SOUTHWEST

Green Line LRT Extension

Corridor Management Committee

August 28, 2013

METROPOLITAN COUNCIL | Metro Transit | FTA | Transit Improvement | Hennepin

EDEN PRAIRIE | MINNETONKA | EDINA | HOPKINS | ST. LOUIS PARK | MINNEAPOLIS

Today's Topics

- Response to 8/7 and 8/14 SWCMC Questions
- Schedule

Response to 8/7 and 8/14 SWCMC Questions

Themes

- Technical Issue #21 – Freight Rail
- Other Technical Issue Updates

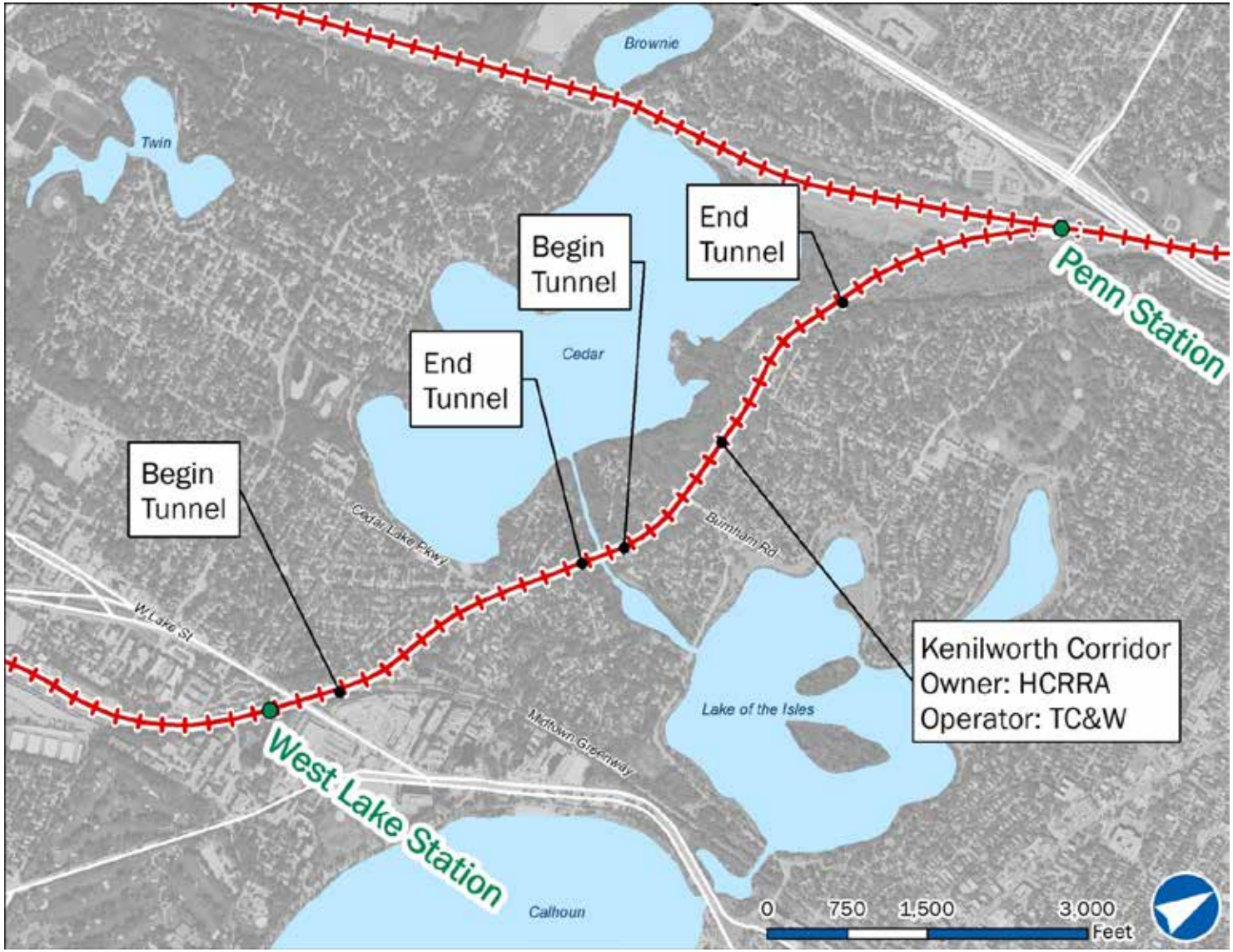
Technical Issue #21 – Freight Rail

Technical Issue #21: Freight Rail

- Kenilworth Shallow LRT Tunnel
  - Proposed Connection to Midtown Corridor
  - Gap Between South and North Shallow Tunnels
  - Trails
  - Technical Considerations
- Kenilworth Deep Bore LRT Tunnel
- Kenilworth LRT Tunnel Cost Comparisons

Kenilworth Shallow LRT Tunnel

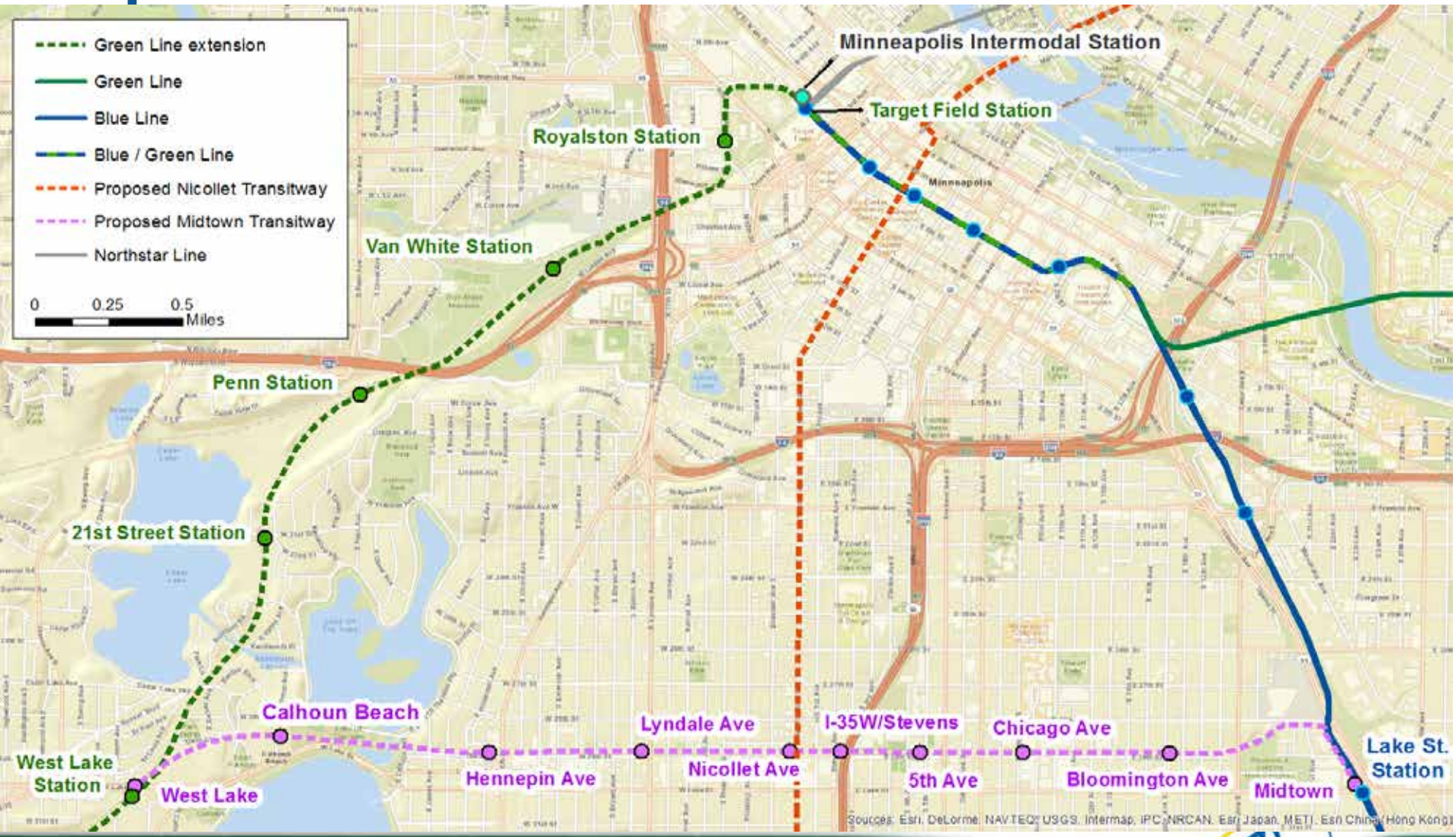
Kenilworth Shallow LRT Tunnel



Kenilworth Shallow LRT Tunnel Dimensions

Section	Length in Feet
South Transition Zone	300
South Shallow Tunnel	2,200
Daylight Section Over Channel (Includes North /South Transition Zone of 300' respectively)	1,088
North Shallow Tunnel	2,500
North Transition Zone	300

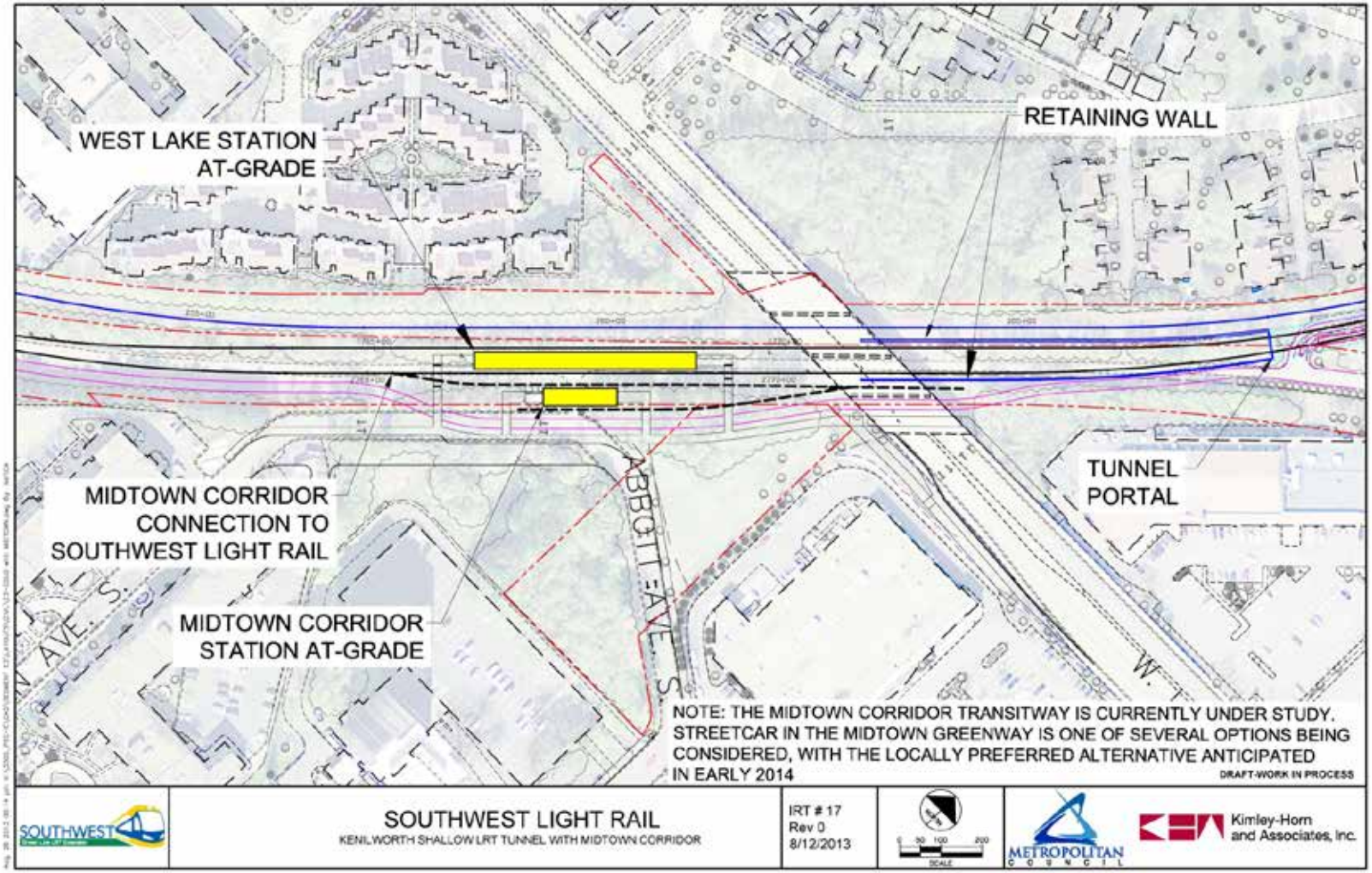
Kenilworth Shallow LRT Tunnel: Proposed Connections to Midtown Corridor



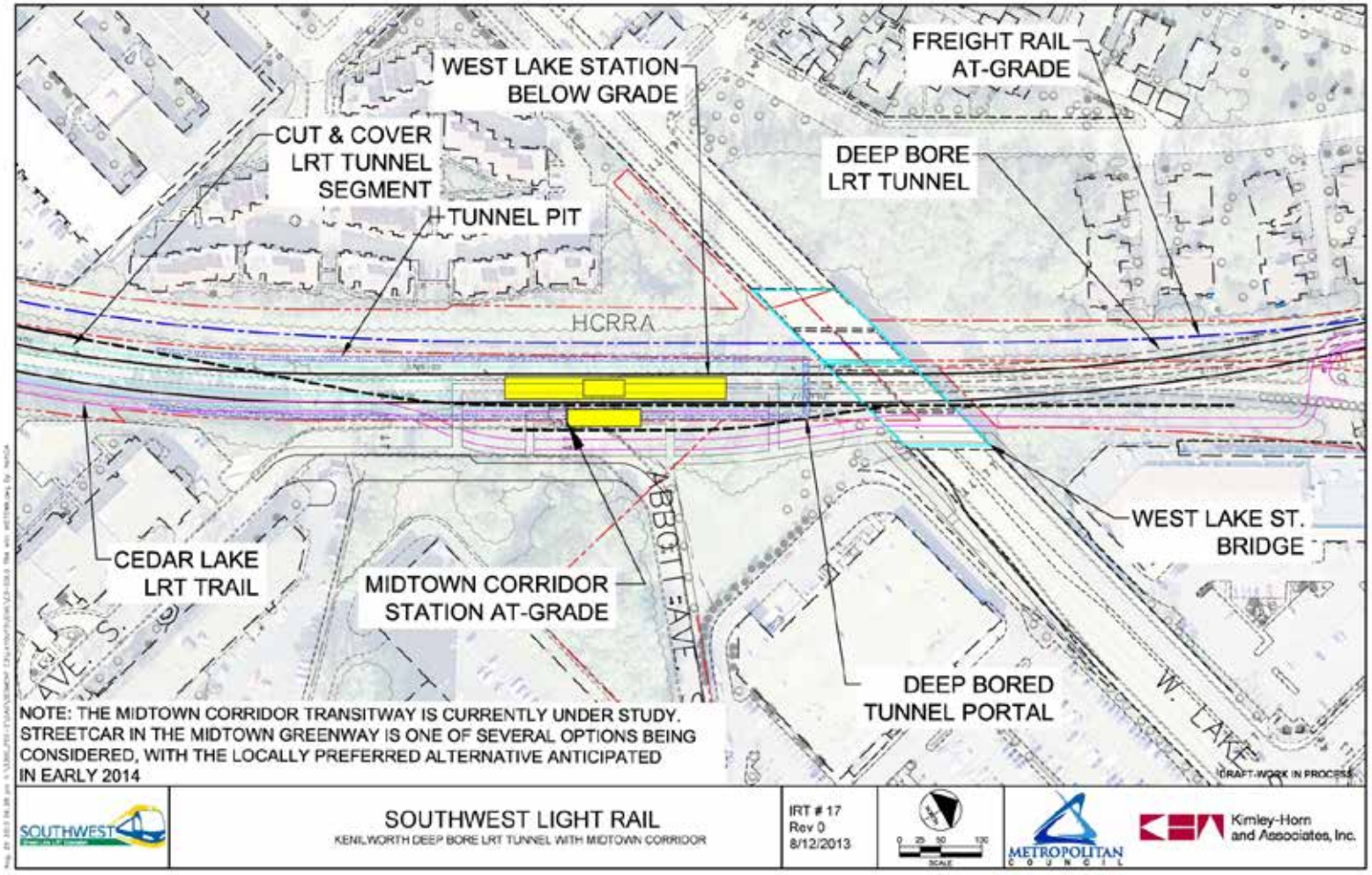
Kenilworth Shallow LRT Tunnel: Connection to Future Midtown Corridor

- SWLRT design accommodates Midtown Corridor if streetcar identified as preferred alternative

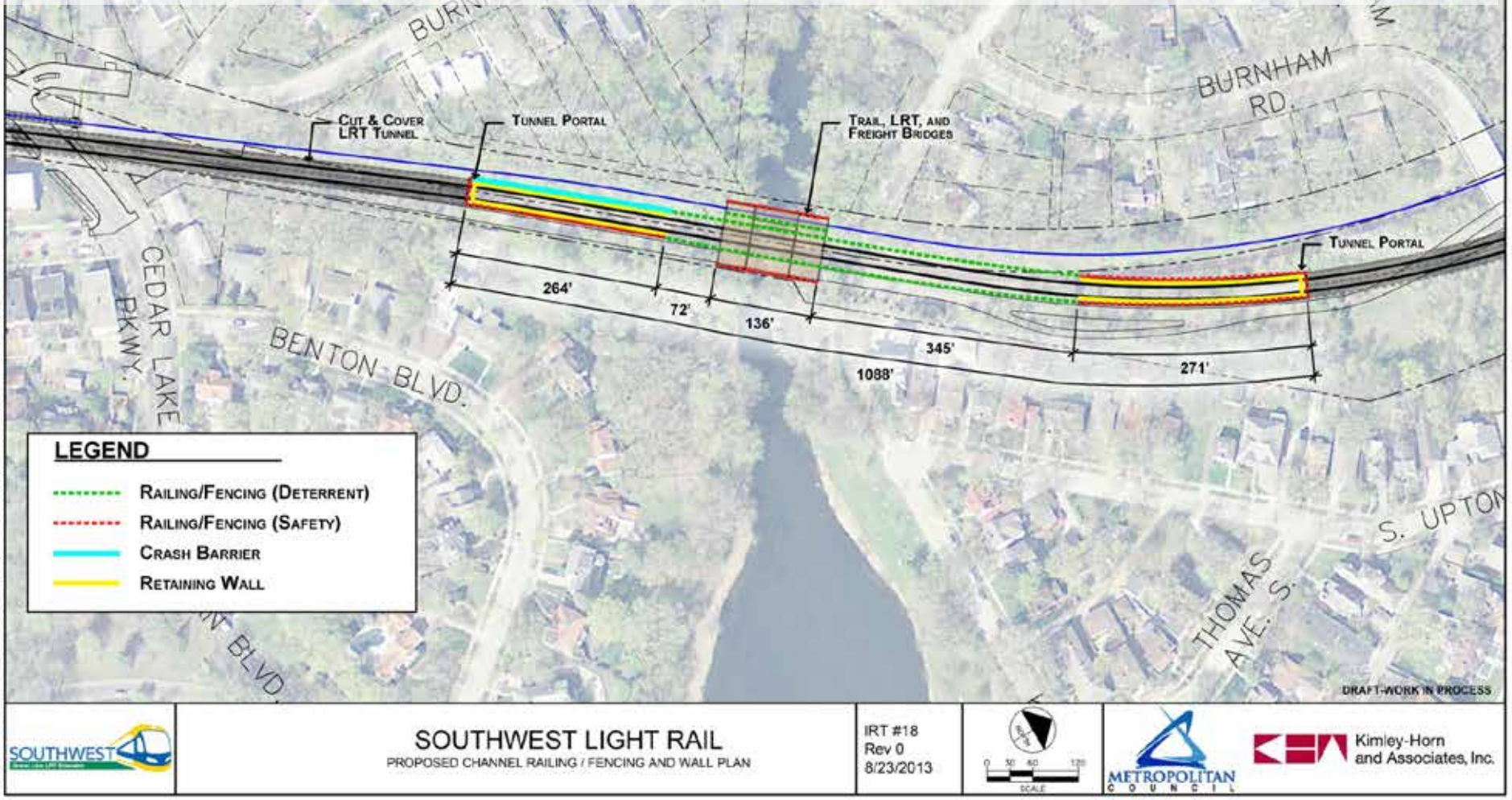
Kenilworth Shallow LRT Tunnel: Proposed Connections to Midtown Corridor



Kenilworth Deep Bore LRT Tunnel: Proposed Connections to Midtown Corridor



Kenilworth Shallow LRT Tunnel: Gap Between South and North Tunnels



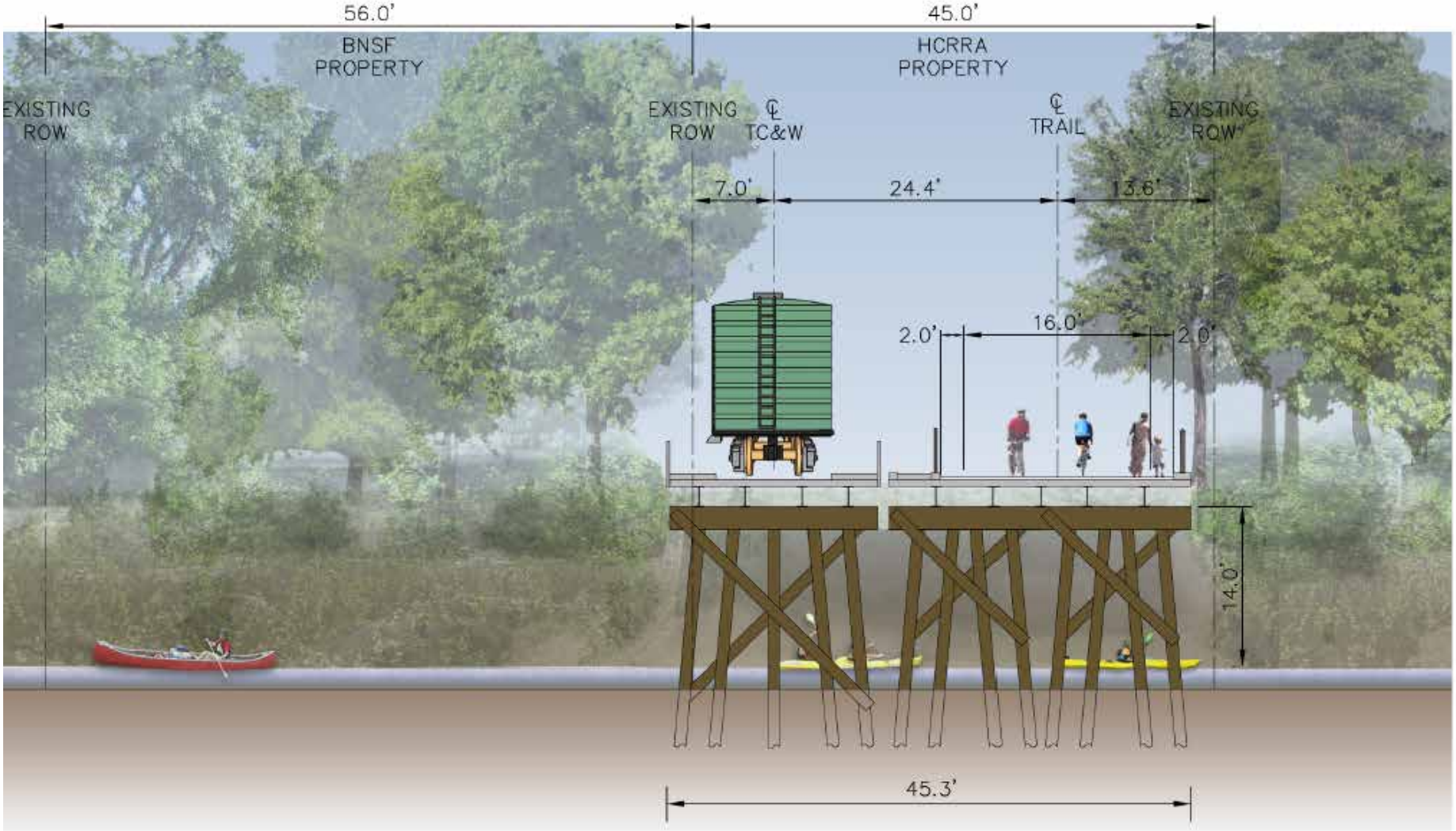
Kenilworth Shallow LRT Tunnel: Gap Between South and North Tunnels

- Historical context
  - Working with MnDOT's Cultural Resources Unit staff on historic channel crossing
  - Bridge structure to match other railroad bridges in area
  - Minimize bridge railings

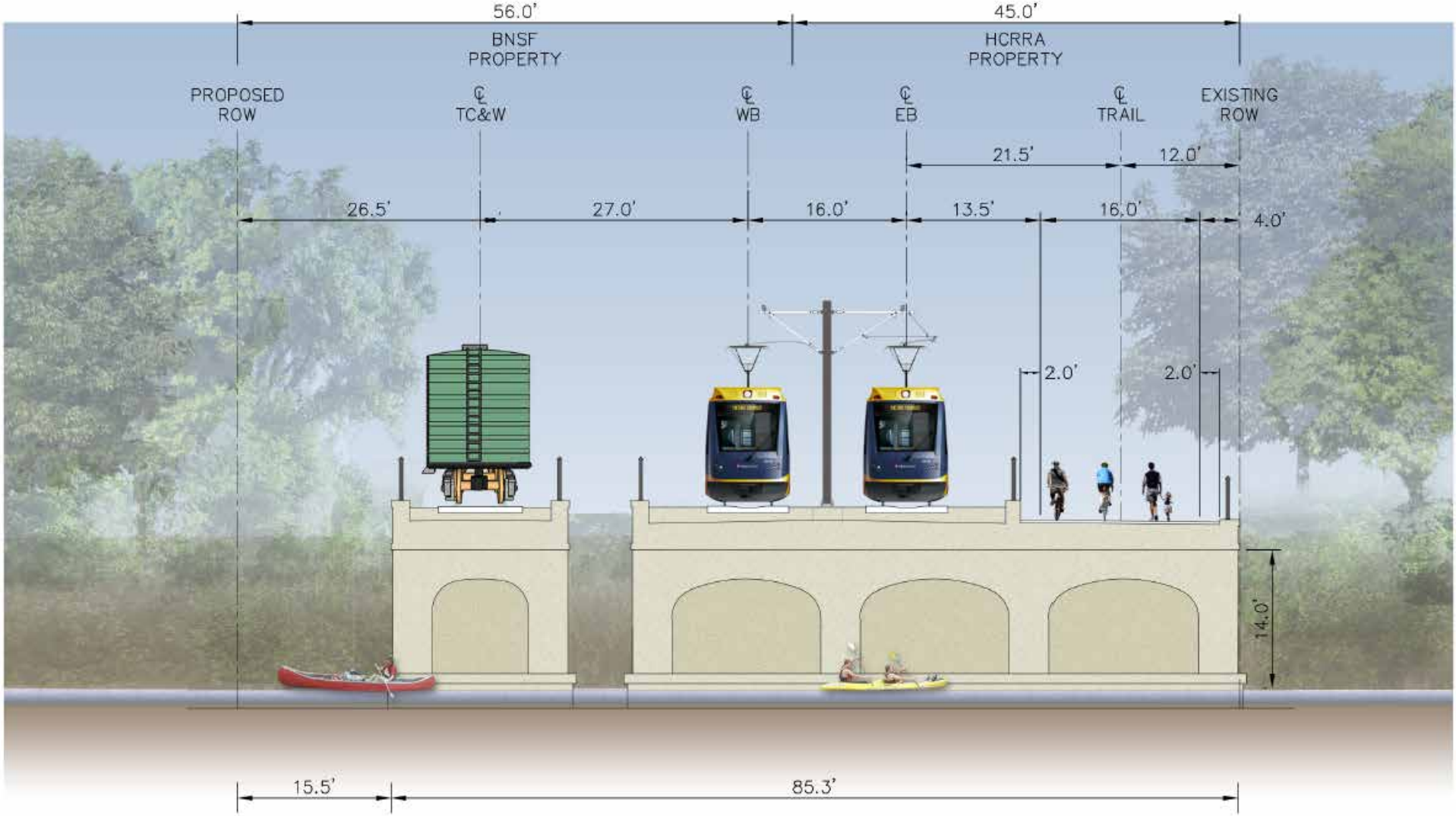
Kenilworth Shallow LRT Tunnel: Gap Between South and North Tunnels – Existing Midtown Greenway Bridge

Kenilworth Shallow LRT Tunnel:

Gap Between South and North Tunnels – Existing Condition



Kenilworth Shallow LRT Tunnel:
Gap Between South and North Tunnels – Proposed



Kenilworth Shallow LRT Tunnel:

Gap Between South and North Tunnels – Existing Condition

Kenilworth Shallow LRT Tunnel:
Gap Between South and North Tunnels – Rendering

Kenilworth Shallow LRT Tunnel:
Gap Between South and North Tunnels - Proposed

Kenilworth Shallow LRT Tunnel: Gap Between South and North Tunnels

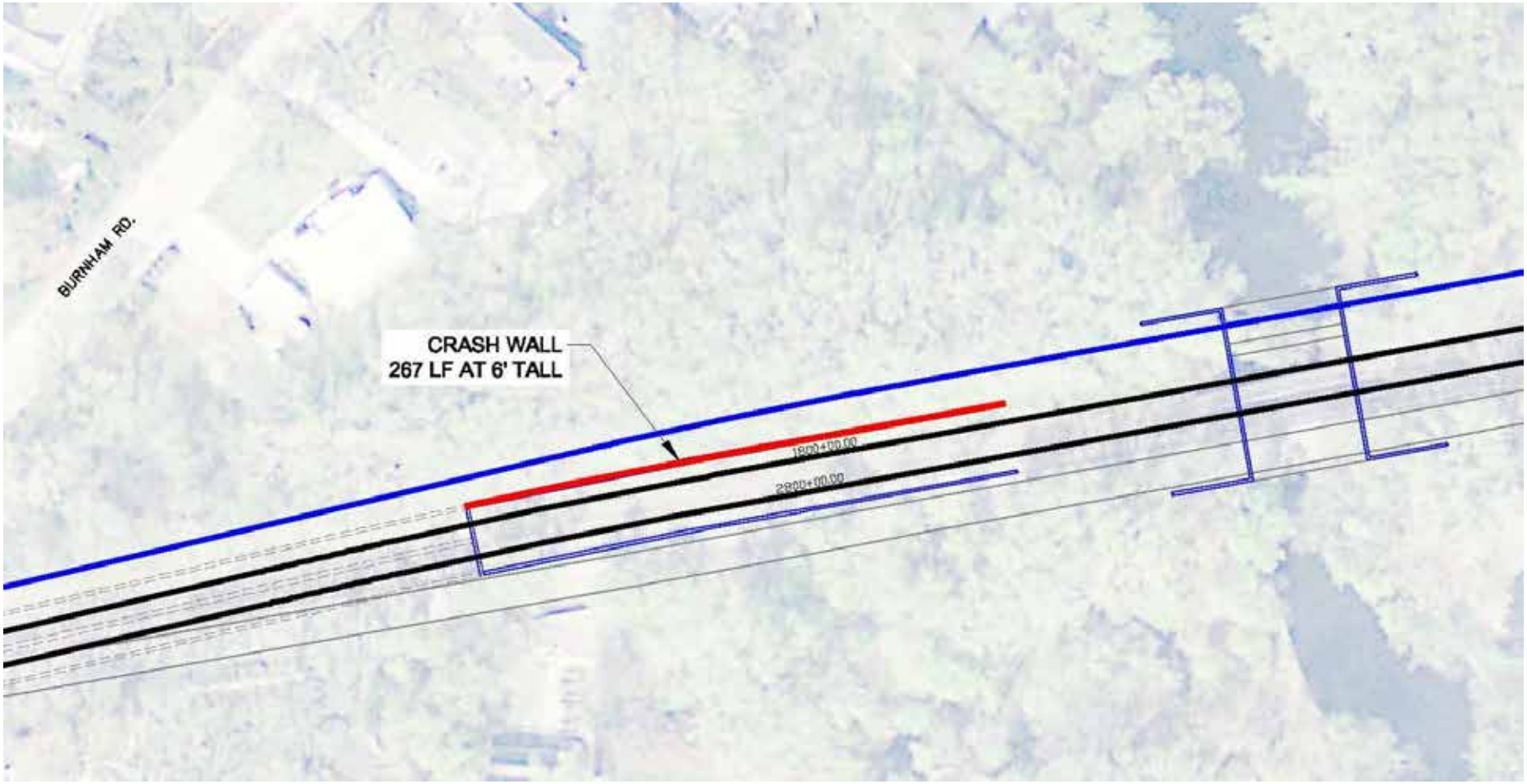
Kenilworth Shallow LRT Tunnel:
Gap Between South and North Tunnels - Rendering

Kenilworth Shallow LRT Tunnel: Gap Between South and North Tunnels

Kenilworth Shallow LRT Tunnel:
Gap Between South and North Tunnels - Rendering

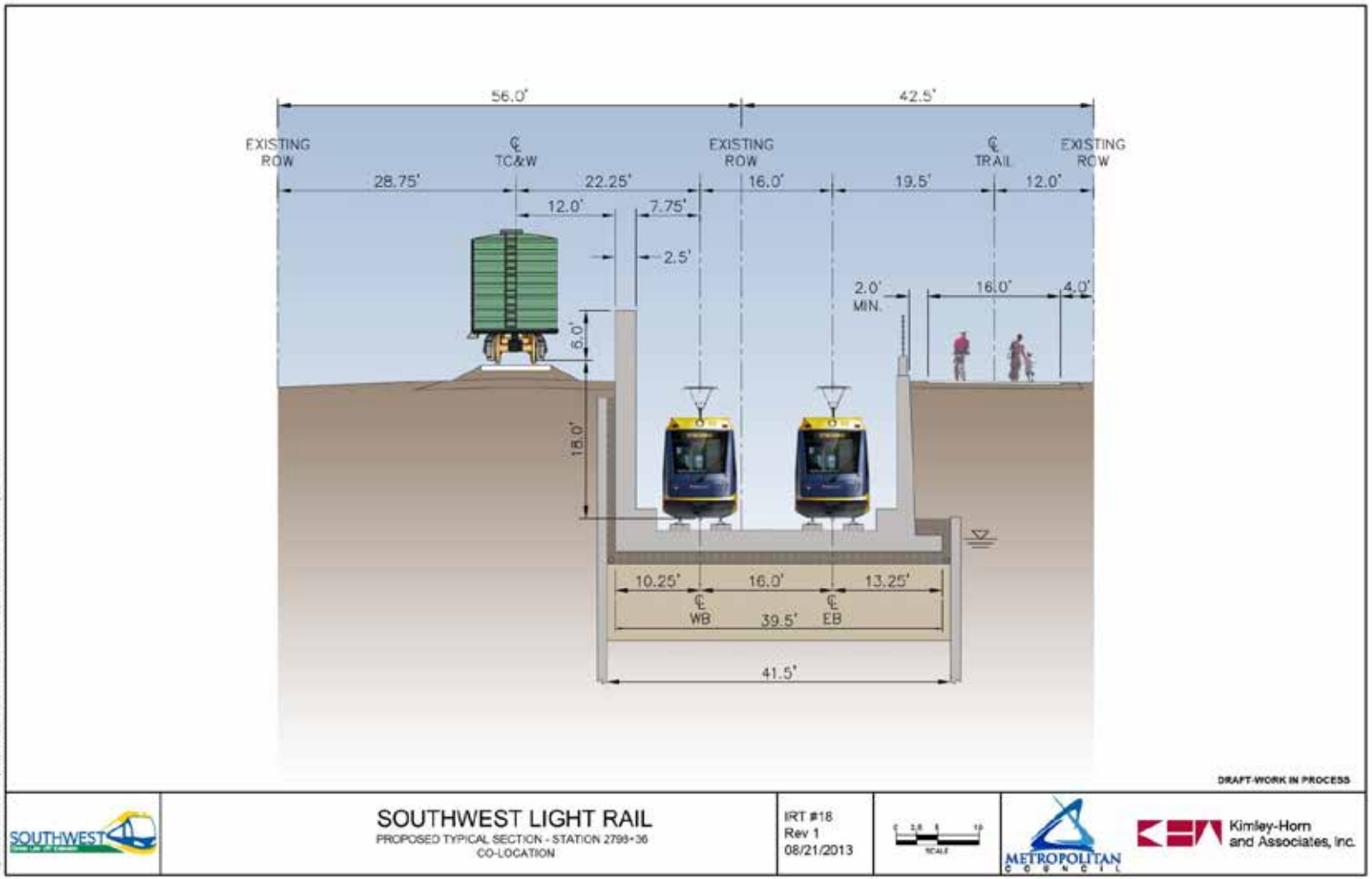
Kenilworth Shallow LRT Tunnel:

Gap Between South and North Tunnels - Crash Wall Locations

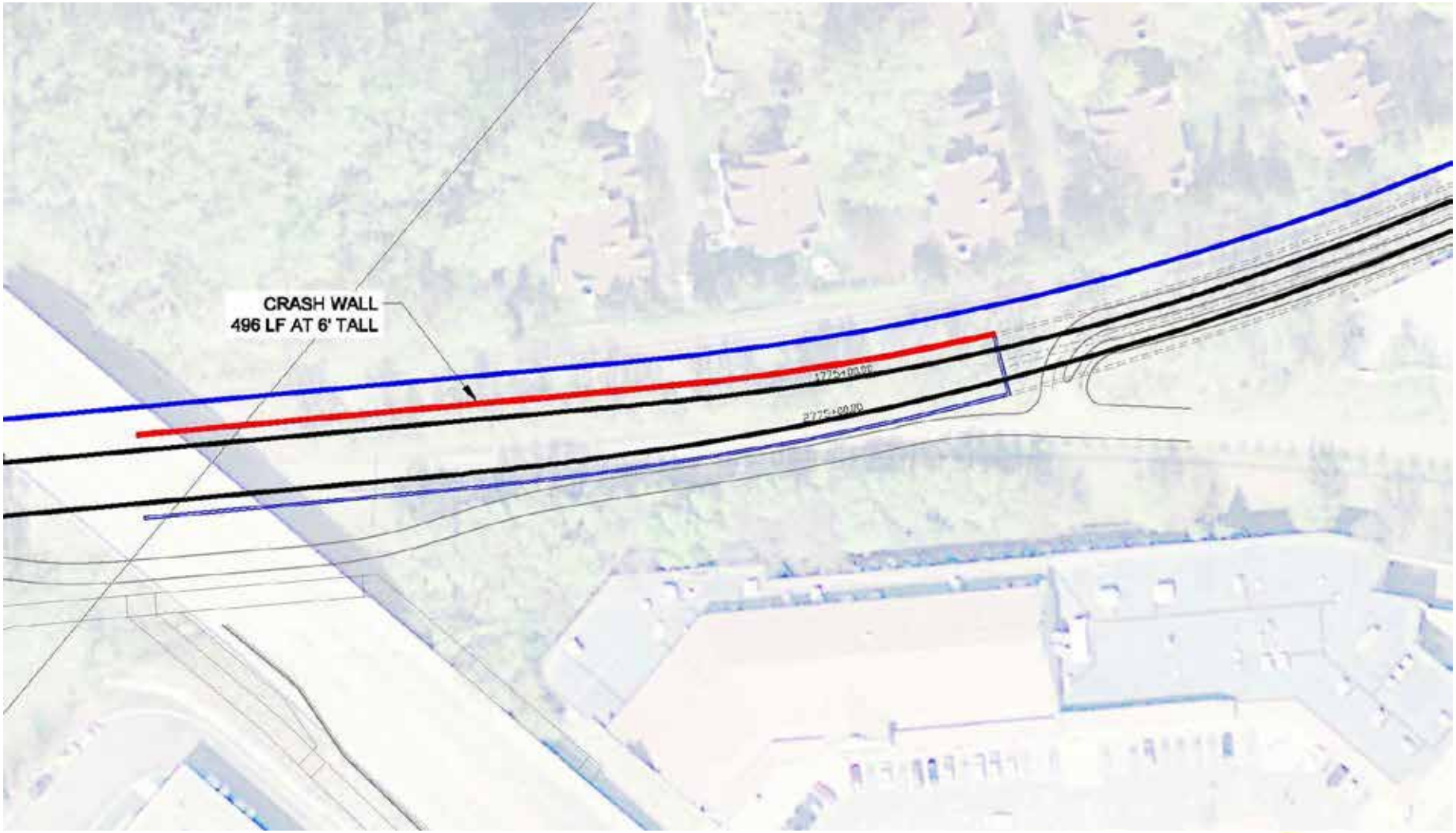


Kenilworth Shallow LRT Tunnel:

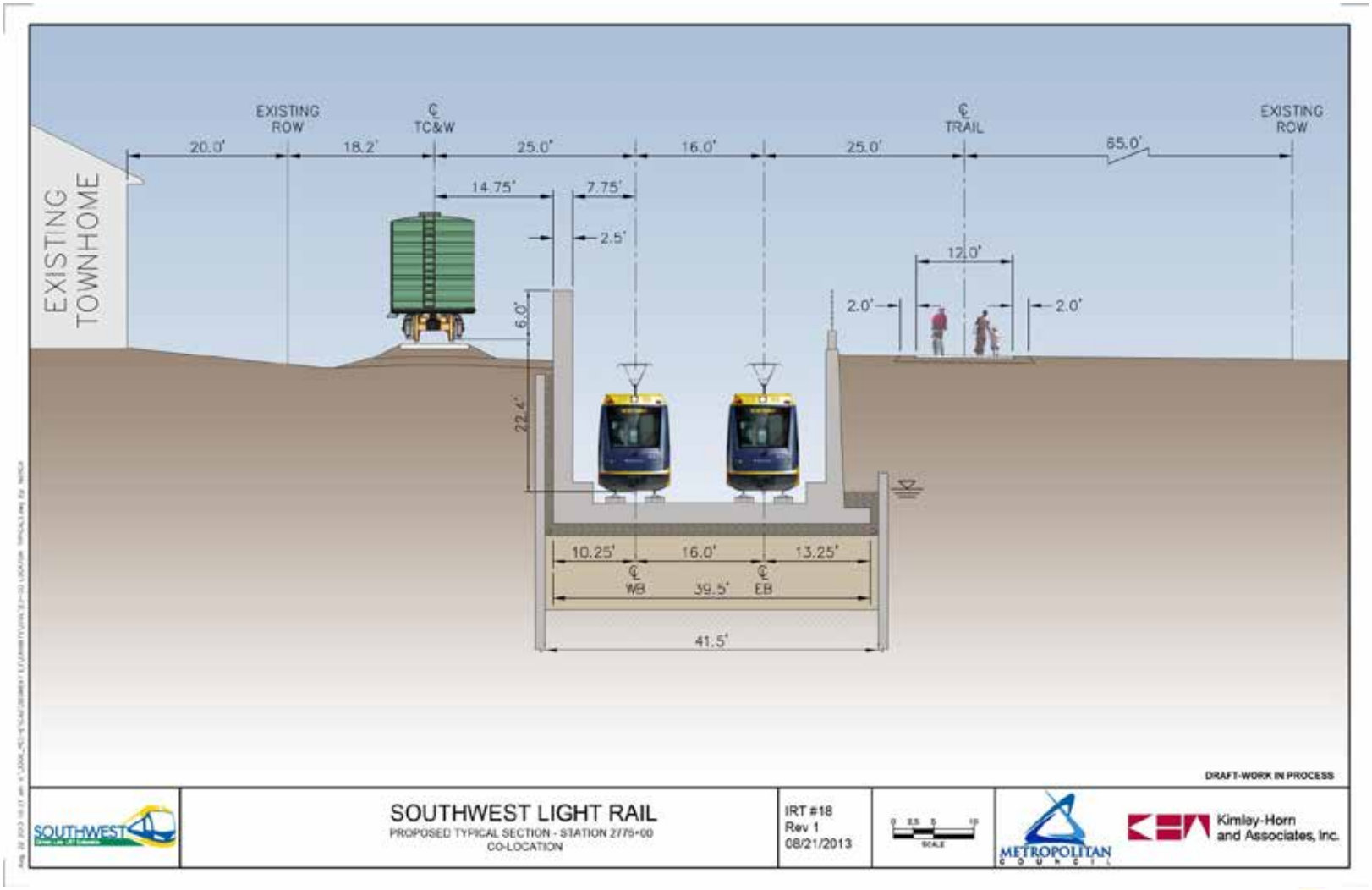
Gap Between South and North Tunnels - Crash Wall Locations



Kenilworth Shallow LRT Tunnel: Other Crash Wall Location



Kenilworth Shallow LRT Tunnel: Other Crash Wall Location



Kenilworth Shallow LRT Tunnel: Trails

- Design process
  - Connectivity to trail will be retained throughout construction
  - Work with City and Minneapolis Park and Recreation Board (MPRB) staff to develop temporary trail detour plan during construction using a phased approach
  - Work with City and MPRB staff to develop design that re-establishes trail functionality
    - Locate trail above LRT tunnel
    - Re-establish trail connections

Kenilworth Shallow LRT Tunnel: Technical Considerations

- Groundwater Hydrogeology
- Temporary Construction Dewatering
- Permanent Water Control
- Project Coordination
- Trees and Vegetation
- Ventilation

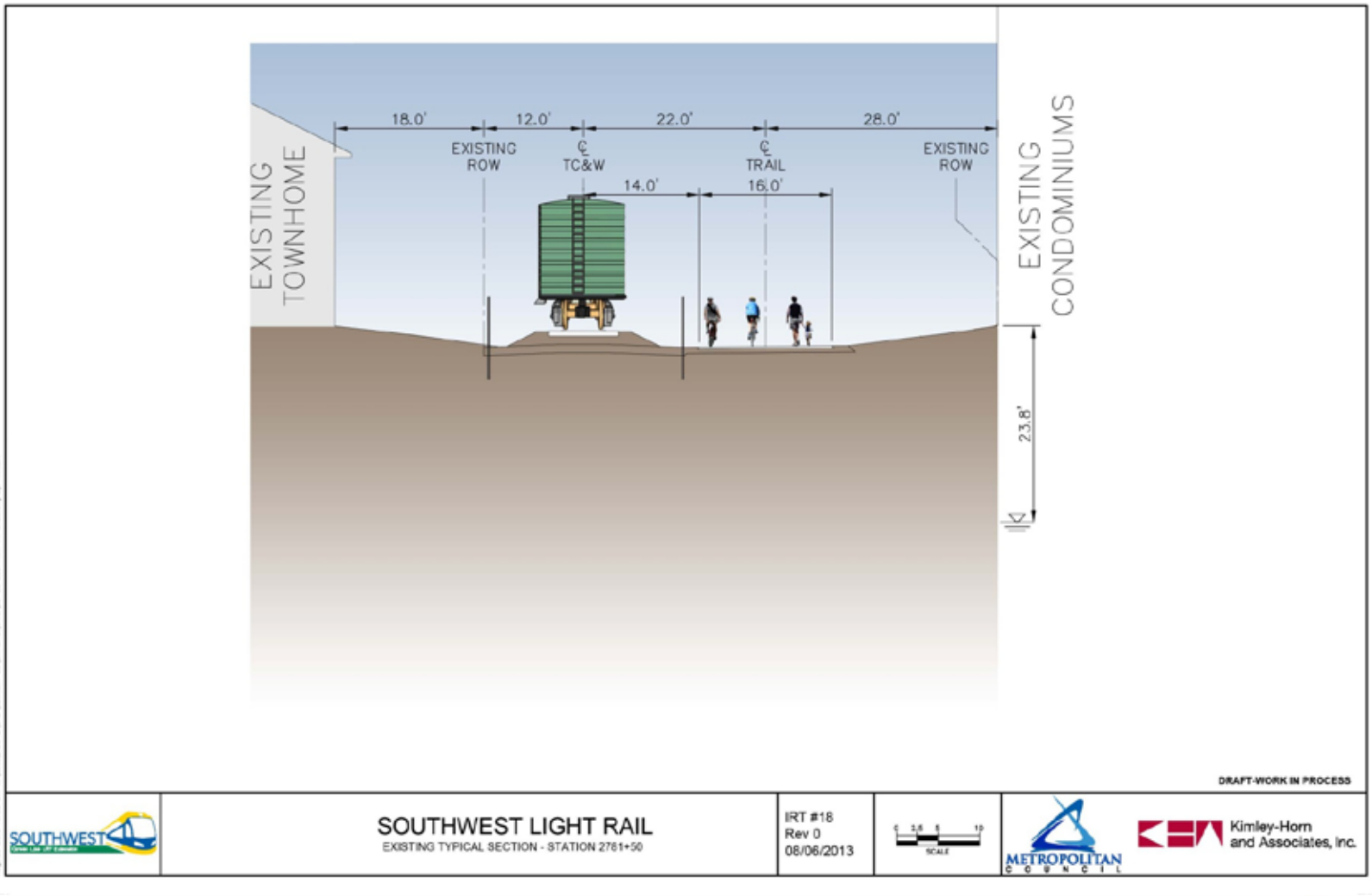
Kenilworth Shallow LRT Tunnel: Groundwater Hydrogeology

- Cedar Lake and Lake of the Isles are at same elevation
- Confirmed existing soils conditions: primarily alluvial sands
- Performed groundwater hydraulic conductivity model
  - Results show minimal upstream fluctuation; significantly less than normal lake level fluctuations

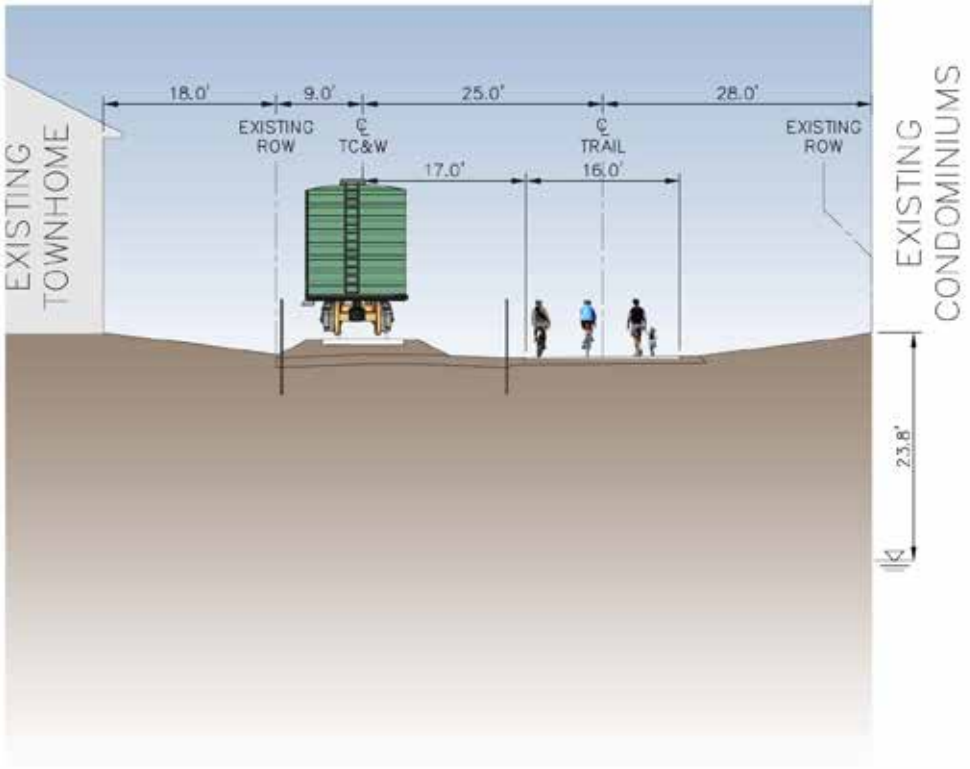
Kenilworth Shallow LRT Tunnel: Temporary Construction Dewatering

- No broad area well-point dewatering required
- Dewatering limited to construction cells
- Treating water prior to storm water discharge
- Outreach to industry on best practices

Kenilworth Shallow LRT Tunnel: Construction Sequencing – Existing Condition



Kenilworth Shallow LRT Tunnel: Construction Sequencing – Shift Freight Rail Tracks



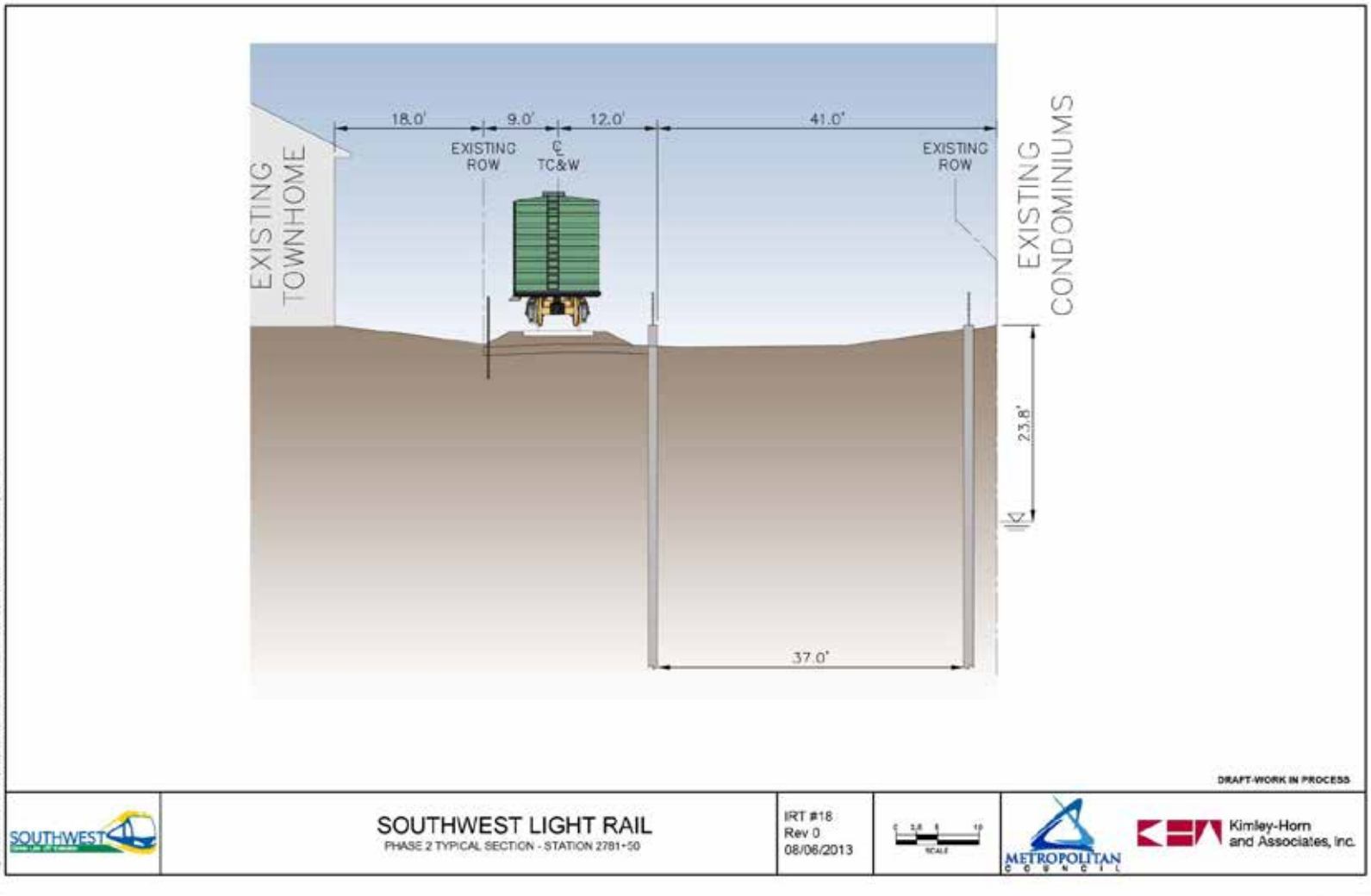
DRAFT-WORK IN PROCESS

SOUTHWEST LIGHT RAIL
PHASE 1 TYPICAL SECTION - STATION 2781+50

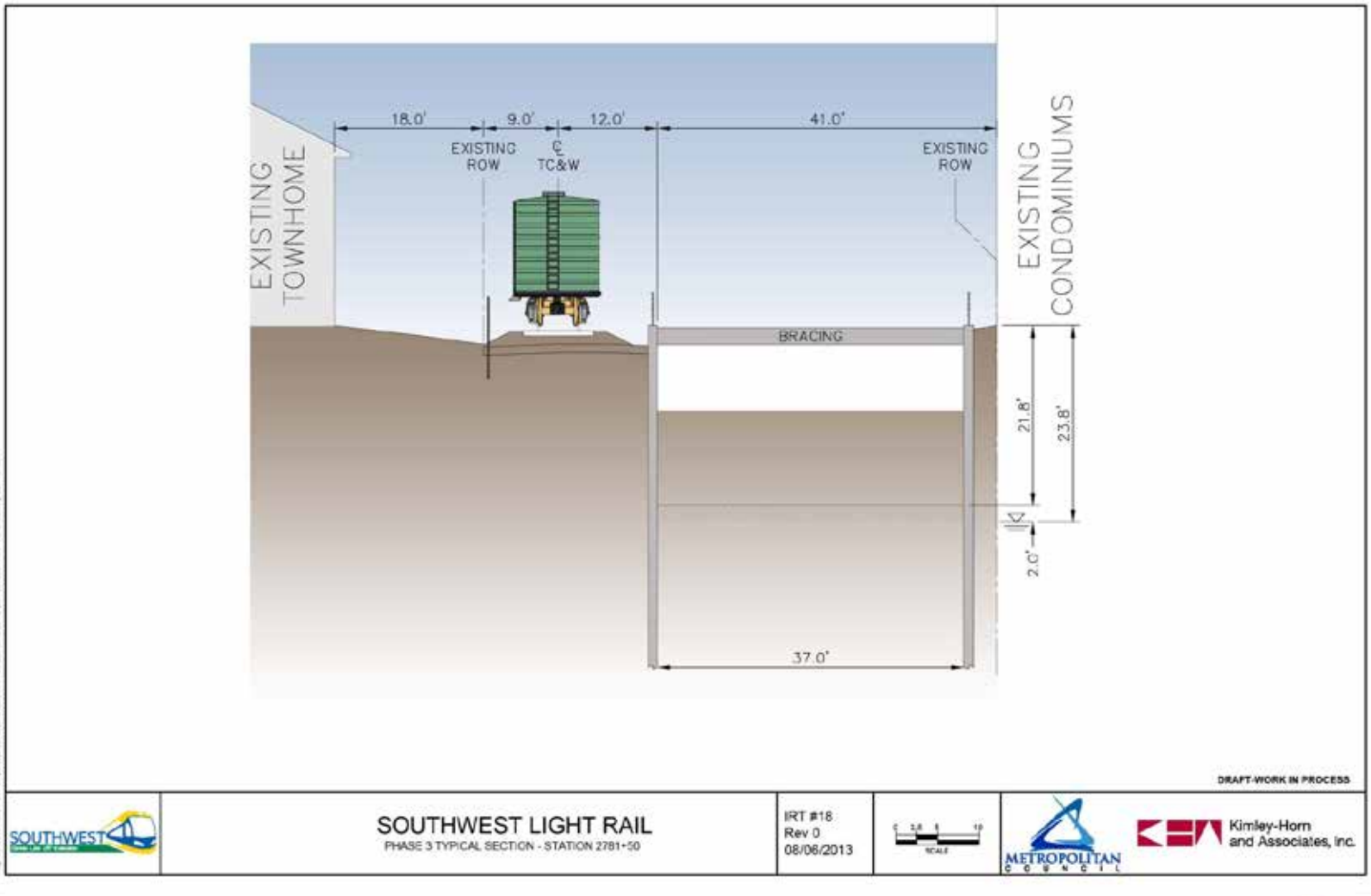
IRT #18
Rev 0
08/06/2013

Kimley-Horn and Associates, Inc.

Kenilworth Shallow LRT Tunnel: Construction Sequencing – Install Sheet Pile



Kenilworth Shallow LRT Tunnel: Construction Sequencing – Install Bracing



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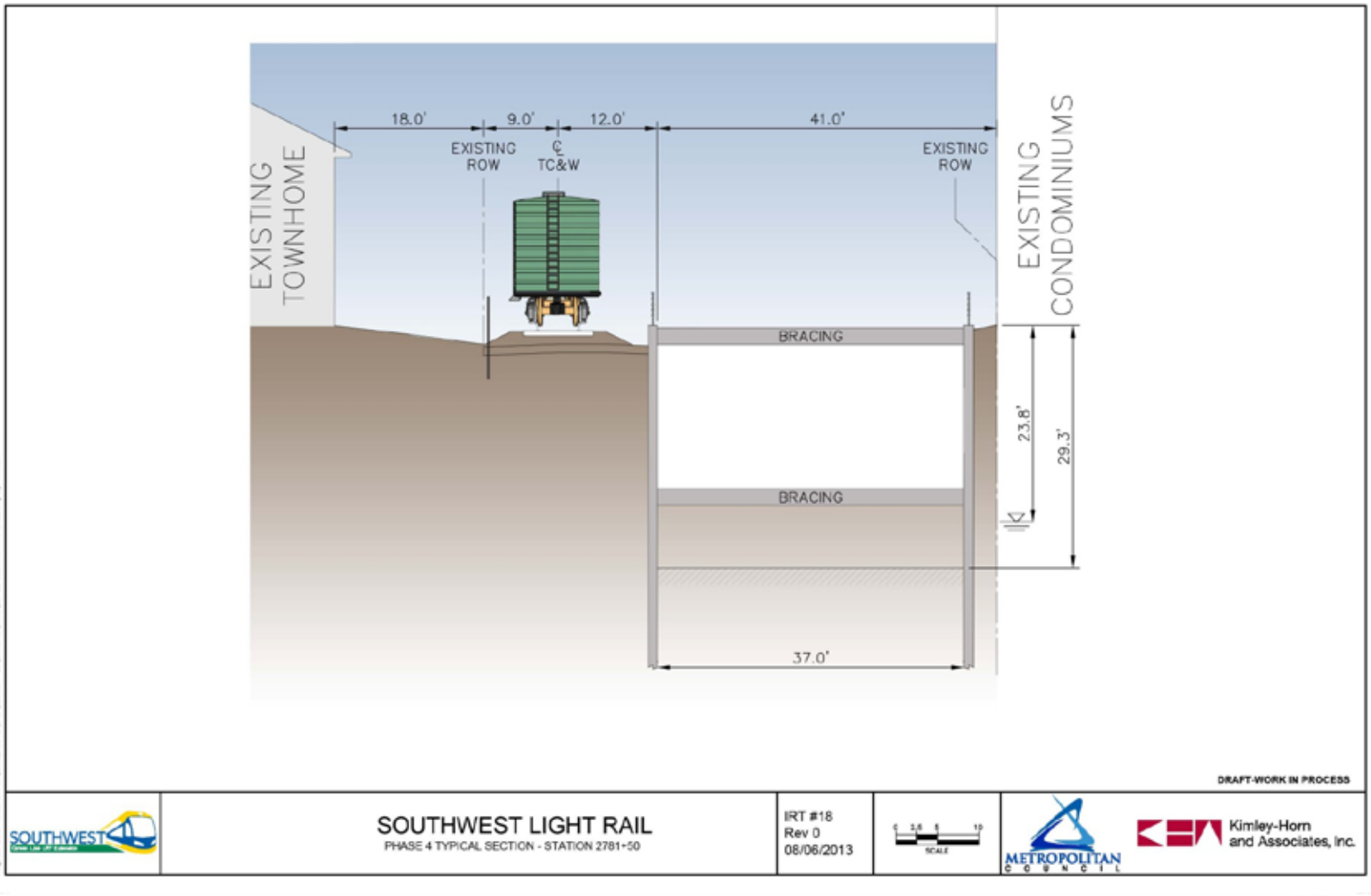
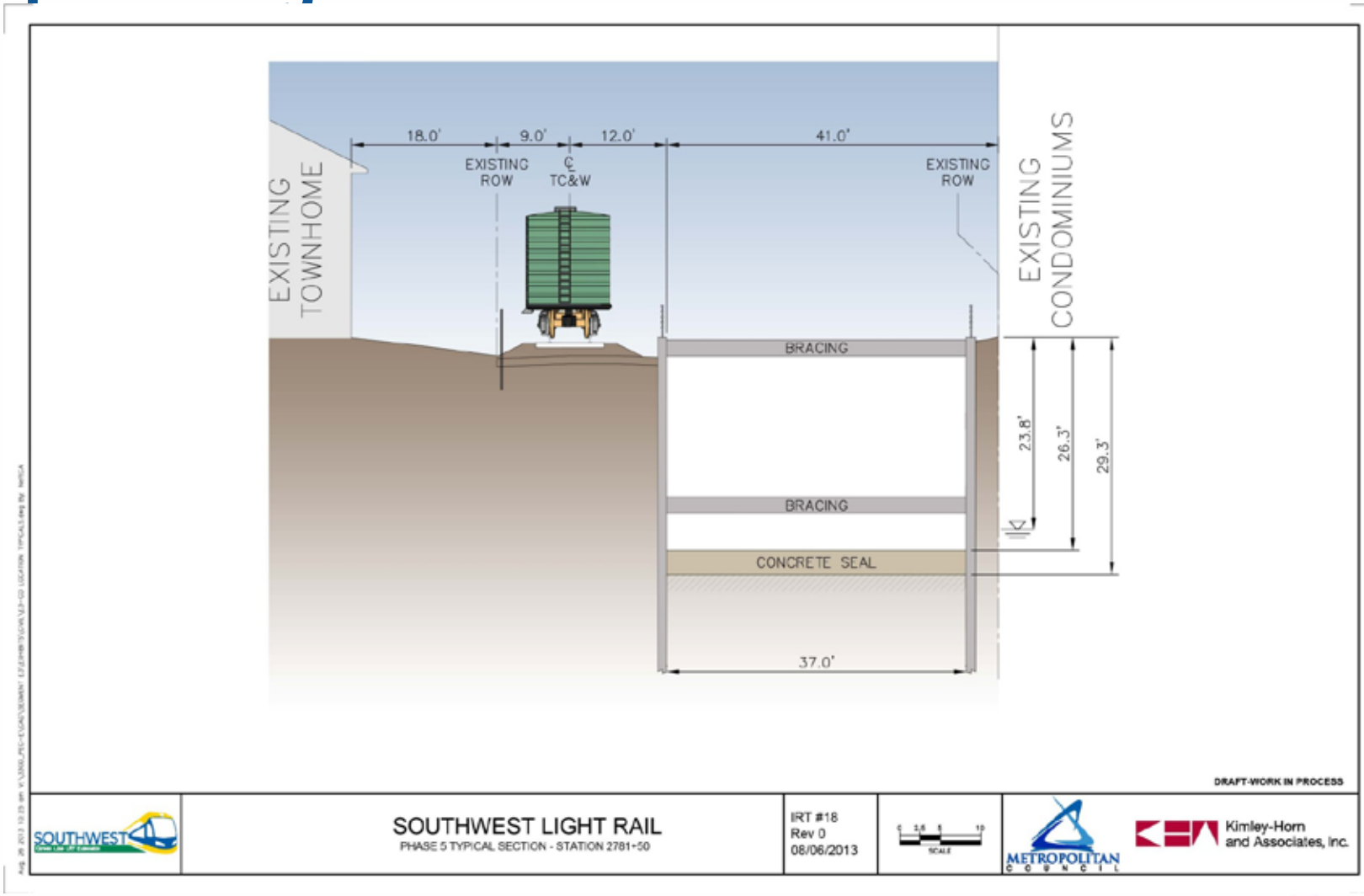
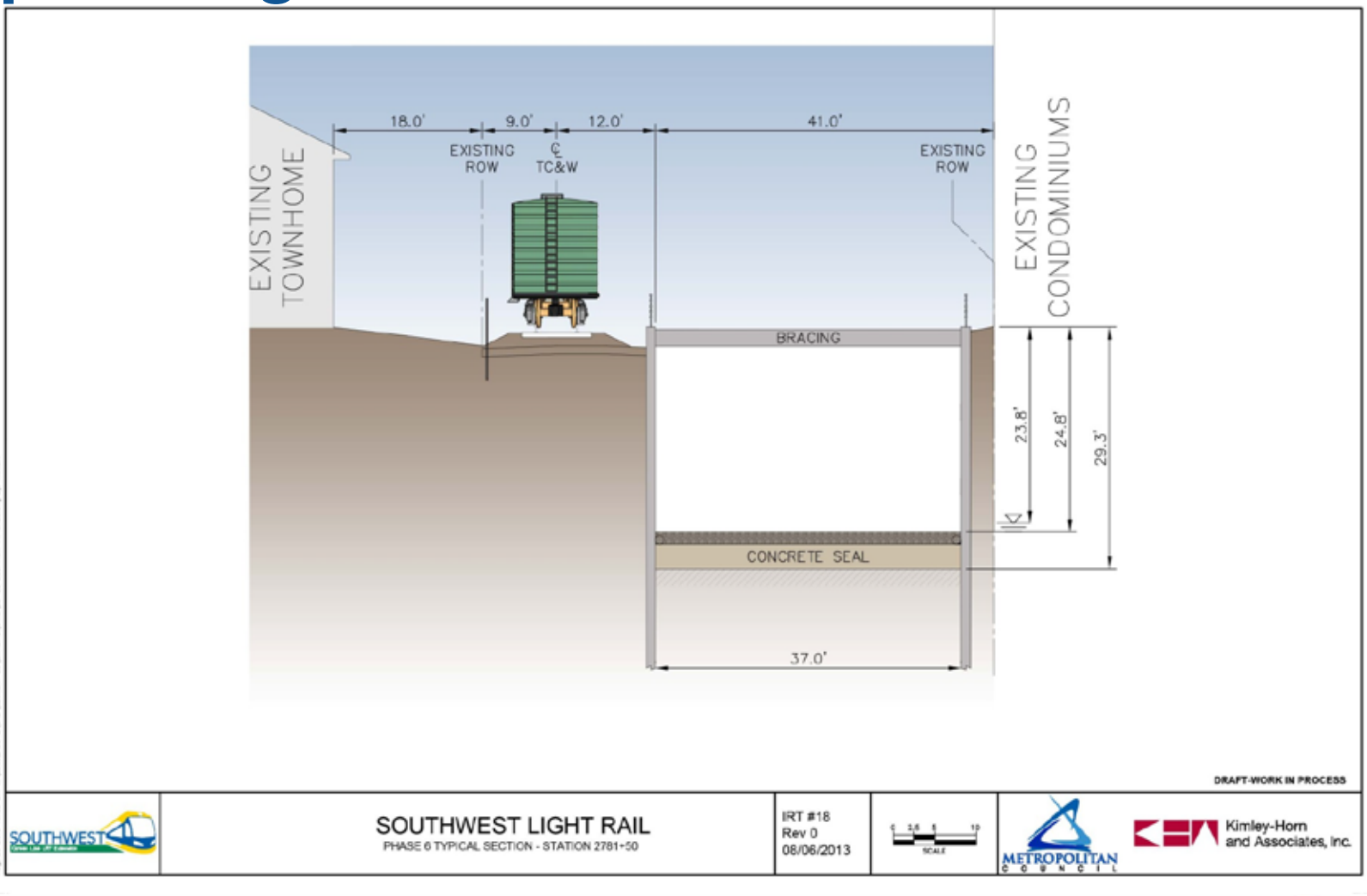


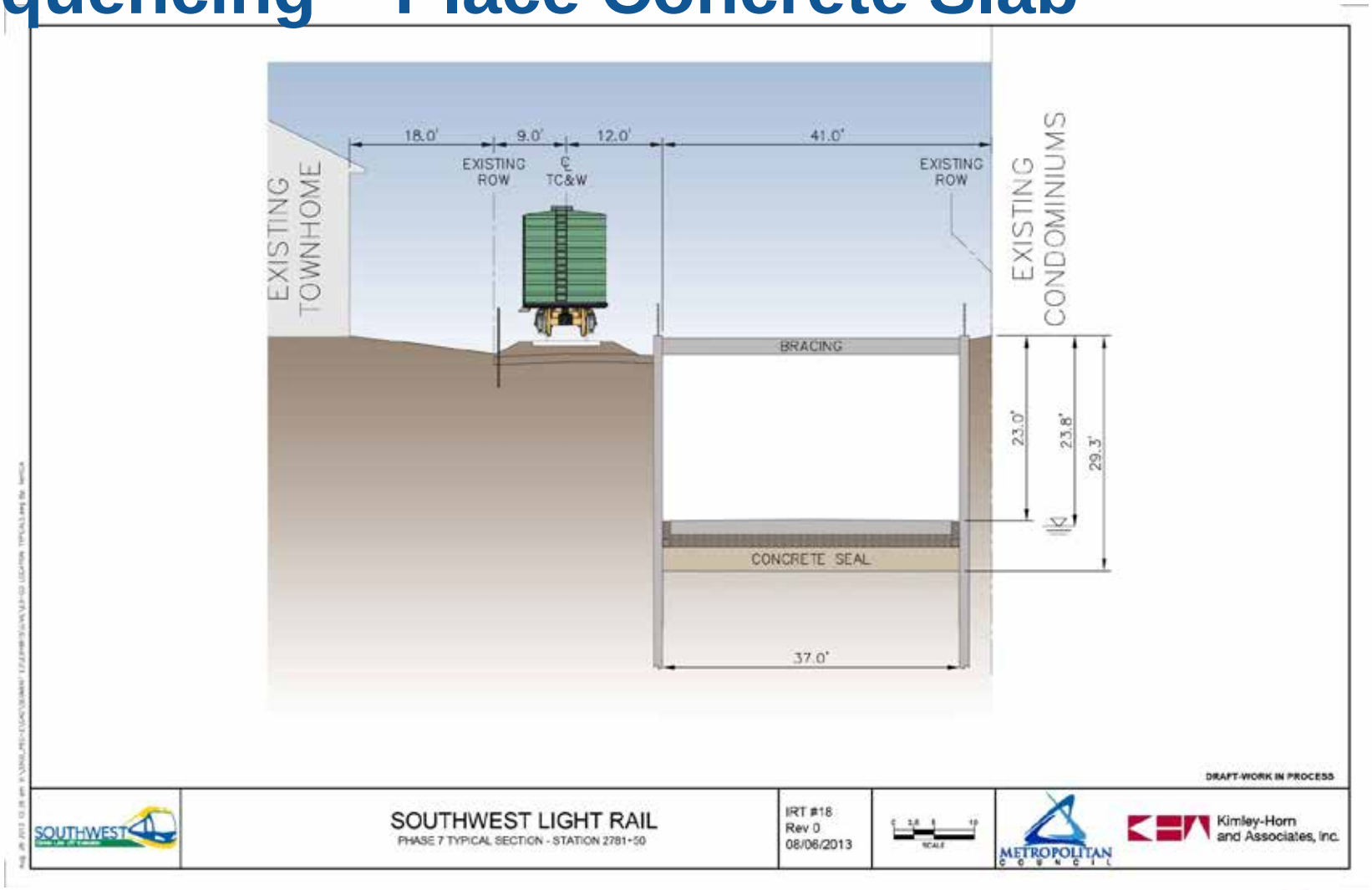
Kenilworth Shallow LRT Tunnel: Construction Sequencing – Install Concrete Seal



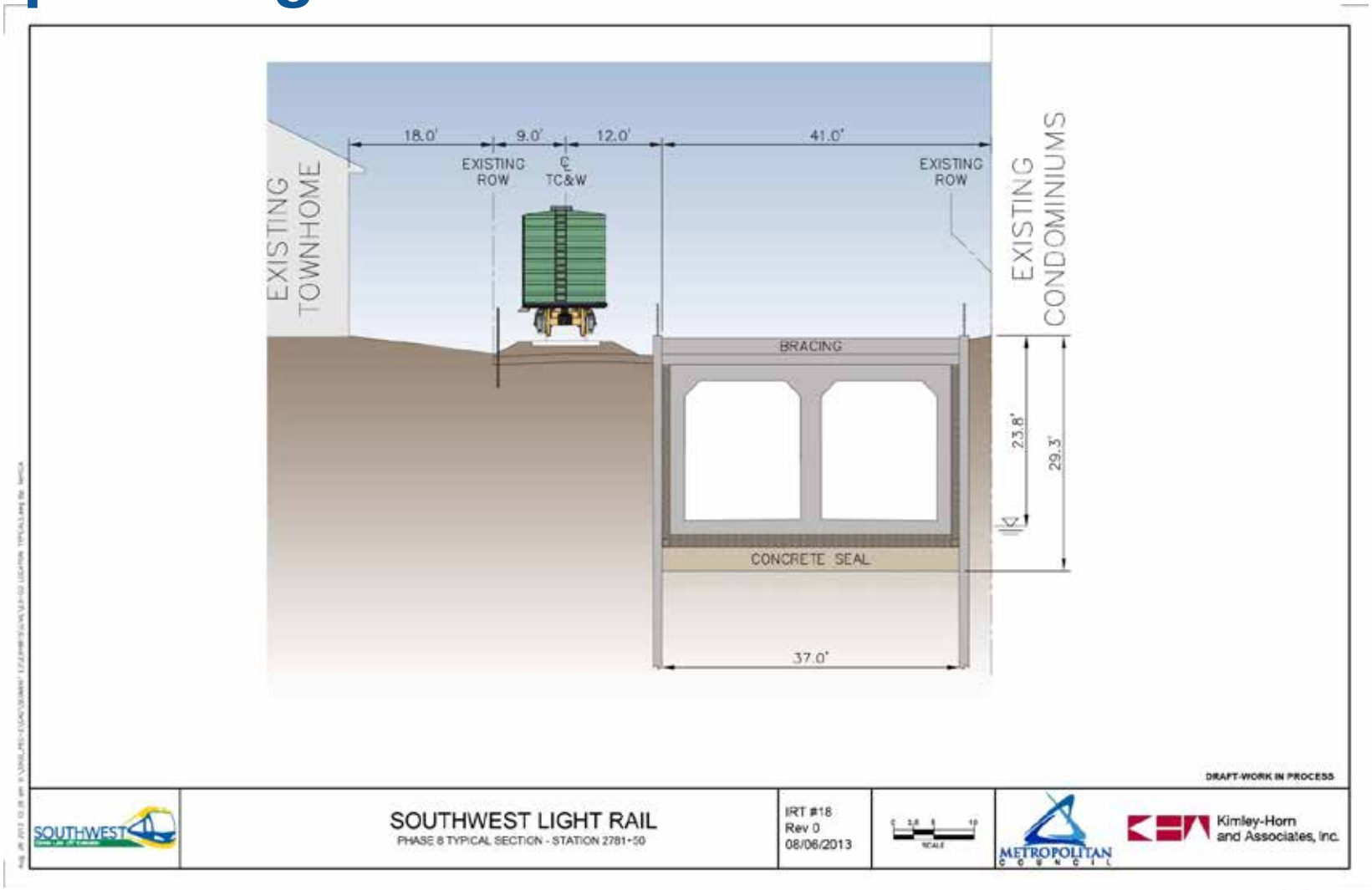
Kenilworth Shallow LRT Tunnel: Construction Sequencing – Install Base Material



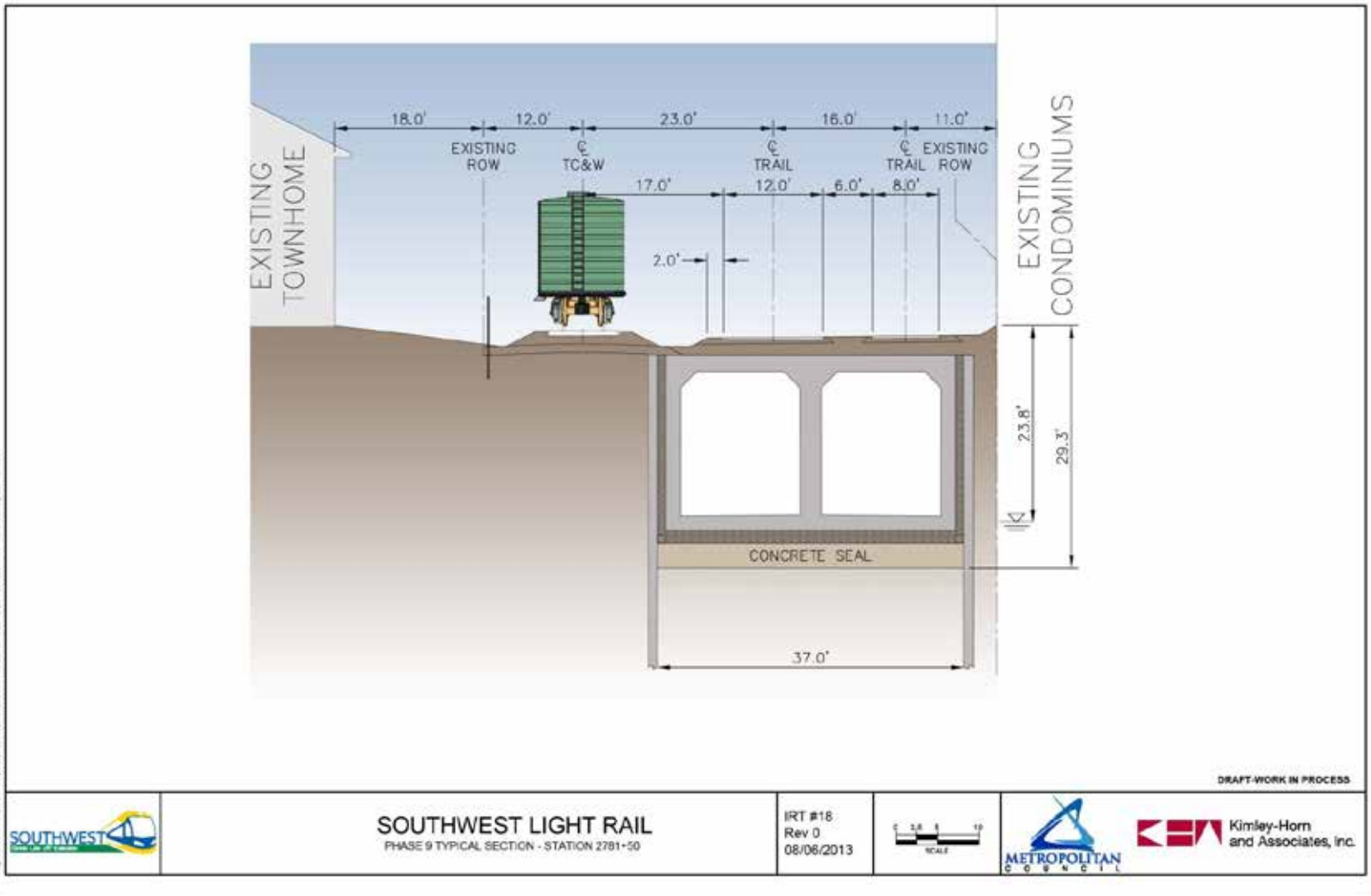
Kenilworth Shallow LRT Tunnel: Construction Sequencing – Place Concrete Slab



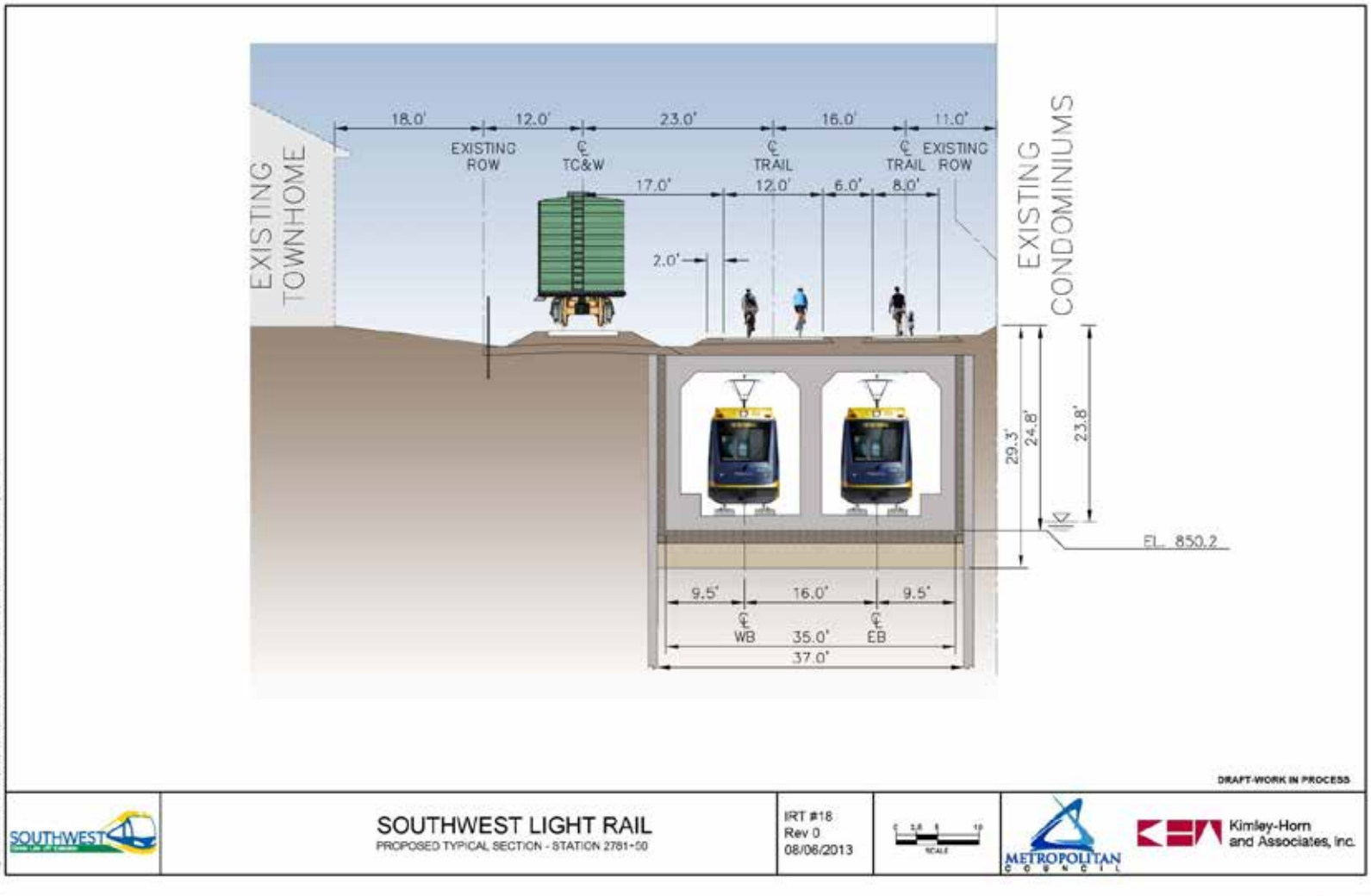
Kenilworth Shallow LRT Tunnel: Construction Sequencing – Place Tunnel walls and roof



Kenilworth Shallow LRT Tunnel: Construction Sequencing – Construct trail and shift tracks



Kenilworth Shallow LRT Tunnel: Construction Sequencing – Project Complete



Kenilworth Shallow LRT Tunnel: Permanent Water Control

- Surface water at tunnel portals routed to storm sewer
- Waterproofing of sheet pile and tunnel to restrict leakage into tunnel
- Water within tunnel routed to sanitary sewer
- Groundwater between sheet pile and tunnel routed to storm sewer
- Developing discharge sizing and evaluating system capacity
- Evaluating water temperature and seasonal concerns

Kenilworth Shallow LRT Tunnel: Project Coordination

- Met with City sewer staff last 2 weeks
- Met with Minnehaha Creek Watershed District (MCWD)
- Will have 3rd party review by MCWD for ground water hydrogeology permitting issues
- Consulted with Department of Natural Resources (DNR) and reviewed ground water hydrogeology permitting issues

Kenilworth Shallow LRT Tunnel: Trees and Vegetation

- Identifying type and quantity of trees impacted
- Coordinating with City of Minneapolis and Minneapolis Park and Recreation Board (MPRB) staff on landscaping plan
- Integrating with overall design theme through corridor
- Locating trail alignment over tunnel to maximize restoration area

Kenilworth Shallow LRT Tunnel: Ventilation

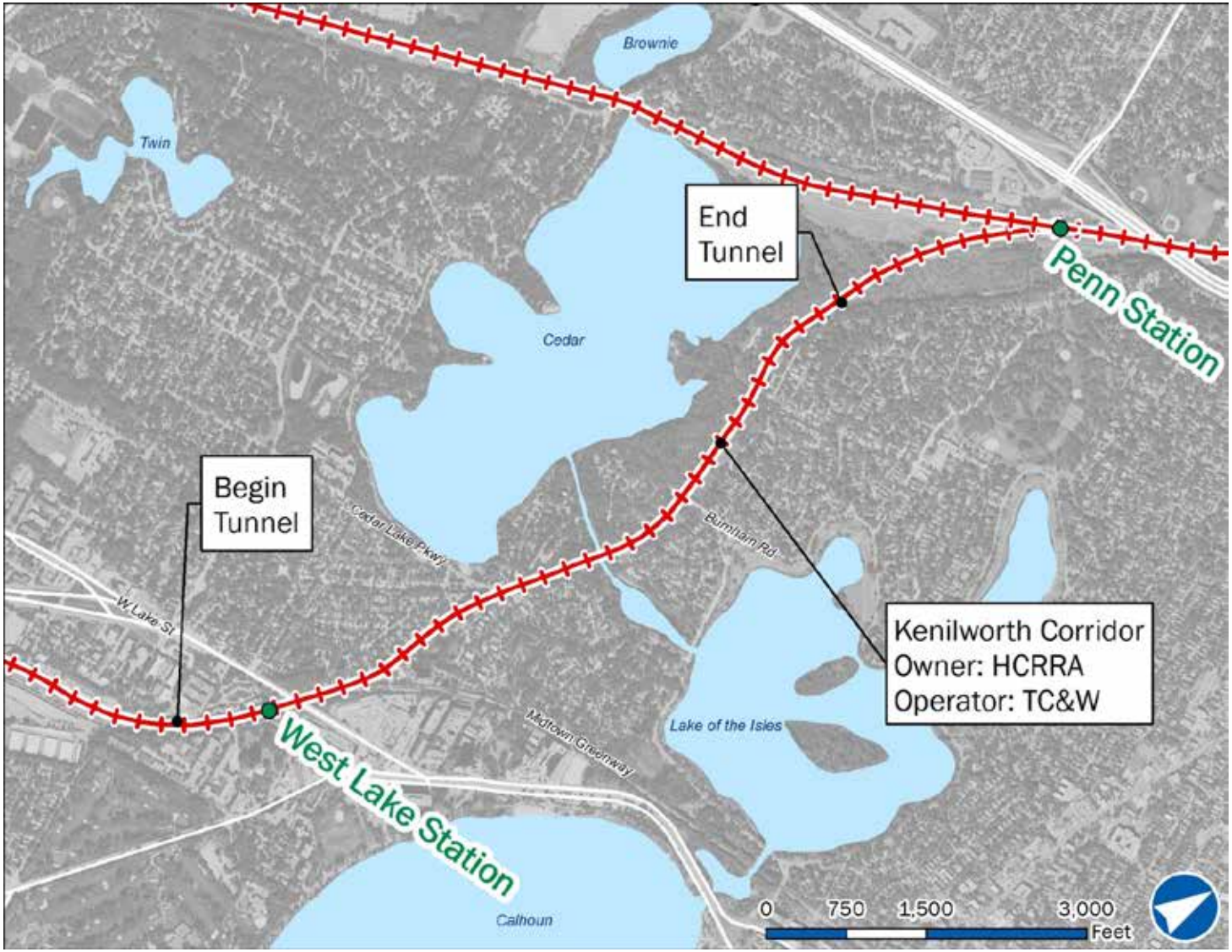
- Normal tunnel ventilation by “piston effect”
- Emergency ventilation conform to National Tunnel Construction Standards (NFPA 130)
- Ventilation focused at tunnel portal areas

Kenilworth Deep Bore LRT Tunnel

Kenilworth Deep Bore LRT Tunnel: Technical Considerations

- Construction access pit
  - Access pits required at each end of tunnel
  - South of West Lake Street bridge (proposed)
  - North of West Lake Street bridge

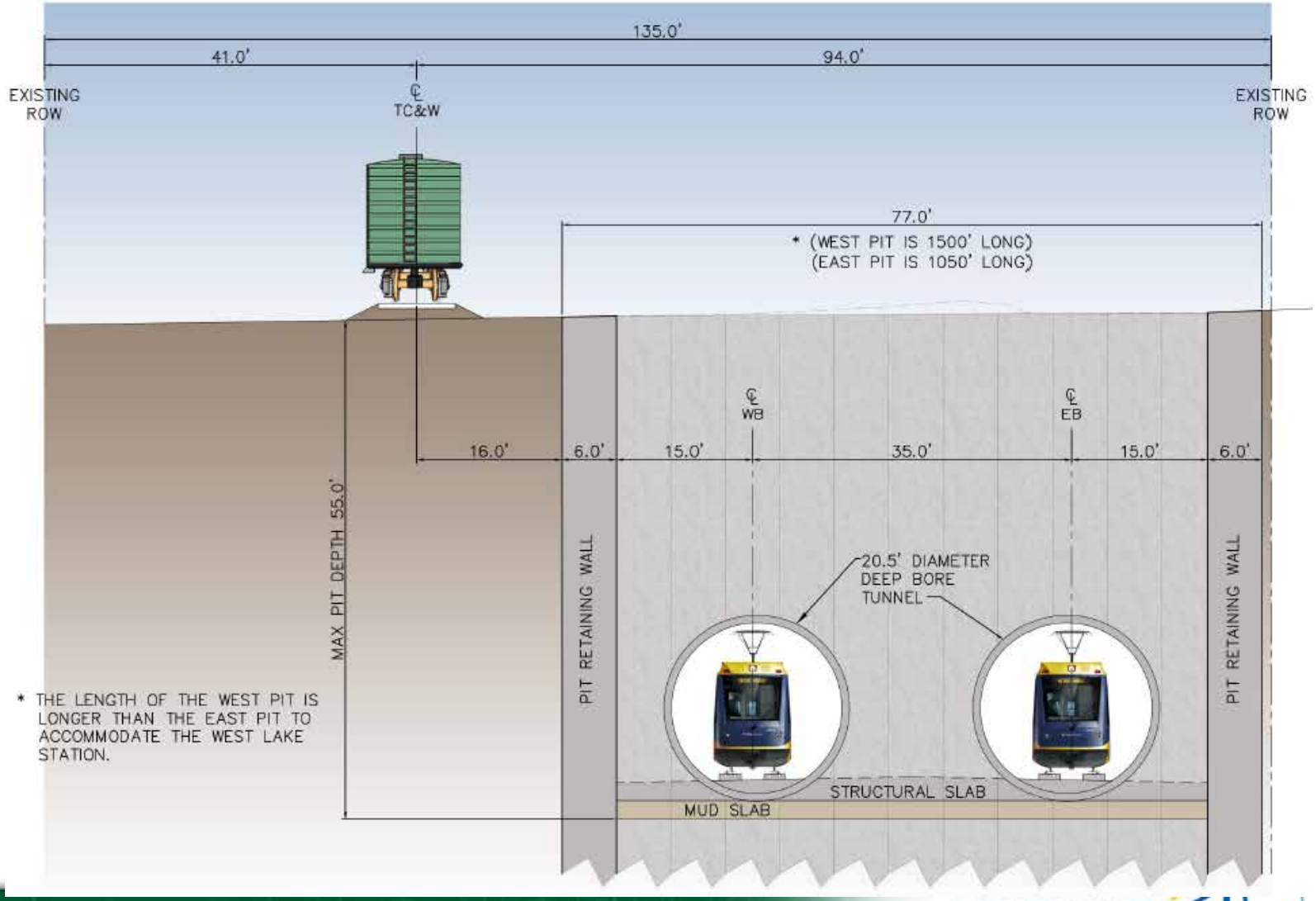
Kenilworth Deep Bore LRT Tunnel



Kenilworth Deep Bore LRT Tunnel Dimensions

Section	Length in Feet
South Transition Zone	500
South Cut & Cover Section	1,000
Twin Bore Tunnels	5,900
North Cut & Cover Section	550
North Transition Zone	500

Kenilworth Deep Bore LRT Tunnel: Access Pits



Kenilworth Deep Bore LRT Tunnel

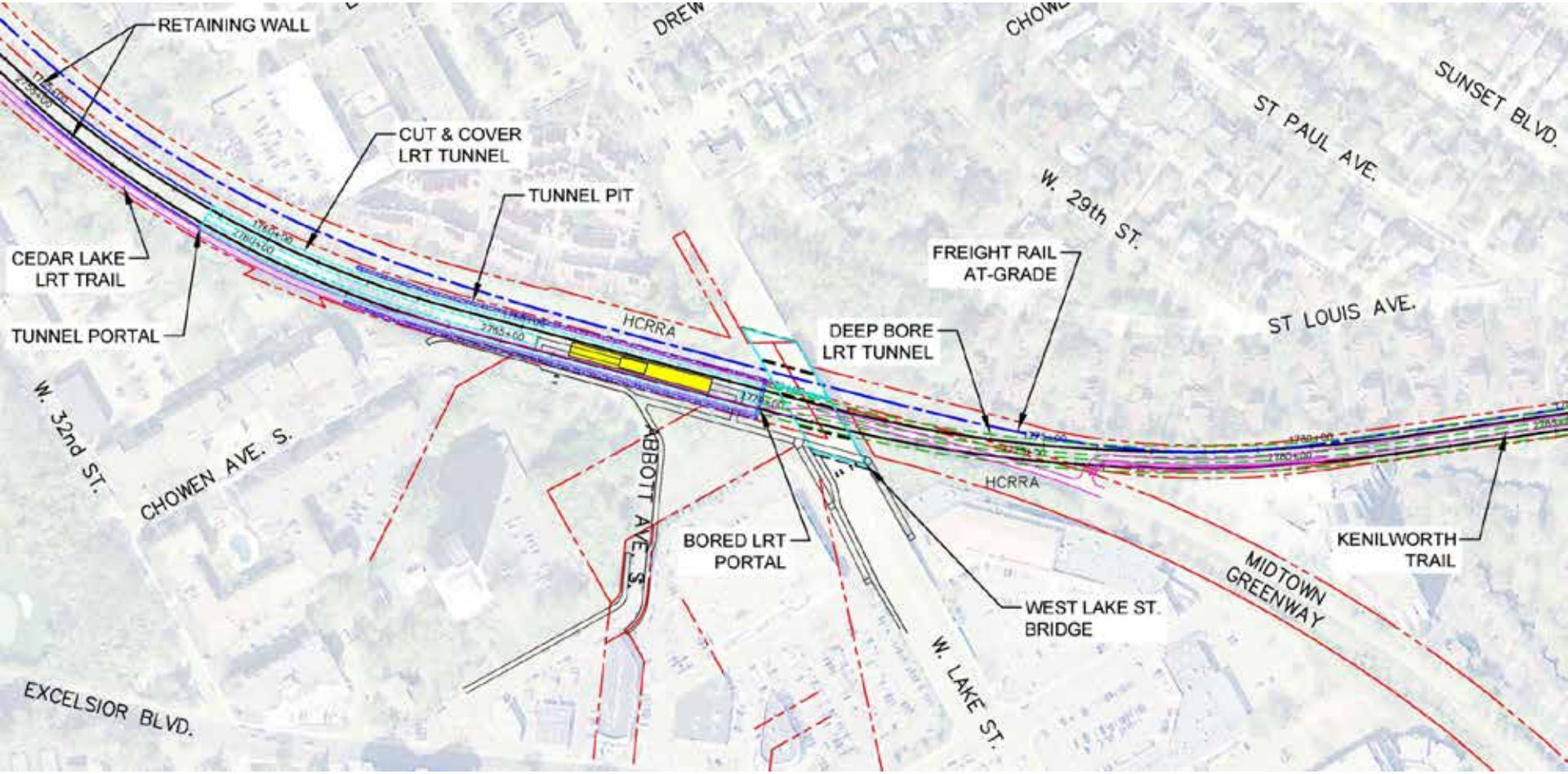
Toronto's Spadina South Tunnel Pits

Deep Bore LRT Tunnel:
Blue Line's Airport North Tunnel Portal

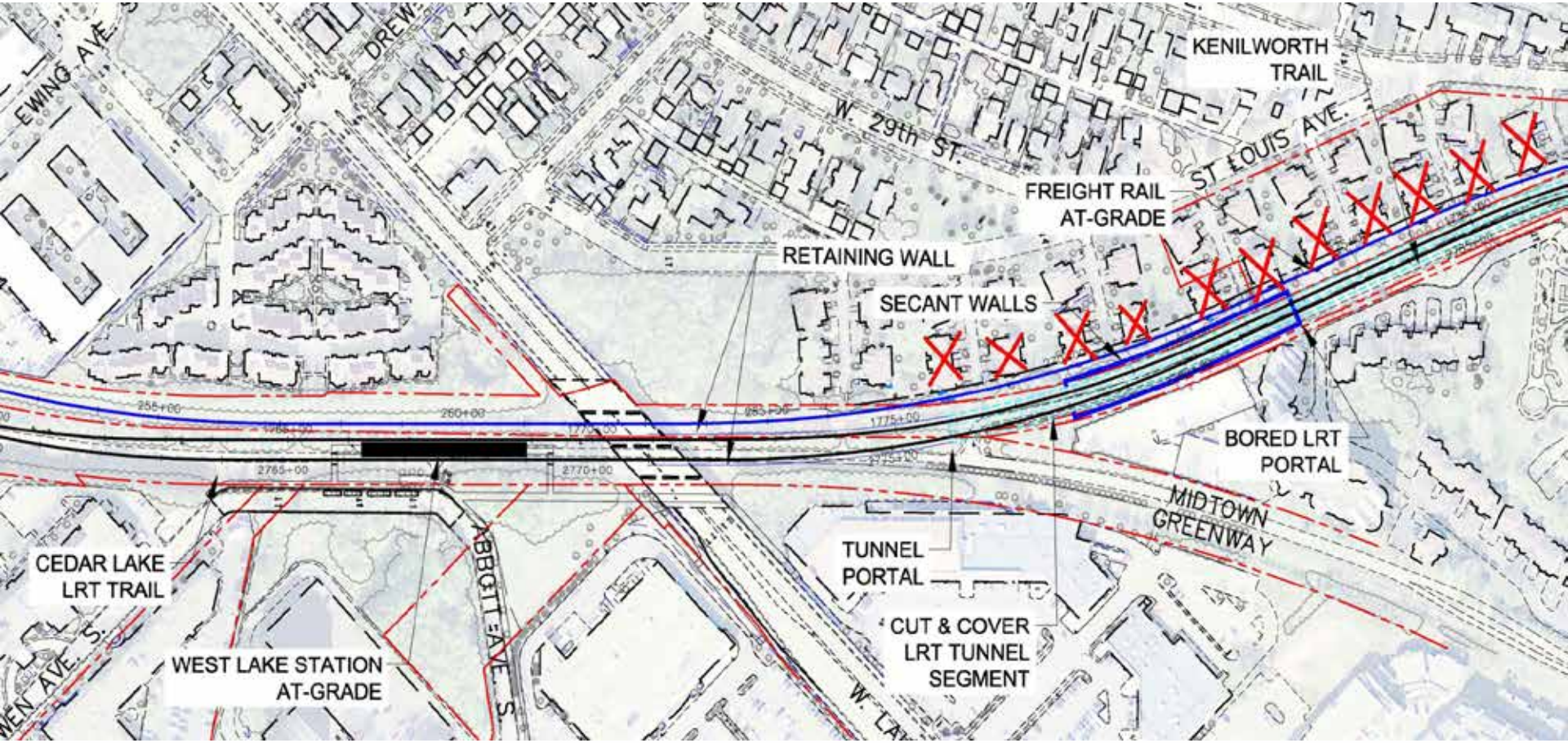
Deep Bore LRT Tunnel:
Blue Line's Airport South Tunnel Portal

Kenilworth Deep Bore LRT:

Property Impact Minimized with Portal South of West Lake Street



Kenilworth Deep Bore LRT:
Property Impact with Portal North of West Lake Street



Kenilworth LRT Tunnel Cost Comparison

Kenilworth LRT Tunnel Cost Comparison

Item	Kenilworth Shallow LRT Tunnel ($M)	Kenilworth Deep Bore LRT Tunnel ($M)
Tunnel Construction Costs ($2013)	$68	$154
Year of Expenditure (YOE) Escalation (3% per year)	$10	$23
Design Related Costs	$19	$44
Contingency (26.7% of Design and Construction Costs)	$26	$59
Subtotal	**$123**	**$280**
Freight Costs (in $YOE)	$48	$48
Other Costs (in $YOE)	($16)	($8)
Total	**$150 - $160**	**$320 - $330**

Kenilworth Deep Bore LRT: Cost Comparison with Hiawatha LRT Tunnel

Item	Hiawatha LRT Tunnel ($M)	Kenilworth Deep Bore LRT Tunnel ($M)
Tunnel Construction Costs ($2001)	$115	N/A
Prorate Construction for Length ($2001) (1.7 miles HLRT vs. 1.6 miles SWLRT)	$108	N/A
Inflation (3.2% per year per Engineering News Record)	$49	N/A
Tunnel Construction Costs ($2013)	$157	$154

Kenilworth Deep Bore LRT: Cost Comparison with Hiawatha LRT Tunnel

Item	Hiawatha LRT Tunnel ($M)	Kenilworth Deep Bore LRT Tunnel ($M)
Tunnel Construction Costs ($2013)	$157	$154
Year of Expenditure (YOE) Escalation (3% per year)	$23	$23
Design Related Costs	$45	$44
Contingency (26.7% of Design and Construction Costs)	$60	$59
Subtotal	**$285**	**$280**
Freight Costs (in $YOE)	N/A	$48
Other Costs (in $YOE)	N/A	($8)
Total	**$285**	**$320 - $330**

Other Technical Issue Updates

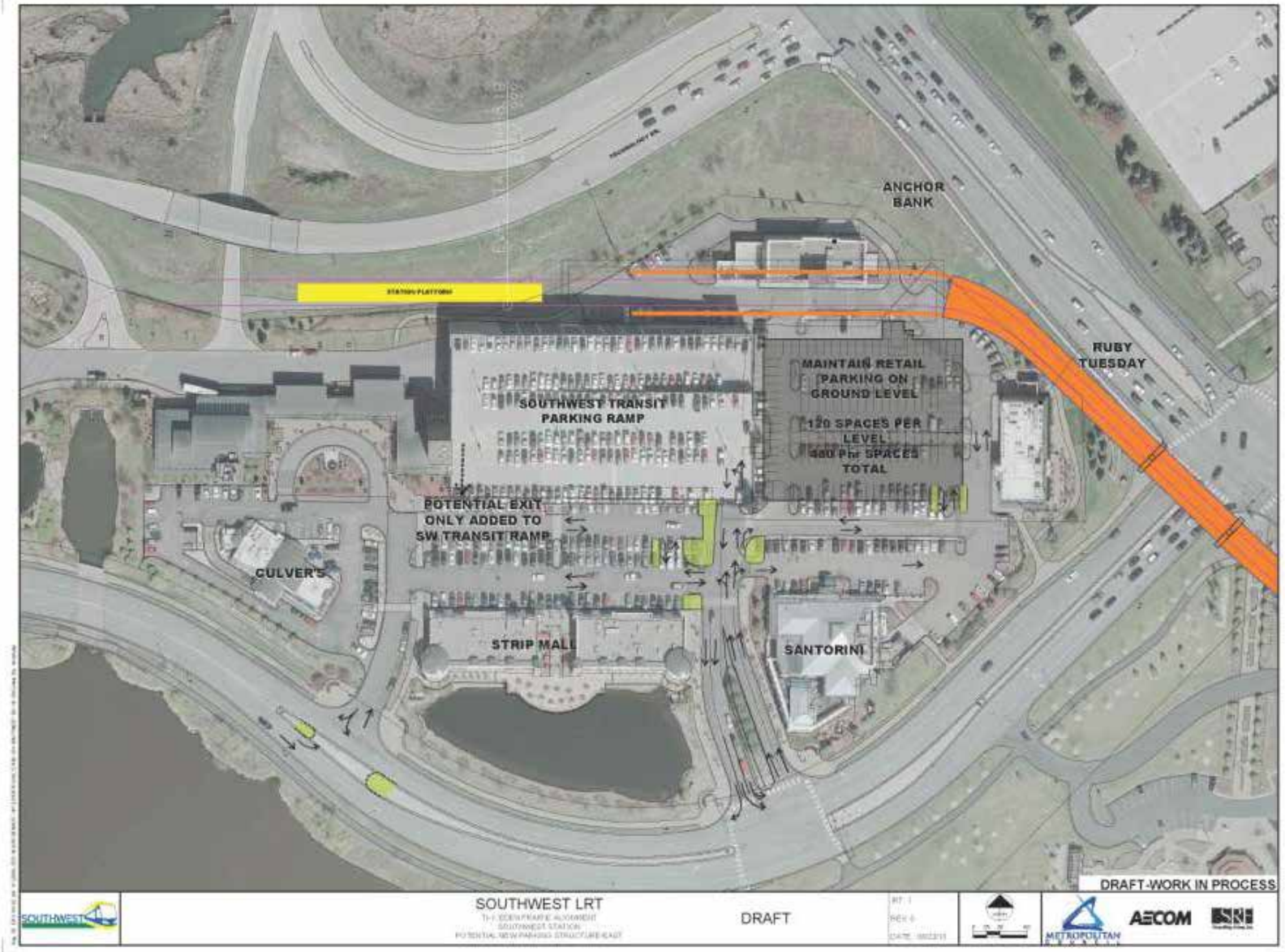
Other Technical Issue Updates

- TI #1: Eden Prairie Alignment - Southwest Station
- TI #1: Eden Prairie Alignment Run Times
- TI #7: Minnetonka/Hopkins Bridge
- TI # 13: Louisiana Station
- TI #16: Beltline Station
- TI #17: West Lake Station

TI #1: Eden Prairie Alignment Southwest Station

- Design update:
  - Build 480 stall parking structure at Southwest Station
- Benefits:
  - Recognizes Resolutions passed by the Cities of Chaska, Chanhassen, and Eden Prairie

TI #1: Eden Prairie Alignment – Design Update



TI #1: Eden Prairie Alignment: Run Times

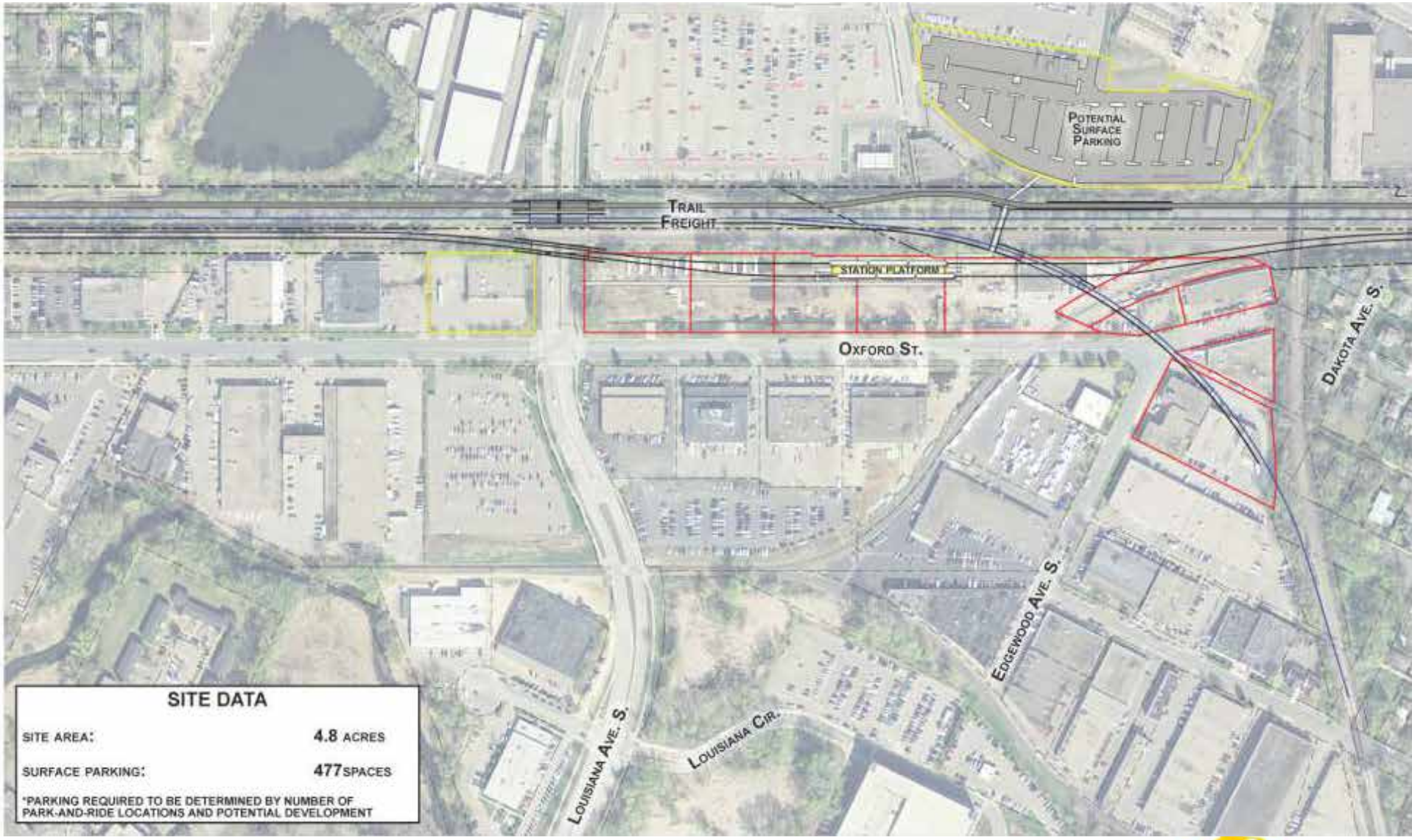
- Travel time between Mitchell Road Station and Golden Triangle Station:
  - Comp Plan/Technology Drive: 11 minutes
  - Singletree/Technology Drive: 12 minutes
  - Singletree/TH 212: 12 minutes

TI #7: Minnetonka/Hopkins Bridge

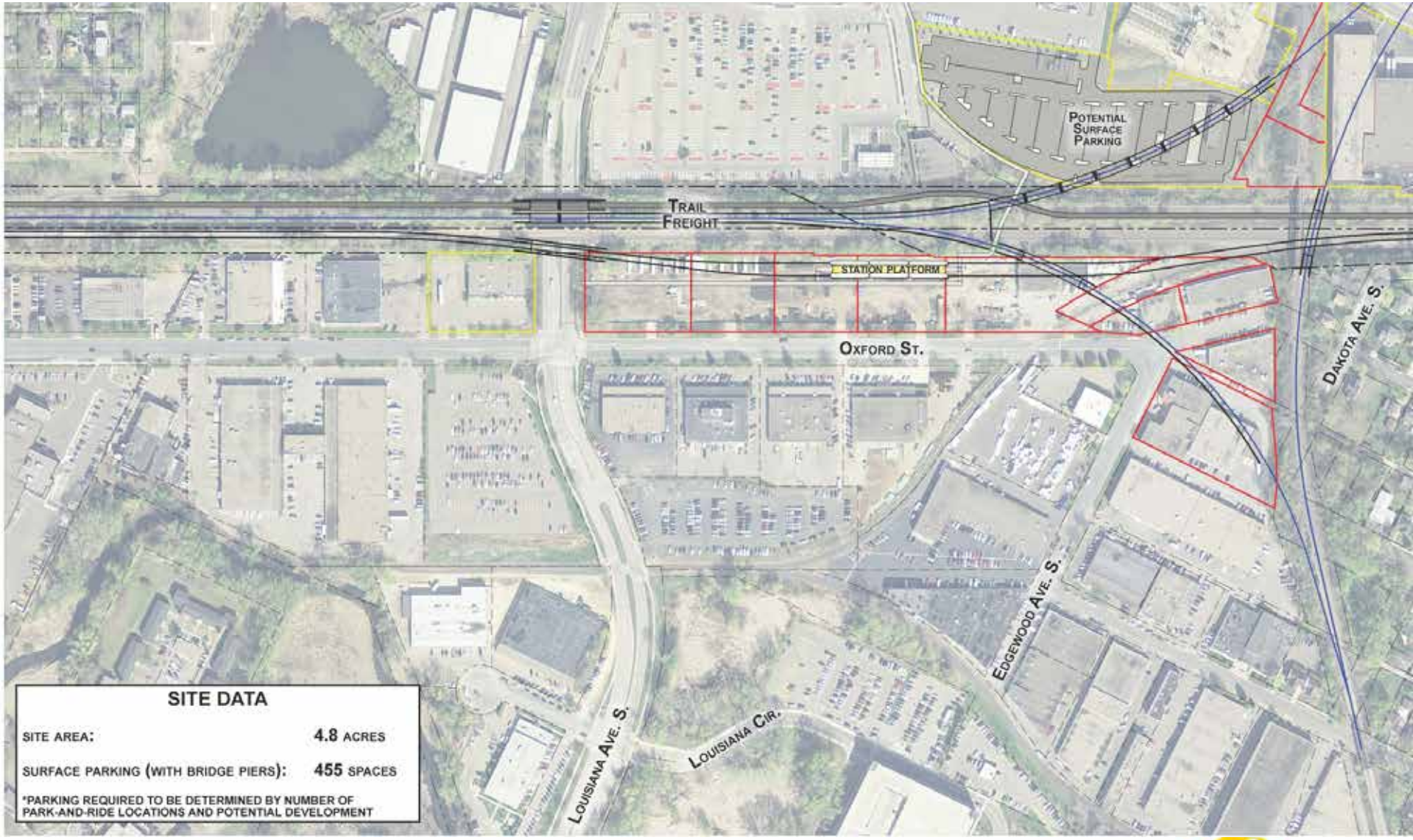
- Clarification:

  Betterment request for pedestrian/bike trail alongside or under bridge (item No. 2) requested only by City of Minnetonka

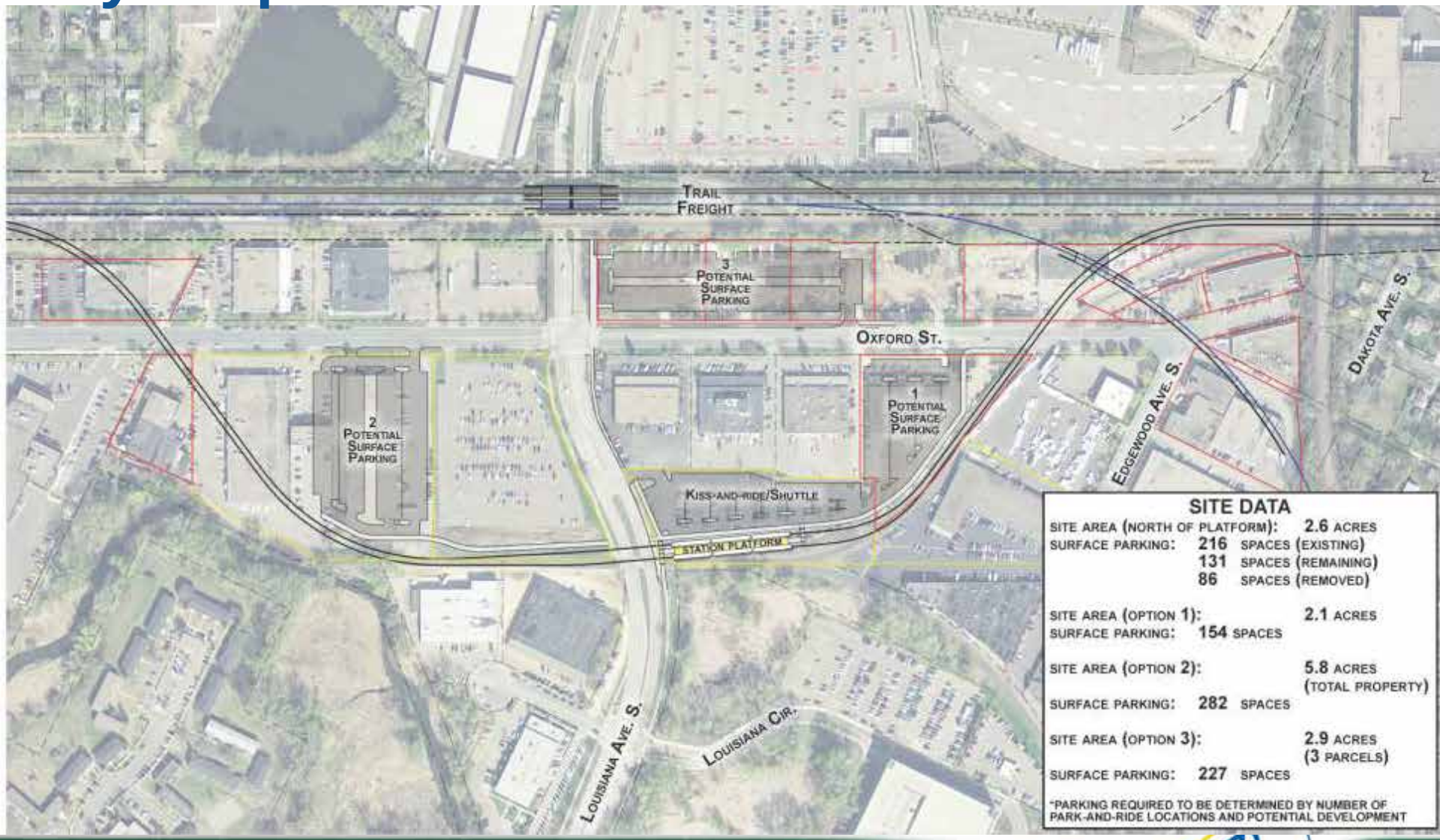
TI #13: Louisiana Station: Co-location



TI #13: Louisiana Station: Relocation

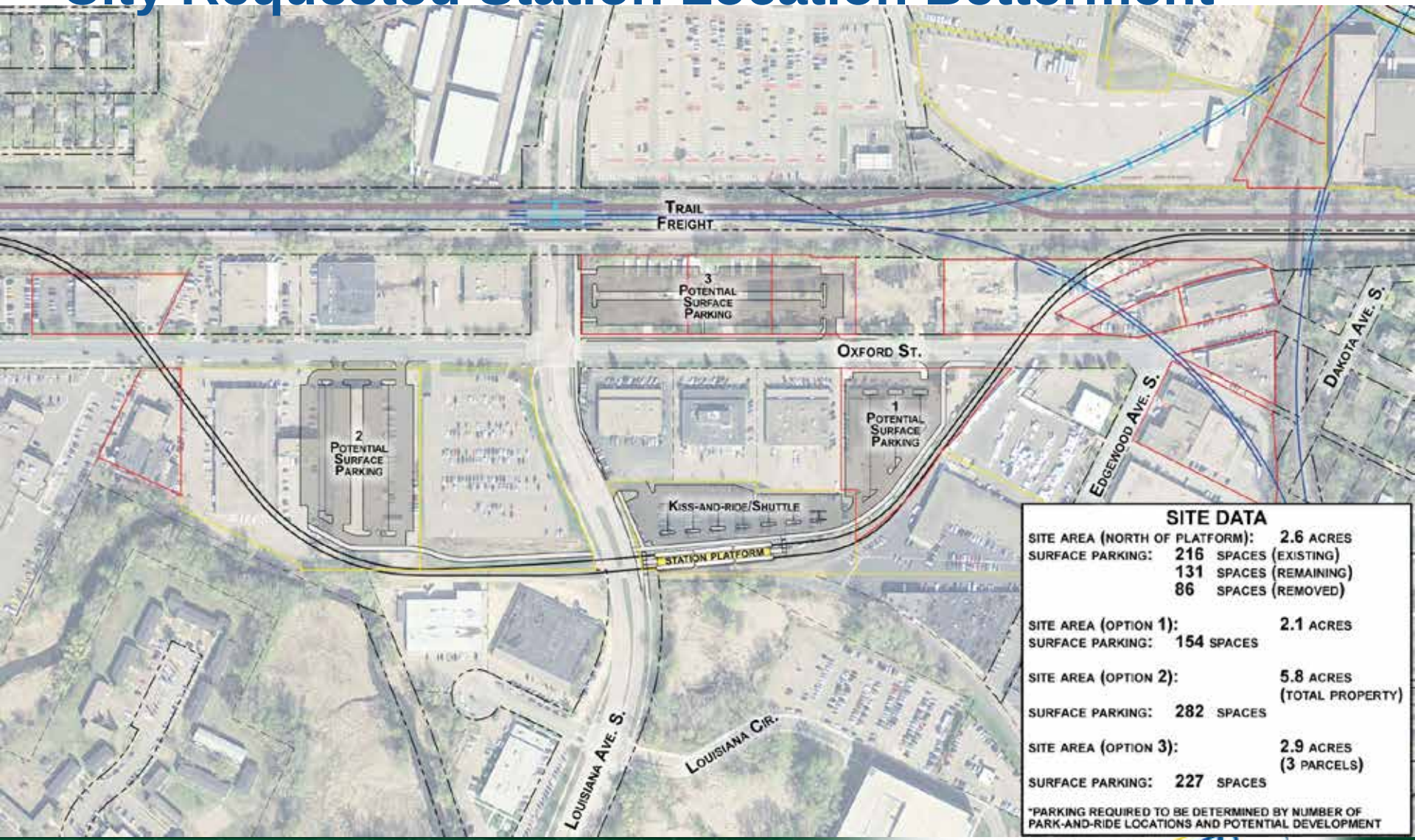


TI #13: Louisiana Station: Co-Location
City Requested Station Location Betterment



TI #13: Louisiana Station: Relocation

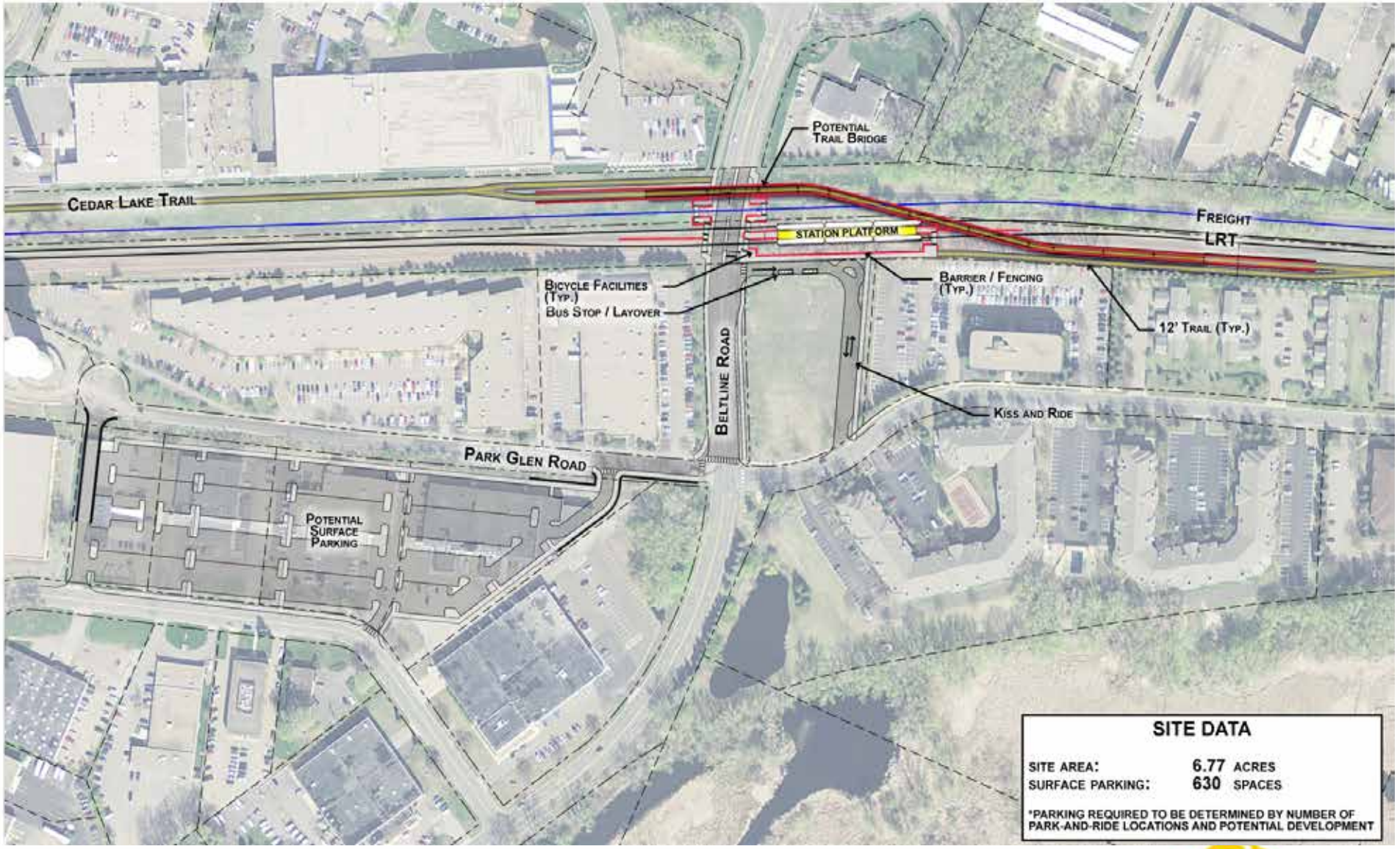
City Requested Station Location Betterment



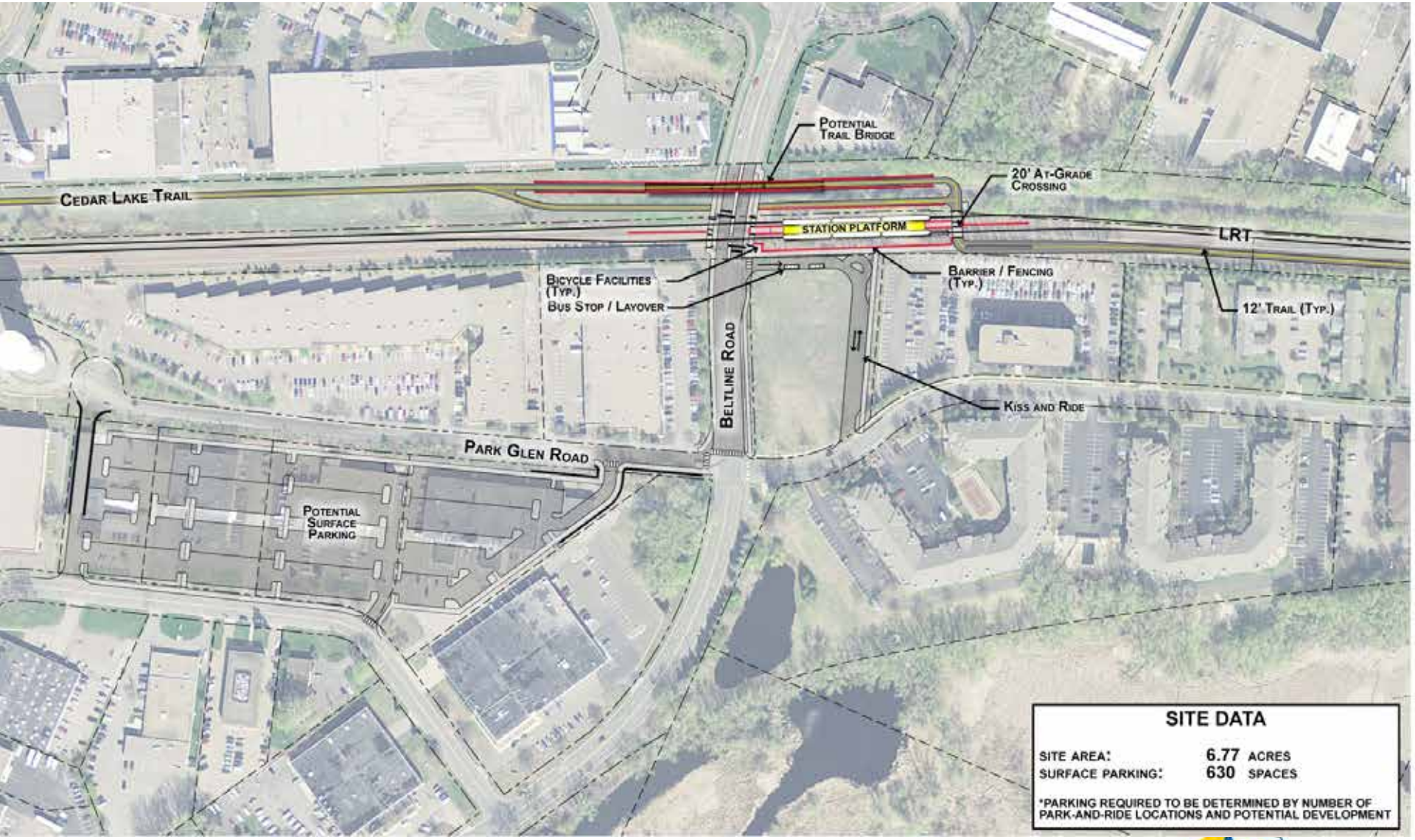
TI #16: Beltline Station

- Design update:
  - Location of freight rail tracks and LRT tracks
  - P&R: 540 surface spaces located north of station
  - Change in trail alignment; trail bridge over Beltline Road not included in cost estimate
- Benefits:
  - Accommodates future development
  - P&R location avoids prime corner redevelopment potential

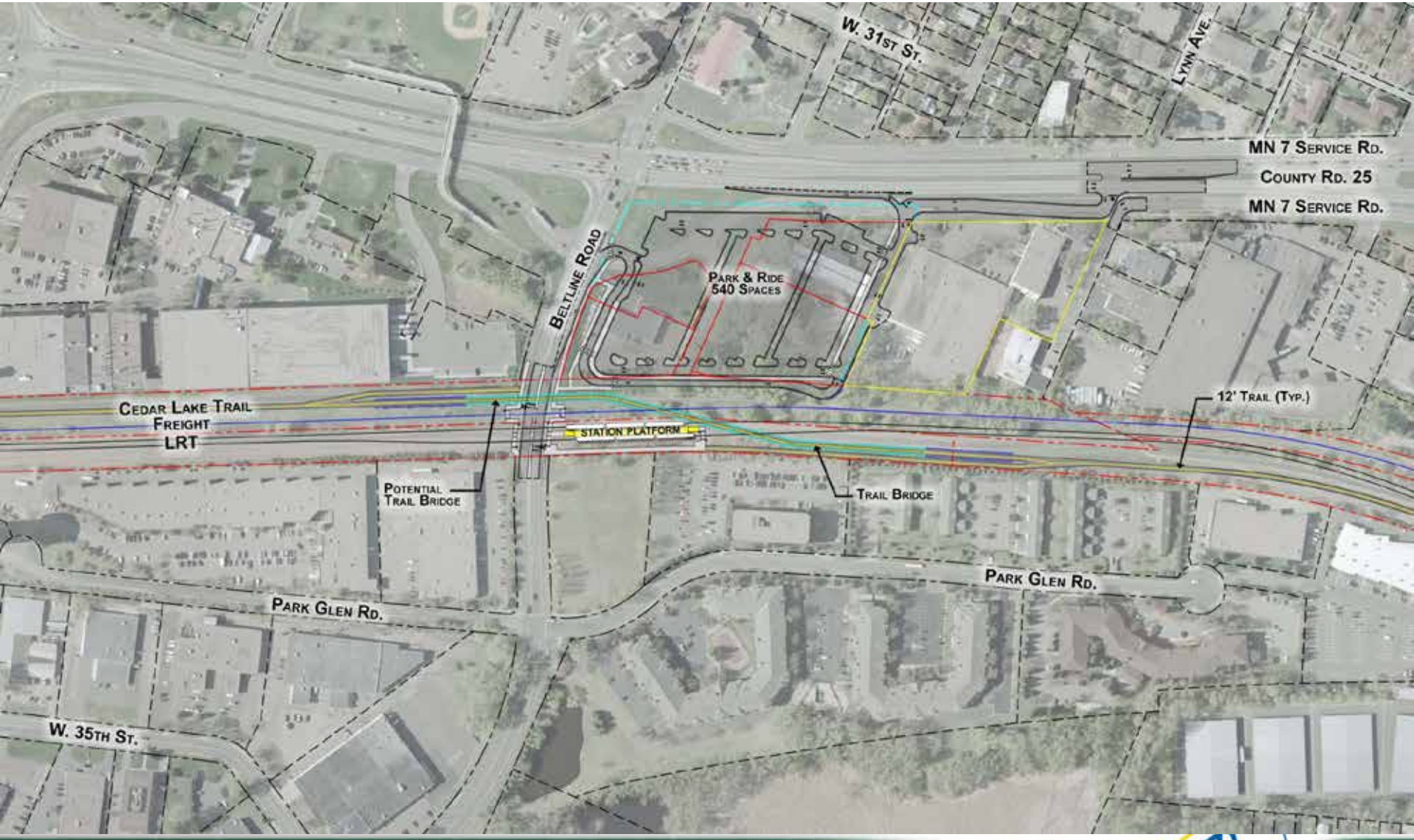
TI #16: Beltline Station: Co-location



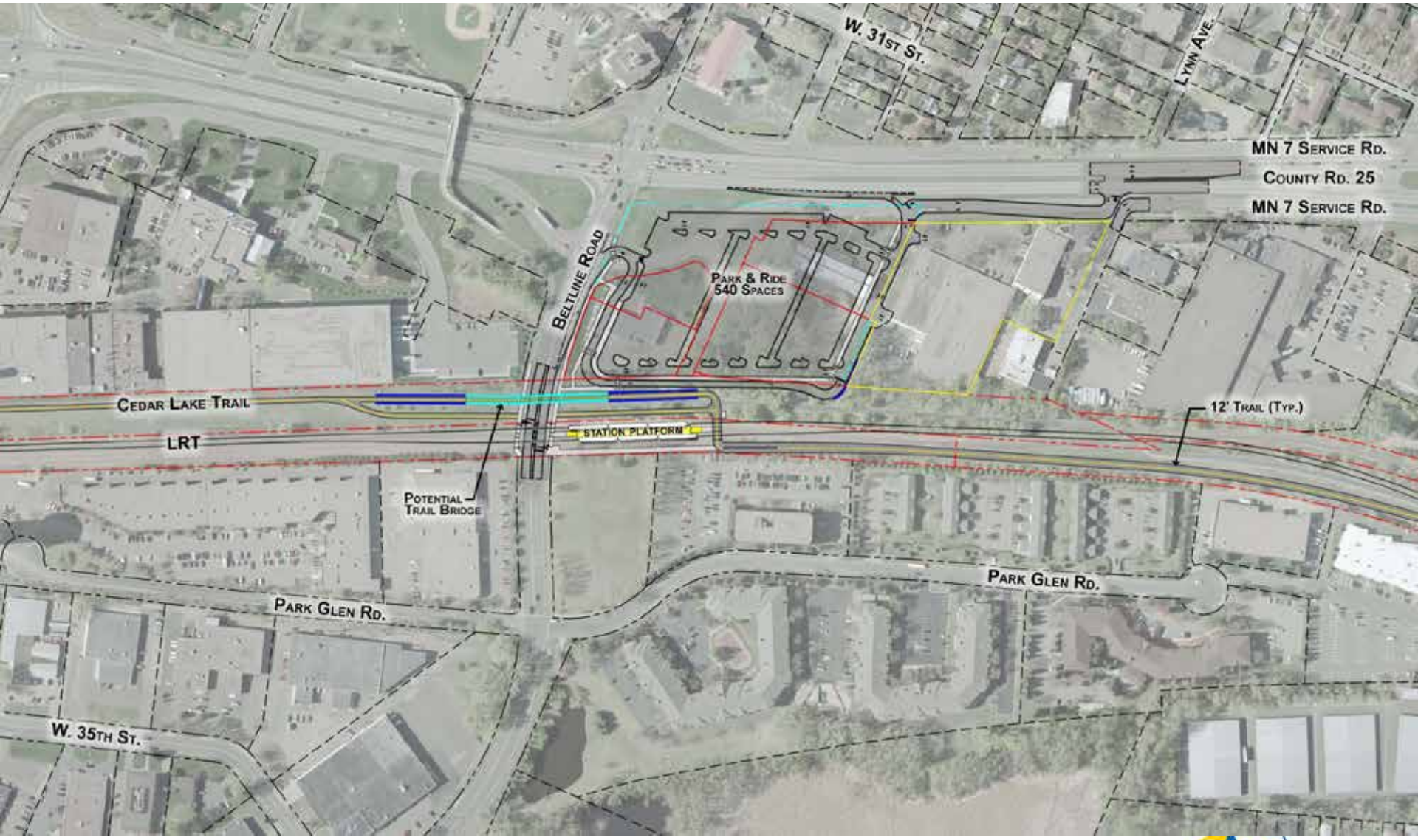
TI #16: Beltline Station: Relocation



TI #16: Beltline Station Design Update: Co-location



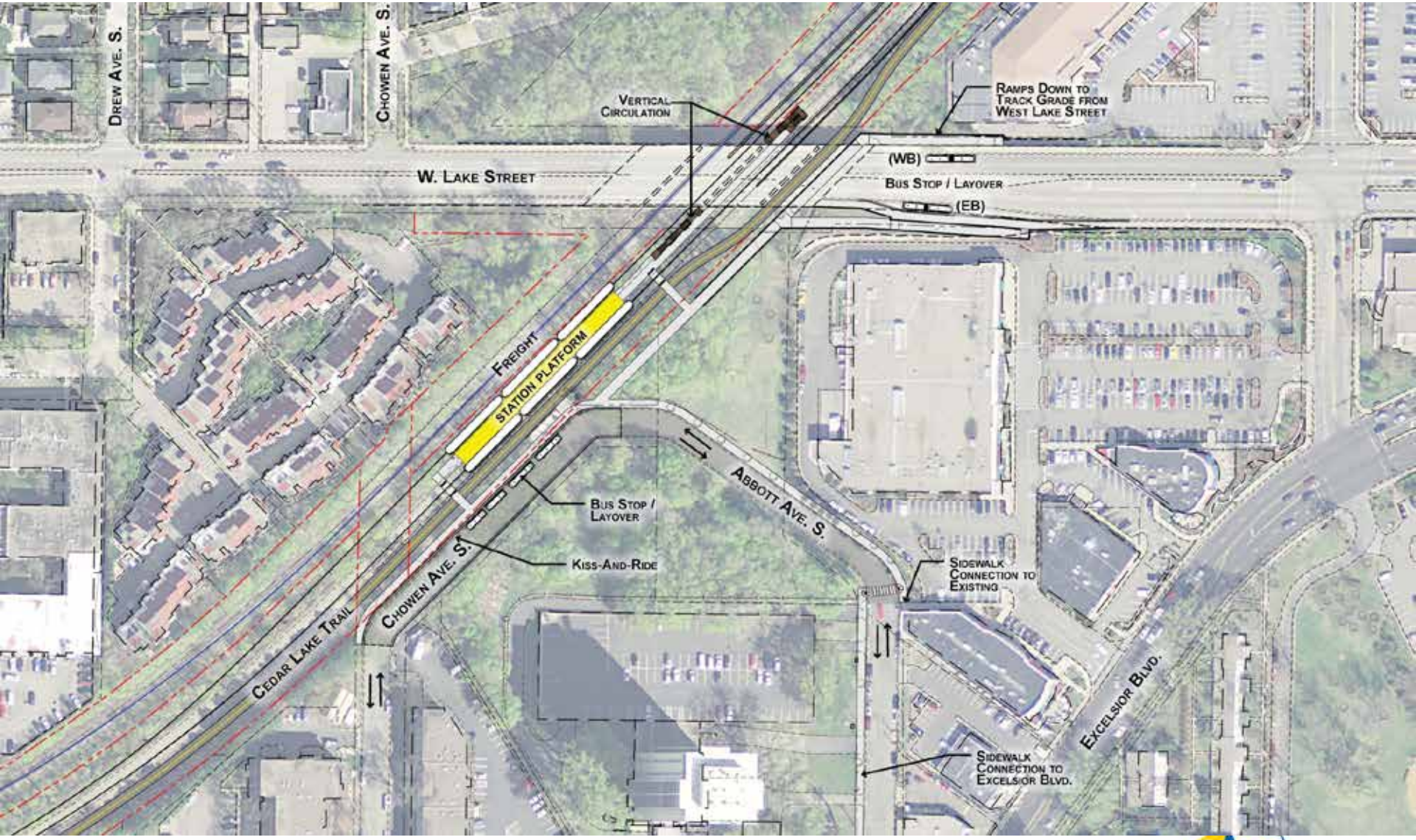
TI #16: Beltline Station Design Update: Relocation



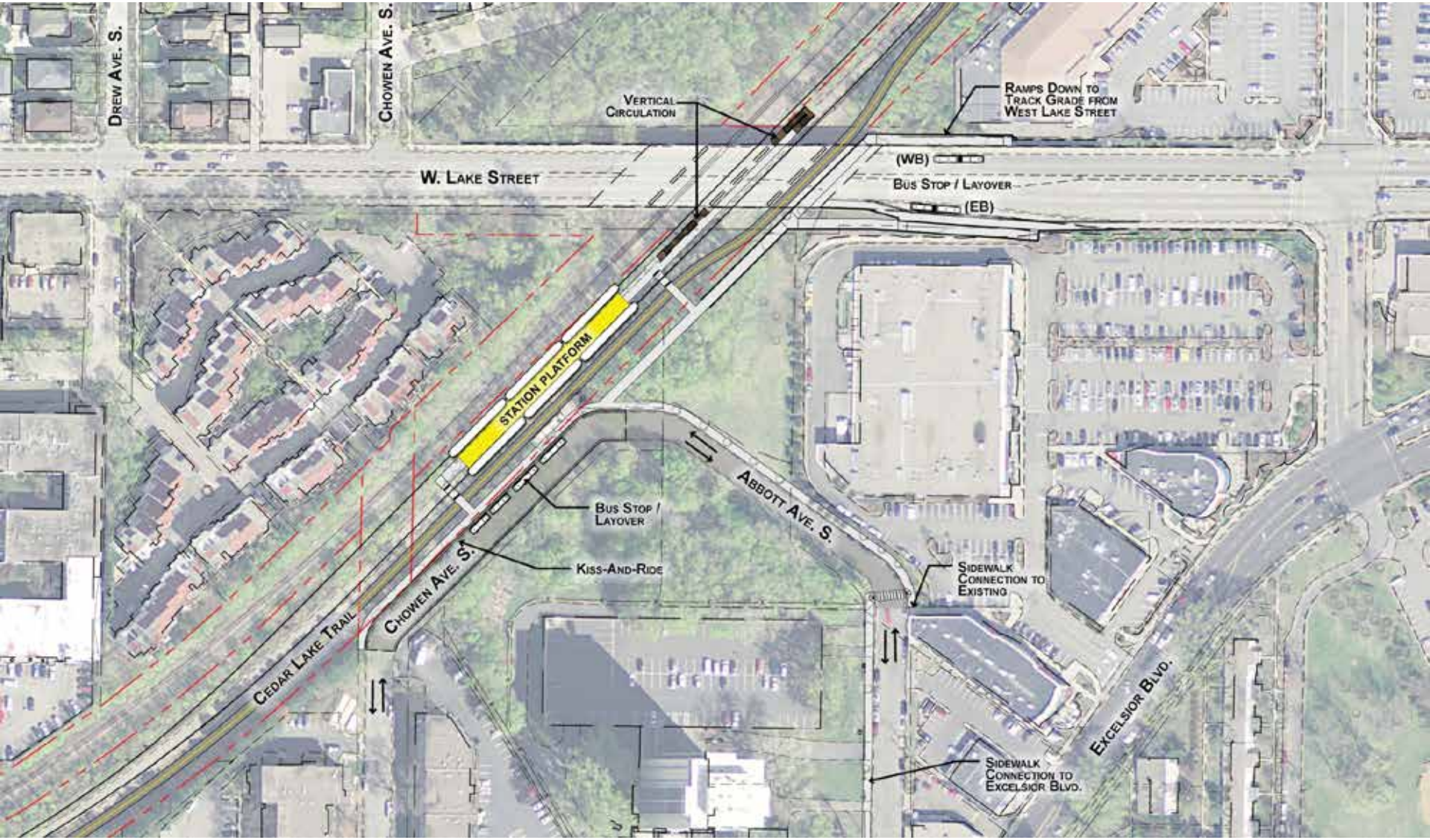
TI #17: West Lake Station

- Design update:
  - Bus connections/facilities within street network
  - Vertical connections to West Lake Street Bridge
- Benefits:
  - Provides direct pedestrian access from West Lake Street Bridge
  - Accommodates future Midtown Corridor
  - Flexible design to accommodate future development

TI #17: West Lake Station Design update: Co-location



TI #17: West Lake Station Design Update: Relocation



Schedule Update

Project Scope and Cost Rollout

- Present / seek input
  - SWLRT Corridor Management Committee – August 28

- Present draft recommended scope and cost / seek input
  - SWLRT Corridor Management Committee – September 4
  - Metropolitan Council - September 11
  - CTIB Board – September 18

- Request approval on scope and cost
  - Transportation Committee – September 23
  - Metropolitan Council – September 25

Principles for SWLRT Major Scoping Decisions

- Comply with current federal and state laws, rules, and guidelines
- Follow Regional Transitway Guidelines, regional policies and regional plans adopted by the Metropolitan Council and follow best business practices of the Council
- Follow SWLRT Design Criteria, including criteria for safety & security
- Positively impact (increase) the Federal Transit Administration (FTA) rating criteria
- Positively impact (increase) ridership
- Positively impact (increase) land use, economic development and access to affordable housing by coordinating with local station area plans

Principles for SWLRT Major Scoping Decisions (cont.)

- Positively impact (increase) equity so that community benefits and burdens are equally shared. The opportunities and challenges of growth and change are equitably shared across our communities, both geographic and cultural
- Positively impact (increase) environmental benefits
- Positively impact (increase) use of the intermodal transportation network including bus, light rail, trails and sidewalks
- Positively impact (decrease) or not impact the project schedule
- Positively impact (decrease) capital cost
- Positively impact (decrease) operating cost
- Actively engage and encourage input from interested persons and impacted communities via public involvement and established advisory committees process

A Look Ahead: Design & Engineering

- Q3 2013: Submit Municipal Consent SWLRT Plans for City and County Review
- Q4 2013: Complete Municipal Consent Approval Process
- Q1 2014: Finalize 30% Design Plans and Specs

More Information

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