.

Evaluation

This scenario, because of the way it has been defined, meets the basic criteria of providing a viable freight railroad facility. From the standpoint of engineering, the freight railroad and LRT alignment can be constructed according to accepted engineering practice. However, there are significant impacts on the LRT system construction costs and future operations. There are also significant property and environmental impacts.

LRT Implementation and Operations

Although the LRT alignment would be constructed as depicted in the Conceptual Engineering Drawings, there would be numerous impacts to LRT implementation and operations:

- A new elevated structure would need to be constructed between Louisiana Avenue and Wooddale Avenue and
- Modifications would need to be made to the LRT stations at Wooddale Avenue, Belt Line Blvd, West Lake Street and 21st Street. Additional

expense would be required to ensure that LRT patrons are not placed in danger from freight trains passing immediately adjacent to the stations. While it may be possible to provide an acceptable at-grade crossing of the freight tracks, this would not be sufficient to allow access to the stations from the north or west while a freight train is passing those stations. Therefore a redesign of each of these stations could potentially include overhead or subterranean walkways to ensure unimpeded access to the platforms.

These changes to the LRT project would need to be financed outside the LRT project.

Freight Operations

The reconstruction of the freight railroad track between the MNS alignment and Cedar Lake Junction would allow the TC&W Railroad to operate in the same manner as it now operates.

Other Transportation System Impacts

The Kenilworth Bicycle Trail would be reconstructed according to the conceptual engineering plans shown in Appendix B and therefore would not be affected by the reconstructed freight track. However, current plans call for an at-grade commuter bicycle trail crossing at Wooddale Avenue Station to bring the commuter bicycle trail from the south side of the LRT alignment to the north side. Reintroduction of freight service would mean adding an at-grade crossing of the freight tracks and the associated inconvenience to bicyclists of needing to wait for freight trains in addition to LRT trains.

Property Impacts

To the west of the HCRRA-owned property, between West Lake Street and Cedar Lake Parkway, is a residential development that includes 57 separate housing units divided into 25 separate buildings that include either two or three attached dwellings. The common area associated with these townhomes is owned by the Cedar Lakes Shores Townhome Association. In order to construct freight rail through the corridor west of the future LRT alignment, at least thirteen of these buildings, incorporating 33 housing units, would need to be acquired and demolished as a direct result of track construction. Since the affected units represent more than half of the development, the remaining residents may view this as compromising the viability of the townhouse association and require that the entire development be taken under the “damage to the remainder theory”.

~~The specific properties affected are listed in Table 4.~~

Potential Environmental Risks

Historic Properties – Implementation of this scenario may generate an adverse impact on Cedar Lake Parkway with LRT elevated and freight rail at-grade. Due to the placement of the freight rail tracks west of the LRT there may be additional impacts to historic properties.

Water and Natural Resources – Reconstruction of the freight track would require the construction of an additional bridge over Cedar-Isles Channel but this would not be expected to negatively affect water quality or stream flow.

Section 4(f) – Placement of the freight rail track 25 feet from the centerline of the LRT track places the freight rail track into Cedar Lake Park which may constitute a constructive use of that 4f property. If it is determined that this is a constructive use, then an evaluation of all reasonable and prudent alternatives must be completed before the project could proceed.

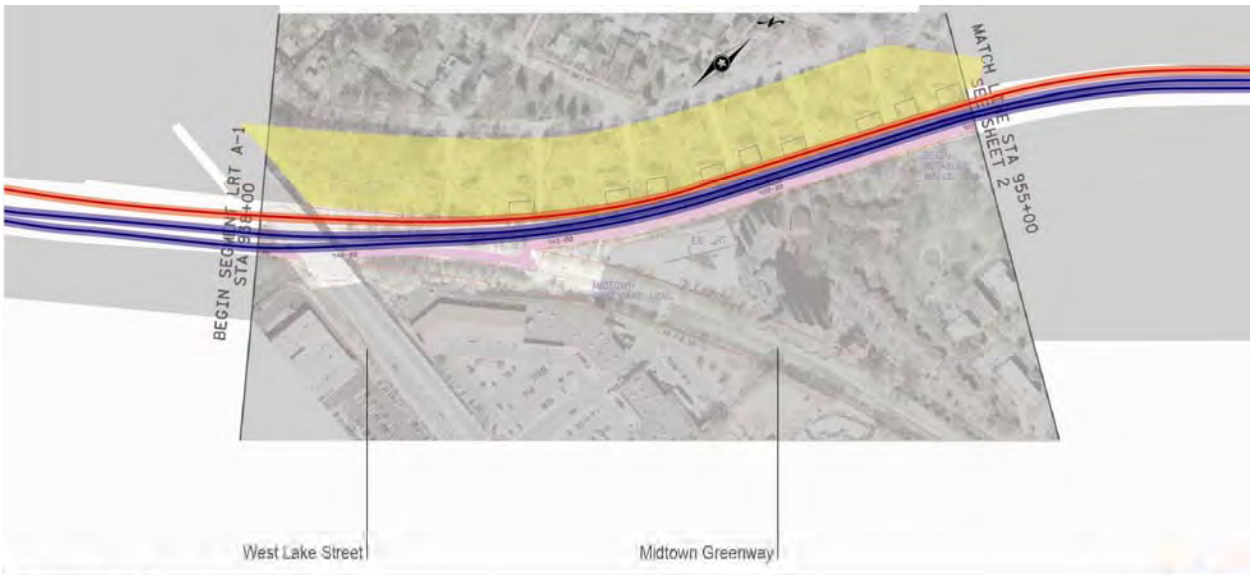


Figure 10
Affected Properties: Freight North / West of LRT
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance
R.L. BANKS & ASSOCIATES, INC.

Groundwater – Implementation of this scenario would not generate additional negative impact on groundwater flow when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Noise/Vibration – While a detailed noise and vibration assessment was not appropriate to conduct at this stage, movement of the freight rail track closer to the properties in Kenilworth Corridor is expected to increase the noise and vibration experienced by those uses compared to current conditions and/or under an LRT only scenario.

Summary

This scenario is not inconsistent with sound engineering principles.

However:

- The LRT system would have increased operations and maintenance cost.
- Placing the freight track on the north side of the LRT track through the Kenilworth Corridor would require an additional LRT bridge west of Wooddale Avenue;
- Thirty-three housing units that are part of a townhome development adjacent to the tracks would need to be acquired. Acquisition of these parcels also would negatively affect the remaining housing units in the townhome association and may compromise the financial viability of the association and
- The noise and vibration associated with passing freight trains would remain.

Scenario 2 – Trail Relocated

Scenario 2 envisions that the existing commuter bicycle trail is removed from the corridor and that the freight railroad is constructed in the space vacated by the trail.

Description

This scenario assumes that the Southwest LRT line would be constructed as shown in the Conceptual Engineering Drawings created as part of the LPA selection process through the Kenilworth Corridor. The freight track would be constructed to the east side of the LRT alignment through the corridor.

As described above, constructing a freight rail track on the east side of the corridor between West Lake Street and Penn Avenue also will require constructing a freight track between the MNS alignment and West Lake Street and the construction of an additional LRT bridge west of I-394.

North of the West Lake Street Bridge, additional right-of-way on the east side of the corridor would be required to accommodate the freight track.

To remain consistent with current Southwest LRT project assumptions, the existing timber trestle bridge at Cedar Isles Channel would have to be reconstructed to accommodate two LRT tracks and the commuter bicycle trail. An additional bridge for the freight rail track also would need to be constructed. On the north end of the corridor, the freight track would continue to be connected to the BNSF railroad in approximately the same location.

Evaluation

This scenario, because of the way it has been defined, meets the basic criteria of providing a viable freight railroad facility. From the standpoint of engineering, the freight railroad and LRT alignment can be constructed according to accepted engineering practice. However, there are significant impacts on the LRT system construction costs and future operations. There are also significant additional property and environmental impacts and ~~. The most critical impact is that~~ the existing commuter bicycle trail through the corridor would disappear.

LRT Implementation and Operations

Although the LRT alignment would be constructed as envisioned in the Conceptual Engineering Drawings, there would be numerous impacts to LRT implementation and operations:

- A new elevated structure would need to be constructed west of the I-394 bridge which would require the Penn Avenue station to be elevated and

- Modifications would need to be made to the LRT stations at Wooddale Avenue, Belt Line Blvd, West Lake Street and 21st Street. Additional expense would be required to ensure that LRT patrons are not placed in danger from freight trains passing immediately adjacent to the stations. While it may be possible to provide an acceptable at-grade crossing of the freight

tracks, this would not be sufficient to allow access to the stations from the south or east while a freight train is passing those stations. Therefore a redesign of each of these stations potentially could include overhead or subterranean walkways to ensure unimpeded access to the platforms.

These changes to the LRT project would need to be financed outside the LRT project.

Freight Operations

The reconstruction of the freight railroad track between the MNS alignment and Cedar Lake Junction would allow the TC&W Railroad to operate in the same manner as it now operates.

Transportation System Impacts

The existing commuter bicycle trail would need to be re routed outside of the corridor, at least between the West Lake Street Station and the 21st Street Station. Figure 11 identifies two potential re routes, one on each side of the corridor. On the west, the trail could follow Cedar Shore Drive between Cedar Lake Avenue and the existing Cedar Lake Trail. This would require the use of city streets to cross West Lake Street. On the east, the re route could follow the Midtown Greenway to Dean Boulevard, 28th Street, Lake of the Isles Parkway and additional streets to reconnect at West 21st Street. It is assumed that a connection between the Midtown Greenway bicycle trail and the commuter bicycle trail west of West Lake Street along the Southwest corridor should be maintained near the West Lake Station but this also may need to be removed from the corridor and re routed to cross West Lake Street at grade.

Neither of these alternatives is desirable from the standpoint of continuing to provide the high quality mobility and riding experience provided by the existing trail. The alternate routes may provide connectivity but are a poor replacement for the high-speed, high quality link provided by the Kenilworth Trail. This link in the commuter bicycle network essentially would disappear.

Property Impacts

To the east of the HCRRA-owned property, between West Lake Street and Cedar Lake Parkway, is a residential development that has as its central feature a grain elevator that has been converted into condominiums. The common area associated with these townhomes is owned by Calhoun Isles Condominiums. To construct freight rail through the corridor east of the future LRT alignment, the twenty-five foot safety zone required to protect the freight rail track would encroach upon the parking structure and a corner of the residential structure. Other properties along the corridor also would be affected, as noted in Figure 12 ~~and listed in Table 4~~.

Altogether, implementation of this scenario would require the acquisition of 117 housing units.

~~It is possible that if the anticipated location of the LRT alignment could be shifted slightly to the west, most of the property impacts would be unnecessary. But it is assumed that LRT has been placed in the best location within the corridor and any changes would affect operating cost and travel time. It also assumes that the railroad is comfortable with the 25 foot safety zone assumed in this analysis.~~

Figure 11

Map -- Bicycle Path Alternatives

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KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

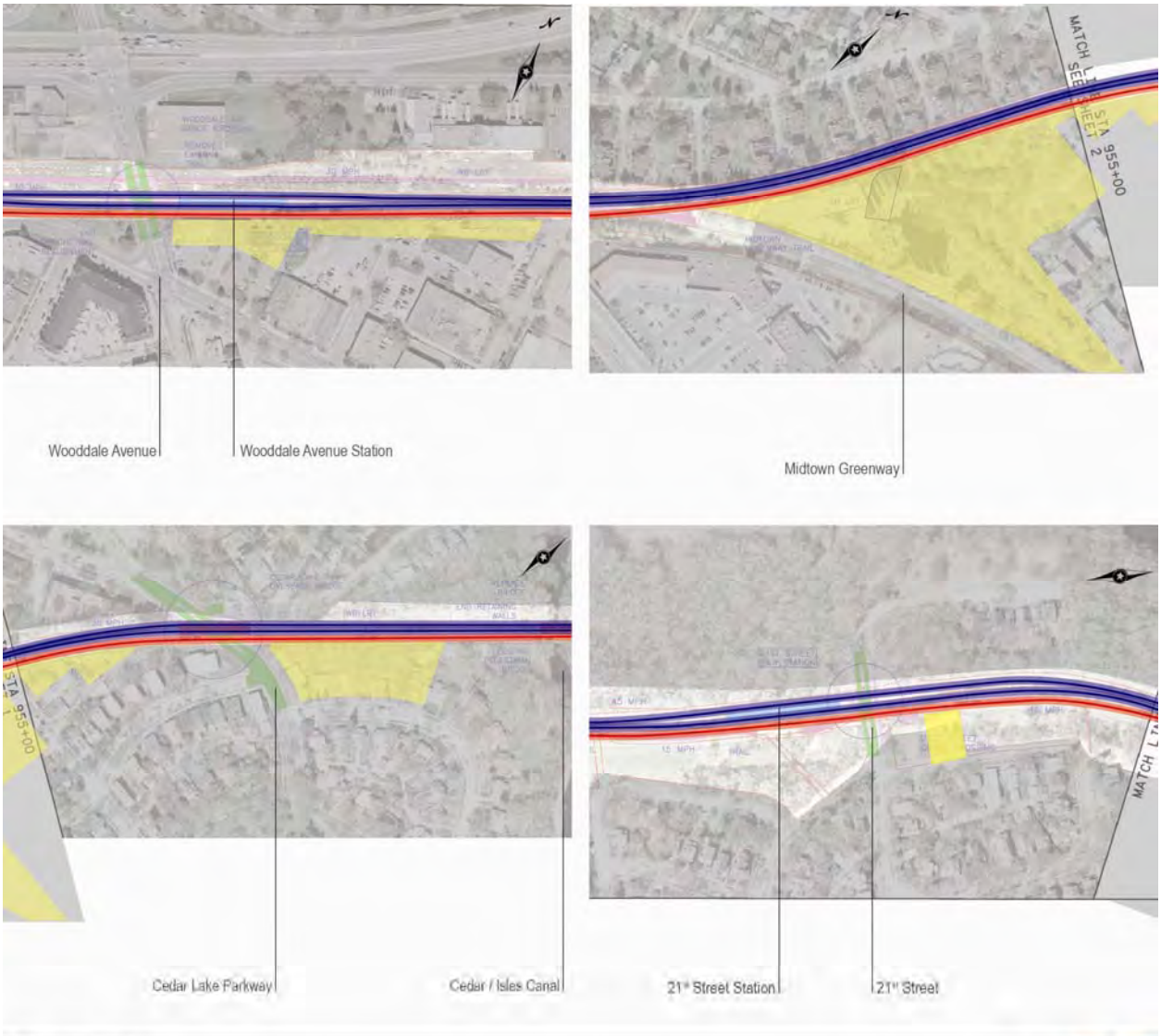


Figure 12
Affected Properties: Freight South / East of LRT
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Potential Environmental Impacts

Historic Properties – Implementation of this scenario may generate an adverse impact on Cedar Lake Parkway with LRT elevated and freight rail at-grade. Due to the placement of the freight rail tracks west of the LRT there may be additional impacts to historic properties.

Water and Natural Resources – Reconstruction of the freight track would require the construction of an additional bridge over Cedar-Isles Channel but this would not be expected to affect water quality or stream flow negatively. The freight alignment would not encroach on the prairie grass restoration project on the north end of the corridor.

Section 4(f) – Implementation of this scenario would not produce additional negative impact on historic properties when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Groundwater – Implementation of this scenario would not produce additional negative impact on groundwater flow when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Noise/Vibration – While a detailed noise and vibration assessment was not appropriate to conduct at this stage, movement of the freight rail track closer to the properties in Kenilworth Corridor is expected to increase the noise and vibration experienced by those uses compared to current conditions and/or under an LRT only scenario.

Summary

This scenario is not inconsistent with sound engineering principles.

However:

- The LRT system would have increased operations and maintenance cost.
- Up to 117 housing units would need to be acquired. from a condominium development and other properties on the east side of the corridor;
- An important link in the regional commuter bicycle trail system would be eliminated;
- Placing the freight track on the south side of the LRT track through the Kenilworth Corridor would require an additional LRT bridge west of I-394 to include an elevated station at Penn Avenue;
- Operation of freight trains immediately adjacent to LRT stations would create significant safety issues unless the affected stations are substantially redesigned to protect LRT patrons and provide access to all LRT patrons while freight trains are passing the stations. This would include grade-separated connections between the LRT platforms and the opposite side of the freight tracks and

Implementation of this scenario by removing the commuter bicycle trail from the Kenilworth Corridor would eliminate a link in the commuter bicycle transportation system. ~~To avoid property acquisition,~~ the Kenilworth Trail would need to be re-routed outside of the corridor and would no longer fulfill its current functionality.

Scenario 3 – Bicycle Trail on Structure

Scenario 3 envisions that the existing commuter bicycle trail is removed and placed on an aerial structure through the corridor and that the freight railroad is constructed in the space vacated by the trail.

Description

As currently proposed, the LRT alignment generally would occupy the western portion of the Kenilworth Corridor. The existing commuter bicycle trail will be modified to remain on the eastern side of the corridor. The basic premise of this scenario is that by elevating the bike trail and placing it on an aerial structure through the corridor there will be sufficient space to construct both the LRT alignment in its proposed location and the freight track along the proposed path of the commuter bicycle trail **potentially without the need to acquire additional right-of-way.**

To accomplish this, the freight track would cross underneath the Lake Street Bridge, from the south, in the space available in the easternmost bay (the current location of the trail.) Despite the objectives behind defining this scenario, additional right-of-way may still be required both north and south of the Lake Street Bridge to remain consistent with the current track design and proposed location of the West Lake Street Station. In addition, it may be necessary to lengthen the West Lake Street Bridge or to remove the slope paving at the eastern abutment to provide sufficient separation between the NB LRT track, which currently also is assumed to be routed through the easternmost bay, and the freight track. ~~Shifting the West Lake Station slightly to the west and routing both LRT tracks through the west bay of the bridge might eliminate this necessity.~~

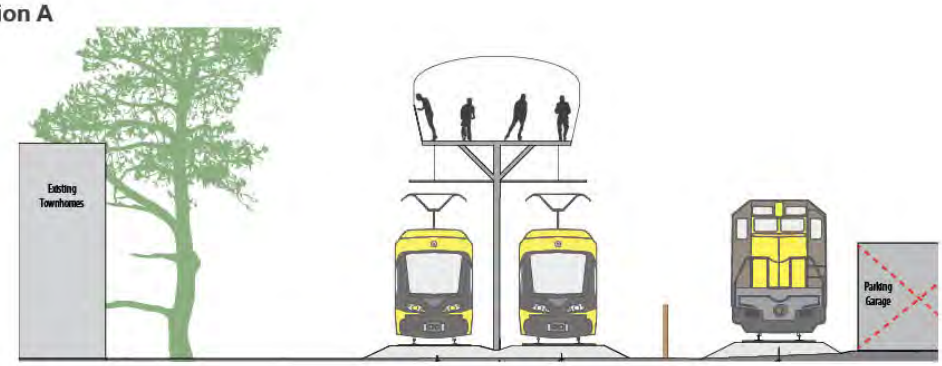
The existing commuter bicycle trail would be placed on an aerial structure, at least between the West Lake Street Station and the 21st Street Station. The aerial structure would begin south of West Lake Street and cross underneath the West Lake Street Bridge. Since the clearance requirements of the commuter bicycle trail are much less than required by either freight or LRT, there is sufficient vertical and horizontal clearance under the bridge. North of the Bridge, the bicycle aerial structure would rise to a height that would allow the structure to be placed over one or both LRT tracks. The physical structure of the bridge could be incorporated into the catenary system of the LRT system.

To provide perspective, an aerial structure over the LRT tracks would be at least as high as a downtown Minneapolis skyway. Currently, LRT vehicles pass underneath the skyways but the limited clearance requires the catenary to be affixed to the underside of the skyway structure. This works over a short distance but would be undesirable over a longer distance. A slightly higher height to allow greater clearance over the LRT tracks would be recommended.

The exact northern extent of the structure will depend upon where the available space between the freight tracks and the LRT tracks allows but probably just north of the 21st Street Station. Figure 13 illustrates what the cross-section of the three alignments at four of the cross-section locations might look like.

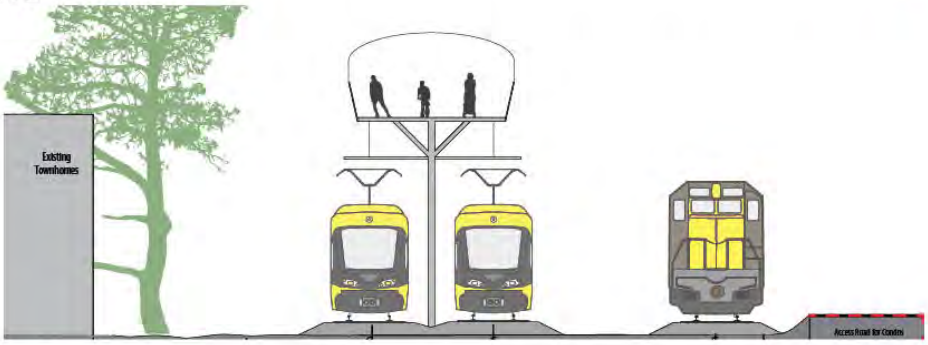
As described above, situating the freight track on the east side of the LRT tracks through he Kenilworth Corridor, an additional LRT bridge would need to be constructed to allow the freight rail track to cross underneath the LRT tracks and connect with the BNSF Railway track near Penn Avenue.

Location A



Location B

Location C



Location D

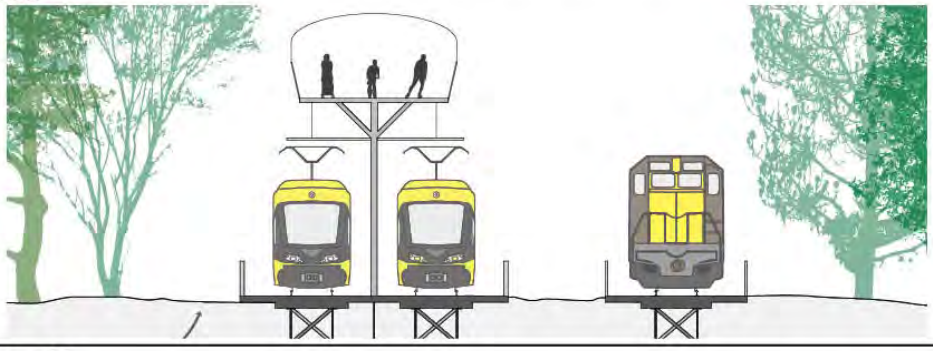


Figure 13

Overhead Bicycle Path Variations along Corridor

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

0 5 10 20
SCALE IN FEET

R.L. BANKS & ASSOCIATES, INC.

Evaluation

LRT Implementation and Operations

Although the LRT alignment would be constructed along the same horizontal alignment as the Conceptual Engineering Drawings, there would be numerous impacts to LRT implementation and operations:

- A new elevated structure would need to be constructed west of the I-394 bridge and would require the Penn Avenue Station to be elevated and

- Modifications would need to be made to the LRT stations at Wooddale Avenue, Belt Line Blvd, West Lake Street and 21st Street. Additional expense would be required to ensure that LRT patrons are not placed in danger from freight trains passing immediately adjacent to the stations. While it may be possible to provide an acceptable at-grade crossing of the freight tracks, this would not be sufficient to allow access to the stations from the south or east while a freight train is passing those stations. Therefore a redesign of each of these stations potentially could include overhead or subterranean walkways to ensure unimpeded access to the platforms.

These changes to the LRT project would need to be financed outside the LRT project.

Freight Operations

The reconstruction of the freight railroad track between the MNS alignment and Cedar Lake Junction would allow the TC&W Railroad to operate in the same manner as it now operates.

Property Impacts

The premise of this scenario is that the construction of an aerial structure to host the bicycle path would avoid the need to acquire right-of-way. However the property impacts are similar to Scenario 2.

To the east of the HCRRA-owned property, between West Lake Street and Cedar Lake Parkway, is a residential development that has as its central feature a grain elevator that has been converted into condominiums. The common area associated with these townhomes is owned by Calhoun Isles Condominiums. To construct freight rail through the corridor east of the future LRT alignment, the twenty-five foot safety zone required to protect the freight rail track would encroach upon the parking structure and a corner of the residential structure. Other properties along the corridor also would be affected, as noted in Figure 12.

Altogether, implementation of this scenario would require the acquisition of 117 housing units.

~~It is possible that if the anticipated location of the LRT alignment could be shifted slightly to the west, most of the property impacts would be unnecessary. But it is assumed that LRT has been placed in the best location within the corridor and any changes would affect operating cost and travel time. It also assumes that the railroad is comfortable with the 25 foot safety zone assumed in this analysis.~~

Transportation System Impacts

Viewed strictly from the point of view of network connectivity, the bicycle aerial structure retains a connection between the southwest suburbs and downtown Minneapolis. The Kenilworth Trail is an important link in the commuter bicycle system in the region and an aerial structure would preserve this aspect of the current trail's utility.

But this option does not retain all of the functionality of the existing commuter bicycle trail. Such a structure would be much less likely to be used by the casual bicyclist or pedestrian. To begin with, access to the structure would be limited. As described above, the trail connects West Lake Street Station to the 21st Street Station. But to provide access to current users who live between these two points, additional access points would need to be provided, ideally as a ramp that could be surmounted by bicyclists or adults pushing strollers. These access points would add to the cost and complexity of the structure and could not be fit into the existing right-of-way.

In addition, the aerial structure would represent a completely different experience than the current trail. The ambiance and serenity provided by the current trail setting could not be reproduced on an aerial structure. The pathway provided would need to be flanked by high fences, probably curving to a connection above, to protect passing trains from thrown objects and to prevent individuals from jumping off. The emotional connection to the surrounding environment would be severed.

An aerial structure of this type also represents safety and security issues to users. Special precautions would need to be taken to prevent someone from making contact with the catenary. The structure itself would need to be well grounded to prevent users from electrical shock. The design of the structure would create security challenges. Individuals easily could become trapped and vulnerable to robbery or assault. Additional security would be necessary. These safety and security issues would lead many current and potential users to avoid the trail.

Above and beyond the additional security cost would be the additional maintenance cost, particularly the challenge of removing snow in the winter time.

The height of the structure would represent a visual impact to residents immediately adjacent to the corridor. Figure 14 is a profile view of what the structure may look like and illustrates the relationship of the structure to one of the houses adjacent to the corridor.

Figure 14
Profile: Bicycle Overpass and Affected House
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Potential Environmental Impacts

Historic Properties –
Implementation of this scenario may generate an adverse impact on Cedar Lake Parkway with LRT elevated and freight rail at-grade. Due to the placement of the freight rail tracks west of the LRT there may be additional impacts to historic properties.

Water and Natural Resources – Reconstruction of the freight track would require the construction of an additional bridge over Cedar-Isles Channel but this would not be expected to affect water quality or stream flow negatively. The freight alignment would not encroach on the prairie grass restoration project on the north end of the corridor.

Section 4(f) – Implementation of this scenario would not produce additional negative impact on historic properties when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Groundwater – Implementation of this scenario would not have additional negative impact on groundwater flow when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Noise/Vibration – While a detailed noise and vibration assessment was not appropriate to conduct at this stage, movement of the freight rail track closer to the properties in Kenilworth Corridor is expected to increase the noise and vibration experienced by those uses compared to current conditions and/or under an LRT only scenario.

Summary

Implementation of this scenario would be inconsistent with sound engineering principles as defined by USDOT because it would create unique safety, security, maintenance and operational problems related to the elevated trail structure.

In addition:

- The LRT system would have increased operations and maintenance cost.
- Up to 117 housing units would need to be acquired.
- The complete functionality of the commuter bicycle trail could not be reproduced on aerial structure and would be more difficult to access by the casual user from the surrounding neighborhoods;
- Users of the aerial structure would be separated from the ambience of the surrounding environment and more vulnerable to assault or robbery;
- The aerial structure would require significantly more maintenance and security than the existing facility;
- The structure would represent an adverse aesthetic impact on the neighboring residents;
- An additional LRT bridge would be necessary west of I-394 to include the Penn Avenue Station and
- The operation of the freight track adjacent to the LRT track would create safety issues that would need additional mitigation and result in a substantial redesign of the Wooddale, Belt Line, West Lake Street and 21st Street Stations and
- The noise and vibration associated with passing freight trains, expected to be eliminated under the current proposal, would remain.

Constructing an aerial structure to host the commuter bicycle trail through the Kenilworth Corridor would not be considered accepted engineering practice because of cost, potential environmental impacts and safety/security issues associated with such a structure. Although the connectivity of the commuter bicycle network would be preserved, the full functionality of the existing trail would not be preserved because residents of the adjacent neighborhoods would no longer enjoy convenient access to the trail and the trail experience would be altered irrevocably.

Scenario 4 – LRT on Structure

Scenario 4 envisions that the LRT alignment is constructed on an aerial structure through the corridor and that the existing freight rail track and commuter bicycle trail remain in their current location.

Description

The basic premise of this scenario is that by placing the LRT alignment on an aerial structure, the existing freight track and the existing commuter bicycle trail can remain in their current location **without the need to take additional right-of-way within the Kenilworth Corridor**. To accomplish this, an LRT aerial structure would need to be at full height through those sections of the corridor that were too narrow.

The south end of the aerial structure would need to be far enough south of West Lake Street to allow the structure to be at full height by the time the structure reached the narrow section just north of the West Lake Street Bridge. The exact location would be a function of how high the structure needed to be and the grade selected. The maximum grade of LRT operations is six percent. Similar to the tunnel, the fact that the structure would need to be at full height by West Lake Street suggests that the West Lake Street station also would need to be elevated. Since LRT tracks in station areas need to be level and since there would not be enough distance between the station and the bridge to allow any additional ascent, the West Lake Street station also would need to be elevated.

Additional analysis would be required to determine the exact location of the north end of the structure. Unlike the tunnel, the point at which the bridge touched down would not require extra width compared to the tracks on the ground. Therefore, it may be possible for the aerial structure to be shorter than a comparable tunnel. The potential freight alignment described in Scenario 1 can be used as a reference to estimate the location of the north end of the structure. At a minimum, the structure would need to extend over Cedar Lake Parkway. But there is the potential that the structure may be required the full length of the corridor to prevent right-of-way takings north of Cedar Lake Parkway, particularly in the vicinity of the 21st Street Station.

On the north end of the corridor, the freight tracks need to be on the west/north side of the LRT alignment. The aerial structure could be extended on the south end to provide an opportunity for the freight track to shift from the south side of the LRT alignment to the north side of the LRT alignment without the construction of an additional LRT bridge between Belt Line Station and West Lake Station.

Aside from the additional expense, the construction of an aerial structure through the Kenilworth Corridor presents a significant engineering challenge. While it may be possible to cross underneath the Lake Street Bridge with the freight tracks and commuter bicycle trail without additional right-of-way, the aerial structure needs to be at full height just north of the bridge. There is clearly not enough distance between the bridge and the narrow right-of-way to make this ascent north of the bridge. It is not typical practice for an LRT structure to intersect another structure, such as a highway bridge, at the same elevation. This means that an LRT aerial structure would need to be constructed over the West Lake Street Bridge. In addition, the West Lake Station, because of its proximity, would need to be at the same elevation as the structure over the bridge.

Figure 15 depicts the profile of a bridge necessary to surmount the West Lake Street Bridge. Figure 16 provides a three dimensional interpretation of what this bridge might look like from ground level.

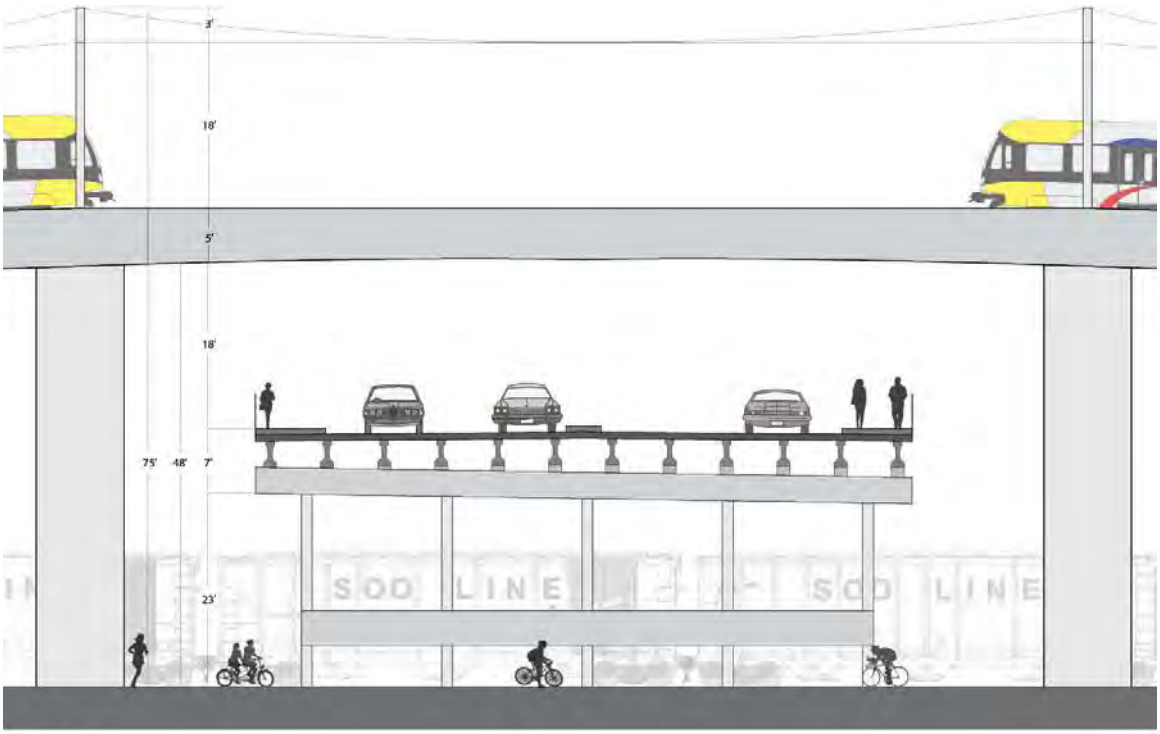


Figure 15
Profile: West Lake Street Overpass[1,2]
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance
1. Lake St Bridge Dimensions taken from Hennepin County Engineering drawings. LRT Overpass merely illustrative
2. Hopper graphic reproduced from Rick Johnson, Soo Line Historical and Technical Society

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Figure 16
Rendering: 3D View of West Lake Street Overpass
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

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Evaluation

LRT Implementation and Operations

Although the LRT alignment would be constructed along the same horizontal alignment as the Conceptual Engineering Drawings, there would be numerous impacts to LRT implementation and operations:

- A long aerial structure hosting the LRT would be necessary between West Lake Street and the vicinity of the 21st Street Station;
- The portion of the aerial structure over the West Lake Street Bridge would be exceptionally high and would require the West Lake Street Station to be elevated;
- A new, elevated structure would need to be constructed west of the I-394 bridge and would require the Penn Avenue Station to be elevated and
- Modifications would need to be made to the LRT stations at Wooddale Avenue, Belt Line Blvd., West Lake Street and 21st Street. Additional expense would be required to ensure that LRT patrons are not placed in danger from freight trains passing immediately adjacent to the stations. While it may be possible to provide an acceptable at-grade crossing of the freight tracks, this would not be sufficient to allow access to the stations from the south or east while a freight train is passing the station. Therefore a redesign of each of these stations potentially could include overhead or subterranean walkways to ensure unimpeded access to the platforms.

These changes to the LRT project would need to be financed outside the LRT project.

Freight Operations

The reconstruction of the freight railroad track between the MNS alignment and Cedar Lake Junction would allow the TC&W Railroad to operate in the same manner as it now operates.

Transportation System Impacts

The commuter bicycle trail through the Kenilworth Corridor would remain in its current location and therefore would not be affected negatively by the implementation of this scenario.

Property Impacts

The premise of this scenario is that the construction of an aerial structure hosting the LRT would avoid the need to acquire right-of-way.

Potential Environmental Impacts

Historic Properties –.Implementation of this scenario may generate an adverse impact on Cedar Lake Parkway with LRT elevated and freight rail at-grade. Due to the placement of the freight rail tracks west of the LRT there may be additional impacts to historic properties.

Water and Natural Resources – Reconstruction of the freight track would require the construction of an additional bridge over Cedar-Isles Channel if the aerial structure has some back to ground level by this point but this would not be expected to affect water quality or stream flow negatively. The freight alignment would not encroach on the prairie grass restoration project on the north end of the corridor.

Section 4(f) –Implementation of this scenario would not produce additional negative impact on historic properties when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Groundwater – Implementation of this scenario would not produce additional negative impact on groundwater flow when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Noise/Vibration – While a detailed noise and vibration assessment was not appropriate to conduct at this stage, movement of the freight rail track closer to the properties in Kenilworth Corridor is expected to increase the noise and vibration experienced by those uses compared to current conditions and/or under an LRT only scenario.

In addition, the operation of LRT on an aerial structure would increase the impact of noise and vibration created by the LRT system because the source of the sound would be higher in the air and able to be transmitted farther into the adjacent properties.

Summary

From the standpoint of engineering, constructing a lengthy LRT aerial structure at this location would not be considered accepted engineering practice because of cost and potential environmental impacts, given the availability of other reasonable alternatives but primarily because of the excessive height necessary to cross the West Lake Street Bridge.

Implementation of this scenario would:

- Allow freight operations to be maintained at acceptable levels;
- Preserve the commuter bicycle trail through the corridor and
- Require no additional right-of-way.

However:

- The LRT system would have increased operations and maintenance cost.
- Constructing an LRT aerial structure through the Kenilworth Corridor in a manner that would prevent the acquisition of additional right-of-way would

require an aerial crossing and an aerial station at West Lake Street of excessive height;

- Even with an aerial structure hosting LRT, placing the freight track on the north side of the LRT track still would require an additional LRT bridge west of Wooddale Avenue;
- The operation of the freight track adjacent to the LRT track would create safety issues that would require additional mitigation and result in a substantial redesign of the Wooddale, Belt Line, West Lake Street and 21st Street Stations and
- The noise and vibration associated with passing freight trains, expected to be eliminated under the current proposal, would remain.

Constructing an aerial structure for LRT would not be considered accepted engineering practice because of the cost and potential environmental impacts given the availability of other reasonable alternatives. To avoid property acquisition, such a structure would have to cross the West Lake Street Bridge at an unacceptably high elevation and would create noise aesthetic impacts that could not mitigated. An aerial structure would be vastly more expensive than other available alternatives, would produce unpredictable environmental impacts and would invite continuing maintenance, safety and security problems.

Scenario 5 – LRT in Tunnel

Scenario 5 envisions that the LRT alignment is constructed in a tunnel through the corridor and that the existing freight rail track and commuter bicycle trail remain in their current location.

Description

The basic premise of this scenario is that by placing the LRT alignment in a tunnel, the existing freight track and the existing commuter bicycle trail can remain in their current location **without the need to take additional right-of-way within the Kenilworth Corridor**. To accomplish this, an LRT tunnel would need to be at full depth through those sections of the corridor where right-of-way width is restricted.

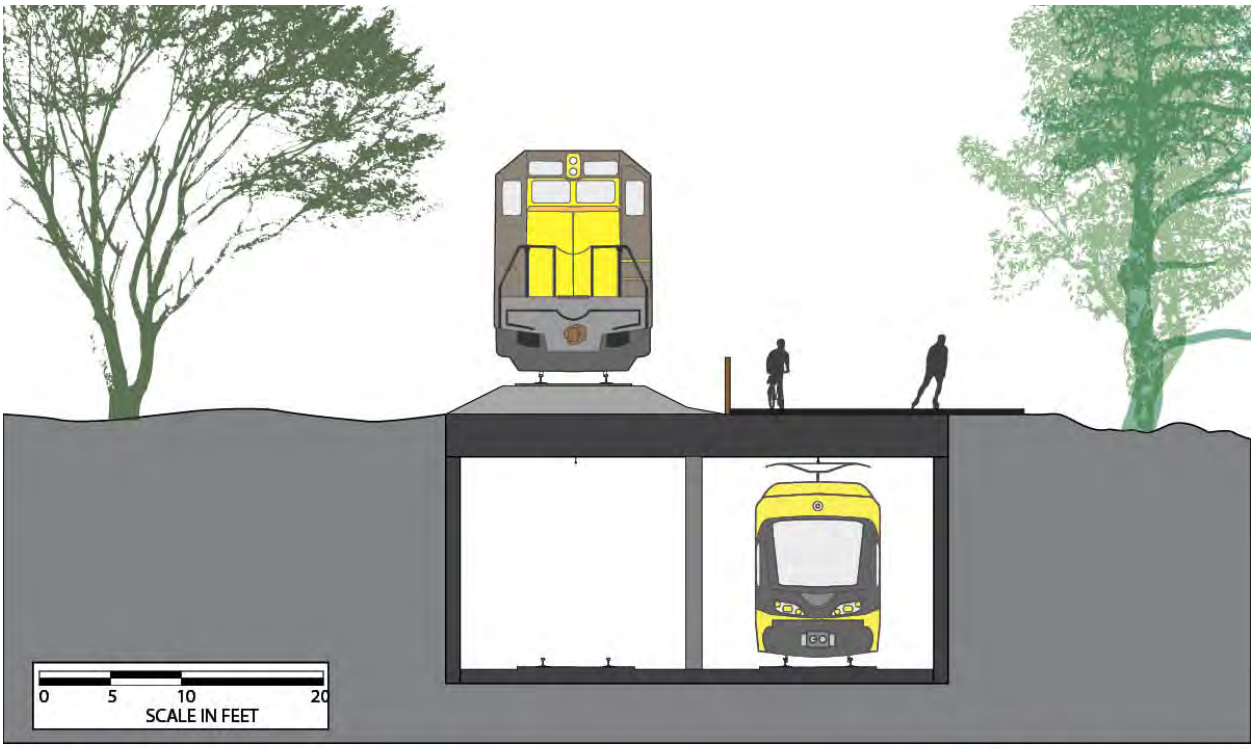
The south end, or portal, of the tunnel would need to be far enough south of West Lake Street to allow the tunnel to be at full depth by the time the tunnel reached the narrow section just north of the West Lake Street Bridge. The exact location would be a function of how deep the tunnel needed to be and the grade selected. The maximum grade of LRT operations is six percent. The fact that the tunnel would need to be at full depth by West Lake Street suggests that the West Lake Street station world need to be incorporated into the tunnel. Since LRT tracks in station areas need to be level and since there would not be enough distance between the station and the bridge to allow any additional descent, the West Lake Street station also would need to be at full depth.

Additional analysis would be required to determine the exact location of the north portal at which there would need to be sufficient right-of-way width to accommodate not only the LRT tracks but also the extra width created by the tunnel portal. The potential freight alignment as described in Scenario 1 can be used as a reference to estimate the location of the north portal. At a minimum, the tunnel would need to extend under Cedar Lake Parkway. But there is the potential that the tunnel may be required the full length of the corridor to prevent right-of-way takings north of Cedar Lake Parkway, particularly in the vicinity of the 21st Street Station.

On the north end of the corridor, the freight tracks need to be on the west/north side of the LRT alignment. The tunnel could be extended on the south end to provide an opportunity for the freight track to shift from the south side of the LRT alignment to the north side of the LRT alignment without the construction of an additional LRT bridge between Belt Line Station and West Lake Station.

Constructing a tunnel to host Light Rail Transit, while technically possible, poses significant engineering issues. The first consideration is the nature of the tunnel design. In general, tunnel construction is of two major types: 1) cut and cover and 2) mined single or twin bored. These are depicted in Figure 13.

A cut and cover tunnel, as its name suggests, involves the digging of an open trench, the placement of the track and system infrastructure therein and the covering over of the tunnel. This construction technique is appropriate where the tunnel is shallow with minimal distance between the top of the tunnel and the ground above. An example of this type of tunnel exists on the Hiawatha LRT line at Minnehaha Parkway, where the LRT line and adjacent roadway were placed in a tunnel to allow Minnehaha Parkway to cross Hiawatha Avenue without an intersection and to connect the Parkway directly to Minnehaha Park. It should be noted that this tunnel was designed specifically to avoid intrusion into the underground hydrologic system in order to prevent unexpected impacts on Minnehaha Creek and Minnehaha Falls.



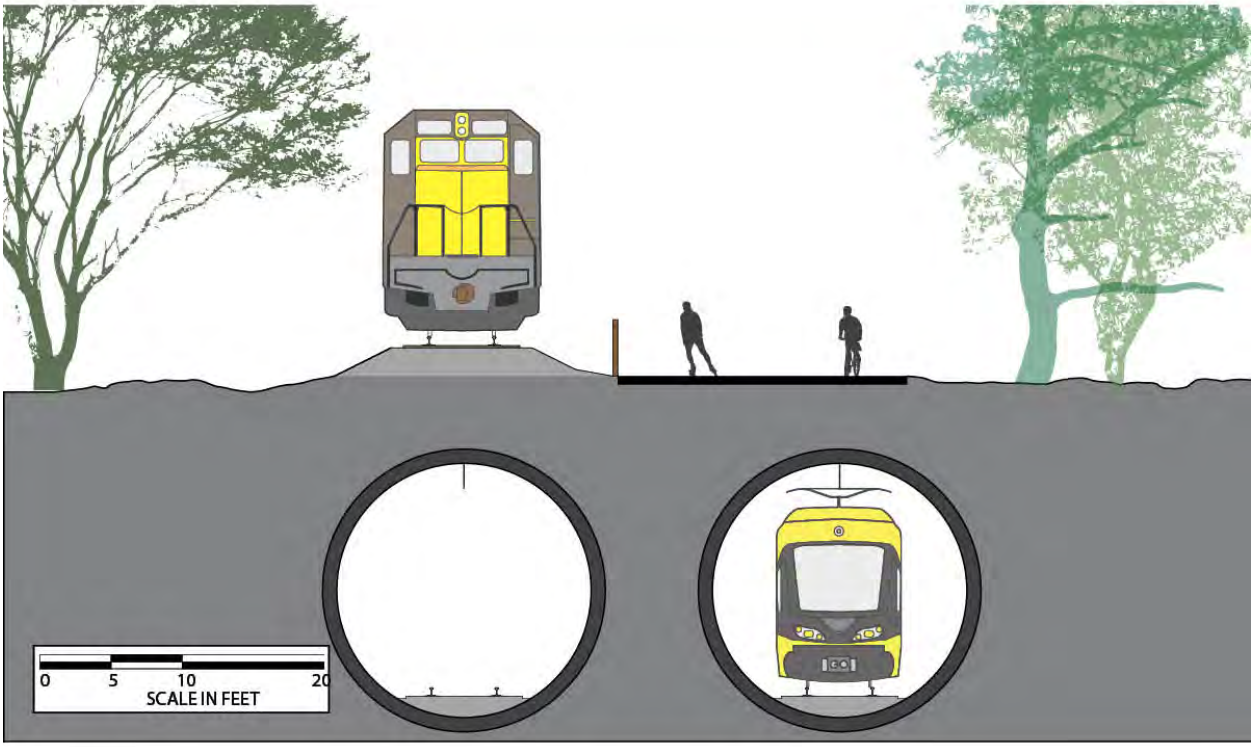


Figure 17
Tunnel Alternatives: Cut and Cover (TOP) and Twin Bore (BOTTOM)

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

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To meet the objectives of the scenario, which is to retain the commuter bicycle trail and freight rail in the Kenilworth Corridor, the freight rail alignment would need to be constructed over a portion of the tunnel alignment in order to stay within the right-of-way. Where the freight alignment is constructed over the cut and cover tunnel, the 'roof' would need to be constructed strong enough to support a fully loaded freight train. In effect, a cut and cover tunnel would need to be constructed as a virtual railroad bridge along the entire length of the tunnel.

Another engineering issue with a cut and cover tunnel in this area is that the elevation of the track within the tunnel would be the same as or below the stream bed of the Cedar-Isles Channel, which is clearly undesirable.

The alternative to a cut and cover tunnel is a mined tunnel. Current practice of constructing a mined tunnel is the use of a tunnel boring machine. A good example of a mined tunnel constructed with a tunnel boring machine is the LRT tunnel under the Minneapolis – St. Paul International Airport, where there is 90 feet between the bottom of the tunnel and the ground surface. The tunnel is in reality two tunnels, each of which is twenty feet in diameter, with cross passages every 750 feet. The design and construction of the LRT tunnel at the airport benefitted from some of the best tunneling conditions available, including favorable geological and hydrological conditions.

Evaluation

LRT Implementation and Operations

Tunnels are common features of heavy rail transit systems (i.e. subway, "el," underground, metro) that require complete grade separation to achieve high speed, long trains and frequent service. But even in such places as New York City and Washington DC, tunnels are employed only in the mostly densely developed areas to avoid a great deal of surface congestion and high levels of activity. This is primarily because tunneling is significantly more expensive as building a surface rail alignment.

LRT is a compromise between heavy rail and streetcars, which operate in the street with other motorized traffic, that relaxes the requirement for true grade separation in exchange for lower capital costs. However, in order to maintain schedule reliability, critical to attracting riders, LRT right-of-way still must be reserved exclusively for LRT trains, meaning that LRT does not share most space with cars or buses.

LRT typically maintains right-of-way exclusivity by using former freight railroad rights-of-way, highway medians, street boulevards or transit malls. When necessary, LRT crosses physical barriers such as freeways using aerial structures but in general, because of the high cost, avoids the use of tunnels except over short distances in downtown areas (Los Angeles), where a tunnel already exists (Boston, St. Louis, Seattle) and when a tunnel is shared with a companion heavy rail system (San Francisco, Philadelphia, Cleveland). Despite their cost, there are examples where tunnels are used on LRT systems to maintain exclusive right-of-way. But they exist in very special circumstances. LRT systems in the United States, other than Minneapolis, that include tunnels outside of downtown areas are:

- **Pittsburg** – A tunnel is used to carry both buses and LRT between the river level and the top of a steep bluff on the south side of the Monongahela River;
- **San Francisco** – MUNI employs two tunnels, the Twin Peaks and Sunset, both of which carry LRT trains through steep hills and
- **Portland** – The Westside Line uses a tunnel to get between downtown and higher elevations on the west side of the city.

In each of the above examples, the construction of a tunnel was the only viable engineering alternative to crossing a specific and unique physical barrier.

Tunnels create maintenance challenges to operators and safety/security issues to users. The restricted space within a tunnel hampers efficient maintenance and creates a higher impact on operations during maintenance activities. From the user's standpoint, special measures need to be taken to ensure safety, particularly related to emergency evacuation and disaster preparedness.

Freight Operations

The reconstruction of the freight railroad track between the MNS alignment and Cedar Lake Junction would allow the TC&W Railroad to operate in the same manner as it now operates.

Transportation System Impacts

The commuter bicycle trail through the Kenilworth Corridor would remain in its current location and therefore would not be affected negatively by the implementation of this scenario.

Property Impacts

The premise of this scenario is that the construction of an LRT tunnel would avoid the need to acquire right-of-way.

Potential Environmental Impacts

Historic Properties –Implementation of this scenario would not produce additional negative impacts on historic properties when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Water and Natural Resources – A significant impediment to the construction of a cut and cover tunnel through the Kenilworth Corridor is the presence of the Cedar Isles Channel. The floor of a cut and cover tunnel would be at or just below the creek bed. It is difficult to conceive how this channel could be re routed or closed without significant impact on the Chain of Lakes.

Section 4(f) –Implementation of this scenario would not produce additional negative impact on historic properties when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Groundwater – The most compelling concern with respect to tunneling through the Kenilworth Corridor is the potential disruption to the underground hydrologic system that connects Cedar Lake to the Lake of the Isles and is part of the larger Chain of Lakes system that literally defines the City of Minneapolis. Absent extensive investigation, it is impossible to predict the exact impact of placing a tunnel across the pathway between the two lakes. But it is almost certain that the tunnel would be below ground water level, would require extensive pumping to keep dry and potentially could interrupt groundwater flow with unpredictable results to the water levels and water quality of the lake system.

Noise/Vibration – A detailed noise and vibration assessment was not appropriate to conduct at this stage.

Summary

Implementation of this scenario would:

- Allow freight operations to be maintained at acceptable levels;
- Preserve the commuter bicycle trail through the corridor and
- Require no additional right-of-way.

However:

- The LRT system would have increased operations and maintenance cost.
- Constructing an LRT tunnel structure through the Kenilworth Corridor in a manner that would prevent the acquisition of additional right-of-way would require a subterranean station at West Lake Street;
- The operation of the freight track adjacent to the LRT track would create safety issues that would need additional mitigation and result in a substantial redesign of the Wooddale, Belt Line, and 21st Street Stations and
- The noise and vibration associated with passing freight trains, expected to be eliminated under the current proposal, would remain.

From the standpoint of engineering, constructing a tunnel at this location would not be considered accepted engineering practice because of cost and potential environmental impacts, given the availability of other reasonable alternatives. In short, the Kenilworth Corridor is not a location that represents a typical application of a tunnel for LRT design purposes. A tunnel would be vastly more expensive than other available alternatives, produces unpredictable environmental impacts and carries continuing maintenance, safety and security problems.

Scenario 6 – Freight and LRT Shared Use of Track

Scenario 6 envisions that the LRT track and commuter bicycle trail are constructed as shown in the Conceptual Engineering Drawings and that the freight rail operation shares track with the LRT alignment.

Description

The basic premise of this scenario is that by allowing the freight operation to share track with the LRT operation, the LRT alignment can be constructed as proposed and the commuter bicycle trail can remain in its current location **without taking additional right-of-way**.

For purposes of this analysis, it was assumed that the shared track would be located between West Lake Street Station and Penn Avenue Station and would involve what is to be the southbound LRT track. At a minimum, on the south end of the Kenilworth corridor, the shared use section would need to be in place just north of the West Lake Street Bridge. On the north end of the Kenilworth corridor, the shared use section would have to end prior to the freight track connecting with the BNSF Railway. Based on the available right-of-way, it appears that the shared freight/LRT track could begin south of the Penn Avenue Station and end north of the West Lake Street Station so that neither of these stations would be affected by the operation of freight trains within the station. However, the 21st Street Station likely would require some design modifications to accommodate the operation of freight trains next to the platforms. The generalized cross-section of this arrangement is shown in Figure 18.

Evaluation

Transit vehicles, such as the LRT vehicles used in Hiawatha service and the planned SWT service, **could share track with freight operations only by means of an FRA waiver based on strict temporal separation** (i.e., most often freight operations are restricted to hours of no passenger service). Locations in the United States where this occurs or has occurred are as follows:

- San Diego, CA (Metropolitan Transit Development Board);
- Baltimore, MD (Maryland Transit Authority);
- Salt Lake City, UT (Utah Transit Authority);
- River Line – Camden - Trenton, NJ (New Jersey Transit) and
- Austin, TX (Capital Metro).

Evaluation of this scenario assumes that the metropolitan area LRT system would enjoy priority use of the shared tracks and that freight operations would be restricted to those hours when operation of the LRT system did not require them.

Figure 18
Alternatives Analysis: Freight and LRT on Shared Track
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

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Although Hiawatha service is advertised to start at 4:00 am, trains began operating in revenue service as early as 3:30 am to be in position to leave either the Target Field Station or Mall of America Station on their first trip, extending the length of the route. In the evening, the last trip leaves Target Field southbound at 1:13 am but trains are still operating on the line in revenue service as late as 2:47 am (2:53 on Friday and Saturday nights). Additional trains operating in non-revenue service (variously called deadhead or pull-out and pull-in) will be operating on the line before and after the revenue service hours

as they shuttle between the LRT storage/maintenance facility and the locations where they commence or complete revenue service. A fully integrated LRT system necessarily requires that trains operate over all lines during the same periods so that customers can complete their trips. Thus the time period with no LRT operations - which is the total extent of the available freight operating period under temporal separation – would be three hours or less and could be under two hours in duration.

LRT Implementation and Operations

From a technical standpoint, freight trains and light rail trains can operate on the same infrastructure. The basic track structure for LRT and freight rail is the same. There are two continuous rails separated by 56 ½ inches (inside of rail to inside of rail) supported by wooden or concrete cross ties placed perpendicular to the rails and held in place by a bed of rock called ballast. But while this basic structure is the same, there are several design issues that need to be taken into account:

- LRT utilizes overhead catenary to collect electricity to provide propulsion. This overhead structure typically is placed such that the wire that makes contact with the collecting device on the LRT vehicle, the pantograph, between thirteen feet ten inches and eighteen feet above top of rail. To accommodate freight trains, the overhead catenary structure on the shared portion of track would need to be raised to allow a minimum clearance between top of rail and the contact wire of 23.5 feet;
- The track shared with freight trains would need to be constructed to accommodate the greater horizontal clearances required by freight cars. Freight cars – especially those carrying oversize shipments - are wider than LRT cars and the design of structures, poles and platforms must take this into account. In particular, this would require an increase in the distance between track centerlines if the overhead catenary poles remain between the tracks;
- Currently, LRT platforms are set at eighteen inches above top of rail to facilitate level loading of LRT vehicles. To allow the necessary clearance needed by freight cars, the station platform on the side with the shared track would need to be dropped to eight inches;
- Pedestrian circulation around LRT stations would need to provide additional safety measures to protect pedestrians from freight trains operating through the affected stations, especially the 21st Street Station and
- Freight train axle loadings are significantly heavier than those of LRT and hence freight track must be of more robust construction and
- The alignment shared with the freight service would need to be compliant with the more restrictive grade standards of freight rail.

The design of the LRT system would need to be modified to accommodate the issues identified above.

Freight Operations

Freight service is important to the state's economy. TC&W, alone, handles approximately 25,000 carloads per year primarily consisting of outbound Minnesota agricultural products which allow Minnesota farmers and companies to compete more effectively. TC&W conducts interchange (exchange of freight cars) with major connecting railroads at various locations in the Twin Cities, one of the country's major freight rail hubs. The configuration of the region's rail network and the preponderant eastbound direction of freight originating on TC&W require that the interchanges be in the Twin Cities to be efficient and competitive. Hence Twin Cities connections are vital to TC&W. Indeed, all loaded cars

handled by TC&W and almost all empty cars are interchanged in the Twin Cities. TC&W operations are described in detail in a July 2010 report titled Twin Cities and Western Railroad: Summary of Train Operations prepared by R.L. Banks & Associates, Inc, on behalf of HCRRA.

As owner of the freight rail trackage connecting TC&W and BNSF via the Kenilworth Corridor, HCRRA assumed an obligation to provide an efficient connection between TC&W's customers and facilities to the west and the Twin Cities.

Each interchange movement must traverse the corridor twice. The cycle includes:

1. Originate at TC&W yard facility at Hopkins and travel eastbound to the Kenilworth Corridor;
2. Traverse the corridor eastbound;
3. Complete journey to connecting rail yard(s), operating over busy freight lines owned by other railroads;
4. Interchange cars at connecting yard(s), again, operating over busy freight lines owned by other railroads;
5. Travel to the corridor;
6. Traverse the corridor westbound and
7. Complete trip to Hopkins.

Delays are likely and unpredictable in steps three, four and five.

The duration of the required freight operating period is not just the length of time it takes a train or several trains to traverse the 8,900-foot Corridor; it must be long enough to encompass steps two through six for both daily interchange round trips as well as to accommodate potential future growth in coal, ethanol and/or grain trains. Steps two through six – traversing the corridor eastbound, interchanging railcars at yards of connecting carriers and traversing the corridor westbound – typically consume between eight and twelve hours. There is no reasonable way to condense the duration of those operations to even approach the available freight operating period.

Total freight movements through the corridor in a 24-hour period range from four to six and could increase as freight traffic rebounds from the recession and grows or should TC&W commence additional movements such as dedicated trains of intermodal containers on flatcars operated in recent years between an intermodal grain loading facility at Montevideo and the CP Shoreham Yard.

Transportation System Impacts

The commuter bicycle trail through the Kenilworth Corridor would remain in its current location and therefore would not be affected negatively by the implementation of this scenario.

Property Impacts

The premise of this scenario is that the shared use of track by freight and LRT would avoid the need to acquire right-of-way.

Potential Environmental Impacts

Historic Properties –Implementation of this scenario may generate an adverse impact on Cedar Lake Parkway with LRT elevated and freight rail at-grade. Due to the placement of the freight rail tracks west of the LRT there may be additional impacts to historic properties.

Water and Natural Resources – Reconstruction of the freight track may require the construction of an additional bridge over Cedar-Isles Channel depending upon the exact extent of the shared use section but this would not be expected to affect water quality or stream flow negatively.

Section 4(f) –.Implementation of this scenario would not produce additional negative impact on historic properties when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Groundwater – Implementation of this scenario would not have additional negative impact on groundwater flow when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Noise/Vibration – While a detailed noise and vibration assessment was not appropriate to conduct at this stage, movement of the freight rail track closer to the properties in Kenilworth Corridor is expected to increase the noise and vibration experienced by those uses compared to current conditions and/or under an LRT only scenario.

Summary

Implementation of this scenario would:

- Allow LRT operations to be maintained at levels consistent with the regional LRT system;
- Preserve the commuter bicycle trail through the corridor and
- Require no additional right-of-way.

However:

- The available freight operating period under conventional temporal separation is less than three hours. TC&W's essential Twin Cities interchange activities cannot be accommodated in such a short period;
- Even with a shared use section, placing the freight track on the north side of the LRT track would still require an additional LRT bridge west of Wooddale Avenue;
- The shared use of track through the 21st Street Station would create additional design issues related to platform height and clearances and
- The noise and vibration associated with passing freight trains, expected to be eliminated under the current proposal, would remain.

Sharing track between the Twin Cities and Western railroad and the LRT line is an unworkable solution because the freight service would be restricted to a time period insufficient to provide rail freight service and continue as a viable economic enterprise.

Scenario 7 – LRT Single Track

Scenario 7 envisions that LRT track and the commuter bicycle trail are constructed as shown in the Conceptual Engineering Drawings with the exception that a portion of the LRT alignment would be constructed as single track through the corridor and that the freight rail track is constructed using the alignment presently anticipated to host a second LRT track where the existing right-of-way is too narrow to accommodate a double track LRT line and single track freight line.

Description

The basic premise of this scenario is that by restricting LRT to a single track through the Kenilworth Corridor there would be sufficient room to construct a parallel freight track and retain the commuter bicycle trail **without taking additional right-of-way**.

The single track section, from south to north, would start at the West Lake Station. There would still be two tracks in the station with the shift to one track occurring as trains leave the station northbound. On the north end, the single track would widen to two tracks just south of the Penn Avenue station. It is estimated that the single track section of the LRT in Scenario 7 would extend about 9700 feet. Maximum LRT design speeds over the segment are between 35 and 45 mph.

The single LRT track section would follow the alignment of the northbound LRT track as described in the Conceptual Engineering Drawings. The freight track would be placed on the west side of the northbound track in the approximate location of what otherwise would be the southbound track. However, the freight track and remaining LRT track would require a separation of at least 25 feet between centerlines versus the fourteen foot separation between the centerlines of double-track LRT. The generalized cross-section of this arrangement is shown in Figure 19.

Evaluation

LRT Implementation and Operations

This scenario is particularly problematic from the standpoint of LRT operations. LRT is traditionally built with two, parallel, one-way tracks to maintain schedule frequency and reliability. Without two tracks, LRT trains would not be able to operate with frequent enough service to attract levels of ridership consistent with the ridership forecasts prepared in connection with the selection of LRT as the preferred transit mode on the Southwest Transitway.

Other services have recognized the incompatibility of single track and close headways. Baltimore's Central Light Rail Line was constructed initially with several single track segments to save money but headways were set at fifteen minutes. The single track segments were later converted to double track and headways now are as short as five minutes. New Jersey's River Line includes single track segments but peak headways are no more frequent than fifteen minutes. Planning for Cincinnati's initial LRT line along the I-71 corridor specified complete double track at full build out but single track segments planned to be built initially would be utilized only at headways of fifteen minutes or more.

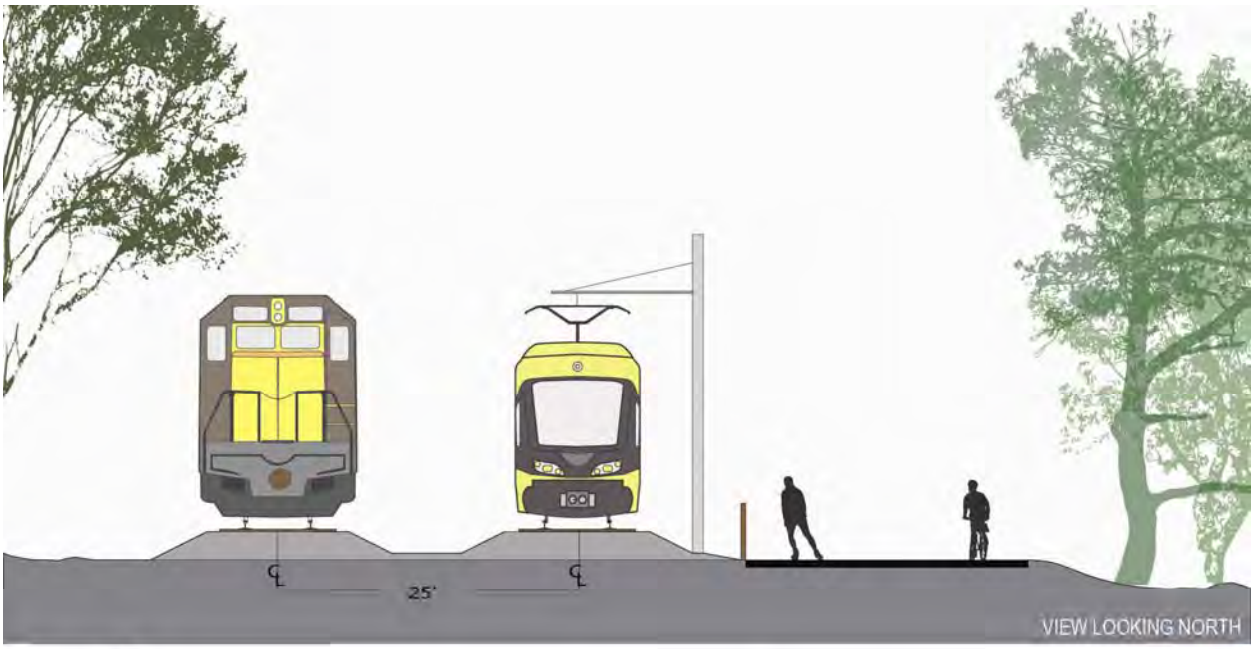

Figure 19
Alternatives Analysis: Freight and Single Track LRT
KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance
R.L. BANKS & ASSOCIATES, INC.

Theoretical cycle time of one LRT train over the single track segment includes approximately 4.75 minutes of running time and 0.5 minutes of "latency" time to align the switch and display the proper signal or a total of 5.25 minutes. This includes the time required to stop at the intermediate station. Theoretical time to get two trains, one in each direction, over the segment is 10.5 minutes. Transit planning practice indicates that practical headways are 50 percent greater than theoretical, which would indicate that 15 minutes should be allowed for one train in each direction to traverse the segment.

If the single track section could be shortened so that it ended after ~~before~~ crossing the Cedar-Isles channel, the estimated length would be about 4000 feet. This would also eliminate a station stop in the single track section. In this case, theoretical cycle time of one LRT train over the single track segment includes approximately 1.5 minutes of running time and 0.5 minutes of "latency" time to align the switch and display the proper signal or a total of 2.0 minutes. Theoretical time to get two trains, one in each direction, over the segment is 4.0 minutes. Transit planning practice indicates that practical headways are 50 percent greater than theoretical, which would indicate that 6.0 minutes should be allowed for one train in each direction to traverse the segment.

Therefore, even if the single track section only included a portion of the corridor, the six minute allowance is just barely less than the seven minute headways in effect on Hiawatha and planned on Southwest. Five minute (or less) headways are often found desirable as transit ridership grows or to serve special events. In practical terms, the single track segment would foreclose the ability to operate at five minute (or less) headways.

The single track segment would create a bottleneck that could affect operations over the entire route. LRT trains that reach the end of the single track segment behind schedule, because of delays in the downtown area or due to the weather or other causes, either will:

- Cause LRT trains in the opposite direction to wait for the already late train putting both trains behind schedule or
- Lose their scheduled slot (or "path") through the single track segment and be held to accommodate the on-time, oncoming train in the opposite direction. This would cause the already late train to become even later, potentially to the point where the next train in the same direction would catch up and bunch up behind the initial late train. Bunching is to be avoided in transit operations because it is a problem that compounds. Because the first train is late, more passengers (especially in the peak period) are waiting to get on, which increases dwell time and the number of passengers on board. As the train fills, boarding and alighting takes longer, compounding the delay. Meanwhile, the following train falls behind its schedule due to the ever-slower train ahead.

Compounding the constriction caused by the single track segment is that it is impossible to maintain exact arrival times of westbound trains because they are exiting downtown, assuming through routing either with Central or Hiawatha and the variability will be enough to disrupt the smooth flow of trains. This in turn ultimately will affect the predictability of travel times and therefore affect ridership on the line.

Creating a single track segment in the otherwise completely double-track Southwest line will impact on-time performance negatively at the projected headways and will curtail the ability to operate closer headways during special events or to respond to rising ridership in the future.

Freight Operations

The reconstruction of the freight railroad track between the MNS alignment and Cedar Lake Junction would allow the TC&W Railroad to operate in the same manner as it now operates.

Transportation System Impacts

The commuter bicycle trail through the Kenilworth Corridor would remain in its current location and therefore would not be affected negatively by the implementation of this scenario.

Reliable LRT operation at future desired headways would be imperiled.

Property Impacts

The premise of this scenario is that the construction of a single track segment to host LRT service would avoid the need to acquire right-of-way.

However the greater distance required by freight rail means that the minimum right-of-way requirement for the freight rail track, the single LRT line and the trail would be 82 feet. This is composed of the following elements.

1) The freight rail alignment needs 25 feet from the center of track to the ROW line;
2) The center of the nearest LRT track can be no less than 25 feet from the center of the freight track;
3) The two LRT tracks utilize 14 feet track centers and

4) The LRT track opposite the freight track needs to be 12 feet from the center of track to the ROW line.

The above elements total 82 feet (minimum). The ROW width between West Lake Street and Cedar Lake Parkway is 62 feet at its most narrow.

Potential Environmental Impacts

Historic Properties –Implementation of this scenario may generate an adverse impact on Cedar Lake Parkway with LRT elevated and freight rail at-grade. Due to the placement of the freight rail tracks west of the LRT there may be additional impacts to historic properties.

Water and Natural Resources – Reconstruction of the freight track may require the construction of an additional bridge over Cedar-Isles Channel, depending upon the exact location of the single track segment but this would not be expected to affect water quality or stream flow negatively.

Section 4(f) –.Implementation of this scenario would not have additional negative impact on historic properties when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Groundwater – Implementation of this scenario would not have additional negative impact on groundwater flow when compared against the current proposal to construct LRT through the Kenilworth Corridor.

Noise/Vibration – While a detailed noise and vibration assessment was not appropriate to conduct at this stage, movement of the freight rail track closer to the properties in Kenilworth Corridor is expected to increase the noise and vibration experienced by those uses compared to current conditions and/or under an LRT only scenario.

Summary

Implementation of this scenario would:

- Allow freight operations to be maintained at acceptable levels;
- Preserve the commuter bicycle trail through the corridor and
- Require no additional right-of-way.

However:

- Inserting a single track segment into the otherwise double-track Southwest Corridor LRT system would create a pinch point that would imperil efficient operations at anticipated headways and forestall operating on closer headways in the future;
- Even with a single track section, placing the freight track on the north side of the LRT track still would require an additional LRT bridge west of Wooddale Avenue;

- The operation of the freight track adjacent to the LRT track would create safety issues that would need additional mitigation and result in a substantial redesign of the Wooddale, Belt Line, West Lake Street and 21st Street Stations and
- The noise and vibration associated with passing freight trains, expected to be eliminated under the current proposal, would remain.

This scenario is inconsistent with the concept of sound engineering judgment because requiring LRT service to operate on a single track through the Kenilworth Corridor would subject the LRT line to operating restrictions that would prevent the line from achieving its forecast ridership and therefore is inconsistent with the stated Purpose and Need of the project.

Conclusions

This study has examined the potential impacts of reintroducing freight rail tracks and associated rail service to the Kenilworth Corridor following the construction of LRT according to the Conceptual Engineering Documents prepared by HDR. Seven scenarios were examined. Each scenario was found to be inconsistent with accepted engineering practice.

Scenario 1 envisioned the placement of freight track on the west side of the LRT tracks through the Kenilworth Corridor.

- Adding the freight track back to the Kenilworth Corridor following the construction of LRT would require the acquisition of a 33-57 housing units and the disruption of an entire townhouse community.

Scenario 2 envisioned the removal of the commuter bicycle trail and placement of the freight track on the east side of the LRT tracks through the Kenilworth Corridor.

- Re-routing the Kenilworth Trail outside the Kenilworth Corridor eliminates a link in the commuter bicycle trail system and would require the acquisition of up to 117 housing units.

Scenario 3 envisioned the placement of the commuter bicycle trail on an aerial structure through the Kenilworth Corridor.

- Constructing an aerial structure to host the commuter bicycle trail through the Kenilworth Corridor would preserve the connectivity of the commuter bicycle network but the full functionality of the existing trail would not be preserved because the adjacent neighborhoods would no longer have convenient access to the trail and the trail experience would be altered irrevocably.
- An aerial structure would:
  - Be more expensive than other available alternatives;
  - Invite continuing maintenance, safety and security problems.

Scenario 4 envisioned the placement of the LRT tracks on an aerial structure through the Kenilworth Corridor.

- To avoid property acquisition, an aerial LRT structure would have to cross the West Lake Street Bridge at an unacceptably high elevation and would.
- An aerial structure would:
  - Be vastly more expensive than other available alternatives;
  - Create noise and aesthetic impacts that could not be mitigated;
  - Produce other unpredictable environmental impacts and
  - Invite continuing maintenance, safety and security problems.

Scenario 5 envisioned the placement of the LRT tracks in a tunnel through the Kenilworth Corridor.

- The Kenilworth Corridor is not a location that represents a typical application of a tunnel with respect to conventional LRT design purposes.

- A tunnel would:
  - Be vastly more expensive than other available alternatives;
  - Produce unpredictable environmental impacts and
  - Invite continuing maintenance, safety and security problems.

Scenario 6 envisioned the sharing of track between the freight service and the LRT service through the Kenilworth Corridor.

- Sharing track between the Twin Cities and Western railroad and the LRT line is an unworkable solution because the freight service would be restricted to a time period insufficient to operate the TC&W in a profitable manner.

Scenario 7 envisioned the placement of a single track section to host the LRT service through the Kenilworth Corridor.

- Requiring the LRT service to operate on a single track through the Kenilworth Corridor would subject the LRT line to operating restrictions that would prevent the line from achieving its forecast ridership and therefore is inconsistent with the stated Purpose and Need of the project.

In addition to the impacts within the Kenilworth Corridor primary study area are the impacts between Louisiana Avenue and West Lake Street as well as on the north end of the corridor near Cedar Lake Junction. While the central issue has been framed as an examination of the co-existence of freight rail and LRT between West Lake Street and Cedar Lake Junction, in order to continue operating through Kenilworth, freight tracks also will need to be replaced between Louisiana Avenue and West Lake Street. This results in the following impacts that occur regardless of the manner in which freight rail is returned to Kenilworth:

- Depending on which side of the LRT alignment the freight track is constructed, an additional LRT bridge will need to be constructed and
- Overall, five LRT stations will need to be redesigned to accommodate the presence of the freight railroad track.

From an engineering perspective, the construction of an additional LRT bridge is not exceptionally difficult. But it does represent an additional capital cost during construction and a long term additional maintenance cost. It also would increase daily operating costs and potentially reduce average operating speeds. The overall effect on speed and operating cost would depend on the final design of the required structure and would be related specifically to the grades and curvature of the bridge.

From an operational standpoint, the most serious issue surrounding the reintroduction of freight traffic is that five LRT stations would be adjacent to an active freight railroad. Freight trains that operate on the TC&W are generally inbound to the Twin Cities in the morning and outbound from the Twin Cities in the afternoon, in other words, during morning and afternoon peak periods. Lengthy freight trains will be blocking pedestrian access to the stations at the busiest times of the day. Considerable redesign of the stations will be necessary to ensure that transit patrons experience safe and secure access to the station platforms from both sides of the LRT tracks even when a freight train is passing.

In summary, Scenarios 1 and 2 would be workable if all affected parties were willing to accept the impacts of implementation. Each of the other scenarios reviewed in this study would result in characteristics, costs or impacts that would be inconsistent with the application of sound engineering judgment.

Appendix A

City of St. Louis Park And Metropolitan Council Resolutions

SOUTHWEST POLICY ADVISORY COMMITTEE
RESOLUTION NO. 2009-3

A RESOLUTION RECOMMENDING THE LOCALLY PREFERRED ALTERNATIVE (LPA) FOR THE SOUTHWEST LIGHT RAIL LINE

WHEREAS, the Metropolitan Council's long-range transportation plan identifies a future fixed transitway corridor in the Southwest metro area through the cities of Minneapolis, St. Louis Park, Hopkins, Minnetonka, and Eden Prairie; and

WHEREAS, a Southwest Light Rail Transit (LRT) line servicing the cities of Minneapolis, St. Louis Park, Edina, Hopkins, Minnetonka, and Eden Prairie will improve mobility and will help maintain a competitive business environment and high quality of life for the entire Southwest Metro Area; and

WHEREAS, because of the growing need for transit improvements to better serve the Southwest metro area, Hennepin County and its partners are taking steps needed to advance the Southwest LRT project in a timely fashion into the preliminary engineering project phase, then to final design and construction, and ultimately, operation; and

WHEREAS, the Southwest Technical Advisory Committee (TAC) took action on September 10, 2009, that LRT 3A be identified as the preliminary LPA for the Southwest LRT project because, based upon the technical analysis, it is the alternative that will best meet the Southwest Transitway's purpose and need statement as expressed by the goals of improving mobility, providing a cost-effective and efficient travel option, preserving the environment, protecting quality of life, and supporting economic development with the following three amendments:

(1) Amendment #1: Freight Rail Relocation as a Parallel Process
This recommendation is contingent upon the following conditions, that Hennepin County, St. Louis Park, Minneapolis, TCW, and Mn/DOT will work cooperatively to identify impacts, mitigation requirements, and mitigation funding options to address the potential of rerouting freight rail; a plan of action to address this issue in a parallel process with the SW LRT DEIS be developed; and, the freight rail issue and impacts are identified as a part of the "secondary and cumulative impacts" in the DEIS

(2) Amendment #2: Trail System
That the regional trail operated by Three Rivers Park District and the City of Minneapolis in the 3A corridor, as an important transportation link in the region, be addressed in the project development process as to design, funding and construction as a separate disconnected action.

(3) Amendment #3: Midtown Corridor
The region continue to explore the development of the Midtown Corridor as a transit connection between the Southwest and Hiawatha Light Rail Transit (LRT) lines.

NOW, THEREFORE, BE IT RESOLVED that the Southwest Policy Advisory Committee supports the Technical Advisory Committee recommendation that LRT 3A be identified as the Locally Preferred Alternative for the Southwest LRT project, with the following three amendments:

(1) Amendment #1: Freight Rail Relocation as a Parallel Process
This recommendation is contingent upon the following conditions, that Hennepin County, St. Louis Park, Minneapolis, TCW, and Mn/DOT will work

cooperatively to identify impacts, mitigation requirements, and mitigation funding options to address the potential of rerouting freight rail; a plan of action to address this issue in a parallel process with the Southwest Transitway DEIS be developed; and, the freight rail issue and impacts are identified as a part of the "secondary and cumulative impacts" in the DEIS

(2) Amendment #2: Trail System
That the regional trail operated by the Three Rivers Park District and the City of Minneapolis in the 3A corridor, as an important transportation link in the region, be addressed as an integral part of the project development process as to design, funding and construction as a separate disconnected action

(3) Amendment #3: Midtown Corridor
That the region continue to explore the development of and commitment to the Midtown Corridor as a rail transit connection between the Southwest and Hiawatha LRT lines

BE IT FURTHER RESOLVED, that the Southwest Policy Advisory Committee recommendation be forwarded to the Hennepin County Regional Railroad Authority for their consideration.

Regional Railroad Authority Board Action Request

09-HCRRA-0064

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Item Description:

HCRRA recommends that LRT alternative 3A be selected as the locally preferred alternative for the Southwest Transitway for inclusion in the Metropolitan Council's 2030 Transportation Policy Plan

Resolution:

WHEREAS, the Hennepin County Regional Railroad Authority is the current project sponsor for the Southwest Transitway project; and

WHEREAS, the Hennepin County Regional Railroad Authority is and will remain the Responsible Governmental Unit (RGU) for the Draft Environmental Impact Statement (DEIS) process; and

WHEREAS, the Metropolitan Council will become the project sponsor for purposes of submission of the Federal Transit Administration (FTA) New Starts application for the Southwest Transitway project after the Locally Preferred Alternative (LPA) is selected and the Metropolitan Council's long-range plan, the 2030 Transportation Policy Plan (TPP) is amended to include the Southwest Transitway LPA; and

WHEREAS, selection of an LPA for inclusion in the TPP is a prerequisite for eligibility for federal New Starts funding for the Southwest Transitway project; and

WHEREAS, the Hennepin County Regional Railroad Authority conducted an Alternatives Analysis (AA) and is conducting a Draft Environmental Impact Statement (DEIS) for the Southwest Transitway project comparing the costs, benefits and impacts of a broad range of transit modes and alternatives to determine which best meets the purpose and need for the project; and

WHEREAS, the Southwest Technical Advisory Committee (TAC) and Policy Advisory Committee (PAC), established to provide technical and policy guidance and make recommendations to the Hennepin County Regional Railroad Authority, have recommended that alternative 3A be identified as the Locally Preferred Alternative (LPA) for the Southwest Transitway Project, with light rail as the mode; and

WHEREAS, the Southwest TAC and PAC recommendations included three amendments related to freight rail, the regional trails, and Midtown rail transit as separate actions; and

WHEREAS, the public has been given an opportunity to comment through two formal public hearings and other methods; and

WHEREAS, the Metropolitan Council is the agency that will select the Locally Preferred Alternative (LPA) for the Southwest Transitway; and

WHEREAS, the Hennepin County Regional Railroad Authority will continue the environmental review process and assist in addressing issues as the project moves to the Metropolitan Council for the preliminary engineering phase of work; therefore

BE IT RESOLVED, that the Hennepin County Regional Railroad Authority recommends to the Metropolitan Council that light rail transit alternative 3A be selected as the Locally Preferred Alternative (LPA) for the Southwest Transitway for inclusion in the Metropolitan Council's 2030 Transportation Policy Plan; and

BE IT FURTHER RESOLVED, that the Hennepin County Regional Railroad Authority recognizes the TAC and PAC amendments to the LPA recommendation as separate actions and directs staff to determine appropriate steps for moving forward to address the three amendments related to freight rail, the regional trails and Midtown rail transit.

Regional Railroad Authority Board Action Request (continued)	
Requesting Department	Regional Railroad Authority
Recommendation from Deputy Exec Director	
Recommendation from Executive Director	

Background

History:

The Southwest Transitway is a proposed 14-mile light rail transit (LRT) line serving Eden Prairie, Minnetonka, Edina, Hopkins, St. Louis Park and Minneapolis. The LRT line will increase system capacity in an area of high demand, respond to travel demand created by existing and planned residential and employment growth, provide a competitive travel option that will attract 'choice' riders (who have a choice between transit and driving) and serve transit dependent populations. This line will also be an expansion of the region's transitway system.

Southwest Transitway Locally Preferred Alternative (LPA) Process

The HCRRA initiated the Southwest Transitway Alternatives Analysis (AA) process in 2005. During the AA process, a broad range of transit modes (LRT, BRT, conventional bus, etc.) were evaluated. Prior to identifying the Locally Preferred Alternative (LPA) for the Southwest Transitway project, the HCRRA chose to initiate the environmental review process, the Draft Environmental Impact Statement (DEIS). The purpose for initiating the environmental review process prior to identification of the LPA was to ensure that the potential impacts to critical environmental resources would be considered when identifying the LPA. In addition, proceeding in this fashion allowed the public and affected agencies to comment upon the purpose and need for the project as well as the alternatives under consideration.

According to Federal guidance, the selection of the LPA and inclusion of the LPA in the Metropolitan Council's Transportation Policy Plan (TPP) concludes the Alternatives Analysis (AA) process. It is at this point that the Metropolitan Council, as the project sponsor, may submit an application to the Federal Transit Administration (FTA) for the project to enter Preliminary Engineering (PE). The process for identification of the LPA is a separate process from the environmental review process, but it is beneficial for projects to combine portions of the processes to avoid duplication and project delays. The Metropolitan Council's selection and adoption of the LPA into the TPP is part of the long-range planning process required by state and federal law. The LPA selection does not replace, nor does it override the requirement to fully examine alternatives and determine the adverse impacts that must be avoided or mitigated under the National Environmental Policy Act (NEPA) and Minnesota Environmental Policy Act (MEPA).

In fall of 2008, the HCRRA in partnership with the Federal Transit Administration (FTA) initiated the environmental review process, the Environmental Impact Statement (EIS), for the Southwest Transitway. An EIS is required for all major federal and state actions, such as the Southwest Transitway project, that will significantly affect the environment. The EIS is a full disclosure document that includes a detailed evaluation of the social, economic, and environmental impacts of the alternatives and identification of mitigation options, presuming that adverse impacts cannot be avoided. The EIS is composed of two documents, the Draft EIS (DEIS) and the Final EIS (FEIS). In the DEIS all reasonable alternatives are discussed at a comparable level of detail and while there is no requirement to identify a preferred alternative, if one has been selected that should be stated in the document. The FEIS, which is typically completed in conjunction with Preliminary Engineering (PE), is required to describe the preferred alternative, the basis for that decision, and the mitigation requirements. The EIS is considered to be completed when a Record of Decision (ROD), which documents the decision made by the lead federal agency, is issued. At the state level, the EIS is considered complete when the Responsible Governmental Unit (RGU) issues an Adequacy Determination.

Southwest Technical Advisory Committee (TAC) Action

On September 10, 2009, the Southwest Technical Advisory Committee (TAC) voted to accept the HDR Engineering, Inc. recommendation that LRT 3A be selected as the Locally Preferred Alternative (LPA) for the Southwest Transitway because it is the alternative that best meets the purpose and need for the project expressed by the goals of improving mobility, providing a cost-effective and efficient travel option, preserving the environment, protecting quality of life and supporting economic development.

The Southwest TAC did add the following three (3) amendments to their recommendation:

Amendment #1: Freight Rail Relocation as a Parallel Process

> This recommendation is contingent upon the following conditions, that Hennepin County, St. Louis Park, Minneapolis, Twin Cities and Western Rail Company, and Mn/DOT work cooperatively to identify impacts, mitigation requirements, and mitigation funding options to address the potential of rerouting freight rail; a plan of action to address this issue in a parallel process with the Southwest Draft Environmental Impact Statement (DEIS) be developed; and, the freight trail issue and impacts are identified as a part of the "secondary and cumulative impacts:" in the DEIS.
>
> Amendment #2: Trail System
>
> That the regional trails operated by the Three Rivers Park District and the City of Minneapolis in the 3A corridor, as an important transportation link in the region, be addressed in the project development process as to design, funding and construction as a separate disconnected action.
>
> Amendment #3: Midtown Corridor
>
> The region continues to explore the development of the Midtown Corridor as a transit connection between the Southwest and Hiawatha Light Rail Transit (LRT) lines.

On September 17, 2009, a public hearing was held before the Southwest Policy Advisory Committee (PAC). Over 200 people attended the hearing and approximately 85 people testified.

Southwest Policy Advisory Committee (PAC) Action

On October 14, 2009, the Southwest Policy Advisory Committee (PAC) voted to accept the Southwest TAC recommendation and forward it to the Hennepin County Regional Railroad Authority. The Southwest PAC did amend the Southwest TAC amendments as follows:

Amendment #1: Freight Rail Relocation as a Parallel Process

> No change.
>
> Amendment #2: Trail System
>
> That the regional trails operated by the Three Rivers Park District and the City of Minneapolis in the 3A corridor, as an important transportation link in the region, be addressed as an integral part of the project development process as to design, funding and construction as a separate disconnected action.
>
> Amendment #3: Midtown Corridor
>
> That the region continue to explore the development of and commitment to the Midtown Corridor as a rail transit connection between the Southwest and Hiawatha LRT lines.

On October 20, 2009 a public hearing was held before the HCRRA. Approximately 30 people testified.

Next Steps

New Starts Application for Preliminary Engineering (PE)

The HCRRA's LPA recommendation will be forwarded to the Metropolitan Council for their consideration. Prior to completion of a New Starts application to enter into Preliminary Engineering and assume project sponsorship, the Metropolitan Council must select the LPA for the Southwest Transitway and amend their Transportation Policy Plan (TPP) to include the LPA.

Draft Environmental Impact Statement (DEIS)

The HCRRA as the local lead agency and the Federal Transit Administration (FTA) as the federal lead agency will complete the DEIS for all alternatives as identified during the National Environmental Policy Act (NEPA) and the Minnesota Environmental Policy Act (MEPA) Scoping process.

Approvals

Department Head	Eckhert, Philip C.	Date	10/29/2009
Deputy/Assistant Administrator		Date	
Director		Date	

Regional Railroad Authority
Hennepin County, Minnesota
RESOLUTION NO. 09-HCRRA-0064R1

[2009]

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The following Resolution was offered by Commissioner McLaughlin and seconded by Commissioner Dorfman:

BE IT RESOLVED, that the Hennepin County Regional Railroad Authority recommends to the Metropolitan Council that light rail transit alternative 3A be selected as the Locally Preferred Alternative (LPA) for the Southwest Transitway for inclusion in the Metropolitan Council's 2030 Transportation Policy Plan; and

BE IT FURTHER RESOLVED, that the Hennepin County Regional Railroad Authority recognizes the TAC and PAC amendments to the LPA recommendation as separate actions.

The question was on and there were 7 YEAS and 0 NAYS, as follows:

Board of Commissioners Hennepin County Regional Railroad Authority	YEAS	NAYS	ABSTAIN	ABSENT
Mike Opat	X			
Mark Stenglein	X			
Gail Dorfman	X			
Peter McLaughlin	X			
Randy Johnson	X			
Jan Callison	X			
Jeff Johnson	X			

RESOLUTION ADOPTED ON 11/3/2009

ATTEST: _____

Clerk to the County Board

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T Transportation Committee

Item: 2010-162

For the Metropolitan Council meeting of May 26, 2010

ADVISORY INFORMATION

Date Prepared: April 27, 2010

Subject: Transportation Policy Plan (TPP) Southwest Transitway LPA and I-94 Amendment

Proposed Action:

That the Metropolitan Council accept the attached Summary of Public Comment and adopt the attached amendments to the 2030 Transportation Policy Plan http://www.metrocouncil.org/planning/transportation/TPP/2008/ProposedTPPamendmentsFeb2010.pdf that:

- Select light rail transit (LRT) on the Kenilworth-Opus-Golden Triangle alignment (Alternative 3A) as the locally preferred alternative (LPA) for the Southwest Transitway; and

- Recognize modifications to I-94 from St. Paul/5th Street to the Lowry Tunnel which includes managed auxiliary/bus lanes that add capacity for more than a mile due to the conversion of the shoulder lane to general traffic use following temporary changes made in response to the I-35W bridge collapse.

Summary of Committee Discussion / Questions:

Amy Vennewitz, MTS Dep. Director Finance & Planning, presented this item. She reviewed the number and type of comments received and responses given during the public comment process that ended on April 22, 2010, and the timeline for the adoption of the TPP amendments.

There were no questions from the committee.

Motion by Peterson, seconded by McFarlin and passed unanimously.

AMENDED Business Item
Item: 2010-162

Transportation Committee

Meeting date: April 26, 2010

Council meeting date: May 26, 2010

ADVISORY INFORMATION	
Date:	April 26, 2010
Subject:	Adoption of 2030 Transportation Policy Plan Amendments for Southwest Transitway LPA and I-94 Corridor
District(s), Member(s):	All
Policy/Legal Reference:	M.S. 473.146, subd. 3 & 23 CFR 450.322
Staff Prepared/Presented:	Arlene McCarthy, Director MTS, 651-602-1754 Amy Vennewitz, Dep. Director, Finance and Planning 651-602-1058 Connie Kozlak, Manager, Systems Planning 651-602-1720
Division/Department:	Metropolitan Transportation Services (MTS)

Proposed Action

That the Metropolitan Council accept the attached Summary of Public Comment and adopt the attached amendments to the 2030 Transportation Policy Plan that:

- Select light rail transit (LRT) on the Kenilworth-Opus-Golden Triangle alignment (Alternative 3A) as the locally preferred alternative (LPA) for the Southwest Transitway; and

- Recognize modifications to I-94 from St. Paul/5th Street to the Lowry Tunnel which includes managed auxiliary/bus lanes that add capacity for more than a mile due to the conversion of the shoulder lane to general traffic use following temporary changes made in response to the I-35W bridge collapse.

Background

The Metropolitan Council is required, under both state and federal law, to develop a multimodal regional transportation plan that identifies transportation system goals and project priorities over a 20-year period. The current 2030 Transportation Policy Plan (TPP) was adopted in January 2009, before a locally preferred alternative (LPA) was recommended for the Southwest Transitway and prior to conclusion of a joint study to determine a management strategy and improvements for the I-94 corridor between Minneapolis and St. Paul.

In November 2009, Hennepin County Regional Railroad Authority, as the lead agency for the Southwest Alternatives Analysis, recommended to the Council that light rail transit on the Kenilworth-Opus Golden Triangle alignment (LRT Alternative 3A) be selected as the LPA for the Southwest Transitway. The Metropolitan Council reviewed the recommendation and developed the proposed TPP amendments identifying LRT on the 3A alignment as the LPA.

In addition, in the fall of 2009 after months of study, MnDOT, the Council and the Minnesota Division of the Federal Highway Administration completed a joint study to

determine what corridor improvements should continue on I-94 after the reopening of the I-35W bridge. The study developed a management strategy for the I-94 corridor that included general traffic use of a former bus-only shoulder in the vicinity of TH 280 and downtown Minneapolis. Because the use of the shoulder as a traffic lane exceeds a mile in length the project must be included in the TPP to meet the interagency agreement for Air Quality Conformity.

The Council submitted the Air Quality Conformity Analysis and Documentation for the proposed TPP amendments for the Southwest LPA and I-94 project to the Minnesota Pollution Control Agency on December 15, 2009. The MPCA response to and concurrence with the proposed conformity determination is attached and will be included in the amended TPP Appendix F, Clean Air Act Conformance. In addition, the proposed amendments were reviewed by the TAB, TAC and their subcommittees and recommended for adoption.

At its February 24th, 2010 meeting the Council authorized a public hearing and 45-day public comment period on the proposed TPP amendments. The public comment period began on March 8th and concluded on April 22nd. Twenty five individuals, ten of whom represented larger organizations/agencies, submitted comments through various means (oral testimony, e-mail, fax, voicemail, letter or comment card) during the public comment period. A public hearing on the amendments was held at the April 12th Transportation Committee meeting with testimony provided by two individuals representing the Hennepin County Regional Rail Authority and Twin West Chamber of Commerce, respectively. An additional public meeting for the Southwest LPA was held on April 15th in Hopkins with testimony from six individuals.

A summary of the public comments on the proposed TPP amendments is attached, along with the specific comments from each individual or organization. The comments included 14 in support of selection of the 3A Alternative as the Southwest LPA, 11 supporting the selection of the 3C Midtown/Nicollet Alternative as the preferred alignment rather than the 3A Alternative, 5 supporting commuter rail on the Southwest corridor rather than LRT and 7 opposed to using the former bus only shoulder on I-94 for general traffic purposes.

Rationale

The Southwest Transitway has gone through an extensive Alternatives Analysis (AA) led by Hennepin County Regional Rail Authority which resulted in a recommendation that the 3A Alternative be selected as the LPA. The AA phase of the project will officially conclude when the LPA is amended into the policy plan, allowing the project to proceed with a federal New Starts application to enter preliminary engineering.

The recommendation for the I-94 management strategy and conversion of the bus-only shoulder to general traffic use was developed through extensive study by MnDOT, the Council and FHWA.

Funding

This action does not require funding.

Known Support / Opposition

Support and opposition to the proposed amendments voiced during the public comment period is shown on the attached Summary of Public Comment.

CITY OF ST. LOUIS PARK

St. Louis Park Railroad Advisory Task Force
Position Statement Summary

The Task Force recommends that freight rail traffic through St. Louis Park should be through traffic only. The Task Force is opposed to introducing any additional rail traffic through the City of St. Louis Park.

All railroad blocking operations should be eliminated in St. Louis Park, Hopkins, and Minnetonka. This should be accomplished by constructing a switching yard west of these three cities.

Construct a southern connection and associated mitigation in the Oxford industrial area based upon a design study that allows for a direct connection of the east-west to north-south rail lines, that has the least effect on the adjacent neighborhoods, and that allows the ability to build the northern connection.

Freight rail traffic from the west headed for St. Paul should continue to travel through the Kenilworth Corridor in Minneapolis unless and until such time as a viable form of mass transit displaces it. The Task Force recognizes that other entities are evaluating the use of the Kenilworth Corridor to be used for mass transit. This Task Force recommends that these entities also evaluate other corridors, specifically the Highway 100 right-of-way be evaluated for mass transit.

The City should proceed with negotiating with all relevant parties to effect the above, seek funding from possible sources, conduct environmental studies, prepare plans to mitigate impact of increases in rail traffic, evaluate structural capacity and safety of existing railroad infrastructure, and implement a "quiet zone".

If at a future date, it is determined that the Kenilworth Corridor is the most feasible route for mass transit and that freight rail and a mass transit system cannot coexist in that corridor, freight rail traffic will be re-routed through St. Louis Park. This is to be accomplished by constructing a northerly connection on the Golden Auto Site and a connection on the iron triangle property. All environmental mitigation must be completed according to the environmental studies prior to re-routing.

The City Council should re-evaluate this strategy if significant changes in rail traffic patterns occur.

Position Statement
Agreement and Understanding of Affected Neighborhoods
of
The St. Louis Park Railroad Advisory Task Force

Proposed Strategy Plan
Based on all material reviewed, the St. Louis Park Railroad Advisory Task Force recommends that the City of St. Louis Park Council initiate the following actions:

Immediate Action

1. The Twin Cities & Western Railroad Company's freight rail traffic to and from the terminals in St. Paul will continue to be routed over its present course through the Kenilworth Corridor.

2. Negotiation of an agreement between the City of St. Louis Park, the Hennepin County Regional Rail Authority, Canadian Pacific Railway, Burlington Northern Santa Fe, and Twin Cities & Western Railroad to maintain TC&W St. Paul freight rail traffic through Kenilworth unless and until such time as freight rail is displaced by some means of mass transit. The agreement must contain the following elements in order to permit re-routing of traffic from Kenilworth to St. Louis Park:

   - In order to trigger re-routing of freight rail traffic, a study must be completed that evaluates other corridors (specifically including the Highway 100 corridor with an eastbound connection either via the Burlington Northern Santa Fe right-of-way, or the I-394 right-of-way). The study must identify the Kenilworth Corridor as the most feasible route for mass-transit.
   - The means of mass transit must physically displace freight rail traffic (light rail transit, heritage trolley, express busway, etc.). Commuter rail is not included in this definition since commuter trains use the same infrastructure as freight rail trains. The study must further conclude that there is no reasonable way to accommodate both freight rail and mass transit within the Kenilworth Corridor in order to trigger re-routing.
   - The mass transit must be a significant form of regional mass transit capable of transporting large numbers of commuters between Minneapolis and the southwest suburbs or greater areas. Transportation intended for recreational use is excluded.
   - In order to implement mass transit in Kenilworth, the project must include sufficient funds to pay for the following items:
     a) Noise, safety, and additional environmental mitigation of the segments in St. Louis Park that will be exposed to increases in rail traffic to the levels defined by the environmental studies performed under items #10 and #11 below.
     b) The construction of a south connection, if such has not already been constructed, in compliance with the most feasible routing alternative determined per paragraph 3 of this document, if necessary for freight rail traffic to reach Savage.
     c) The construction of a north connection across the Golden Auto Site, and a connection to the BNSF line on the iron-triangle property, if necessary to permit freight rail traffic to reach St. Paul.

3. Completion of a study reviewing the engineering and financial feasibility of the construction of the south connection. The major components of the study shall include:
    - Real estate purchases and business relocations;
    - Impact to Methodist Hospital by an at-grade crossing of Louisiana Avenue;
- Identifying the environmental impacts to the adjacent communities, and determining the route that has the minimum impact to these communities;
- Evaluating alternatives to assure that a north connection across the Golden Auto Site can still be funded and constructed if the south connection is built;
- Evaluating the alternatives to assure that the south connection will allow rail traffic to continue through the Kenilworth route if a north connection is also constructed without obstructing the HCRRA transit corridor;
- Conducting neighborhood meetings to present the study to the affected neighborhoods to gain their support.

The study should consider the following options:

a) A direct connection to the north-south track from the east-west track in the north-east corner of the industrial park (Avoids all at-grade crossings, and removes the entire existing switching wye).
b) Extending the west-end of the existing switching wye track to connect to the east-west track (Includes an at-grade crossing of Louisiana Avenue and creates a new crossing of Oxford Street. Includes removal of the north leg of the switching wye).
c) Extend the south leg of the existing switching wye track to connect to the east-west track east of the Louisiana Avenue bridge (Creates an at-grade crossing of Oxford Street and includes the removal of the north leg and west stub of the switching wye).
d) By any other feasible means.

4. If the study described under #3 above finds a south connection to be feasible, purchase right-of-way for the connection including business condemnation/relocation, and construct the south connection according to the recommendation of the study.

5. If and when a south connection is built, negotiate an agreement with the Canadian Pacific and Twin Cities & Western Railroad Companies that would grant the City the power to review potential changes in rail traffic patterns and/or rail users over this proposed rail connection. The City would reserve the right to deny additional rail traffic if alternative routes were available, or to require the operating rail company to fund mitigation to maintain environmental impacts at their existing levels.

6. If and when a south connection is built, negotiate an agreement with the Canadian Pacific Railway to facilitate the removal of track and abandonment of railroad rights-of-way on the portions of the existing switching wye that are to be removed (as defined by the study under item #3 above). This agreement must also provide for eliminating rail service to any businesses served by the wye track.

7. Construction of a switching yard outside of the cities of St. Louis Park, Hopkins, and Minnetonka and removal of all sidetrack through these cities (with the exception of the sidetrack to remain for run-around/passing track as determined by the study under item #3 above).

Position Statement Summary
May 23, 2001
Page of 10

If public funding subsidizes construction of the switching yard, negotiate an agreement that requires rail car storage and blocking operations to be performed outside of the cities of St. Louis Park, Hopkins and Minnetonka. The agreement will allow no exceptions based upon future railroad growth or infrastructure deployment. The agreement must prohibit storage, blocking or switching of railroad cars on the run-around/passing track, and all other locations in these cities.

8. Acquisition and environmental cleanup of all or part of the Golden Auto Site through the use of the Hennepin County Environmental Response Fund. The property would be platted such that sufficient right-of-way in the southeast portion of the site would be owned by the Hennepin County Regional Rail Authority and is reserved for a future rail interconnect. The remainder, if any, of the site would either be retained as a potential transit station site, or sold for private development, as determined by the City of St. Louis Park.

9. Negotiate an agreement with the Minnesota Department of Transportation (MnDOT) to reconstruct the Highway 100 freight rail bridge if the Highway 100 reconstruction project is implemented before such time as freight rail is displaced in the Kenilworth Corridor.

   This agreement should also include a provision where if the freight rail is eliminated from Kenilworth prior to the Highway 100 reconstruction project, the money savings realized by MnDOT to avoid constructing a freight rail bridge (including any temporary construction elements) will be completely turned over to fund railroad mitigation in St. Louis Park.

10. Complete an environmental analysis of the rail segments in St. Louis Park and Minneapolis that will accomplish the following:
    - Identify and model the environmental impacts of the existing and proposed rail traffic (including, but not limited to, impacts on the residential homes adjacent to the track; the impact of the railroad on the St. Louis Park High School; air, noise, and vibration impact; and street-railroad crossing impacts);
    - Study the environmental impacts along the Kenilworth corridor and determine the appropriate mitigation measures for railroad and/or other transit activities;
    - Study wetland and wildlife impacts from proposed rail construction and rail traffic;
    - Identify a series of mitigation steps that can be implemented based on levels of impact; (including but not limited to: upgrade track to seamless rail, landscaping, earthen berms, noise walls, home and school soundproofing, and removal of homes)
    - Develop a finance plan and identify funding source(s) for the various mitigation steps.

11. Assist the St. Louis Park School Board in assessing safety, noise, or other impacts introduced by additional rail traffic to the High School and Peter Hobart School. The assessment must include analysis of pedestrian and vehicular safety at the grade crossing of Dakota Avenue and Library Lane. The study should recommend physical mitigation measures, and revisions to school evacuation procedures. Identified mitigation measures must be implemented prior to freight rail traffic being re-routed through St. Louis Park.

12. Evaluate the existing St. Louis Park Railroad infrastructure for assessment of structural capacity (i.e. rail, bridge and street crossings). Compare the findings to the short-term and long-term expected railroad traffic projections, and recommend structural improvements if required. This assessment should be performed by an outside party, and not by the railroad companies. The railroad companies or parties not including the City of St. Louis Park will be responsible for funding the required improvements.

13. The City of St. Louis Park, in cooperation with the Cities of Minneapolis, Hopkins, and Minnetonka should evaluate the implementation of a southwest regional "Quiet Zone". The evaluation should analyze the existing at-grade intersections and determine which improvements would be cost-effective to implement a "Quiet Zone" according to the new FRA Regulations. The key elements in the evaluation should be:
    - Pedestrian safety considerations (including evaluating the installation of fencing along the tracks adjacent to residential areas and pedestrian bridges at appropriate locations)
    - Noise impacts of crossing bells vs. train horns.
    - Cost estimates and identification of funding sources.
    - Physical improvements (street closure, signal installation, safety barriers, and other geometric improvements).

14. The City of St. Louis Park should distribute this Official Position Statement to MnDOT, Met Council, and any other entities considering light rail transit, busways, and other mass transit options in the Kenilworth Corridor. These parties must be fully informed of the conditions that the City of St. Louis Park has established concerning re-routing of freight rail traffic through their communities, including the requirement to fund infrastructure improvements as well as the identified noise, safety, and other environmental mitigation measures.

Future Action

The Task Force is not in favor of accepting additional freight rail traffic over the any rail track segment in St. Louis Park as a result of re-routing the traffic; however, the Task Force has identified possible scenarios that may occur at some future date. Each scenario requires a specific set of actions if the above Immediate Actions are implemented.

Kenilworth Corridor – Transit Displacement

If freight rail is displaced by some viable form of mass transit (defined by #2 under Immediate Action above) freight rail traffic will be eliminated from the Kenilworth Corridor and re-routed on the north-south line through St. Louis Park. In such case, the Task Force recommends the following actions:

1. Implement the environmental mitigation measures that are recommended by the studies defined under items #10 and #11 under Immediate Actions.

2. Construct a connection to the north with a bridge over the HCRRA right-of-way to provide a through movement for the TC&W St. Paul trains. A southern connection must be in place or be constructed concurrently to assure that rail traffic to/from Savage does not back-up into the northern neighborhoods.

3. Construct the iron triangle connection.

4. Remove the existing freight rail track in the Kenilworth corridor.

5. Remove the existing freight rail track east of the north/south line in St. Louis Park, including the full length of the run-around/passing track and Bass Lake Yard. Canadian Pacific Railway rights-of-way will be purchased by Hennepin County Regional Rail Authority.

6. If the freight rail traffic is re-routed prior to the reconstruction of Highway 100, the cost savings realized by MnDOT to construct a bridge for light rail transit in lieu of a freight rail bridge will directly be passed along to St. Louis Park to fund environmental mitigation.

Commuter Railroad from the South

If the Dan Patch commuter rail project is implemented, the iron triangle connection would be constructed to carry commuter trains into Minneapolis. If this occurs while freight rail traffic is still being routed through Kenilworth, the Task Force recommends that the City of St. Louis Park take the following action:

1. Maintain the Twin Cities & Western Railroad Company's freight rail traffic to and from the terminals in St. Paul over its present course through the Kenilworth Corridor, until such time as that freight rail traffic is displaced by mass transit.

Whether freight rail traffic is being routed through Kenilworth or St. Louis Park, the Task Force recommends that the City of St. Louis Park take the following action:

1. St. Louis Park City work closely with MnDOT on the planning of the commuter rail line to assure that the appropriate mitigation measures are implemented to limit the effects of the environmental impacts from the projected rail traffic.

Rail Traffic from West to North

The Official Position Statement of the St. Louis Park Railroad Advisory Task Force is based on the anticipated shift of the Twin Cities & Western Railroad's river traffic from its current market to the north (Camden), to the south (Savage). It is possible that economic conditions may change and the Camden traffic may continue or increase. If the Camden traffic increases and/or if other new rail traffic coming from the west to the north exceeds projected volumes, the following actions may be taken:

1. If conditions reach unreasonable levels, the neighborhood leaders from the southern affected neighborhoods (Brooklawns, Elmwood, South Oak Hill, Creekside, and Brookside), will contact the St. Louis Park City Council to initiate action.

2. Based on the severity of the problem and the anticipated duration, the City Council may implement one of the following series of actions:
   A) Serious situation/Long-term Duration:
      - Request MnDOT, the HCRRA, and/or the railroad companies to construct a northern connection on the Golden Auto Site with a bridge over the HCRRA right-of-way.
      - Implement environmental mitigation along segments with additional rail traffic.
   B) Serious situation/Temporary Situation:
      - City staff will work with TC&W to conduct operations in such a way where the impacts are minimal to the adjacent residents.
   C) Less than serious situation/Long-term Duration:
      - City staff will work with TC&W on minimizing impacts to adjacent neighborhoods
      - Implement environmental mitigation measures, if necessary
   D) Less than serious situation/Temporary Situation:
      - City staff will work with TC&W on minimizing impacts to adjacent neighborhoods

Position Statement Summary
May 23, 2001
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The St. Louis Park City Council will interpret the situation according to the above criteria.

Rail Traffic from South to East

Although there is no indication that freight rail traffic would be introduced on this path, the Task Force recommends the following actions to prevent northbound trains from using a new south or north interconnect to connect to the east-west line and proceed through Kenilworth. These actions would only be necessary if this additional traffic could not be obstructed by the agreement defined under Item #5 under the Immediate Actions.

1. Study the environmental impacts from the additional traffic to determine if impacts from projected volumes would exceed reasonable levels.

2. If the conditions reach unreasonable levels, The City Council may take one of the following actions, based on the severity of the problem and the anticipated duration:
   A) Serious situation/Long-term Duration:
      - Study alternate routes to determine if there is a feasible route that could entirely avoid, or minimize the additional rail traffic through St. Louis Park. The selected route should not include an east connection in St. Louis Park, or allow trains to perform switching movements that involve stopping or backing of trains.
      - Implement environmental mitigation on segments with increased rail traffic.
   B) Serious situation/Temporary Situation:
      - City staff will work with the operating rail company to conduct operations in such a way where the impacts are minimal to the adjacent residents.
   C) Less than serious situation/Long-term Duration:
      - City staff will work with the operating rail company to minimize impacts to adjacent neighborhoods.
      - Implement environmental mitigation measures on segments with increased rail traffic.
   D) Less than serious situation/Temporary Situation:
      - City staff will work with the operating rail company to minimize impacts to adjacent neighborhoods

The St. Louis Park City Council will interpret the situation according to the above criteria.

Attachments to this Position Statement

(A) List of Advisory Task Force members;
(B) Chronology of meetings, field trips and neighborhood meetings since the initiation of the Task Force;
(C) Financing Plan.

St. Louis Park Railroad Advisory Task Force Members List

Neighborhoods

Birchwood:	P. Gardner/S. Silvernail
Blackstone:	Gerri Nassen
Bronx Park:	Ruth Bergene
Brookside:	Dee Welsh
Brooklawns:	Scott Lorentz
Cedarhurst:	Jerry Stamm
Eliot View:	Tom Powers
Elmwood:	John Basill
Lake Forest:	Lynne Carper
Bronx Park:	Kim Daniels
Sorenson:	Jami LaPray
Minneapolis:	George Puzak

City of St. Louis Park Staff

Councilmembers:	Sue Sanger
	Sue Santa
	Chris Nelson
City Manager:	Charlie Meyer
Planning:	Judie Erickson
School Board:	Joel Koch

Consultants

Project Managers:	Dick Koppy/Lee Koppy
Rail Design:	Roger Anderson
Environmental:	Eric Hansen
Noise:	David Braslau

Hennepin County

Commissioner:	Gail Dorfman/Kate Walker
HCRRA:	Gary Erickson/Warren Potter

Other Affected Cities

Minneapolis:	John Wertjes
Minnetonka:	Desyl Peterson

Railroad Companies

TC&W:	Dan Rickel
Canadian Pacific:	Mark Nordling
BNSF:	Brian Sweeney

MnDOT

Railroad/Waterway:	Robert Swanson
Hwy 100 Design:	Wayne Norris
Multi-Modal:	**Kate Garwood**
Commuter Rail:	Gabe Guevara

Position Statement Summary
May 23, 2001
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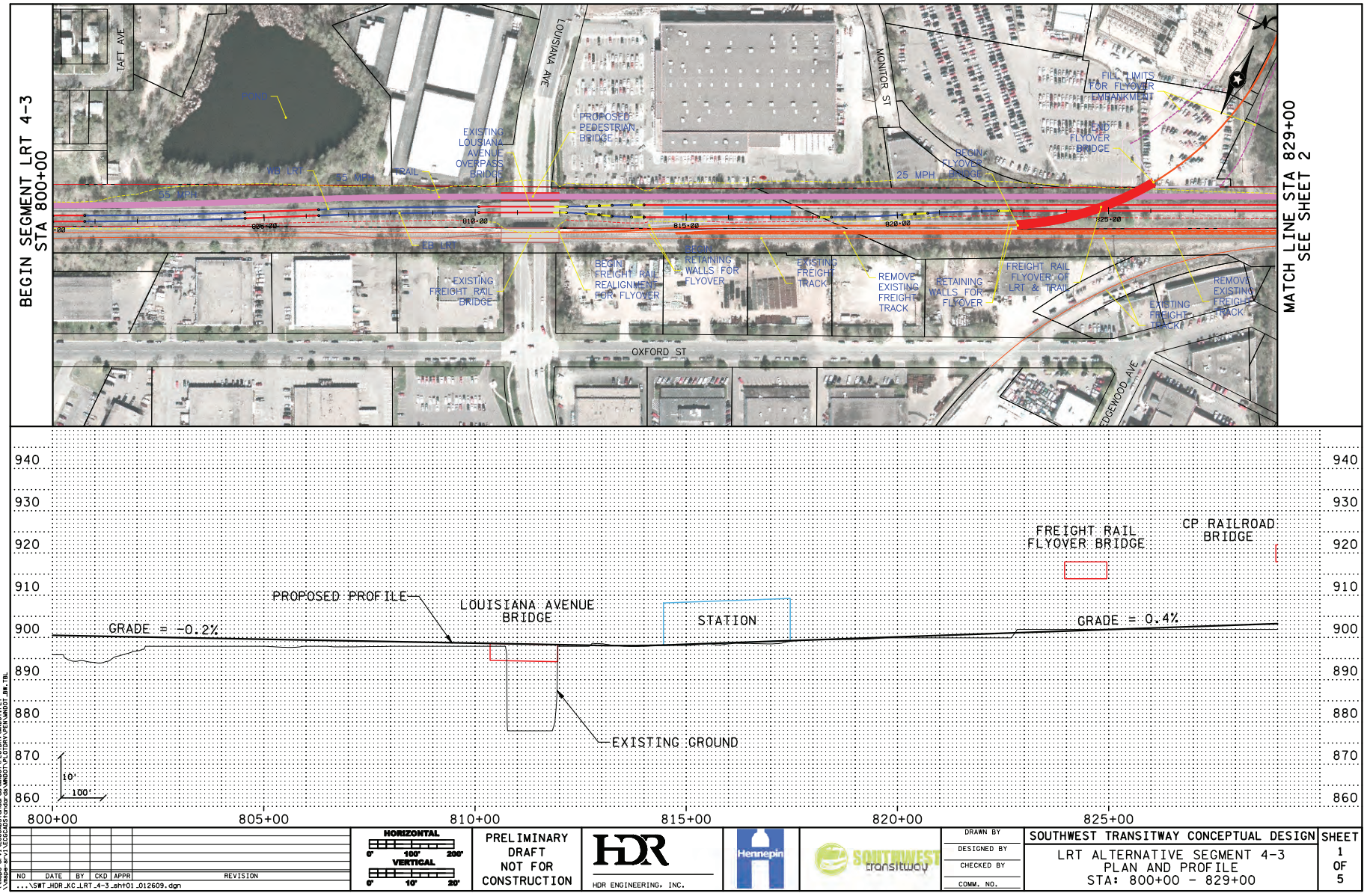
Appendix B

Conceptual Engineering Drawings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LOUISIANA AVE
MONITOR ST
POND
EXISTING LOUISIANA AVENUE OVERPASS BRIDGE
PROPOSED PEDESTRIAN BRIDGE
FILL LIMITS FOR FLYOVER EMBANKMENT
BROWN FLYOVER BRIDGE
WB LRT
EB LRT
35 MPH
25 MPH
RAIL
EXISTING FREIGHT RAIL BRIDGE
BEGIN FREIGHT RAIL REALIGNMENT FOR FLYOVER
BEGIN RETAINING WALLS FOR FLYOVER
EXISTING FREIGHT TRACK
REMOVE EXISTING FREIGHT TRACK
RETAINING WALLS FOR FLYOVER
FREIGHT RAIL FLYOVER OF LRT & TRAIL
OXFORD ST
DOGWOOD AVE
940
930
920
910
900
890
880
870
860
800+00
805+00
810+00
815+00
820+00
825+00
FREIGHT RAIL FLYOVER BRIDGE
CP RAILROAD BRIDGE
PROPOSED PROFILE
LOUISIANA AVENUE BRIDGE
STATION
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GRADE = 0.4%
EXISTING GROUND
10'
100'
HORIZONTAL
VERTICAL
PRELIMINARY DRAFT NOT FOR CONSTRUCTION
HDR ENGINEERING, INC.
Hennepin
SOUTHWEST transitway
DRAWN BY
DESIGNED BY
CHECKED BY
COMM. NO.
SOUTHWEST TRANSITWAY CONCEPTUAL DESIGN
LRT ALTERNATIVE SEGMENT 4-3
PLAN AND PROFILE
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SHEET 1 OF 5
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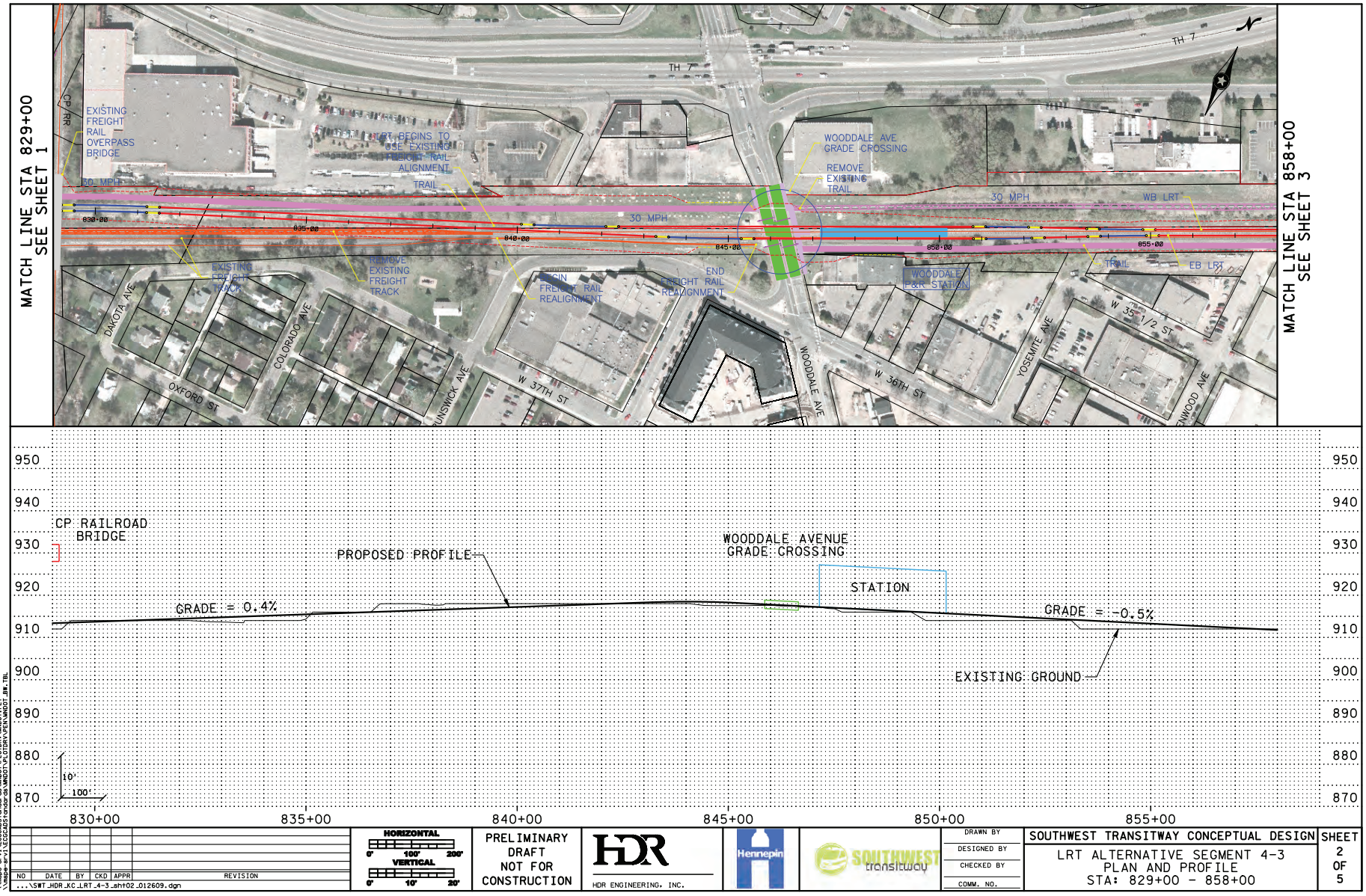

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COMM. NO.	

SOUTHWEST TRANSITWAY CONCEPTUAL DESIGN

LRT ALTERNATIVE SEGMENT 4-3
PLAN AND PROFILE
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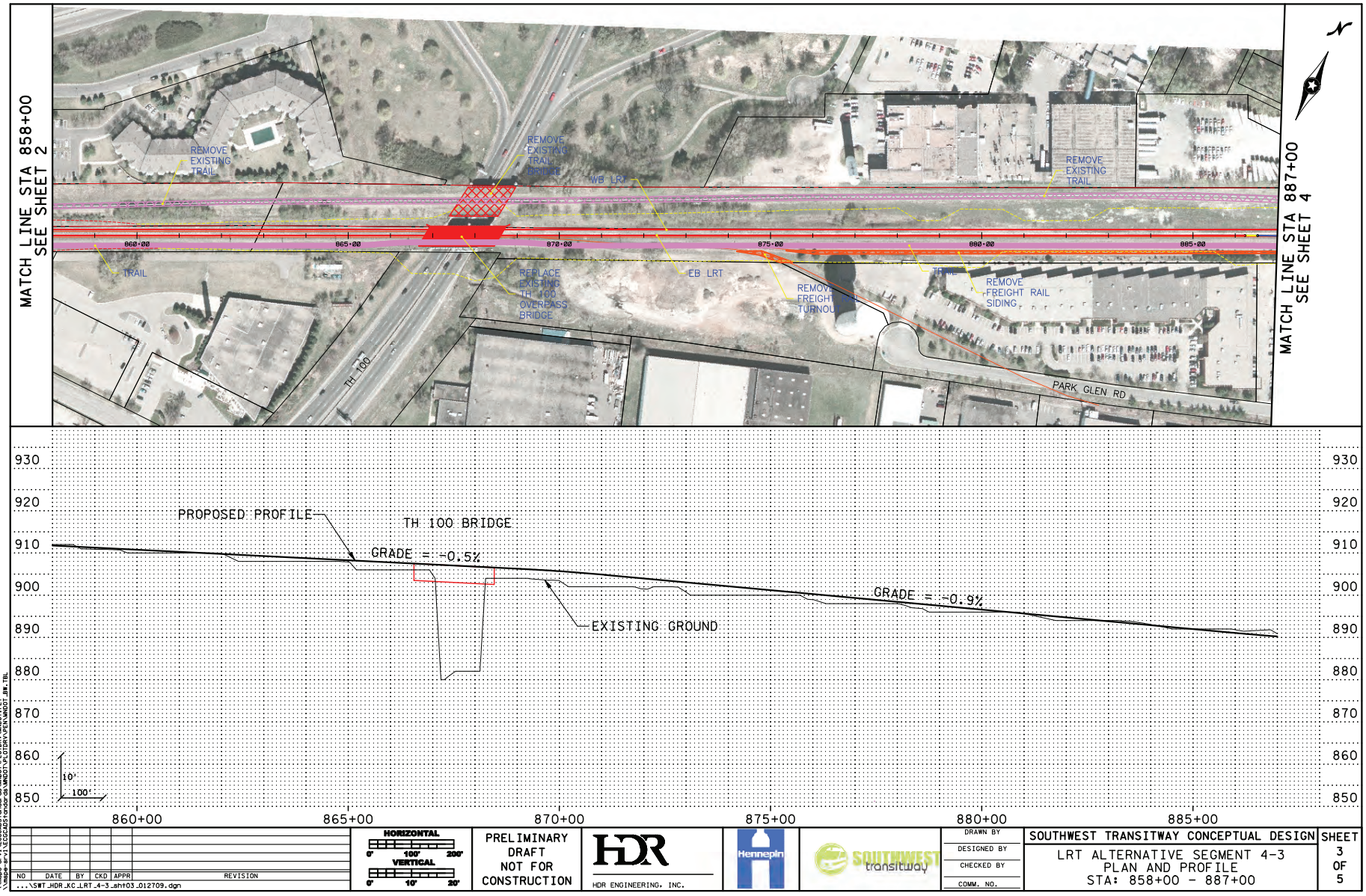
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SEE SHEET 4
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WB LRT
EB LRT
REMOVE EXISTING TRAIL
TRAIL
REPLACE EXISTING TH 100 OVERPASS BRIDGE
REMOVE FREIGHT RAIL TURNOUT
REMOVE FREIGHT RAIL SIDING
TH 100
PARK GLEN RD
860+00
865+00
870+00
875+00
880+00
885+00
PROPOSED PROFILE
TH 100 BRIDGE
GRADE = -0.5%
GRADE = -0.9%
EXISTING GROUND
930
920
910
900
890
880
870
860
850
10'
100'
HORIZONTAL
0' 100' 200'
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PRELIMINARY DRAFT NOT FOR CONSTRUCTION
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HDR ENGINEERING, INC.
Hennepin
SOUTHWEST transitway
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SHEET 3 OF 5
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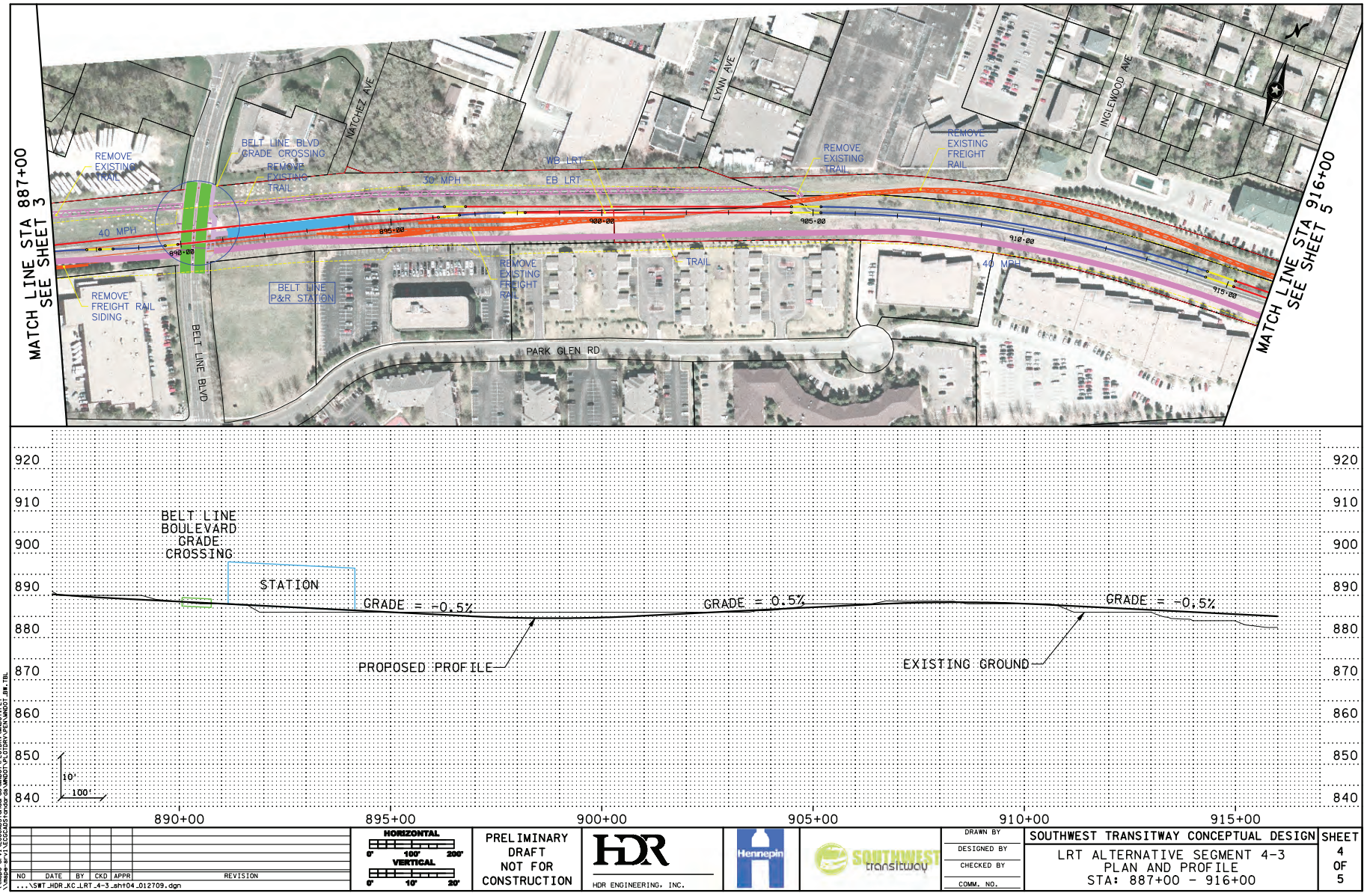
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SEE SHEET 5
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LYNN AVE
INGLEWOOD AVE
30 MPH
WB LRT
EB LRT
REMOVE EXISTING TRAIL
REMOVE EXISTING FREIGHT RAIL
40 MPH
40 MPH
890+00
895+00
900+00
905+00
910+00
915+00
REMOVE FREIGHT RAIL SIDING
BELT LINE P&R STATION
REMOVE EXISTING FREIGHT RAIL
TRAIL
BELT LINE BLVD
PARK GLEN RD
BELT LINE BOULEVARD GRADE CROSSING
STATION
GRADE = -0.5%
GRADE = 0.5%
GRADE = -0.5%
PROPOSED PROFILE
EXISTING GROUND
920
910
900
890
880
870
860
850
840
10'
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HORIZONTAL
0' 100' 200'
VERTICAL
0' 10' 20'
PRELIMINARY DRAFT NOT FOR CONSTRUCTION
HDR ENGINEERING, INC.
Hennepin
SOUTHWEST transitway
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DESIGNED BY
CHECKED BY
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SOUTHWEST TRANSITWAY CONCEPTUAL DESIGN
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PLAN AND PROFILE
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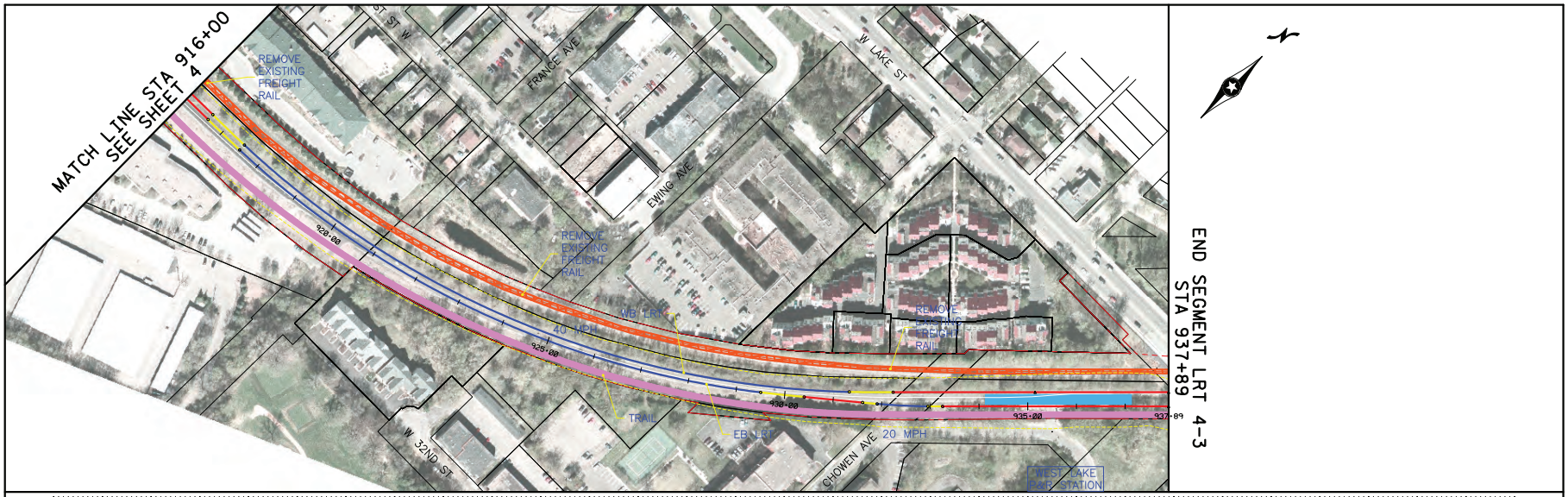

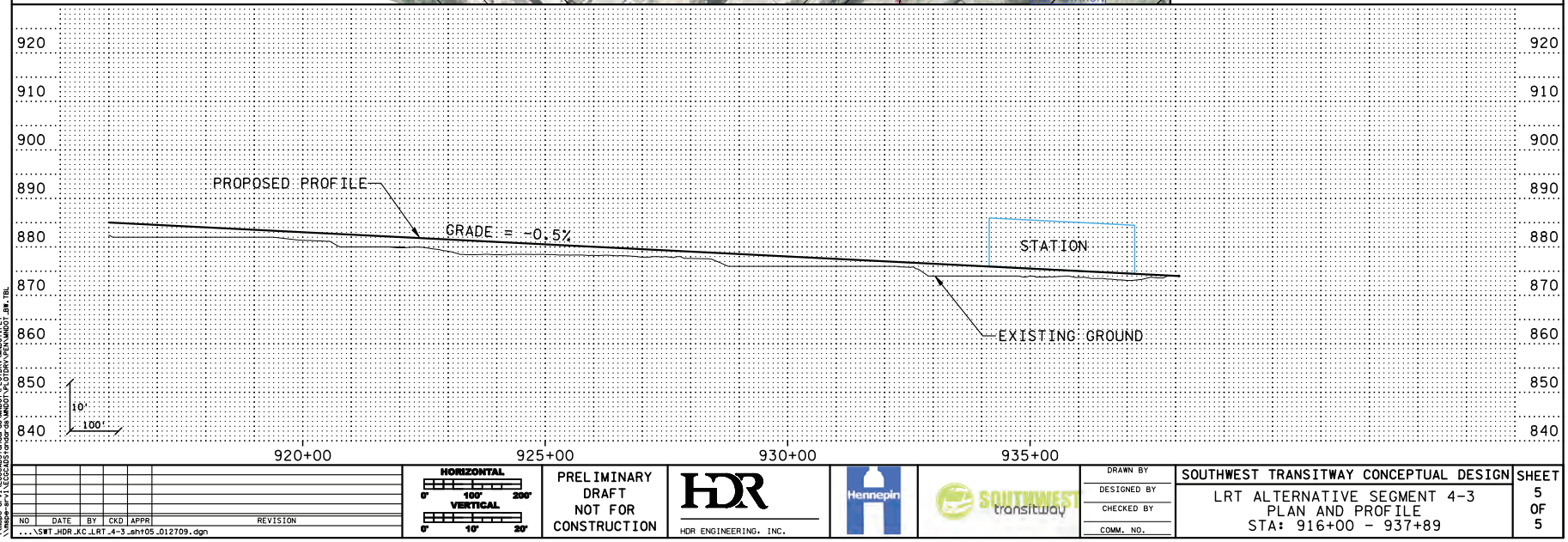

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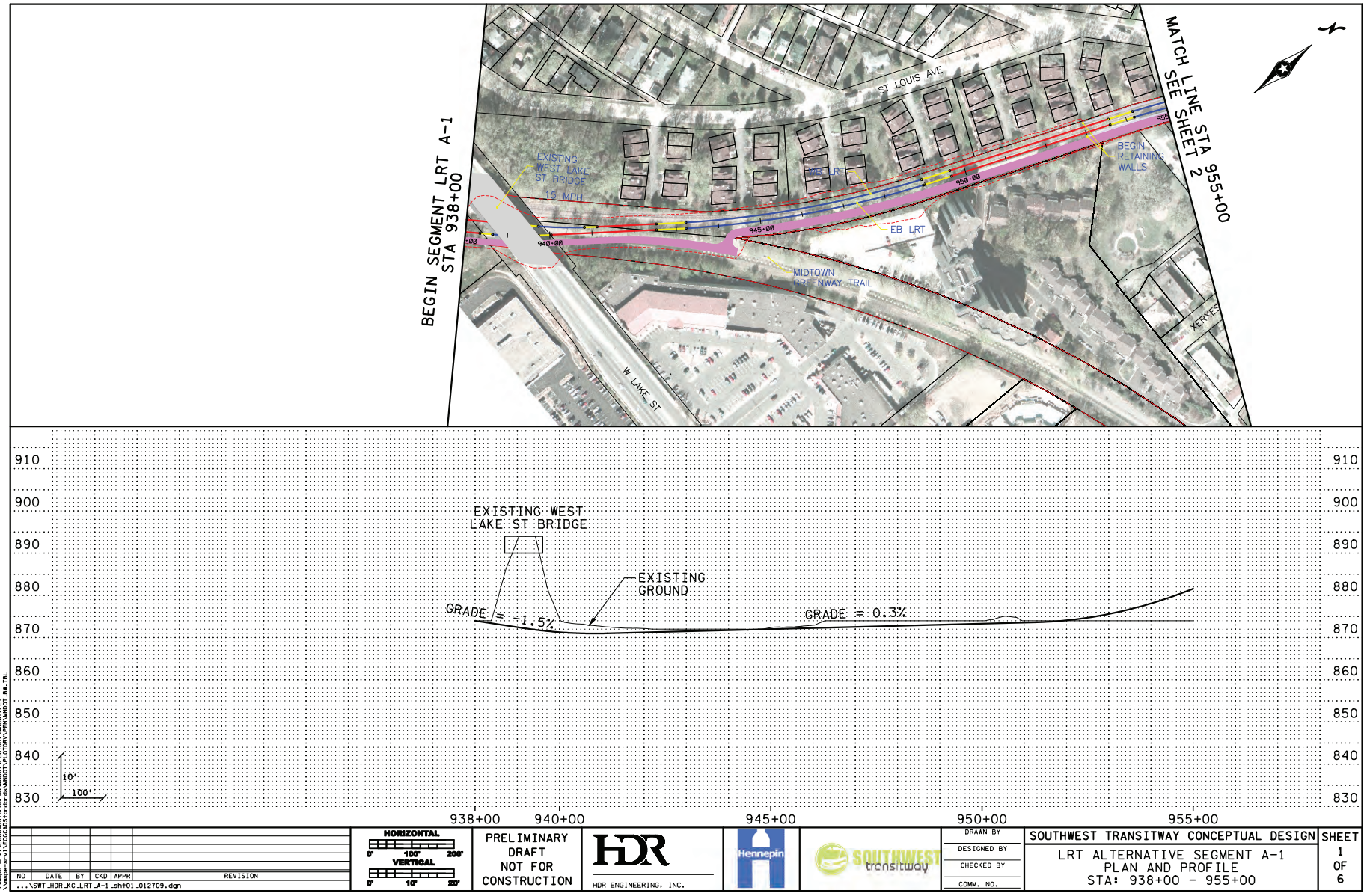
HDR ENGINEERING, INC.

DRAWN BY
DESIGNED BY
CHECKED BY
COMM. NO.

SOUTHWEST TRANSITWAY CONCEPTUAL DESIGN

LRT ALTERNATIVE SEGMENT 4-3
PLAN AND PROFILE
STA: 916+00 - 937+89

SHEET 5 OF 5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WB LRT
EB LRT
BEGIN RETAINING WALLS
MIDTOWN GREENWAY TRAIL
W LAKE ST
XERXES
940+00
945+00
950+00
EXISTING WEST LAKE ST BRIDGE
EXISTING GROUND
GRADE = -1.5%
GRADE = 0.3%
910
900
890
880
870
860
850
840
830
10'
100'
938+00
940+00
945+00
950+00
955+00
HORIZONTAL
0' 100' 200'
VERTICAL
0' 10' 20'
PRELIMINARY DRAFT NOT FOR CONSTRUCTION
HDR ENGINEERING, INC.
Hennepin
SOUTHWEST transitway
DRAWN BY
DESIGNED BY
CHECKED BY
COMM. NO.
SOUTHWEST TRANSITWAY CONCEPTUAL DESIGN
LRT ALTERNATIVE SEGMENT A-1
PLAN AND PROFILE
STA: 938+00 - 955+00
SHEET 1 OF 6
NO DATE BY CKD APPR REVISION
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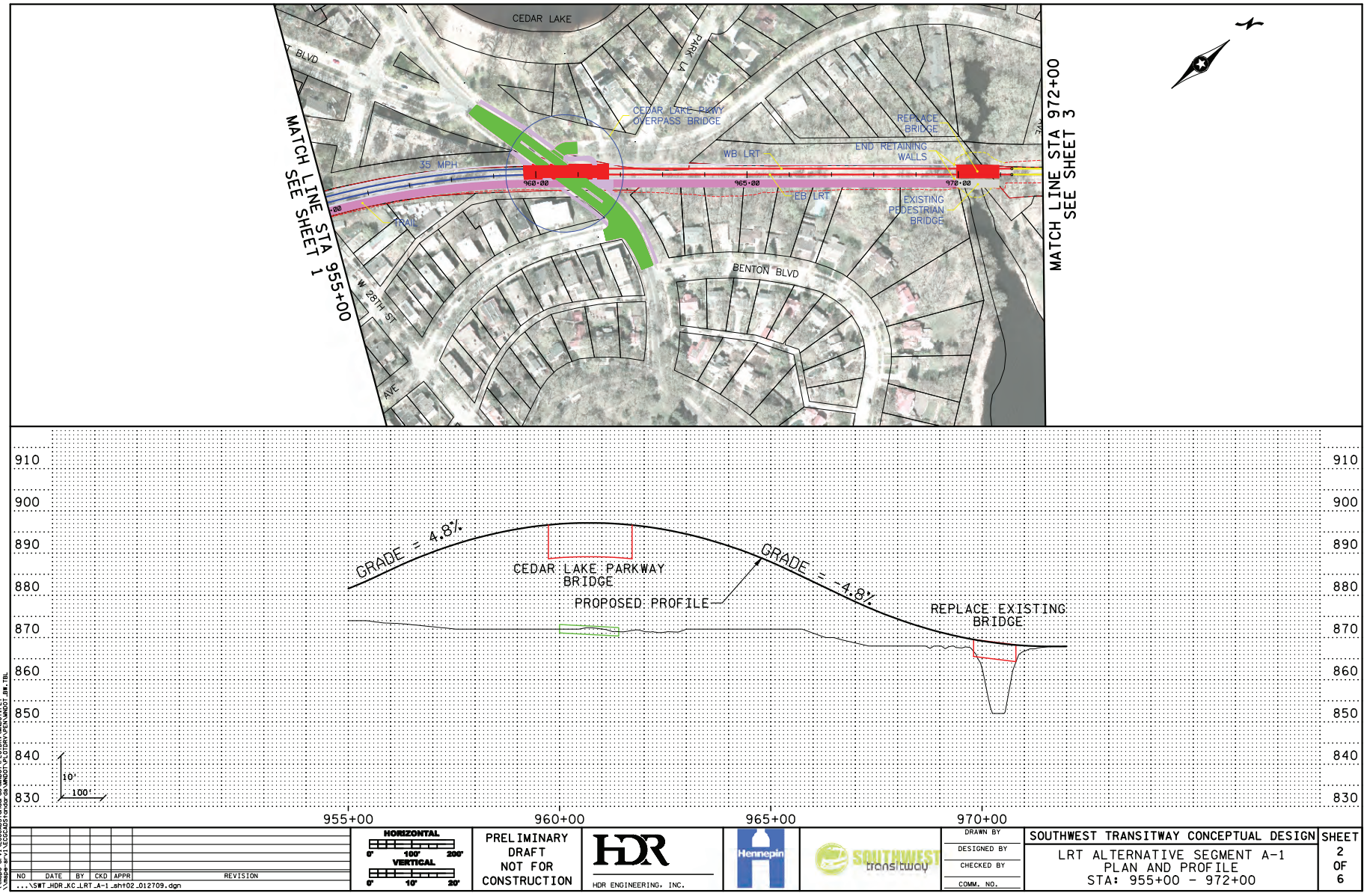
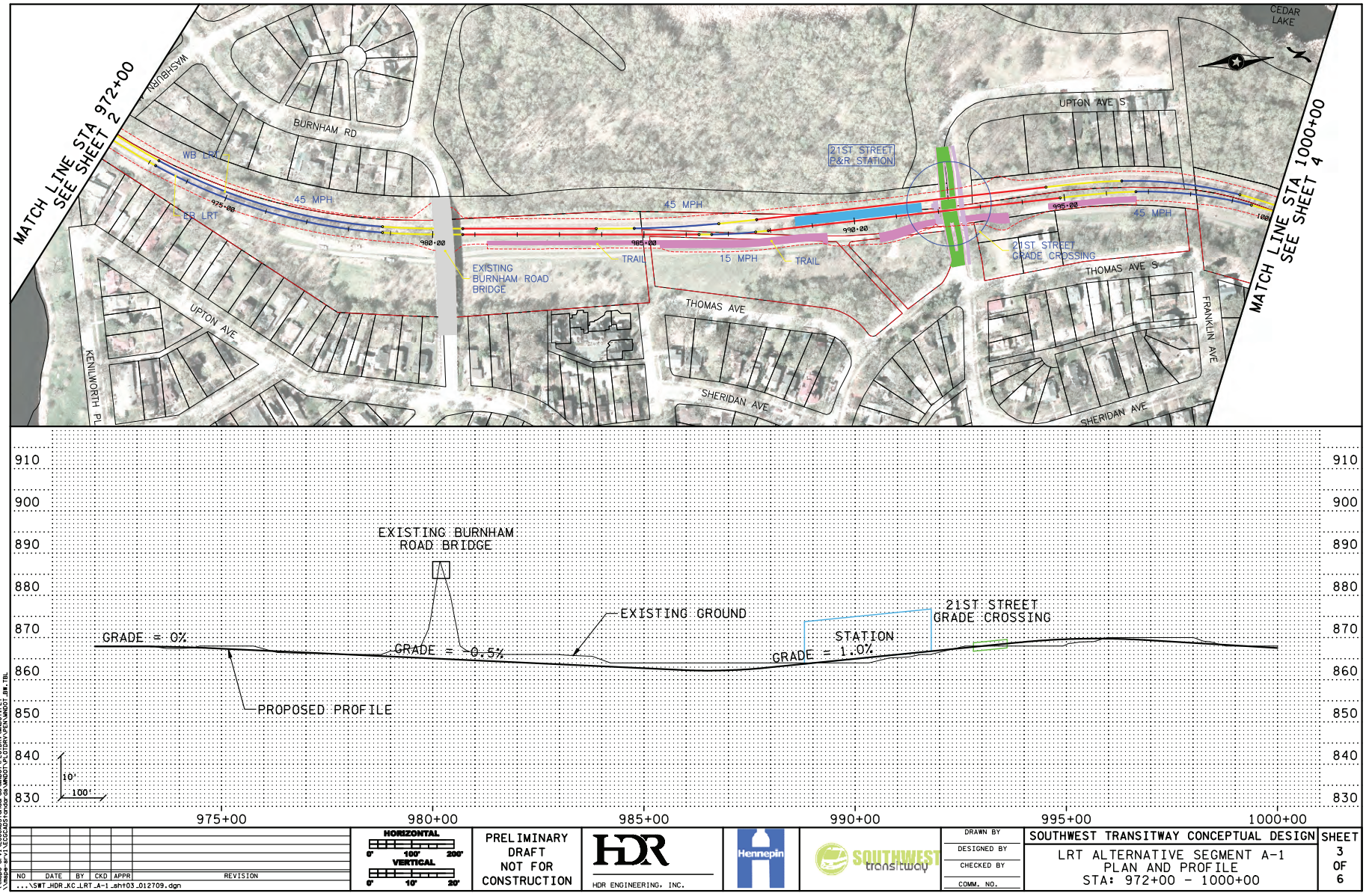
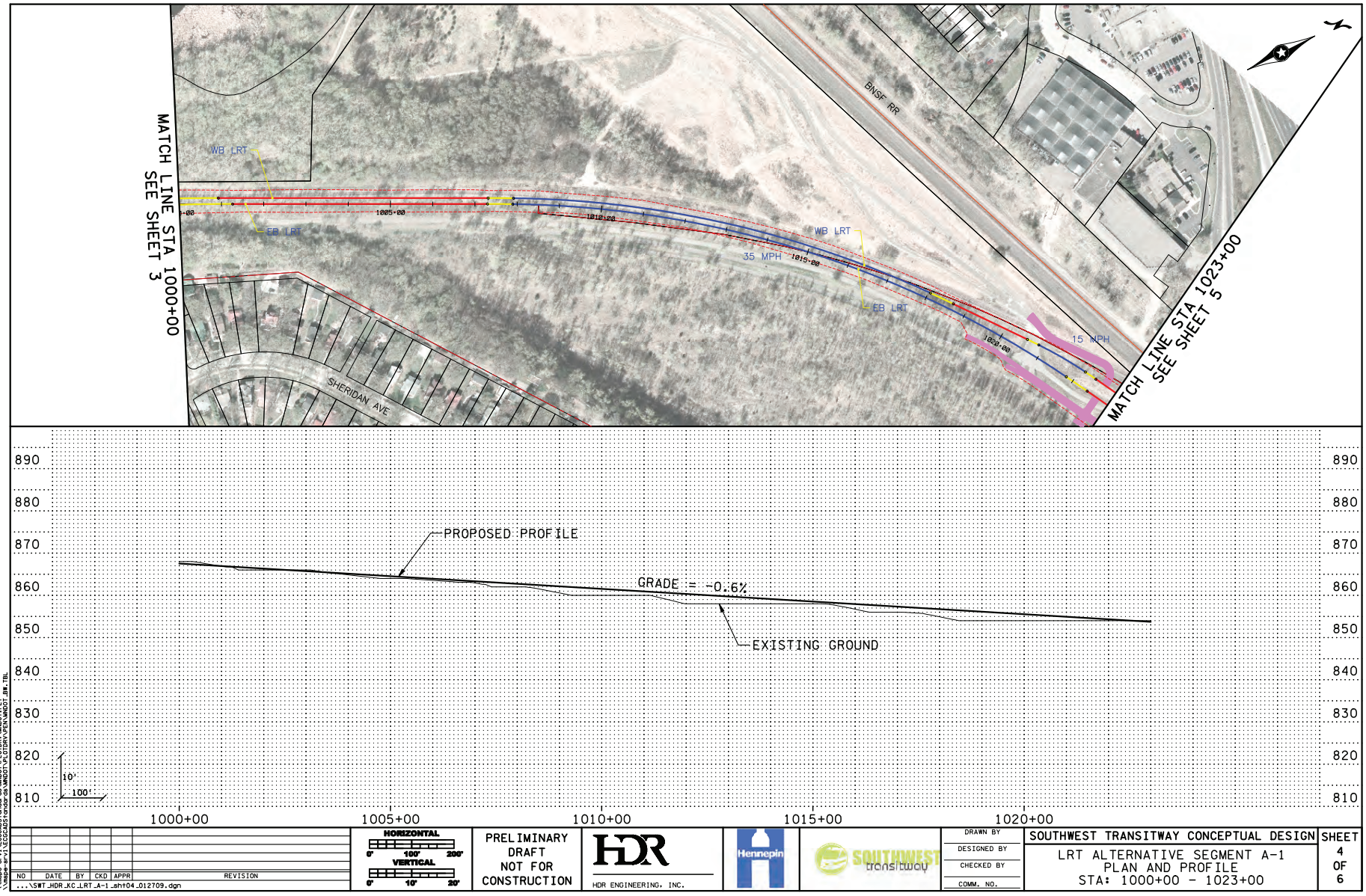
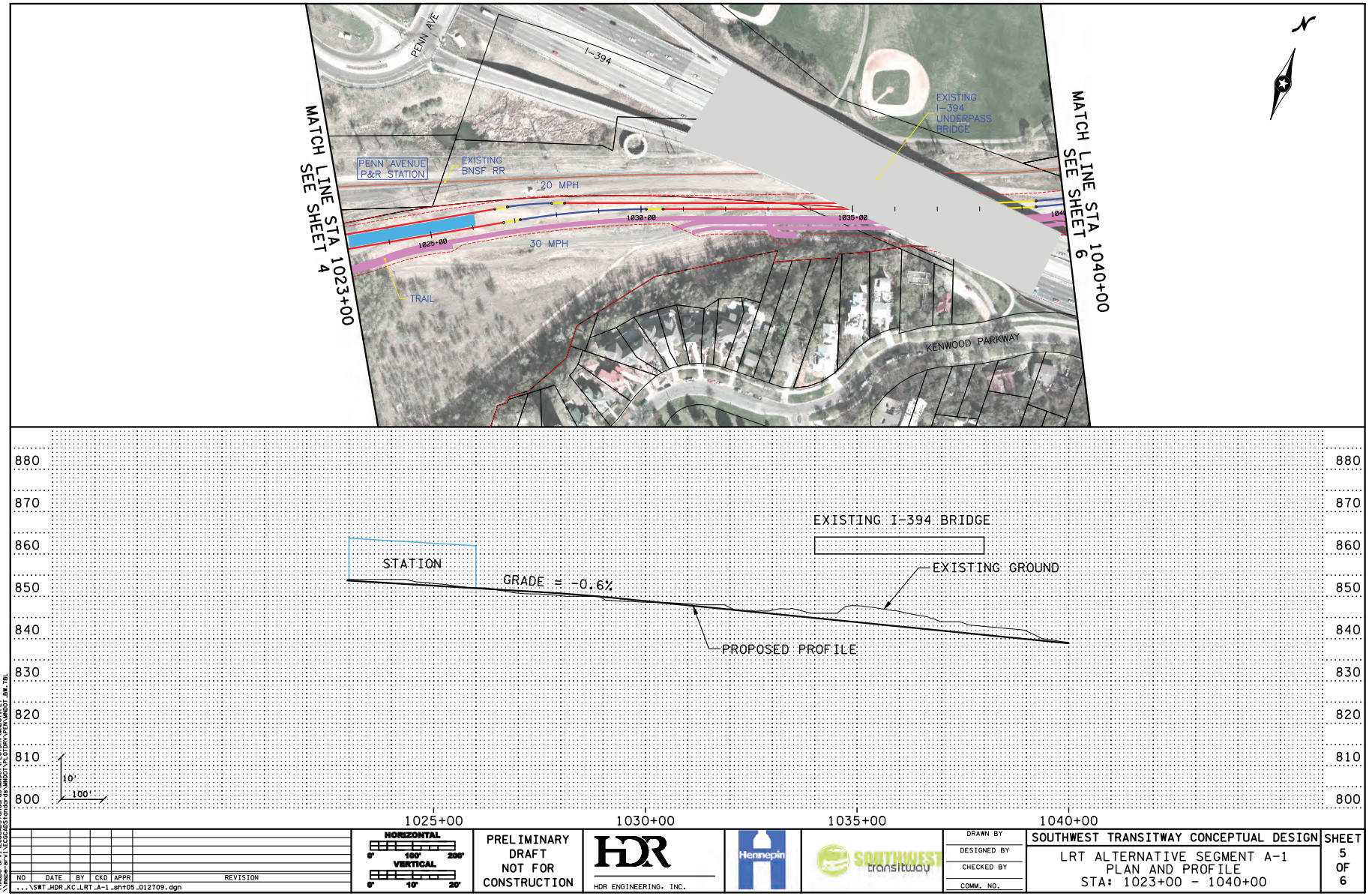
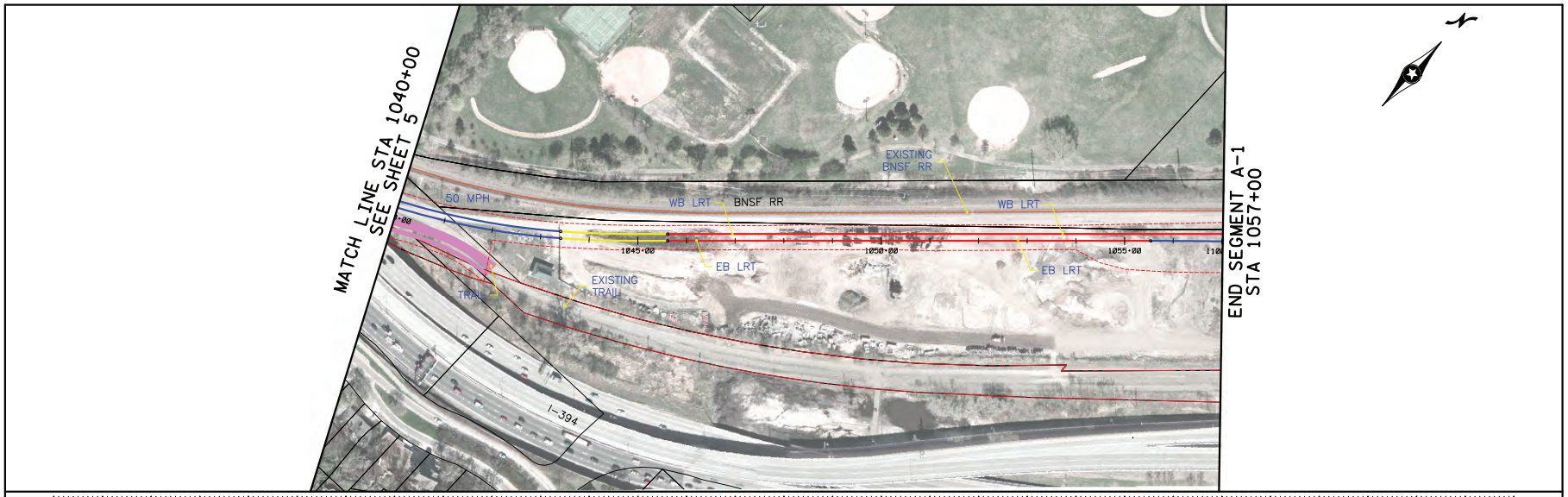

CEDAR LAKE
CEDAR LAKE PKWY OVERPASS BRIDGE
REPLACE BRIDGE
END RETAINING WALLS
WB LRT
EB LRT
EXISTING PEDESTRIAN BRIDGE
35 MPH
960+00
965+00
970+00
TRAIL
BENTON BLVD
W 26TH ST
MATCH LINE STA 955+00 SEE SHEET 1
MATCH LINE STA 972+00 SEE SHEET 3
GRADE = 4.8%
GRADE = -4.8%
CEDAR LAKE PARKWAY BRIDGE
PROPOSED PROFILE
REPLACE EXISTING BRIDGE
910
900
890
880
870
860
850
840
830
955+00
960+00
965+00
970+00
10'
100'
HORIZONTAL
VERTICAL
PRELIMINARY DRAFT NOT FOR CONSTRUCTION
HDR ENGINEERING, INC.
DRAWN BY
DESIGNED BY
CHECKED BY
COMM. NO.
SOUTHWEST TRANSITWAY CONCEPTUAL DESIGN
LRT ALTERNATIVE SEGMENT A-1
PLAN AND PROFILE
STA: 955+00 - 972+00
SHEET 2 OF 6
NO DATE BY CKD APPR REVISION

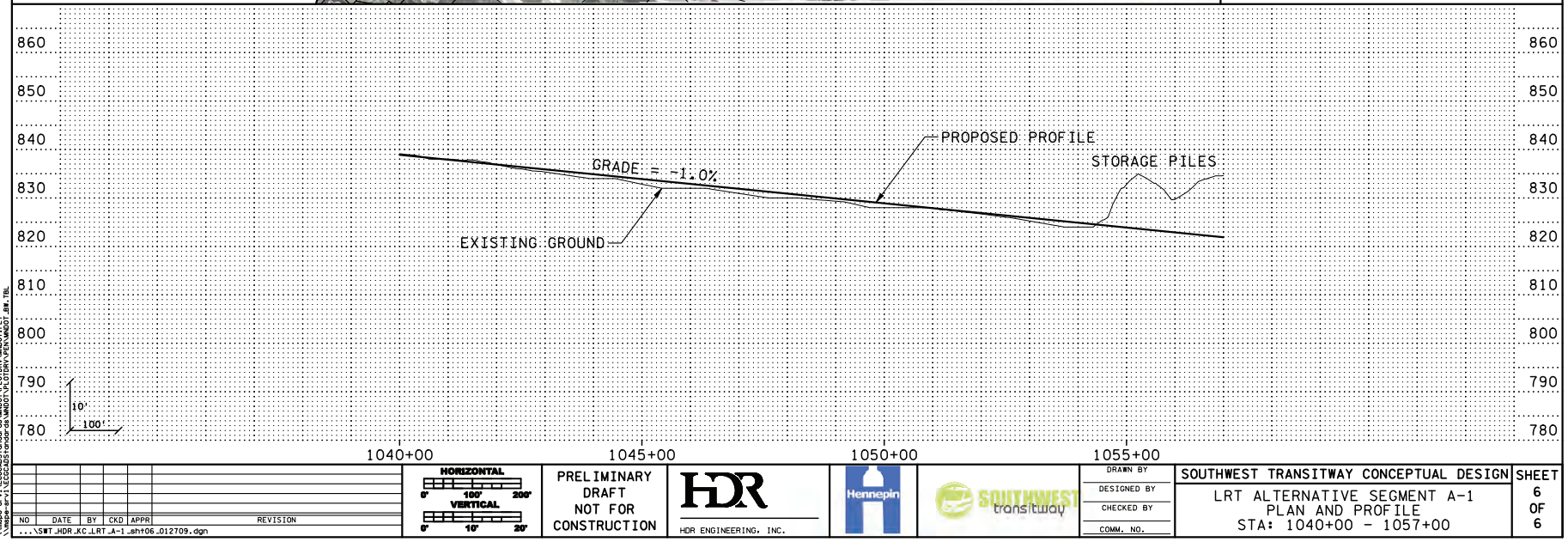

MATCH LINE STA 972+00
SEE SHEET 2
MATCH LINE STA 1000+00
SEE SHEET 4
WASHBURN
BURNHAM RD
WB LRT
EB LRT
45 MPH
975+00
980+00
985+00
990+00
995+00
1000+00
EXISTING BURNHAM ROAD BRIDGE
TRAIL
15 MPH
21ST STREET P&R STATION
21ST STREET GRADE CROSSING
CEDAR LAKE
UPTON AVE S
THOMAS AVE S
THOMAS AVE
UPTON AVE
KENILWORTH PL
SHERIDAN AVE
FRANKLIN AVE
EXISTING BURNHAM ROAD BRIDGE
EXISTING GROUND
PROPOSED PROFILE
GRADE = 0%
GRADE = -0.5%
GRADE = 1.0%
STATION
910
900
890
880
870
860
850
840
830
10'
100'
HORIZONTAL
0' 100' 200'
VERTICAL
0' 10' 20'
PRELIMINARY DRAFT NOT FOR CONSTRUCTION
HDR ENGINEERING, INC.
Hennepin
SOUTHWEST transitway
DRAWN BY
DESIGNED BY
CHECKED BY
COMM. NO.
SOUTHWEST TRANSITWAY CONCEPTUAL DESIGN
LRT ALTERNATIVE SEGMENT A-1
PLAN AND PROFILE
STA: 972+00 - 1000+00
SHEET 3 OF 6
NO DATE BY CKD APPR REVISION
...\SWT_HDR_KC_LRT_A-1_sht03_012709.dgn


MATCH LINE STA 1000+00
SEE SHEET 3
WB LRT
EB LRT
1005+00
1010+00
BNSF RR
WB LRT
35 MPH
1015+00
EB LRT
1020+00
15 MPH
SHERIDAN AVE
MATCH LINE STA 1023+00
SEE SHEET 5
890
880
870
860
850
840
830
820
810
PROPOSED PROFILE
GRADE = -0.6%
EXISTING GROUND
10'
100'
1000+00
1005+00
1010+00
1015+00
1020+00
HORIZONTAL
0' 100' 200'
VERTICAL
0' 10' 20'
PRELIMINARY
DRAFT
NOT FOR
CONSTRUCTION
HDR ENGINEERING, INC.
Hennepin
SOUTHWEST transitway
DRAWN BY
DESIGNED BY
CHECKED BY
COMM. NO.
SOUTHWEST TRANSITWAY CONCEPTUAL DESIGN
LRT ALTERNATIVE SEGMENT A-1
PLAN AND PROFILE
STA: 1000+00 - 1023+00
SHEET
4
OF
6
NO DATE BY CKD APPR REVISION
...\SWT_HDR_KC_LRT_A-1_sht04_012709.dgn



Southwest Transitway: Conceptual Engineering Drawings Created by HDR





HORIZONTAL 0' 100' 200'
VERTICAL 0' 10' 20'

PRELIMINARY
DRAFT
NOT FOR
CONSTRUCTION

HDR ENGINEERING, INC.

NO	DATE	BY	CKD	APPR	REVISION
					...\SWT_HDR_KC_LRT_A-1_sht06_012709.dgn

DRAWN BY
DESIGNED BY
CHECKED BY
COMM. NO.

SOUTHWEST TRANSITWAY CONCEPTUAL DESIGN

LRT ALTERNATIVE SEGMENT A-1
PLAN AND PROFILE
STA: 1040+00 - 1057+00

SHEET 6 OF 6

Appendix C

Location of Reconstructed Freight Track

Placed on Grade on North / West Side of and adjacent to LRT Tracks

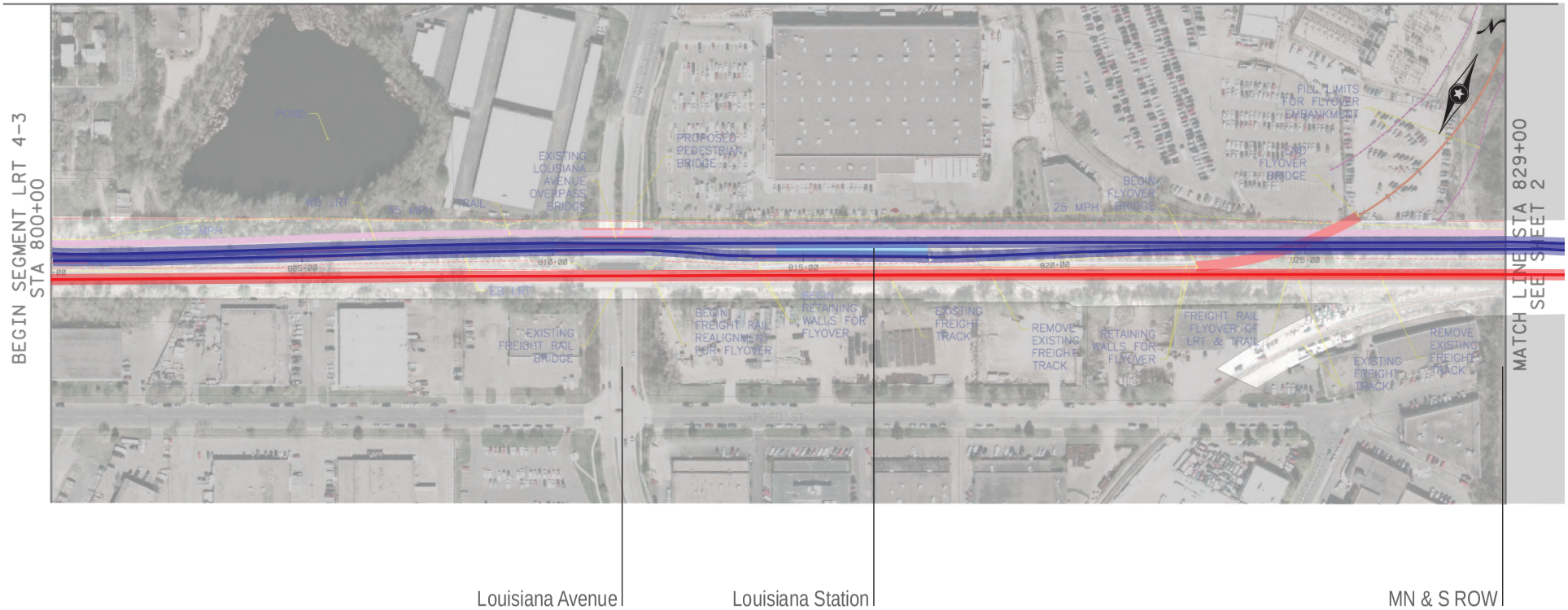


Figure X
North Alignment: Sheet 4-3-1

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

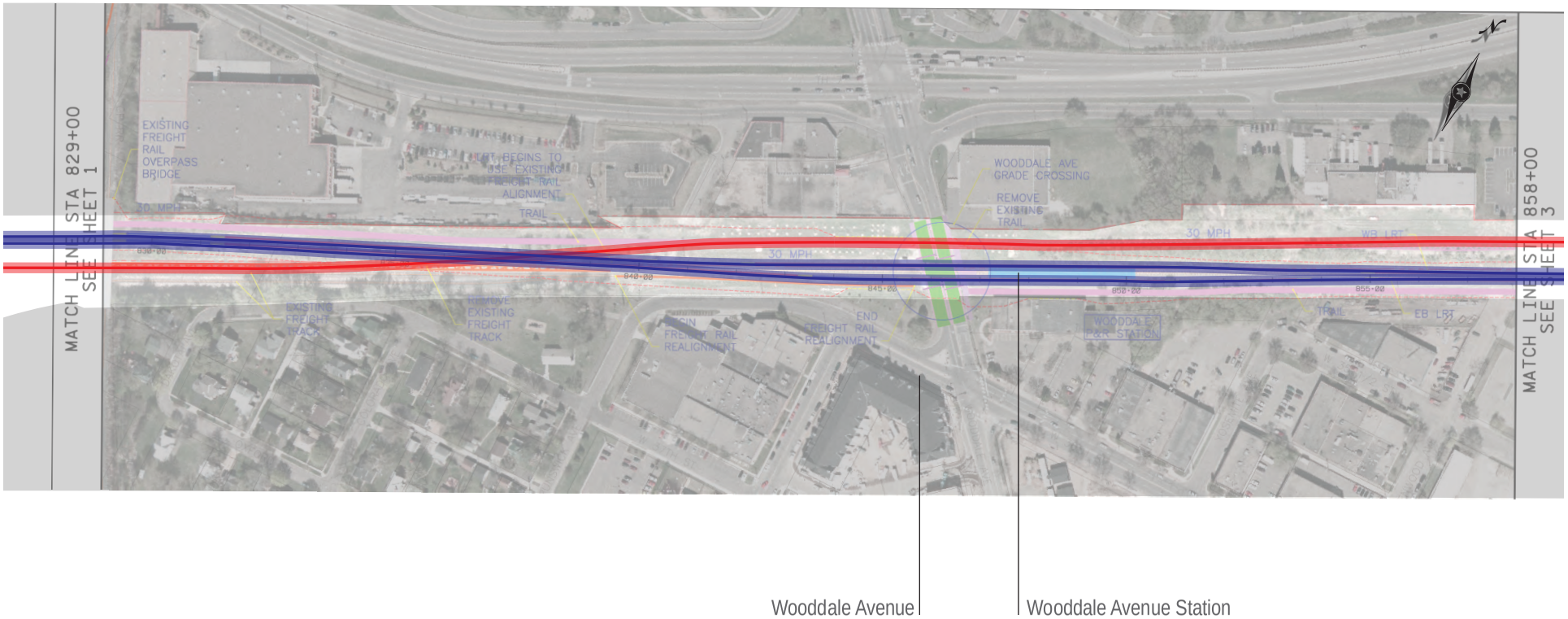


Figure X
North Alignment: Sheet 4-3-2

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

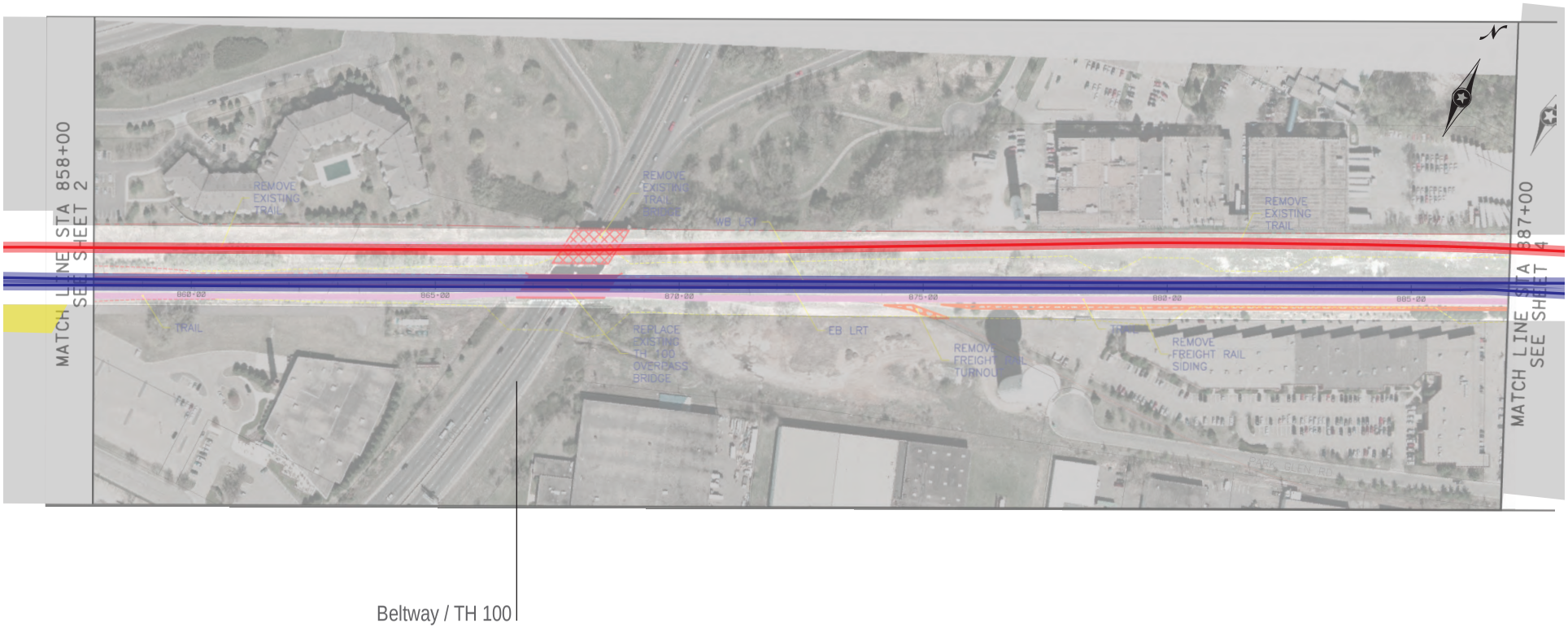


Figure X
North Alignment: Sheet 4-3-3

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

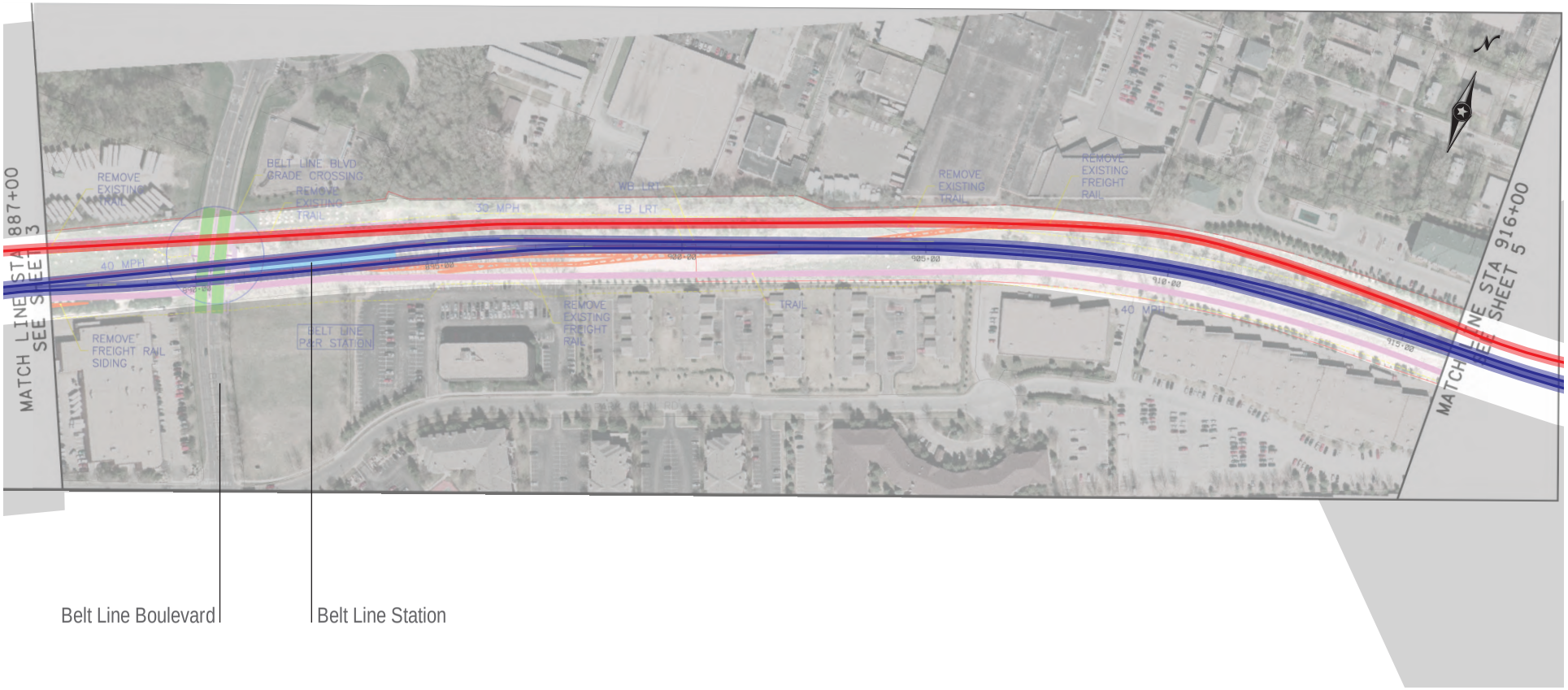


Figure X
North Alignment: Sheet 4-3-4

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

Figure X
North Alignment: Sheet 4-3-5

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

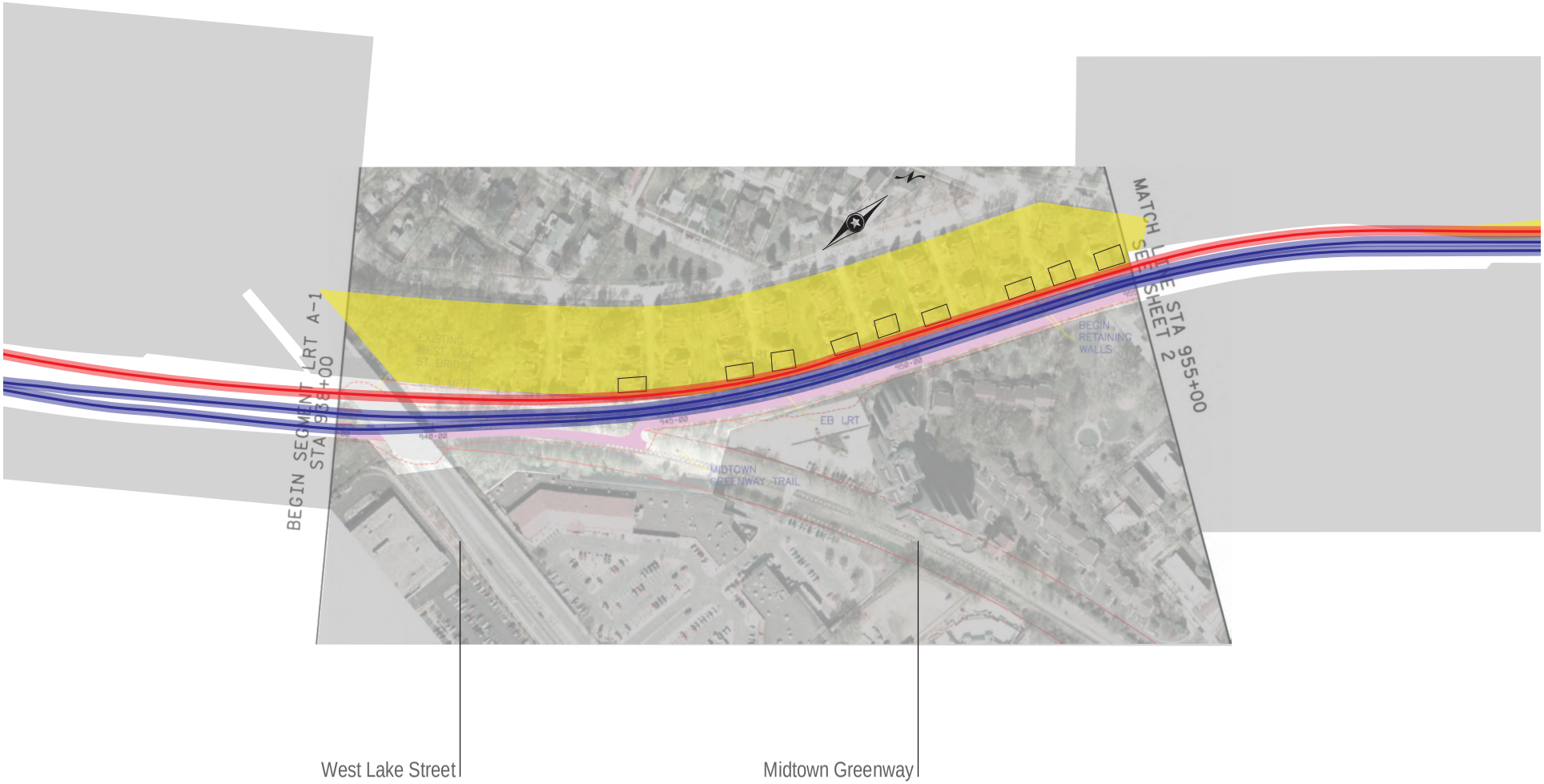


Figure X
North Alignment: Sheet A-1-1

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

Figure X
North Alignment: Sheet A-1-2

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

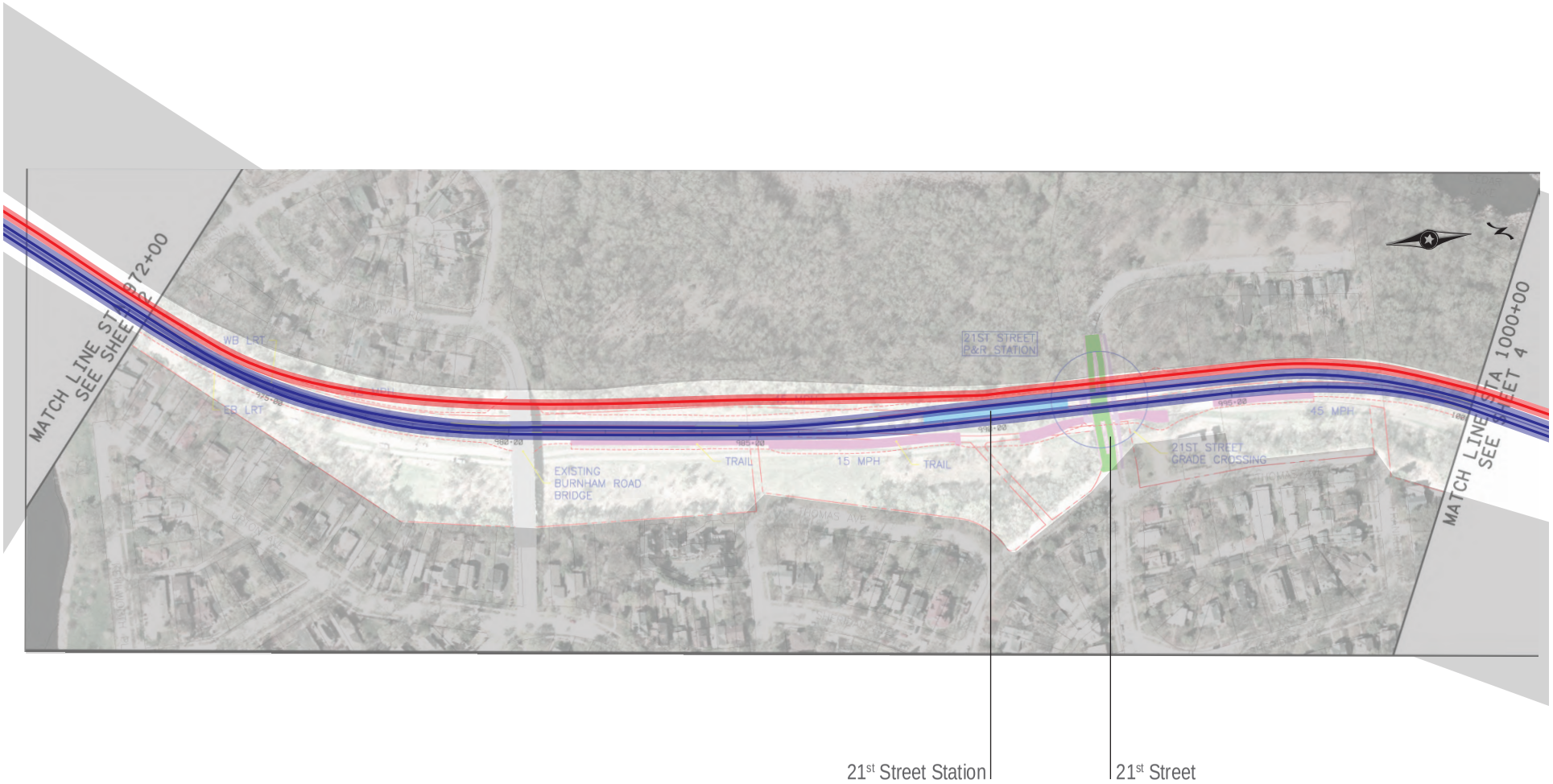


Figure X
North Alignment: Sheet A-1-3

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

Figure X
North Alignment: Sheet A-1-4

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

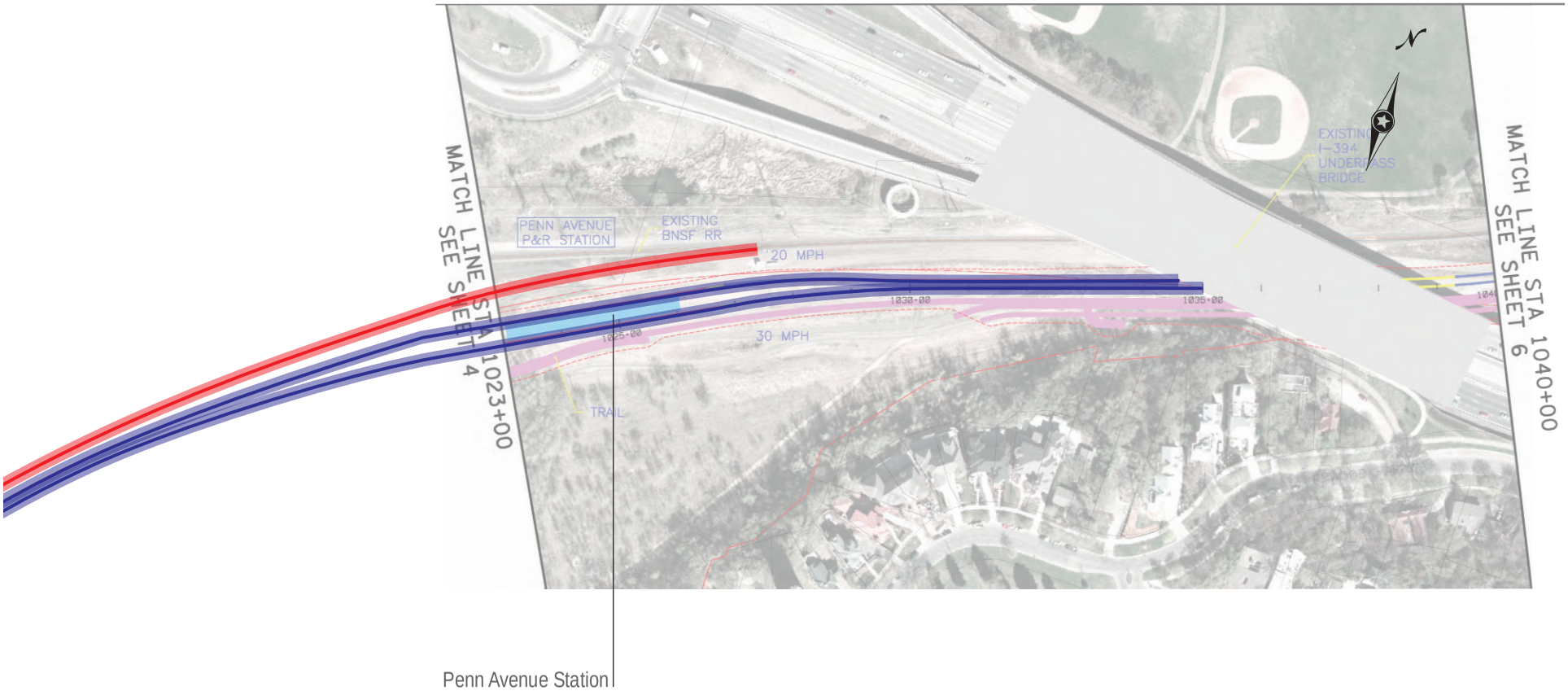


Figure X
North Alignment: Sheet A-1-5

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

Appendix D

Location of Reconstructed Freight Track

Placed on Grade on South/East Side of and adjacent to LRT Tracks

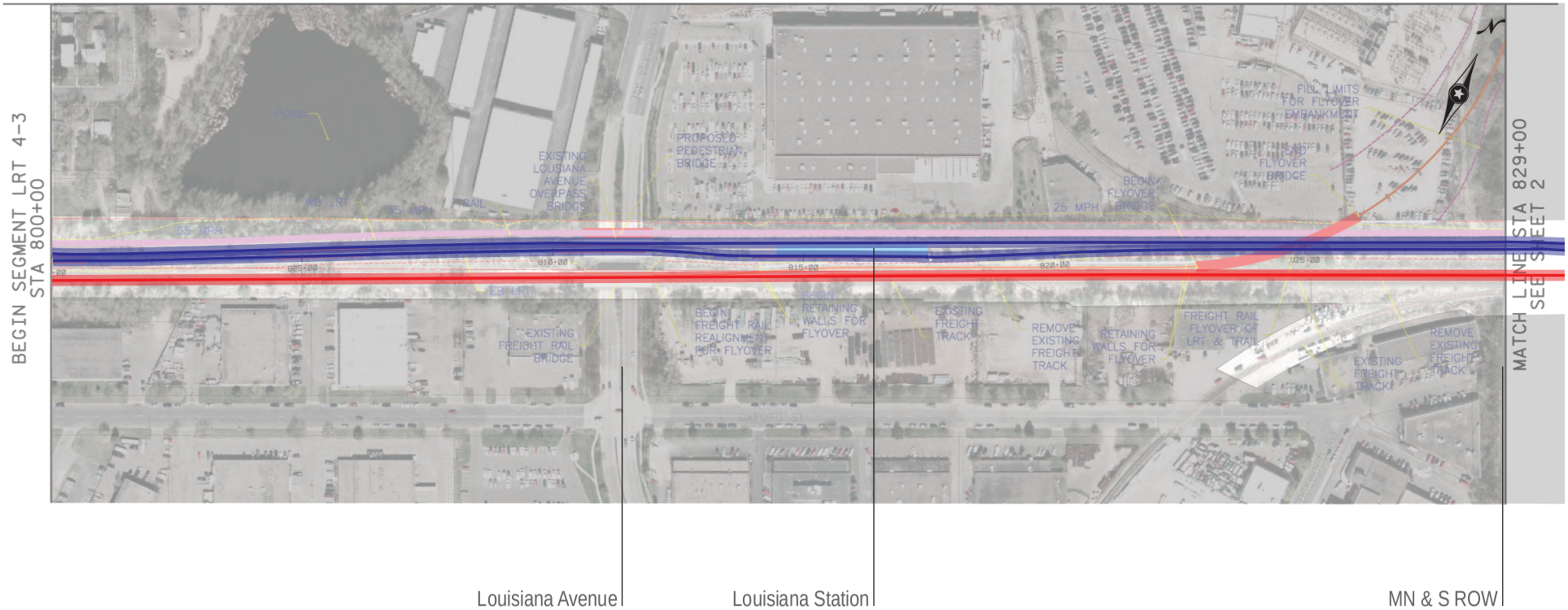


Figure X
South Alignment: Sheet 4-3-1

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

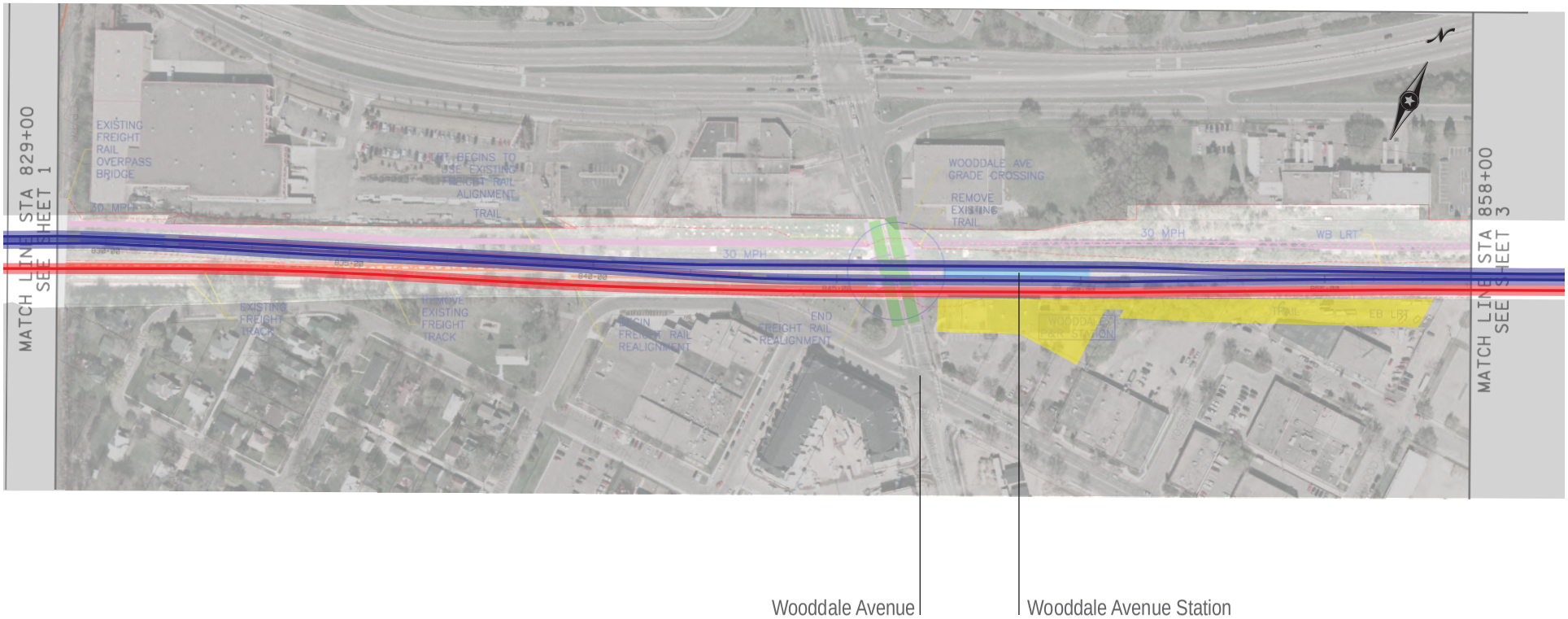


Figure X
South Alignment: Sheet 4-3-2

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

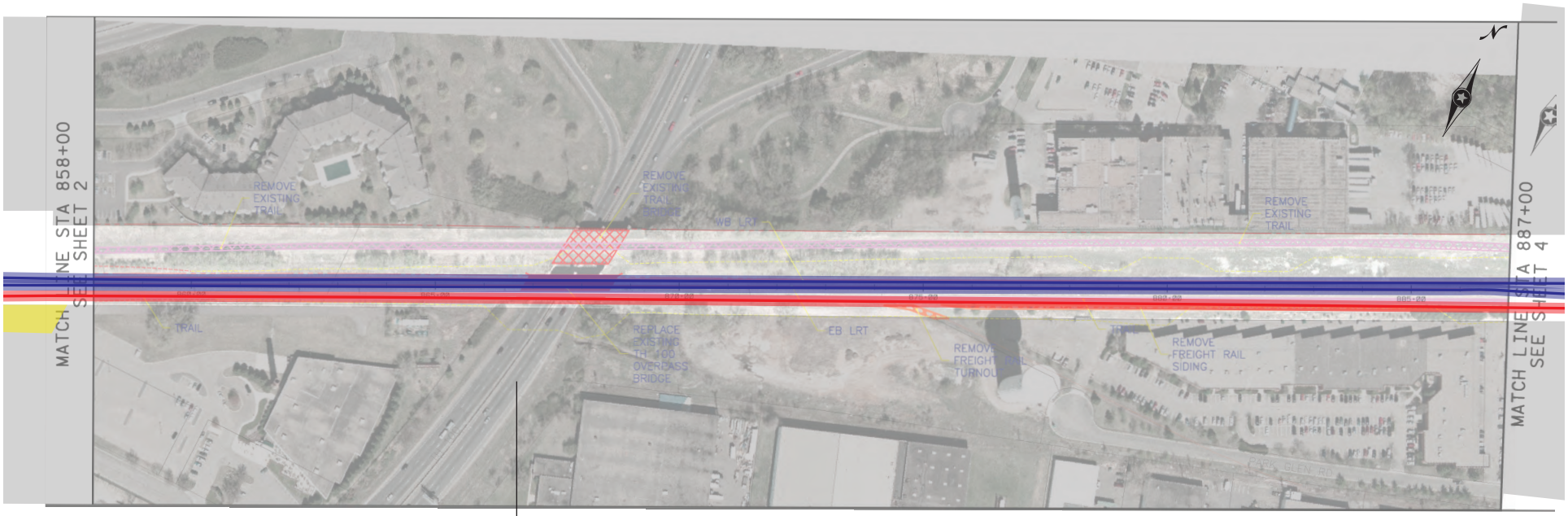


Figure X
South Alignment: Sheet 4-3-3

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

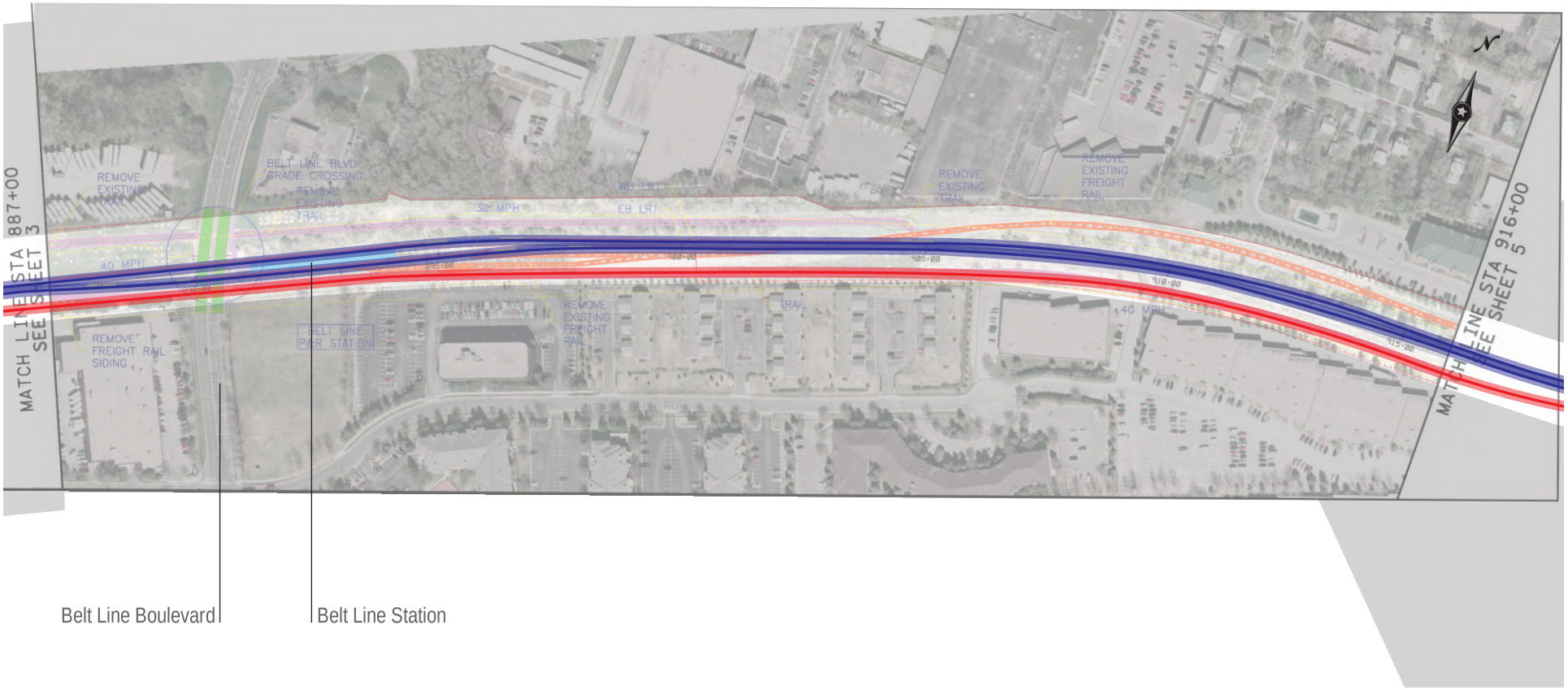


Figure X
South Alignment: Sheet 4-3-4

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

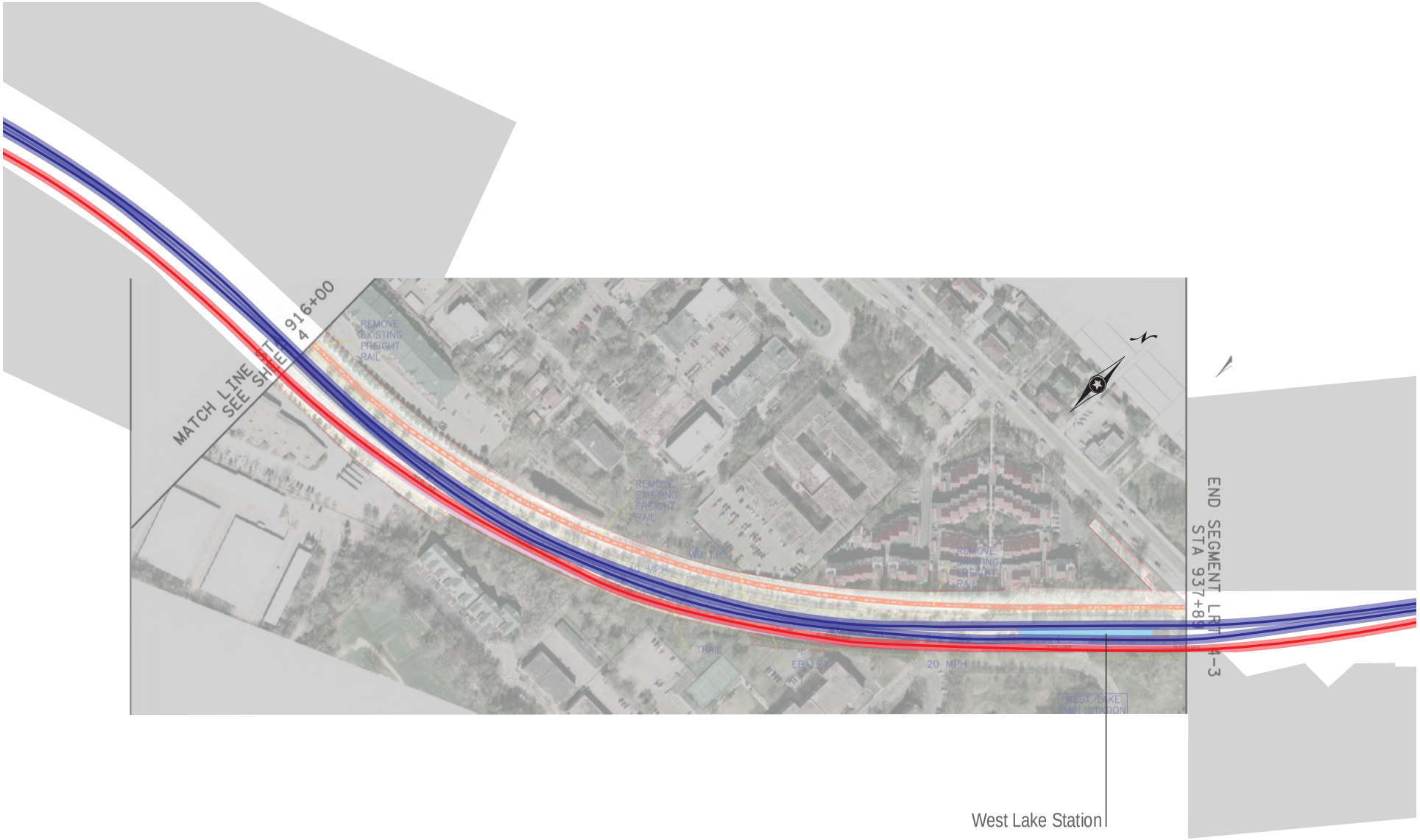


Figure X
South Alignment: Sheet 4-3-5

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

Figure X
South Alignment: Sheet A-1-1

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

Figure X
South Alignment: Sheet A-1-2

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

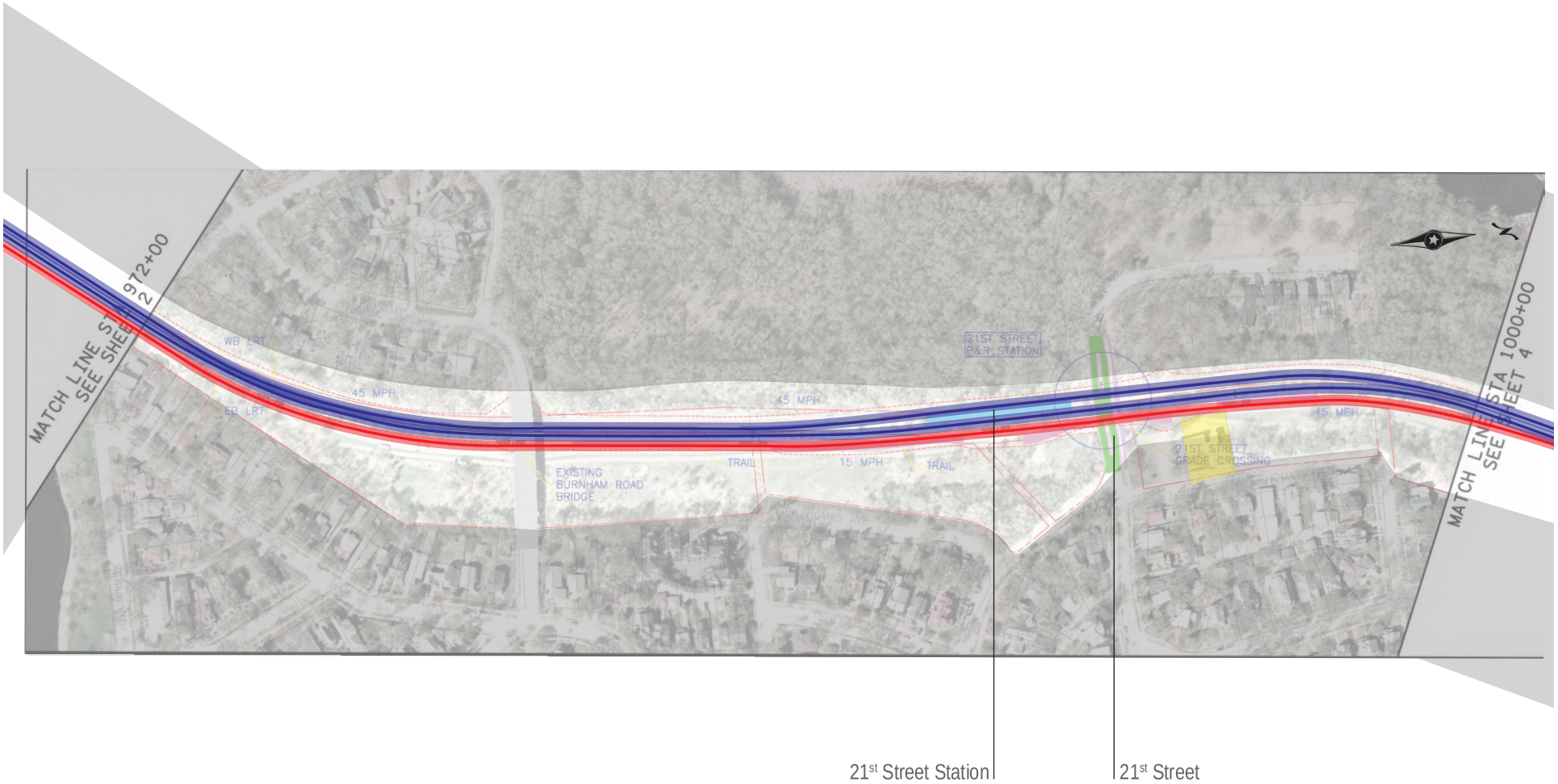


Figure X
South Alignment: Sheet A-1-3

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

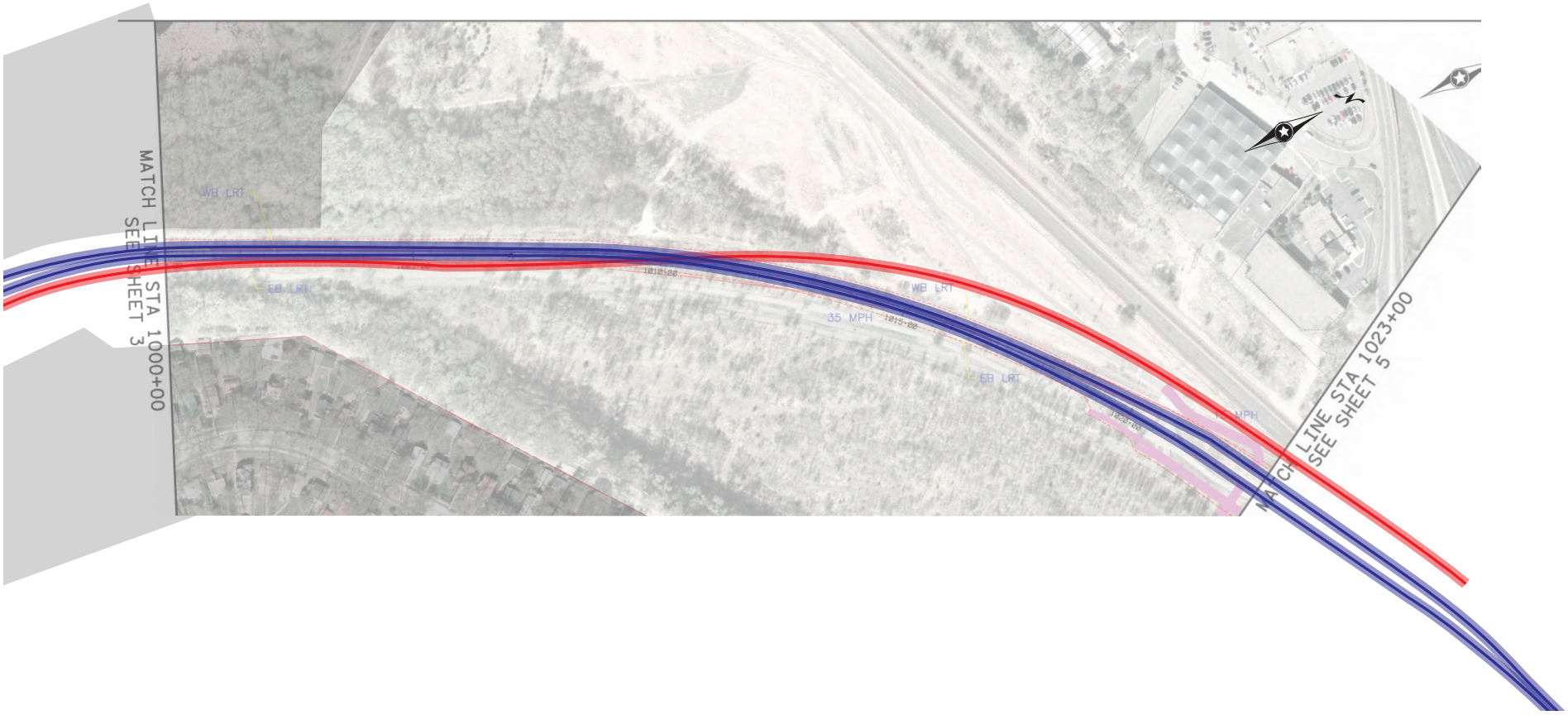
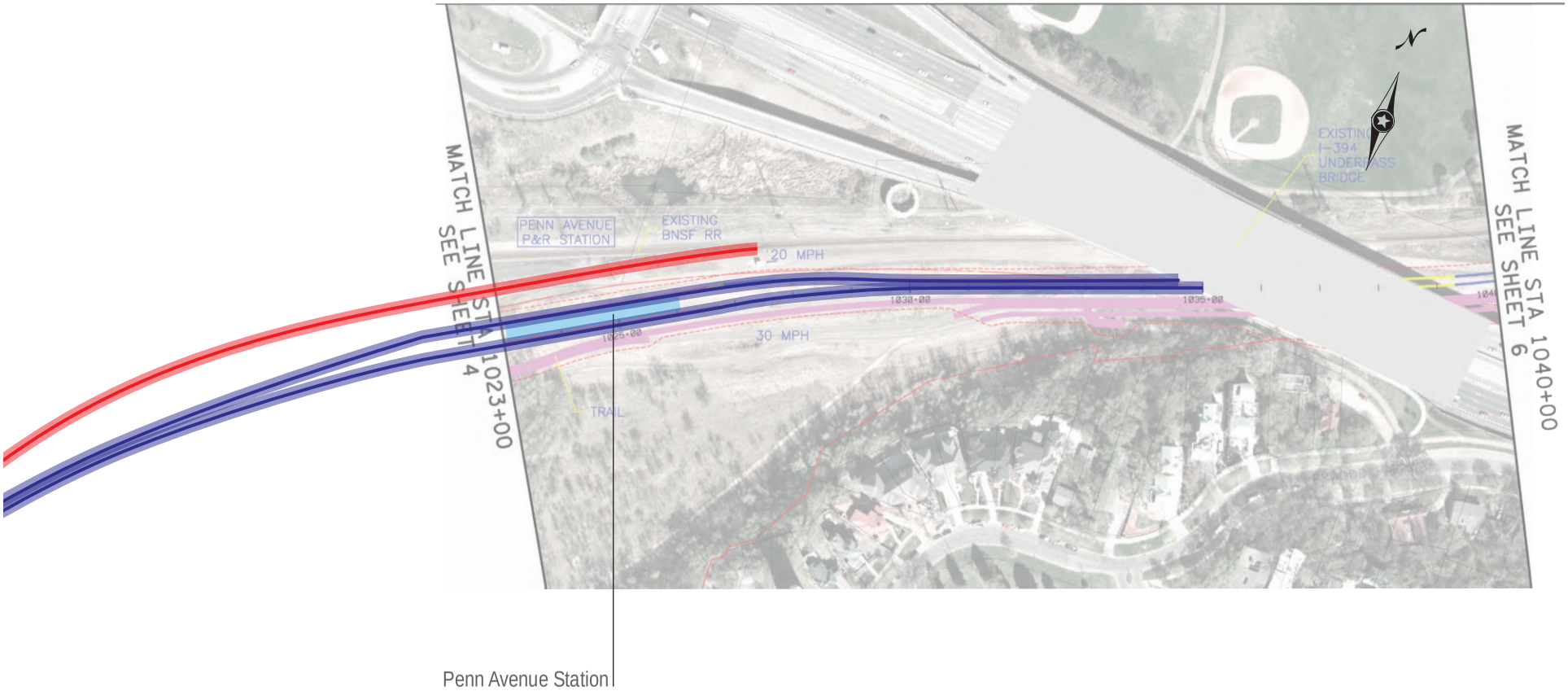


Figure X
South Alignment: Sheet A-1-4

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.



Penn Avenue Station

Figure X
South Alignment: Sheet A-1-5

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Planned Light Rail and 25' Clearance
Planned Freight Track and 25' Clearance
Affected Real Estate

R.L. BANKS & ASSOCIATES, INC.

Appendix E

Cross-Sections at Selected Locations

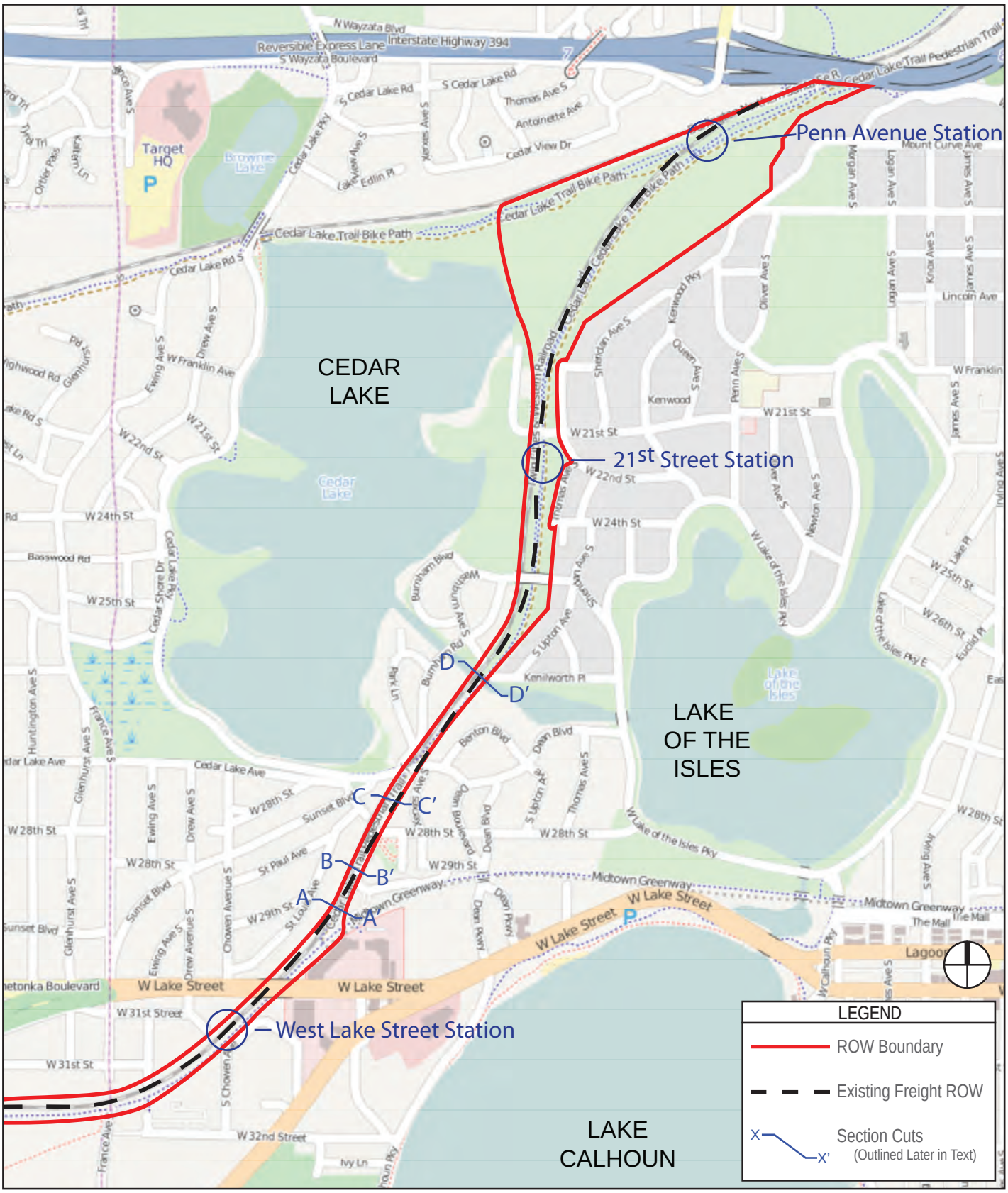


Figure 1
Map -- Overview of Study Area

R.L. BANKS & ASSOCIATES, INC.

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

Photographs taken near Location B

Figure X
Cross Section B: Existing Condition

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location B: Light Rail Transit Conceptual Engineering Drawings

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location B: Freight Railroad North / West of LRT

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location B: Freight Railroad South / East of LRT

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location B: Freight Railroad South / East of LRT, Bike Path Overhead

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Photographs taken near Location C

Photographs taken near Location C

Figure X
Cross Section C: Existing Condition

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location C: Light Rail Transit Conceptual Engineering Drawings

Figure X
Cross Section at Location C: Freight Railroad North / West of LRT

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location C: Freight Railroad South / East of LRT

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location C: Freight Railroad South / East of LRT, Bike Path Overhead

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

LOCATION D

Photographs taken near Location D

Figure X
Cross Section D: Existing Condition

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location D: Light Rail Transit Conceptual Engineering Drawings

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location B: Freight Railroad North / West of LRT

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

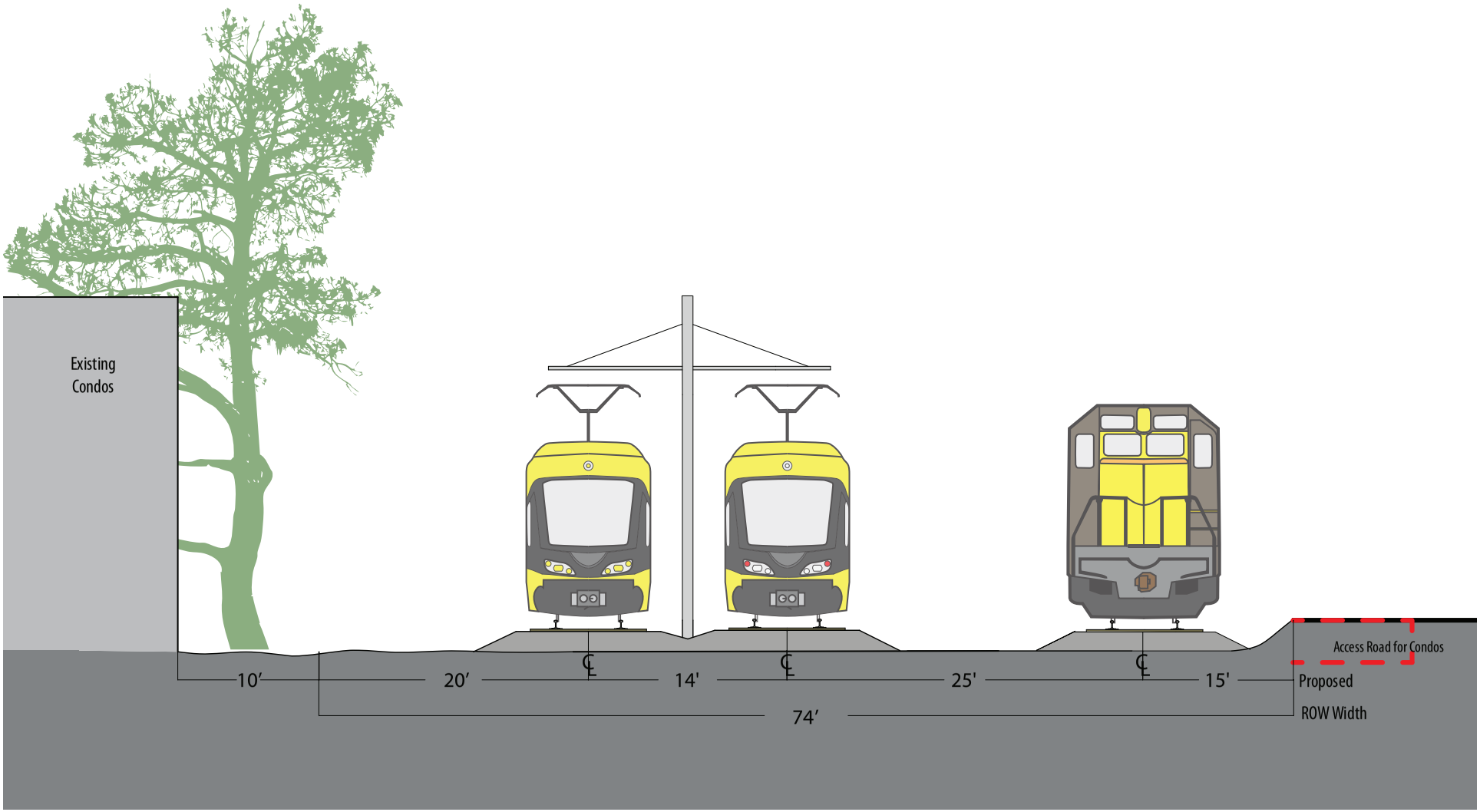


Figure X
Cross Section at Location D: Freight Railroad South / East of LRT

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

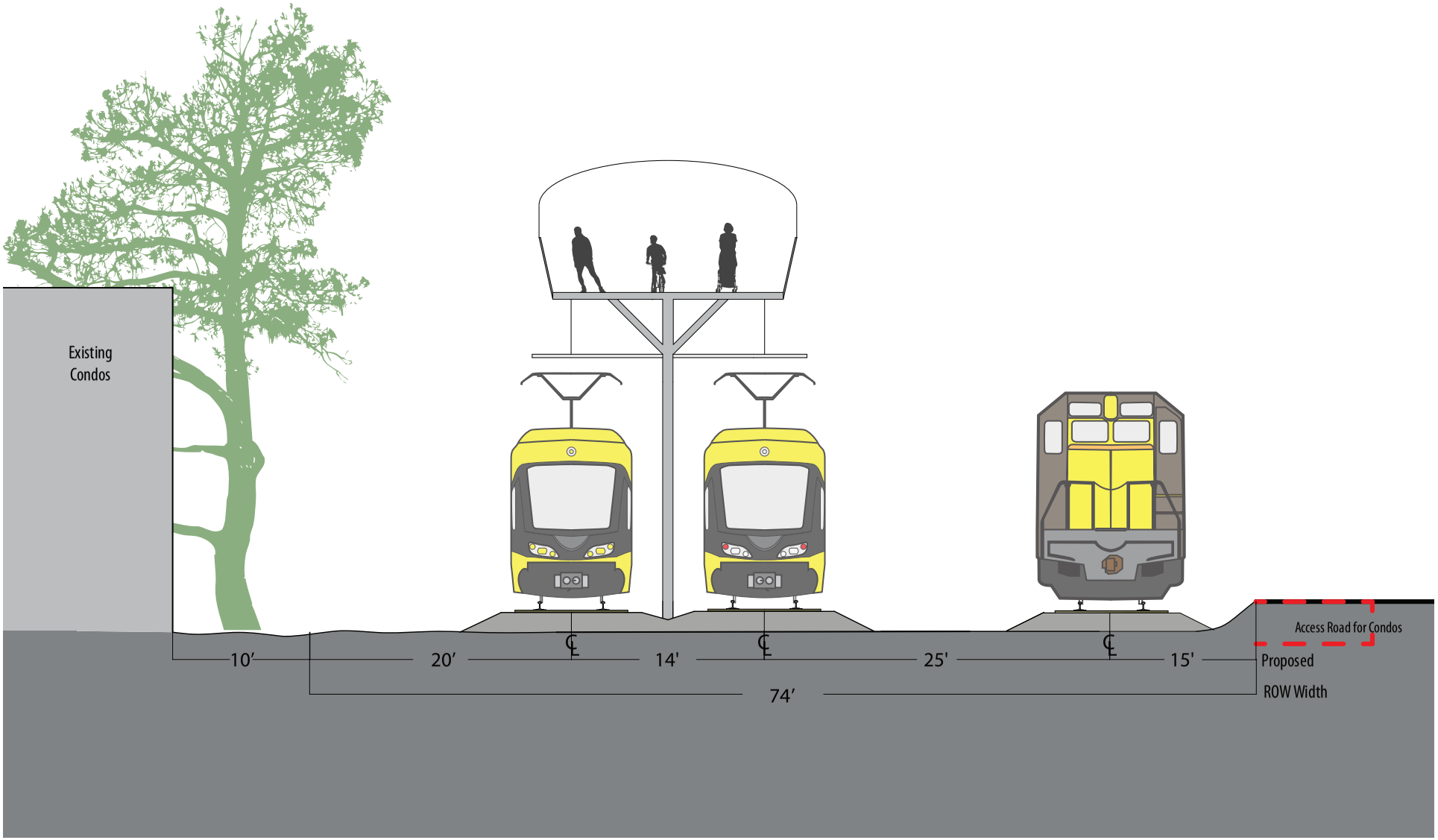


Figure X
Cross Section at Location D: Freight Railroad South / East of LRT, Bike Path Overhead

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

LOCATION F

Photographs taken near Location F

Photographs taken near Location F

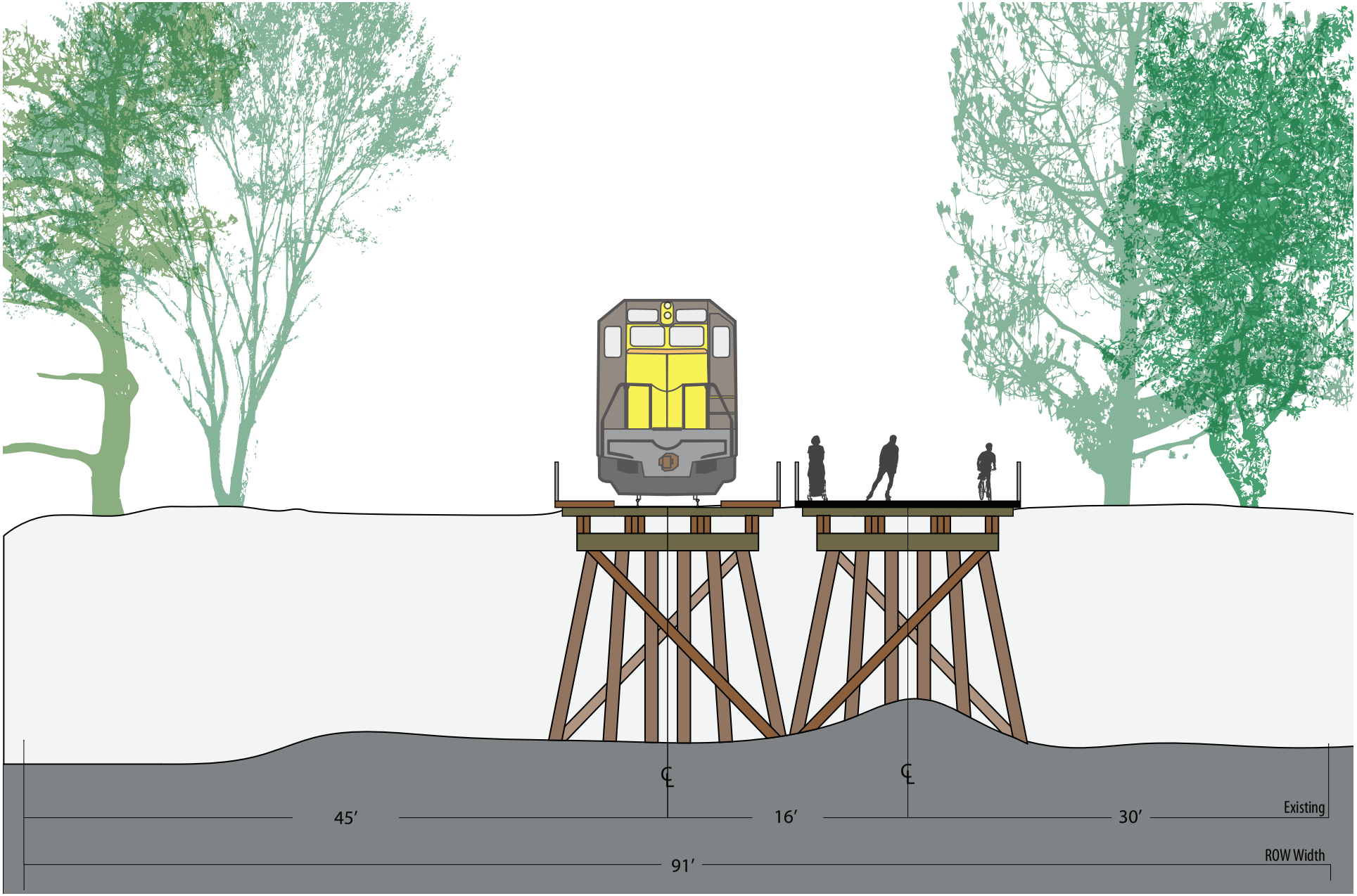


Figure X
Cross Section F: Existing Condition

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

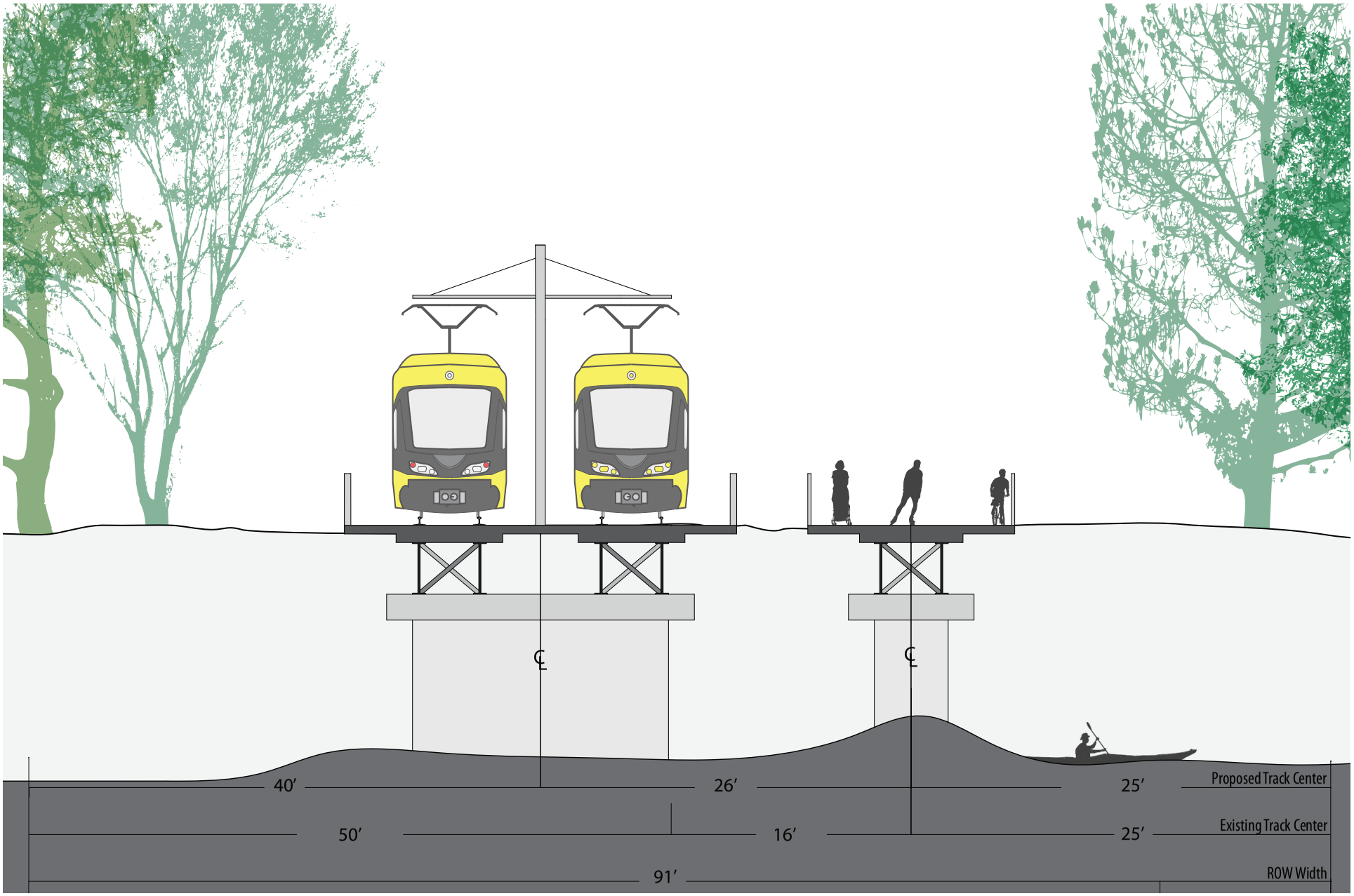


Figure X
Cross Section at Location F: Light Rail Transit Conceptual Engineering Drawings

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

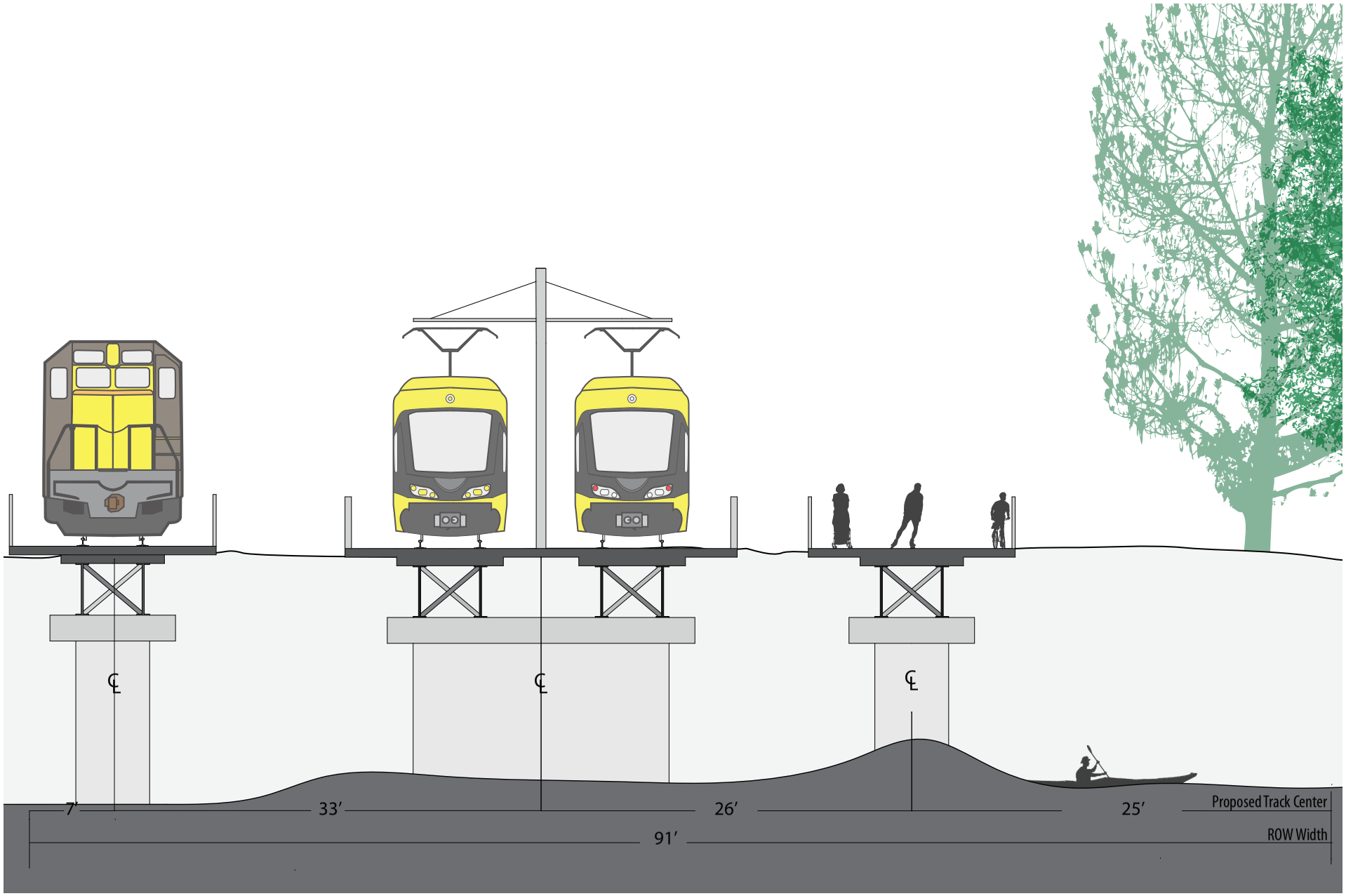


Figure X
Cross Section at Location F: Freight Railroad North / West of LRT

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location F: Freight Railroad South / East of LRT

KENILWORTH CORRIDOR: Analysis of Freight Rail / LRT Coexistance

R.L. BANKS & ASSOCIATES, INC.

Figure X
Cross Section at Location F: Freight Railroad South / East of LRT, Bike Path Overhead

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