Johnson Trolley Missing Link
Feasibility Study
Public Information Center

May 28, 2014
Agenda

• Introductions
• Background
• Existing Conditions and Constraints
• Proposed Alternatives
• Evaluation Criteria
• Next Steps
Existing Conditions and Constraints

- Multiple jurisdictions
- Right-of-way
- Utilities
  - Street level power lines
  - Communication equipment
  - High tension power lines
  - Underground water line
  - Wetlands
Proposed Alternatives

Existing Condition

Missing Link Alternatives

- Non-Structural Alternative
  - No Bridge/West Long Drive
- Existing Alignment
- Offset Alignment
  - 2 Alternative Designs
Existing Condition:
U.S. Route 206 - Eggert Crossing Road
Existing Condition:
U.S. Route 206 - Eggert Crossing Road
Existing Condition:
U.S. Route 206 - Eggert Crossing Road

2.4 mi
Existing Condition:
U.S. Route 206 - Eggert Crossing Road
Option 1: Non-Structural Alternative
West Long Drive to Existing Rail Bed
Option 1: Non-Structural Alternative
West Long Drive to Existing Rail Bed

1.63 mi
Option 1: Non-Structural Alternative
West Long Drive to Existing Rail Bed

1.63 mi

0.43 mi
Option 1: Bicycle Compatibility

- Higher Speed
- Conflicts with Ramp Traffic
- 4 Lanes

- 35 mph
- Sufficient Width for Shared-Lane

- Low Volume, Low Speed Residential Street
Option 1: Pedestrian Accommodations

US 206:
- Continuous sidewalk
- Ped crossings at interchange
Option 1: Non-Structural Alternative
West Long Drive to Existing Rail Bed

Strengths

• Extends off-road portion of trail system
• Utilizes low volume roadway for new section
• Improves trail approach for potential future bridge improvements

Weaknesses

• Circuitous route – increases total trip distance by 0.2 miles
• Inadequate bicycle and pedestrian accommodations
• Does not resolve exposure to U.S. 206 traffic
• Requires 2 small structures

Cost

<table>
<thead>
<tr>
<th>Structural</th>
<th>Trail / Grading</th>
<th>Utility Impacts</th>
<th>Mobilization, Contingencies, &amp; Construction Engineering</th>
<th>Other*</th>
<th>Total** (incl. escalation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$174,000</td>
<td>$535,000</td>
<td>$0</td>
<td>$421,000</td>
<td>$134,000</td>
<td>$1,264,000</td>
</tr>
</tbody>
</table>

*Other includes: MPT, construction layout, clearing site, etc
**Includes escalation (2 years, 2.0% per year)
Trail Cross Section

Edge of shared-use path

Safety railing

42 in min

1 ft min

5 ft

10 ft

2 ft

Less than 5 ft (for rail)

1 ft min

Safety railing

42 in min

Drop is 4 ft or more

(1V:2H) or steeper

Johnson Trolley Missing Link Feasibility Study
Option 2: Existing Alignment
Straight Line Ramps
Option 2: Existing Alignment
Straight Line Ramps

**Strengths**
- Reduces total trip distance by 1.0 mile
- Simple structural design
- Shortest path

**Weaknesses**
- Significant utility impacts both north and south of I-95
- Extends construction timeline, increases required utility coordination

**Cost**

|                          | Structural | $   | (%) | Trail / Grading | $   | (%) | Utility Impacts | $   | (%) | Mobilization, Contingencies, & Construction Engineering | $   | (%) | Other* | $   | (%) | Total** (incl. escalation) | $   |
|--------------------------|------------|------|-----|-----------------|------|-----|----------------|------|-----|------------------------------------------------------|------|-----|-----------------------------|------|
|                          | $2,917,000 | (36%)|     | $539,000        | (7%) |     | $1,240,000     | (15%)|     | $2,635,000                                           | (32%)|     | $778,000                    | (10%)|
|                          |            |      |     |                 |      |     |                |      |     |                                                      |      |     | $8,109,000                  |      |

*Other includes: MPT, construction layout, clearing site, etc
**Includes escalation (2 years, 2.0% per year)
Existing Alignment – Switchback Ramps
Existing Alignment – Hybrid
Example Bridge Design

Source: Google Street View
Example Bridge Design
Example Bridge Design

Source: panoramio.com
Option 3: Offset Alignment
Straight Ramps
Option 3: Offset Alignment
Straight Ramps

Strengths
• Reduces total trip distance by 0.9 mile
• Simple structural design
• Reduced utility impacts

Weaknesses
• Larger footprint in I-95 ROW
• Requires at-grade crossing of Denow Road

Cost

<table>
<thead>
<tr>
<th>Structural</th>
<th>Trail / Grading</th>
<th>Utility Impacts</th>
<th>Mobilization, Contingencies, &amp; Construction Engineering</th>
<th>Other*</th>
<th>Total** (incl. escalation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2,778,000</td>
<td>$797,000</td>
<td>$370,000</td>
<td>$2,268,000</td>
<td>$677,000</td>
<td>$6,890,000</td>
</tr>
</tbody>
</table>

*Other includes: MPT, construction layout, clearing site, etc
**Includes escalation (2 years, 2.0% per year)
Option 4: Offset Alignment
Switchback Ramps
### Option 4: Offset Alignment

**Switchback Ramps**

#### Strengths
- Reduces total trip distance by 0.9 mile
- Switchbacks reduce footprint
- Mitigate utility conflicts

#### Weaknesses
- Slightly increased complexity due to switchbacks
- Potential conflict between ramp structure and utilities clear zone
- Requires at-grade crossing of Denow Road

#### Cost

<table>
<thead>
<tr>
<th>Structural</th>
<th>$2,718,000 (41%)</th>
<th>Trail / Grading</th>
<th>$791,000 (12%)</th>
<th>Utility Impacts</th>
<th>$280,000 (4%)</th>
<th>Mobilization, Contingencies, &amp; Construction Engineering</th>
<th>$2,190,000 (33%)</th>
<th>Other*</th>
<th>$656,000 (10%)</th>
<th>Total** (incl. escalation)</th>
<th>$6,635,000</th>
</tr>
</thead>
</table>

*Other includes: MPT, construction layout, clearing site, etc
**Includes escalation (2 years, 2.0% per year)
## Alternatives Comparison

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Structural</th>
<th>Trail / Grading</th>
<th>Utility Impacts</th>
<th>Mobilization, Contingencies, &amp; Construction Engineering</th>
<th>Other*</th>
<th>Total** (incl. escalation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1: Non-Structural</td>
<td>$174,000</td>
<td>$535,000</td>
<td>$0</td>
<td>$421,000</td>
<td>$134,000</td>
<td>$1,264,000</td>
</tr>
<tr>
<td>Option 2: Existing Alignment</td>
<td>$2,917,000</td>
<td>$539,000</td>
<td>$1,240,000</td>
<td>$2,635,000</td>
<td>$778,000</td>
<td>$8,109,000</td>
</tr>
<tr>
<td>Option 3: Offset U</td>
<td>$2,778,000</td>
<td>$797,000</td>
<td>$370,000</td>
<td>$2,268,000</td>
<td>$677,000</td>
<td>$6,890,000</td>
</tr>
<tr>
<td>Option 4: Offset Switchbacks</td>
<td>$2,718,000</td>
<td>$791,000</td>
<td>$280,000</td>
<td>$2,190,000</td>
<td>$656,000</td>
<td>$6,635,000</td>
</tr>
</tbody>
</table>

*Other includes: MPT, construction layout, clearing site, etc
**Includes escalation (2 years, 2.0% per year)
## Alternatives Comparison

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Structural</th>
<th>Trail / Grading</th>
<th>Utility Impacts</th>
<th>Mobilization, Contingencies, &amp; Construction Engineering</th>
<th>Other*</th>
<th>Total**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1: Non-Structural</td>
<td>14%</td>
<td>42%</td>
<td>0%</td>
<td>33%</td>
<td>11%</td>
<td>100%</td>
</tr>
<tr>
<td>Option 2: Existing Alignment</td>
<td>36%</td>
<td>7%</td>
<td>15%</td>
<td>32%</td>
<td>10%</td>
<td>100%</td>
</tr>
<tr>
<td>Option 3: Offset U</td>
<td>40%</td>
<td>12%</td>
<td>5%</td>
<td>33%</td>
<td>10%</td>
<td>100%</td>
</tr>
<tr>
<td>Option 4: Offset Switchbacks</td>
<td>41%</td>
<td>12%</td>
<td>4%</td>
<td>33%</td>
<td>10%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Other includes: MPT, construction layout, clearing site, etc
**Includes escalation (2 years, 2.0% per year)
## Alternatives Comparison

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Structural</th>
<th>Trail / Grading</th>
<th>Utility Impacts</th>
<th>Mobilization, Contingencies, &amp; Construction Engineering</th>
<th>Other*</th>
<th>Total** (incl. escalation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1: Non-Structural</td>
<td>$174,000</td>
<td>$535,000</td>
<td>$0</td>
<td>$421,000</td>
<td>$134,000</td>
<td>$1,264,000</td>
</tr>
<tr>
<td>Option 2: Existing Alignment</td>
<td>$2,917,000</td>
<td>$539,000</td>
<td>$1,240,000</td>
<td>$2,635,000</td>
<td>$778,000</td>
<td>$8,109,000</td>
</tr>
<tr>
<td>Option 3: Offset U</td>
<td>$2,778,000</td>
<td>$797,000</td>
<td>$370,000</td>
<td>$2,268,000</td>
<td>$677,000</td>
<td>$6,890,000</td>
</tr>
<tr>
<td>Option 4: Offset Switchbacks</td>
<td>$2,718,000</td>
<td>$791,000</td>
<td>$280,000</td>
<td>$2,190,000</td>
<td>$656,000</td>
<td>$6,635,000</td>
</tr>
</tbody>
</table>

*Other includes: MPT, construction layout, clearing site, etc

**Includes escalation (2 years, 2.0% per year)
Evaluation Criteria

- Integration with *The Circuit*
- Safety of bicycle/pedestrian users
- Construction cost
- Constructability
  - Traffic impacts
  - Utility relocations
  - Construction staging
- Maintenance/operating cost
- Good neighbor
Next Steps

• Deliver Technical Memoranda
• Public Meeting
• Final Report
• Future Connections