Cost Effective Asset Management - Pedestrian Bridge Case Studies
Seattle’s Roadway Structures

- Bridges: 124
- Retaining walls: 613
- Stairways: 502
- Areaways: 238
Levy Bridge Seismic Retrofit Program

- Guided by our SDOT Seismic Retrofit policy guidelines
- Started with 16 bridges in 2016
- CDR phase indicated higher costs than anticipated
- Levy Oversight Committee briefed on reducing the number of projects in December 2020
- Current deliverable is retrofit of 11 bridges
  - Complete/In construction (4): Cowen Park Bridge, West Howe St Bridge, SW Andover Pedestrian Bridge, 8th Ave/133rd Bridge
  - In Design (7): McGraw St Bridge, Admiral Way N & S Bridges, 15th Ave NE/105th St Bridge, 15th Ave NW/Leary Way Bridge, Delridge Pedestrian Bridge and Aurora/N 41st St Pedestrian Bridge
Aurora/N 41st Street Pedestrian Bridge

- Original Scope for Seismic Retrofit:
  - carbon fiber wrapping the bridge girders
  - replacing the steel plates and bolts that connect the drop in span into the stairway approaches
  - integrating the footings

- Cost Estimate: $2.75M
Delridge Pedestrian Bridge

• Original Scope for Seismic Retrofit:
  • Abutment modifications
  • Reinforcement at the tops of columns
  • Jacketing specific columns
  • Widening spread footings
  • Superstructural slab modifications and torsional bracing

• Cost Estimate: $4M-$4.5M and ongoing maintenance costs
Grade Separation Considerations

- Traffic volume on the road that needs to be crossed
- Vehicular speeds
- Pedestrian generators and attractors that the crossing connects
- Crash history
- Adjacent land use
- Pedestrian volumes crossing the roadway
- Construction and maintenance costs
Aurora/N 41st Street Pedestrian Bridge

• 6 travel lanes + median
• 58,000 vehicles per day along Aurora at 40 MPH
• 515+ people cross the bridge/day
• 6 crashes; no pedestrian or fatal collision in a 4-block radius in 3 years (in contrast to patterns of crashes along most of Aurora)
• Closest crosswalk 5 blocks north
Delridge Pedestrian Bridge at Youngstown

- 5 travel lanes
- 20,000 vehicles per day pass under along Delridge at 25 MPH
- 50+ people cross the bridge/day
- 80+ people cross at grade/day
- No reported collisions in a 4-block radius in 3 years
- Alternative to using bridge is the ADA-compliant signalized crossing (75 feet away)
## Analysis

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>AURORA/41st ST PED BRIDGE</th>
<th>DELRIDGE PED BRIDGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian counts on bridge</td>
<td>500 people/day</td>
<td>53 people/day</td>
</tr>
<tr>
<td>Pedestrian counts at grade</td>
<td>0 people/day</td>
<td>84 people/day</td>
</tr>
<tr>
<td>Vehicle counts under bridge</td>
<td>58,000 vehicles/day</td>
<td>20,000 vehicles/day</td>
</tr>
<tr>
<td>3-year Collision History (within 4 block radius)</td>
<td>6 crashes</td>
<td>None reported</td>
</tr>
<tr>
<td>Speed limit</td>
<td>40 MPH</td>
<td>25 MPH</td>
</tr>
<tr>
<td>Adjacent Land Use</td>
<td>commercial street; school within 2 blocks</td>
<td>single and multi-family homes, organizations, and open space</td>
</tr>
<tr>
<td>Most cost-effective approach</td>
<td>Investment in Retrofit</td>
<td>No investment in retrofit</td>
</tr>
</tbody>
</table>
Next Steps on Aurora/N 41st Ped Bridge

- Complete seismic retrofit design in 2022
- Initiate construction with Levy funds in 2023
- Public engagement process would inform community members prior to construction about retrofit process, timing, and pedestrian detour routes
- People driving and taking transit on Aurora Ave N would be informed of any construction-related traffic impacts
- SDOT would continue longer-term planning for an at-grade crossing here to understand operations, costs, and potential funding sources.
Next Steps on Delridge Pedestrian Bridge

• Seismic retrofit design started in 2021
• Design choices that require infill of ramps/abutments, column and deck changes that alter the original design
• Identify construction timing with respect to community disruption (9-12 month duration)
Next Steps on Delridge Pedestrian Bridge

Assess ability to remove the bridge with crossing and other site improvements in order to achieve Levy goal of seismic safety for a low-use facility

• The Delridge - RapidRide H Line project installed pedestrian improvements in the area, including a new crosswalk, signal improvements, new RapidRide stations, and sidewalks

• The crosswalk is ADA compliant and available to all users, the bridge would still be non-compliant after retrofit

• Costs savings with demolition = ~$3 million; can be put towards installing a community-requested cross walk, upgrading the signal and adding art with the Office of Arts and Culture
Delridge Community Engagement

Delridge Neighborhood Development Association
• Expressed preference for retrofit
• Pedestrian bridge serves as neighborhood gateway; interest in beautifying bridge if retrofitted

Seattle Parks & Recreation; Delridge Community Center
• Mixed feedback; at grade crossing is more accessible for people walking, but bridge offers an alternative crossing on a busy street

Community surveys, emails, in-person comments
• 63% of survey respondents want the bridge to be retrofitted
• 96% of respondents from Cooper School Artist Lofts/Youngstown prefer retrofit
• People not wanting to see more changes to the neighborhood
Next Steps

**Delridge Ped Bridge**
- Engagement with adjacent property owners and community
- Design and scope removal and crosswalk projects
- Refine cost estimates
- Explore gateway treatments and public art options
- Identify other investment opportunities

**Aurora/N 41st St Ped Bridge**
- Complete design in 2022
- Construction to begin spring 2023
Thank you.