Corridor Management Committee

August 28, 2013
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

<table>
<thead>
<tr>
<th>Section</th>
<th>Length in Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Transition Zone</td>
<td>300</td>
</tr>
<tr>
<td>South Shallow Tunnel</td>
<td>2,200</td>
</tr>
<tr>
<td>Daylight Section Over Channel (Includes North / South Transition Zone of 300’ respectively)</td>
<td>1,088</td>
</tr>
<tr>
<td>North Shallow Tunnel</td>
<td>2,500</td>
</tr>
<tr>
<td>North Transition Zone</td>
<td>300</td>
</tr>
</tbody>
</table>
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
  ß Working with MnDOT’s Cultural Resources Unit staff on historic channel crossing
  ß Bridge structure to match other railroad bridges in area
  ß 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
Kenilworth Shallow LRT Tunnel: Construction Sequencing – Install Sheet Pile
Kenilworth Shallow LRT Tunnel:
Construction Sequencing – Install Bracing
Kenilworth Shallow LRT Tunnel: Construction Sequencing – Install Bracing
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 3\textsuperscript{rd} party review by MCWD for groundwater hydrogeology permitting issues
- Consulted with Department of Natural Resources (DNR) and reviewed groundwater 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 Corridor
Owner: HCRRA
Operator: TC&W
## Kenilworth Deep Bore LRT Tunnel Dimensions

<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>South Transition Zone</td>
<td>500</td>
</tr>
<tr>
<td>South Cut &amp; Cover Section</td>
<td>1,000</td>
</tr>
<tr>
<td>Twin Bore Tunnels</td>
<td>5,900</td>
</tr>
<tr>
<td>North Cut &amp; Cover Section</td>
<td>550</td>
</tr>
<tr>
<td>North Transition Zone</td>
<td>500</td>
</tr>
</tbody>
</table>
Kenilworth Deep Bore LRT Tunnel: Access Pits

* The length of the West Pit is longer than the East Pit to accommodate the West Lake Station.
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

<table>
<thead>
<tr>
<th>Item</th>
<th>Kenilworth Shallow LRT Tunnel ($M)</th>
<th>Kenilworth Deep Bore LRT Tunnel ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tunnel Construction Costs ($2013)</td>
<td>$68</td>
<td>$154</td>
</tr>
<tr>
<td>Year of Expenditure (YOE) Escalation (3% per year)</td>
<td>$10</td>
<td>$23</td>
</tr>
<tr>
<td>Design Related Costs</td>
<td>$19</td>
<td>$44</td>
</tr>
<tr>
<td>Contingency (26.7% of Design and Construction Costs)</td>
<td>$26</td>
<td>$59</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>$123</strong></td>
<td><strong>$280</strong></td>
</tr>
<tr>
<td>Freight Costs (in $YOE)</td>
<td>$48</td>
<td>$48</td>
</tr>
<tr>
<td>Other Costs (in $YOE)</td>
<td>($16)</td>
<td>($8)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$150 - $160</strong></td>
<td><strong>$320 - $330</strong></td>
</tr>
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## Kenilworth Deep Bore LRT: Cost Comparison with Hiawatha LRT Tunnel

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

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**Notes:**
- **Prorate Construction for Length ($2001):** (1.7 miles HLRT vs. 1.6 miles SWLRT)
- **Inflation:** (3.2% per year per Engineering News Record)
## Kenilworth Deep Bore LRT: Cost Comparison with Hiawatha LRT Tunnel

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<td>$154</td>
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<tr>
<td>Year of Expenditure (YOE) Escalation (3% per year)</td>
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<td>$23</td>
</tr>
<tr>
<td>Design Related Costs</td>
<td>$45</td>
<td>$44</td>
</tr>
<tr>
<td>Contingency (26.7% of Design and Construction Costs)</td>
<td>$60</td>
<td>$59</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>$285</strong></td>
<td><strong>$280</strong></td>
</tr>
<tr>
<td>Freight Costs (in YOE)</td>
<td>N/A</td>
<td>$48</td>
</tr>
<tr>
<td>Other Costs (in YOE)</td>
<td>N/A</td>
<td>($8)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$285</strong></td>
<td><strong>$320 - $330</strong></td>
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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

SITE DATA

SITE AREA: 4.8 ACRES
SURFACE PARKING: 477 SPACES

*PARKING REQUIRED TO BE DETERMINED BY NUMBER OF PARK-AND-RIDE LOCATIONS AND POTENTIAL DEVELOPMENT
TI #13: Louisiana Station: Relocation

SITE DATA

SITE AREA: 4.8 ACRES

SURFACE PARKING (WITH BRIDGE PIERS): 455 SPACES

*PARKING REQUIRED TO BE DETERMINED BY NUMBER OF PARK-AND-RIDE LOCATIONS AND POTENTIAL DEVELOPMENT
TI #13: Louisiana Station: Co-Location
City Requested Station Location Betterment
TI #13: Louisiana Station: Relocation
City Requested Station Location Betterment

<table>
<thead>
<tr>
<th>SITE DATA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SITE AREA (NORTH OF PLATFORM):</td>
<td>2.6 ACRES</td>
</tr>
<tr>
<td>SURFACE PARKING:</td>
<td>216 SPACES (EXISTING)</td>
</tr>
<tr>
<td></td>
<td>131 SPACES (REMAINING)</td>
</tr>
<tr>
<td></td>
<td>86 SPACES (REMOVED)</td>
</tr>
<tr>
<td>SITE AREA (OPTION 1):</td>
<td>2.1 ACRES</td>
</tr>
<tr>
<td>SURFACE PARKING:</td>
<td>154 SPACES</td>
</tr>
<tr>
<td>SITE AREA (OPTION 2):</td>
<td>5.8 ACRES</td>
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<tr>
<td>SURFACE PARKING:</td>
<td>282 SPACES</td>
</tr>
<tr>
<td>SITE AREA (OPTION 3):</td>
<td>2.9 ACRES</td>
</tr>
<tr>
<td>SURFACE PARKING:</td>
<td>227 SPACES</td>
</tr>
</tbody>
</table>

"PARKING REQUIRED TO BE DETERMINED BY NUMBER OF PARK-AND-RIDE LOCATIONS AND POTENTIAL DEVELOPMENT"
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

SITE DATA
SITE AREA: 6.77 ACRES
SURFACE PARKING: 630 SPACES

*PARKING REQUIRED TO BE DETERMINED BY NUMBER OF PARK-AND-RIDE LOCATIONS AND POTENTIAL DEVELOPMENT
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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