WASHINGTON WAY BRIDGE REPLACEMENT PROJECT

City Council
Historic Preservation Commission
Parks and Recreation Advisory Board
Joint Workshop
July 30, 2013

WASHINGTON WAY BRIDGE REPLACEMENT

PROJECT TEAM

- **OBEC Consulting Engineers** – Project Management, bridge & roadway design
- **Kittelson and Associates** – Traffic analysis
- **Artifacts Consulting** – Historic permitting
- **GreenWorks** – Architectural design
- **Gibbs & Olson** – Stormwater design and survey
- **GRI** – Geotechnical design
- **Ecological Land Services** – Environmental permitting

PRESENTATION OVERVIEW

- Project background
- Open House #1
- Traffic Analysis
- Preferred Design Option
- Other Items for Consideration
- Estimated Cost

PROJECT BACKGROUND

Aerial view of the project site

WASHINGTON WAY BRIDGE REPLACEMENT

PROJECT BACKGROUND AND FUNDING

- Washington Way Bridge requires continual maintenance and replacement of structural members.
- City received Federal Highway Bridge Program (HBP) grant in November 2012.
- Total bridge replacement funding = $5,308,000
- HBP grant at 80%
  - $4,246,000
- City local match at 20%
  - $1,062,000
- One-time funding increase available, subject to WSDOT review and approval.

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WASHINGTON WAY BRIDGE REPLACEMENT

PROJECT TIMELINE

- Start bridge design – April 2013
- Public outreach
  - 1st open house: June 20, 2013
    - Present bridge design options
  - Joint workshop: July 30, 2013
    - Present preferred bridge design concepts
  - 2nd open house: August 21, 2013
    - Present preferred bridge design
- Complete environmental process – December 2013
- Complete final bridge design – May 2014
- Start construction – July 2014
- Complete construction – September 2015

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WASHINGTON WAY BRIDGE REPLACEMENT

PROJECT APPROVAL TIMELINE

- **Joint workshop, July 2013**
  Provide input and direction to staff on preferred bridge elements.
- **Parks and Recreation Advisory Board, September 2013**
  Approve de-minimus concurrence on impacts to the Lake Sacajawea and Cloney parks.
- **Historic Preservation Commission, September 2013**
  Approve Certificate of Appropriateness.
- **City Council, October 2013**
  Final project design approval
- **WSDOT review, March 2014**
  Final project review

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HISTORIC PHOTOS OF BRIDGE AREA

Historic photos of Sacajawea Park

1940s view looking north toward the east bridge approach with the Longview Community Church in the background.

Image courtesy of the Longview Public Library.

1925-1935 view looking north towards the bridge with the Longview Community Church in the background.

Image courtesy of the Longview Public Library.

1920s view showing the future bridge site prior to bridge construction. View looking west across the lake.

Image from the City of Longview Maintenance Binder, Image 50.

1925 view of the first bridge built between 1923 and June of 1925. Similar in design to the 1935 bridge, this one was five feet narrower than the 1935 replacement

Image from the City of Longview Maintenance Binder, Image 49.

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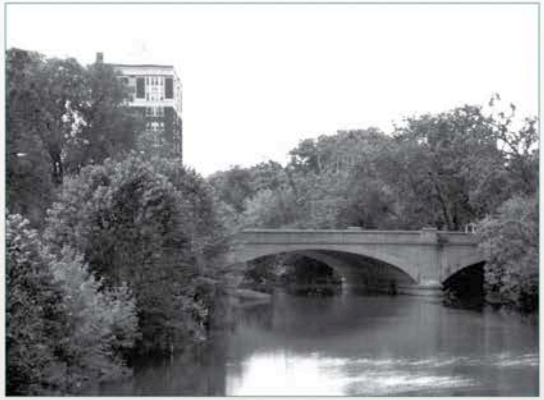
WASHINGTON WAY BRIDGE REPLACEMENT

EXAMPLES OF BRIDGES IN OTHER PARKS

Indianapolis Park System, concrete arch bridge. Courtesy of the National Park Service.



Indianapolis Park System, Delaware Street Bridge. Courtesy of the National Park Service.

Mill Creek Viaduct, 1932. Courtesy of the Kansas City Public Library.

Indianapolis Park System, Martin Luther King Jr. Bridge. Courtesy of the National Park Service.

Indianapolis Park System, New York Street Bridge. Courtesy of the National Park Service.

Seventy-seventh Street Bridge, 1935, the Paseo Parkway. Courtesy of the Kansas City Public Library.

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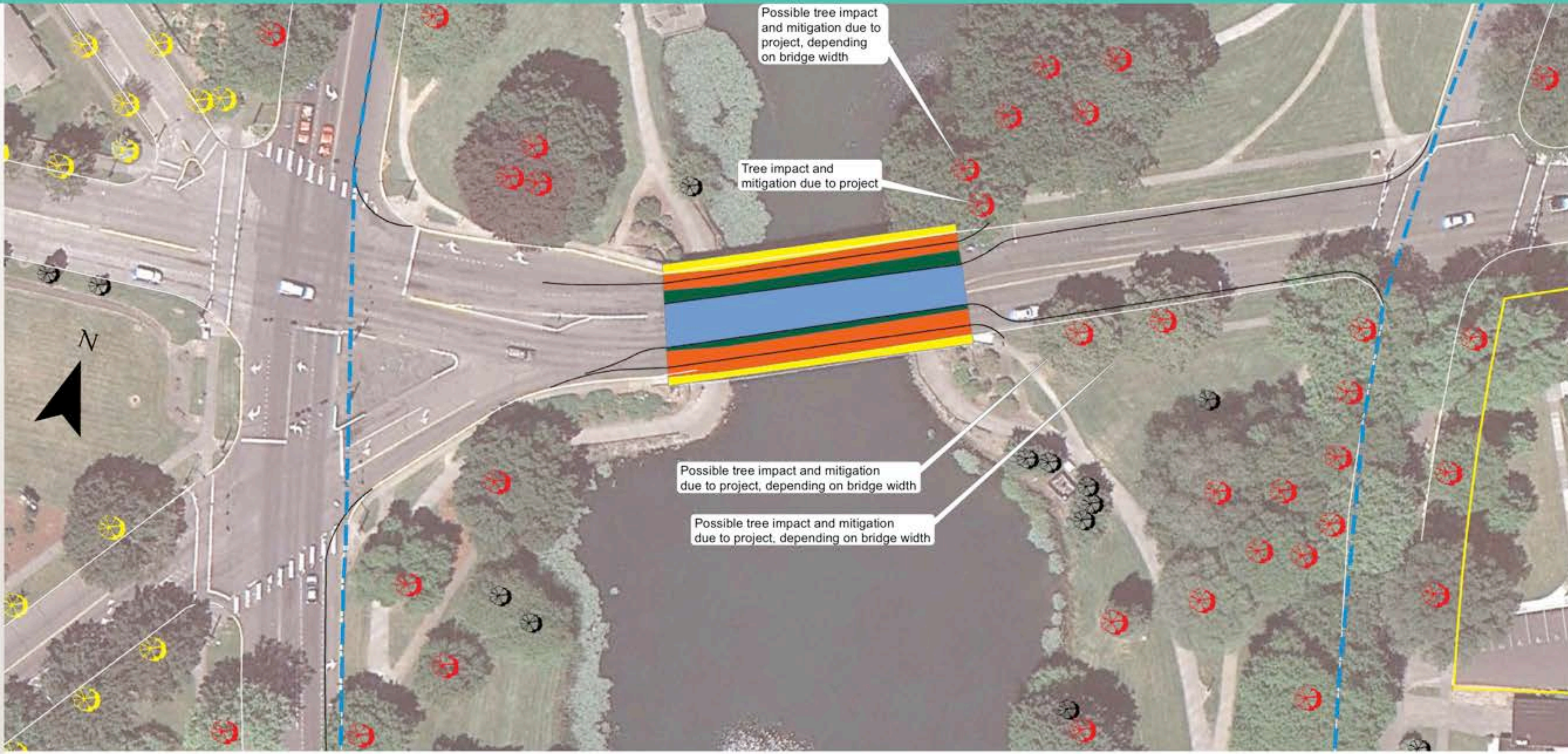
WASHINGTON WAY BRIDGE REPLACEMENT
HISTORY OF PROJECT AREA



Legend

Bridge Development
- Bridge construction, 1923-1925
- First replacement bridge, 1935
- First widening of replacement bridge, 1957
- Second widening of replacement bridge, 1964

Park Trees
- Historic, Contributing to the district
- Historic Non-Contributing
- Non-Historic Non-Contributing

Circulation Networks
- Existing street curbs (shown as white lines)
- Former street curbs before widening

Boundaries
- Lake Sacajawea Historic District
- Longview Community Church Historic Property

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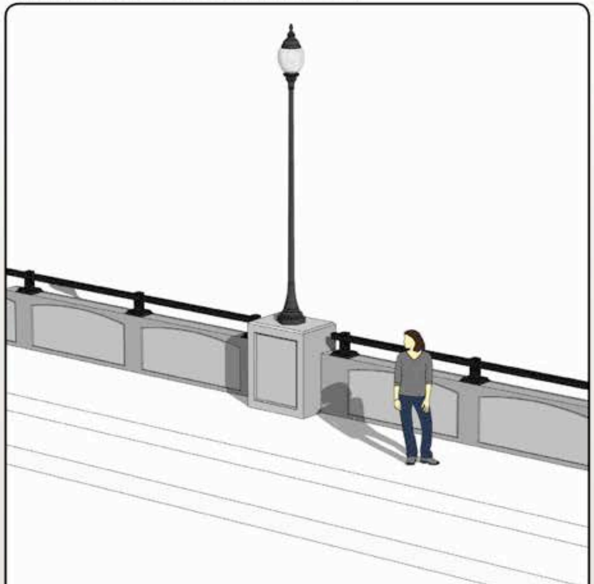
WASHINGTON WAY BRIDGE REPLACEMENT

BRIDGE RAIL ALTERNATIVES

CONCRETE RAIL

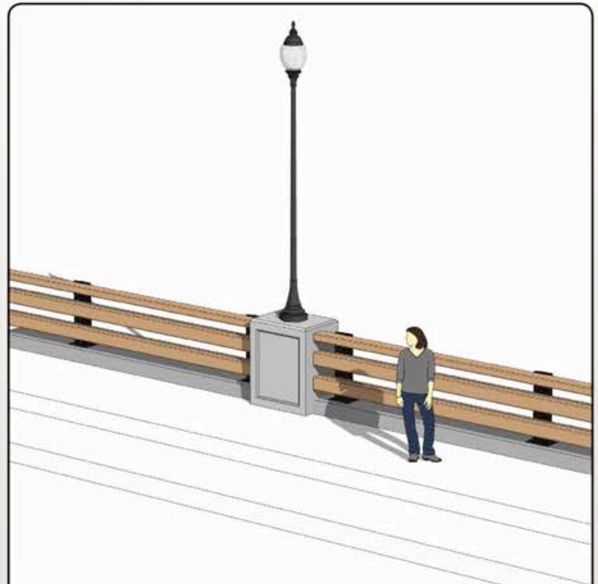
- PRECAST CONCRETE
- OPENING SHAPE CAN BE MODIFIED
- LOCAL EXAMPLES: ALLEN STREET BRIDGE
- HISTORIC APPEARANCE

METAL RAIL ON CONCRETE



- POWDER COATED METAL
- CAST-IN-PLACE OR PRECAST CONCRETE
- HISTORIC APPEARANCE
- RANGE OF POSSIBLE DECORATIVE PATTERNS

METAL RAIL



- SIMILAR APPEARANCE TO EXISTING BRIDGE RAIL
- POWDER COATED METAL
- APPEARANCE CAN BE SIMILAR TO WOOD

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GREENWORKS

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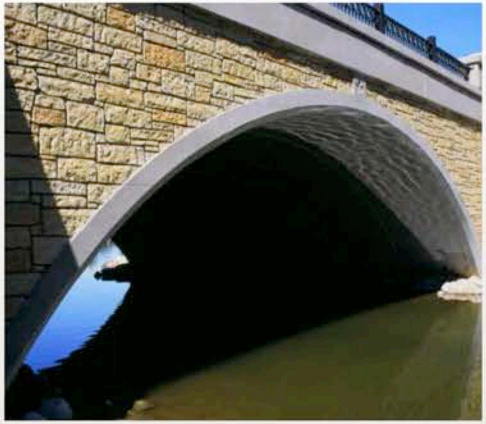
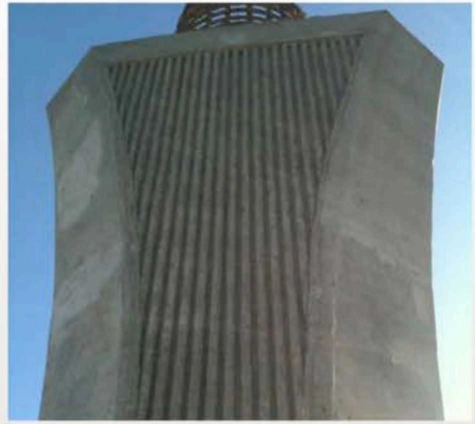
WASHINGTON WAY BRIDGE REPLACEMENT

MATERIALS AND FINISHES

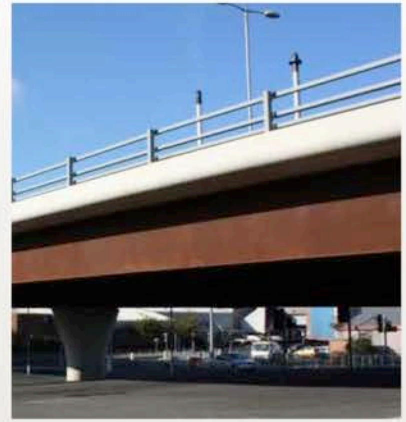
FORMED STONE/PATTERN (ALLEN ST. BRIDGE)



FORMED STONE & STAINED CONCRETE



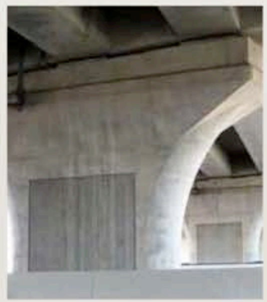
LINEAR TEXTURE - CONCRETE



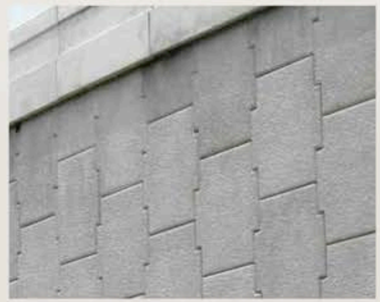
WEATHERING STEEL

GEOMETRIC FORMS AND FORMED STONE

GEOMETRIC FORMS & PAINTED STEEL



TEXTURED FORM LINER



BUSH HAMMERED TEXTURE

BOARD FORMED CONCRETE

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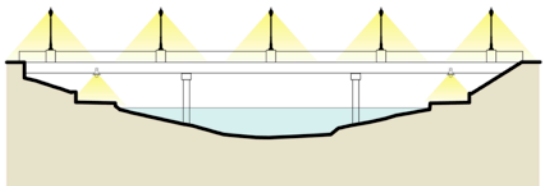
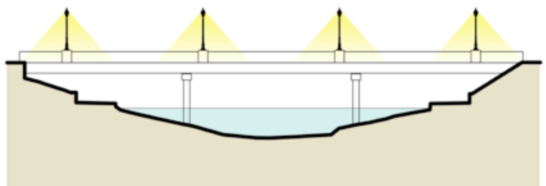
WASHINGTON WAY BRIDGE REPLACEMENT

LIGHTING CONCEPTS

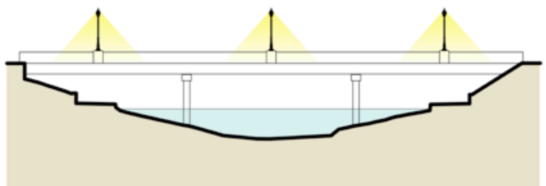
BRIDGE DECK LIGHTING



ELEVATION A - 5 LIGHT POLES

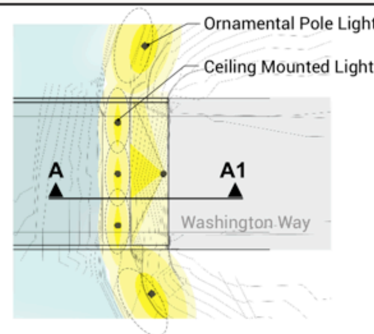


ELEVATION B - 4 LIGHT POLES

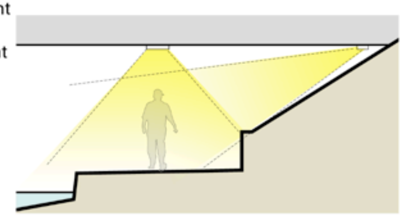


ELEVATION C - 3 LIGHT POLES

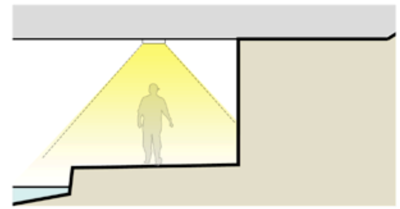
BRIDGE PATH LIGHTING



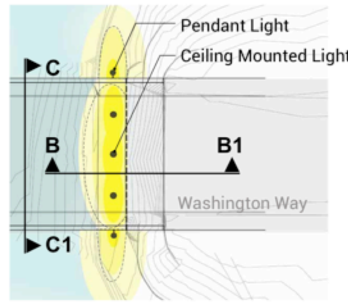
PLAN VIEW



SECTION VIEW A



SECTION VIEW B



PLAN VIEW

ELEVATION VIEW C

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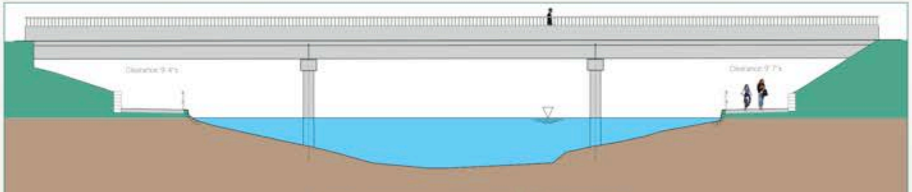
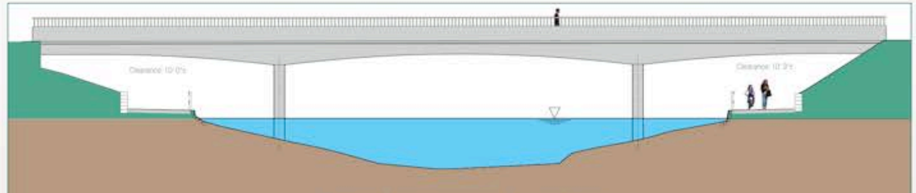
WASHINGTON WAY BRIDGE REPLACEMENT

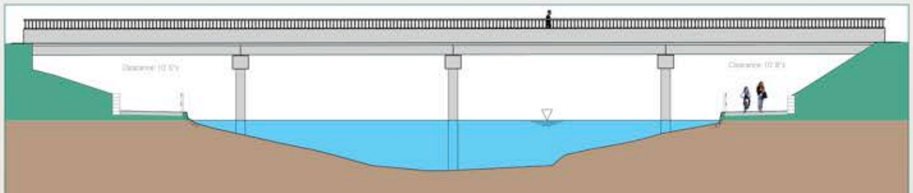
BRIDGE ALTERNATIVES



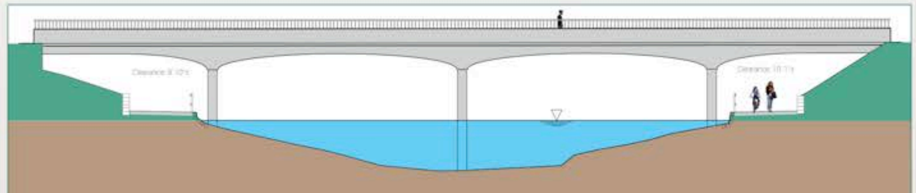
Three-Span Uniform-Depth Alternative
(looking north)



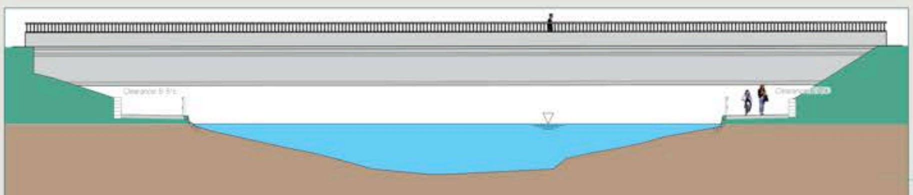
Three-Span Haunched Alternative
(looking north)



Four-Span Uniform-Depth Alternative
(looking north)



Four-Span Haunched Alternative
(looking north)



Single-Span Alternative
(looking north)

Note:
Neither single-span nor two-span alternatives will be considered due to inadequate vertical clearance for the paths underneath the bridge.

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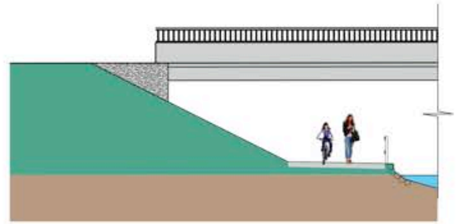
ABUTMENT ALTERNATIVES

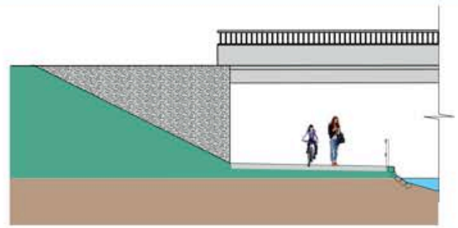
Existing abutment



"Spill-through" Abutment Option

Advantages
- Maintains existing open look and feel
- Minimizes earth pressures on abutment
- Minimizes abutment cost

Disadvantages
- Increased bridge length, resulting in:
  - Added structure cost
  - Increased seismic loads
- Maintains existing narrow paths at sharp corners and under the bridge



"Tall" Abutment Option

Advantages
- Minimizes bridge length, resulting in:
  - Reduced structure cost
  - Reduced seismic loads
- Improves path widths at the corners and under the bridge

Disadvantages
- Creates monolithic wall next to path
- Increased earth pressures on abutment
- Increased abutment costs

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WASHINGTON WAY BRIDGE REPLACEMENT

BRIDGE MATERIAL TYPES

Cast-in-place concrete

- Most flexible variations in form and texture
- Longest construction period
- Not conducive to staged construction if post-tensioned
- Typically higher cost

Precast concrete

- Least flexible for variations in form and texture
- Shortest construction period
- Conducive to staged construction
- Typically lowest cost

Steel

- Moderately flexible for variations in form, low flexibility for texture
- Slightly longer construction period than precast
- Conducive to staged construction
- Similar in cost to precast concrete

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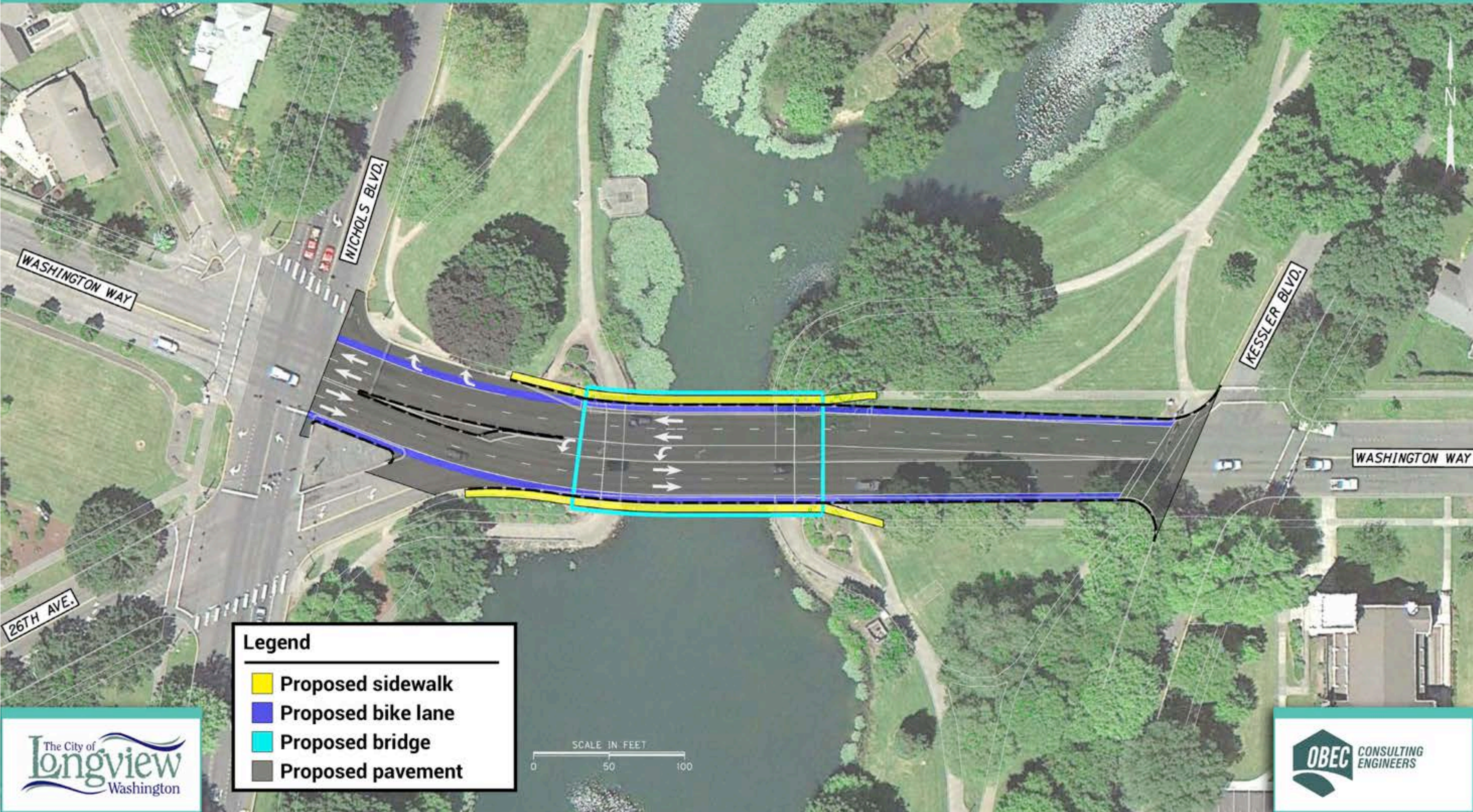
WASHINGTON WAY BRIDGE REPLACEMENT

ROADWAY PLAN VIEW



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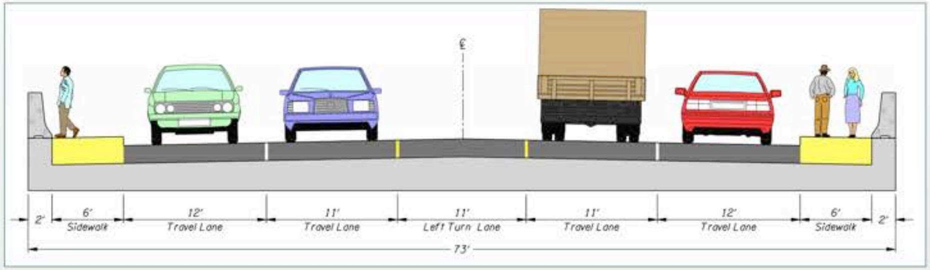
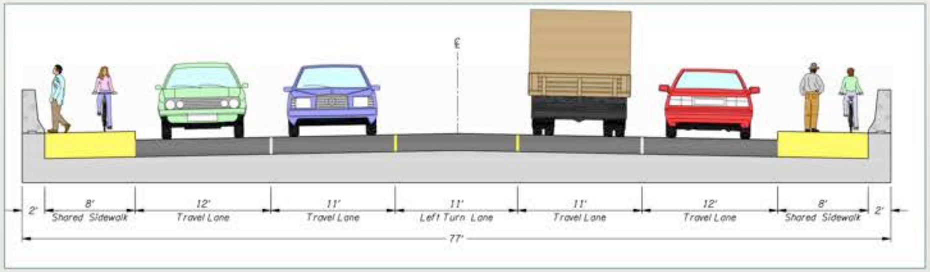
WASHINGTON WAY BRIDGE REPLACEMENT

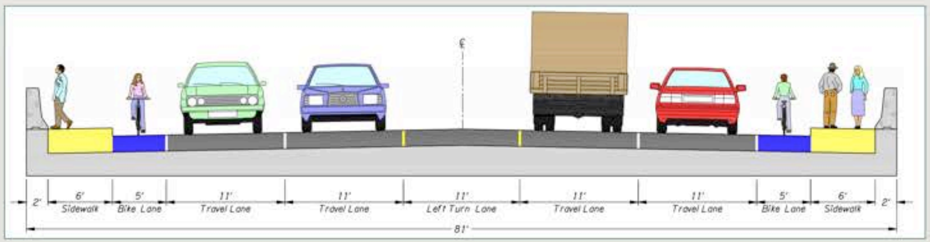
ROADWAY ALTERNATIVES



73' Alternative
- No bicycle lanes
- Lowest cost bridge



77' Alternative
- Shared pedestrian and bicycle sidewalk
- Approx. 5% ($125,000) additional for bridge structure than 73' alternative



81' Alternative
- Bicycle lanes
- Highest cost (Approx. 10% [$250,000] additional for bridge structures than 73' alternative)

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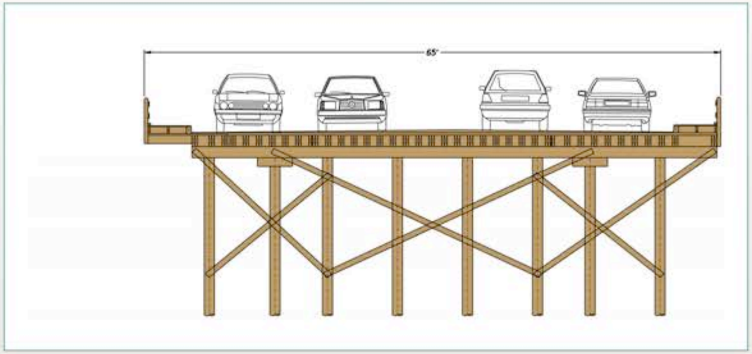
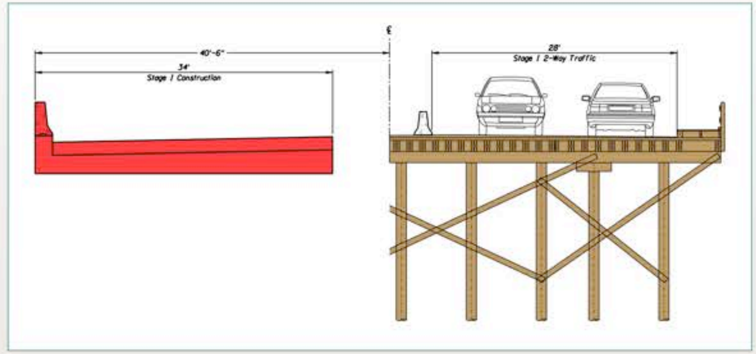
WASHINGTON WAY BRIDGE REPLACEMENT

STAGED CONSTRUCTION ALTERNATIVE

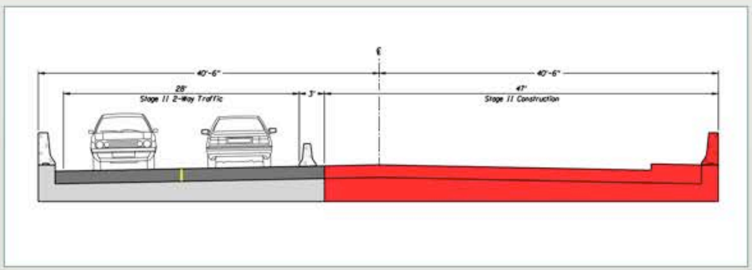
Existing bridge



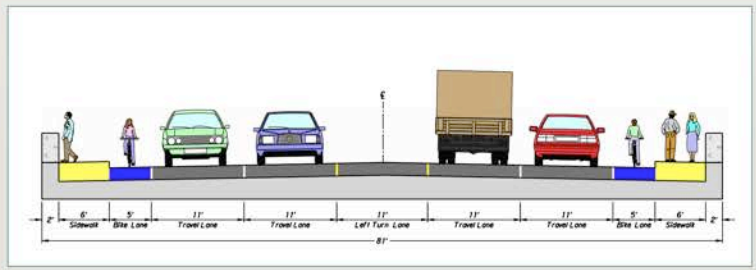
Stage 1



Stage 2



New bridge



Schedule Implications

- Road closure: 9- to 13-month construction
- Staged construction: 15- to 21-month construction

Cost Implications

- Staged construction: 10–15% cost increase ($450K – $680K)

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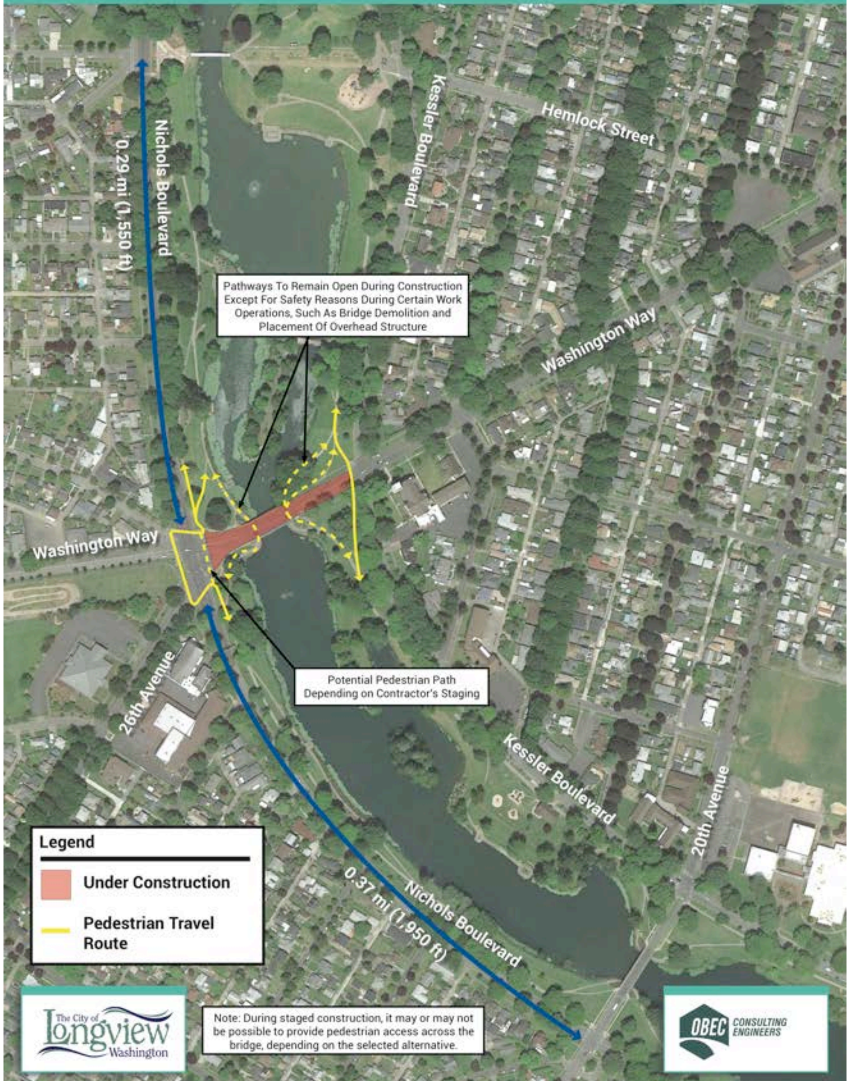
WASHINGTON WAY BRIDGE REPLACEMENT

DETOUR ROUTE

WASHINGTON WAY BRIDGE REPLACEMENT

PEDESTRIAN CIRCULATION



WASHINGTON WAY BRIDGE REPLACEMENT

TRAFFIC ANALYSIS

- Study Area – bridge and adjacent intersections
  - Washington Way/Nichols Blvd/26th Avenue
  - Washington Way/Kessler Blvd
- Traffic data collection completed June 2013
  - Daily road tube counts – collected on bridge
  - Intersection turning movement counts – weekday a.m. and p.m. peak hour
- Traffic operations analysis
  - Analysis years - 2013 and 2035
  - Developed future traffic volumes using CWCOG regional model
  - All study intersection are forecast to meet City operating standards (LOS D and v/c of 0.85 or less.
- Safety Assessment
  - Review of historical crash data

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WASHINGTON WAY BRIDGE REPLACEMENT

TRAFFIC ANALYSIS – Roadway/Bridge Cross Section

- Roadway/bridge cross-section – looked for opportunities to optimize travel for motorists, pedestrians and bicyclists
- Average Daily Traffic (ADT)
  - Year 2013 ~ 10,000 vehicles
  - Year 2035 ~ 18,000 to 20,000 vehicles
- Intersection Operations on Washington Way at Nichols Blvd and Kessler Blvd
  - Existing configurations
  - Signal modifications
  - Roundabout
- ADT ⇨ Intersection Operations (unique signalized intersection at Washington Way/ Nichols Blvd/26th Ave) ⇨ Vehicles Queues ⇨ Recommendation of a five-lane cross-section

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WASHINGTON WAY BRIDGE REPLACEMENT

WASHINGTON WAY/NICHOLS BLVD/26TH AVE INTERSECTIONS

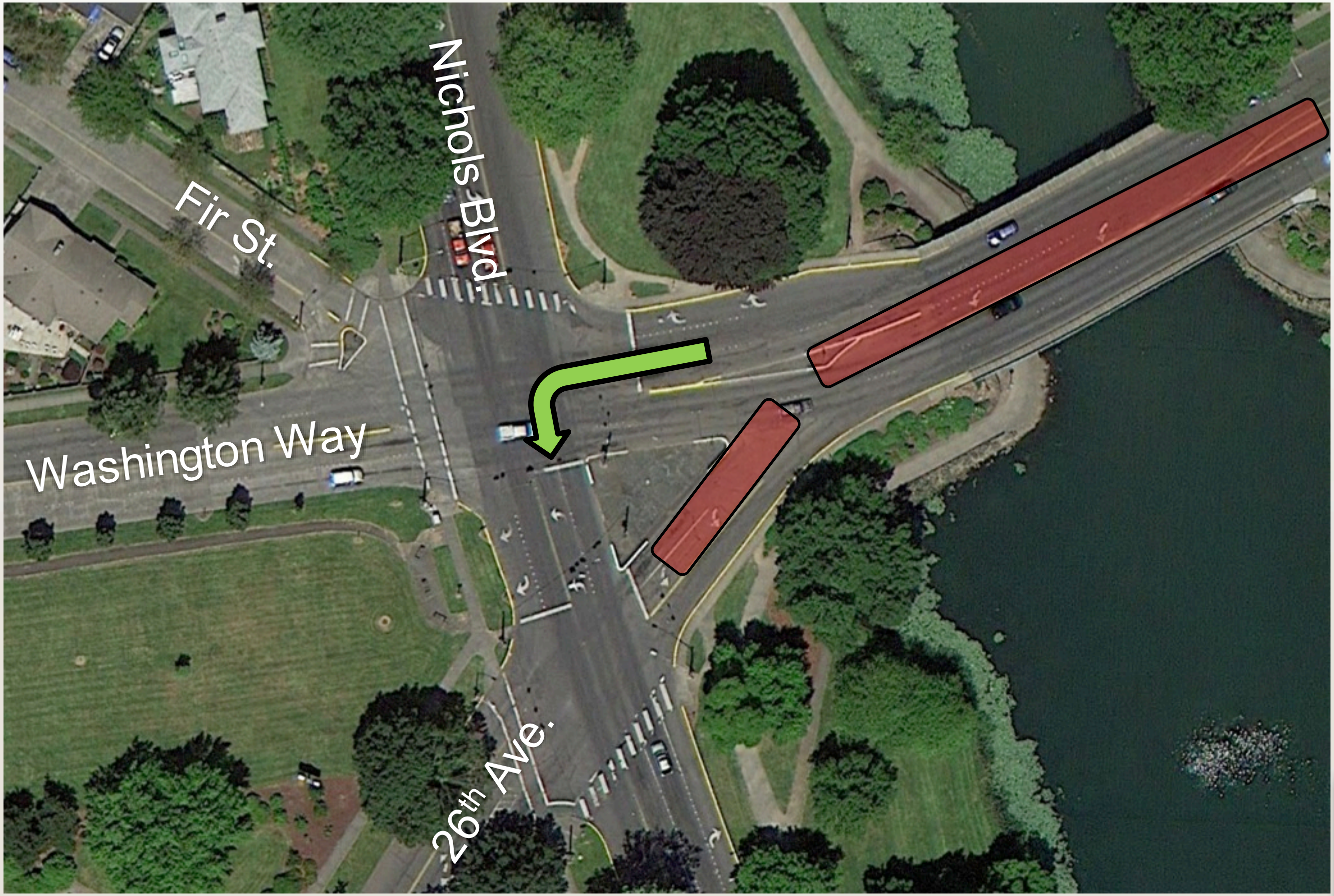
POTENTIAL INTERSECTION ENHANCEMENTS

- Three concepts were evaluated
  - Concept 1: Relocate westbound left-turn lane from 26th Ave (off of the bridge) to Nichols Blvd
  - Concept 2: Remove traffic signal at Nichols Blvd/26th Ave and modify the Washington Way/Nichols Blvd intersection
  - Concept 3: Multi-lane roundabout

WASHINGTON WAY BRIDGE REPLACEMENT

WASHINGTON WAY/NICHOLS BLVD – Concept 1

Relocate existing westbound left-turn lane from the bridge to Nichols Blvd.



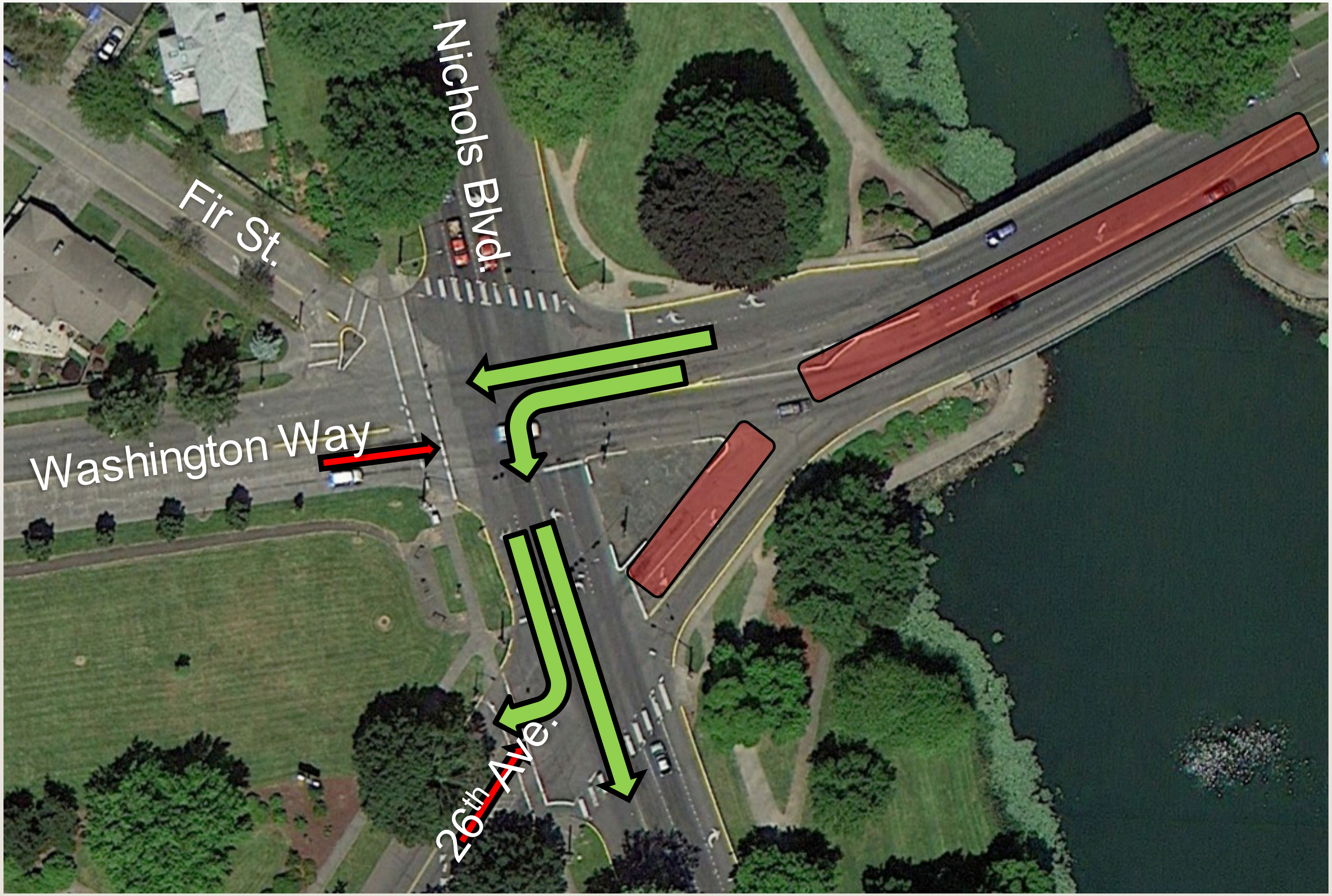
WASHINGTON WAY/NICHOLS BLVD – Concept 1

- Evaluated a variety of lane configurations (westbound approach)
- Unique signalized intersections at Washington Way/Nichols Blvd and Nichols Blvd/26th Ave.
  - Non-traditional signal phasing
- Signalized intersection operations is less than optimal to accommodate:
  - New westbound left-turn lane at Nichols Blvd
  - Existing traffic signal at Nichols Blvd/26th Ave
- Intersections are not forecast to meet City operating standards (LOS D and v/c of 0.85 or less).
- Potential for longer vehicle queues and delays.

WASHINGTON WAY BRIDGE REPLACEMENT

WASHINGTON WAY/NICHOLS BLVD – Concept 1

Relocate existing westbound left-turn lane from the bridge to Nichols Blvd.



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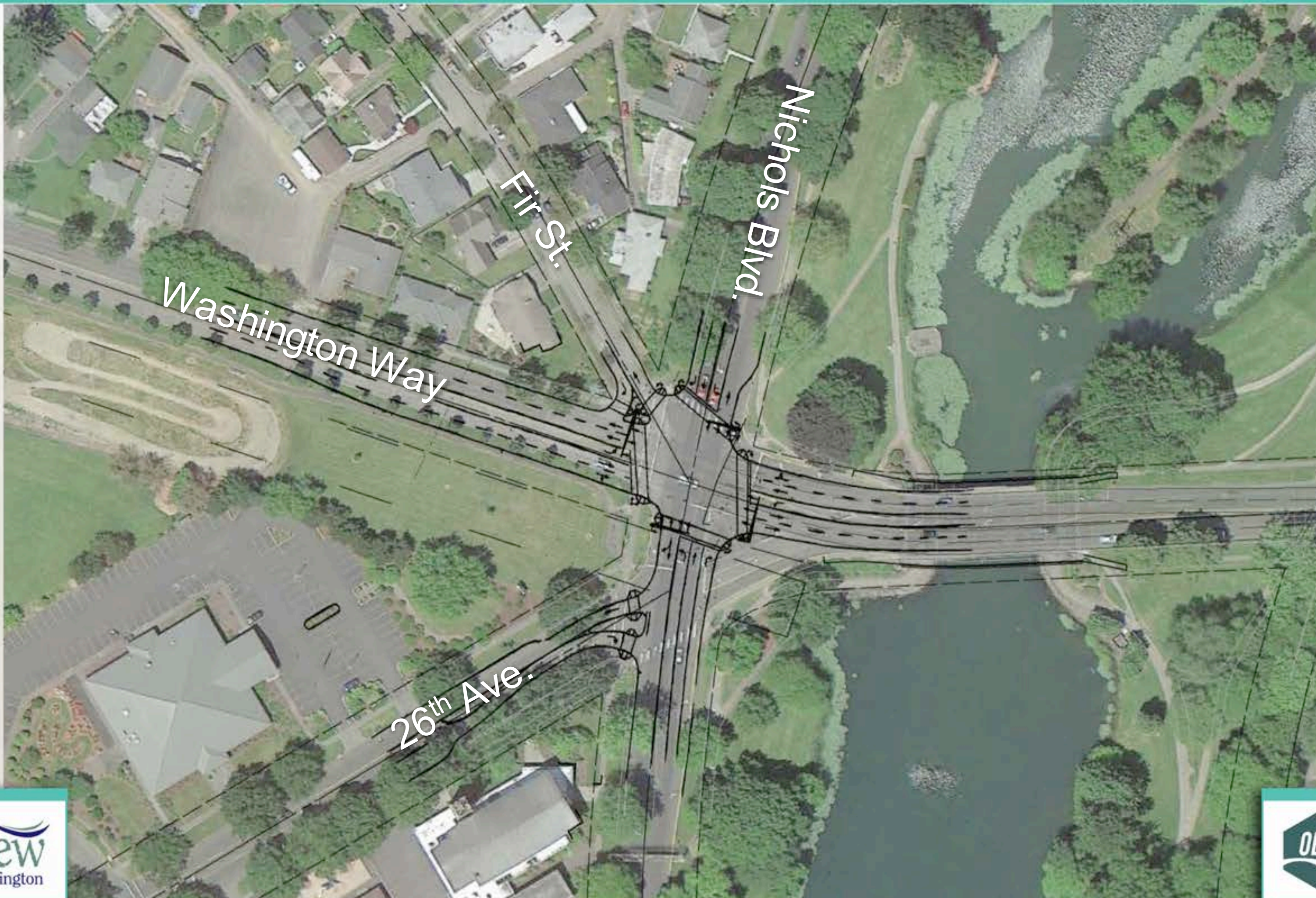
WASHINGTON WAY BRIDGE REPLACEMENT

WASHINGTON WAY/NICHOLS BLVD – Concept 2



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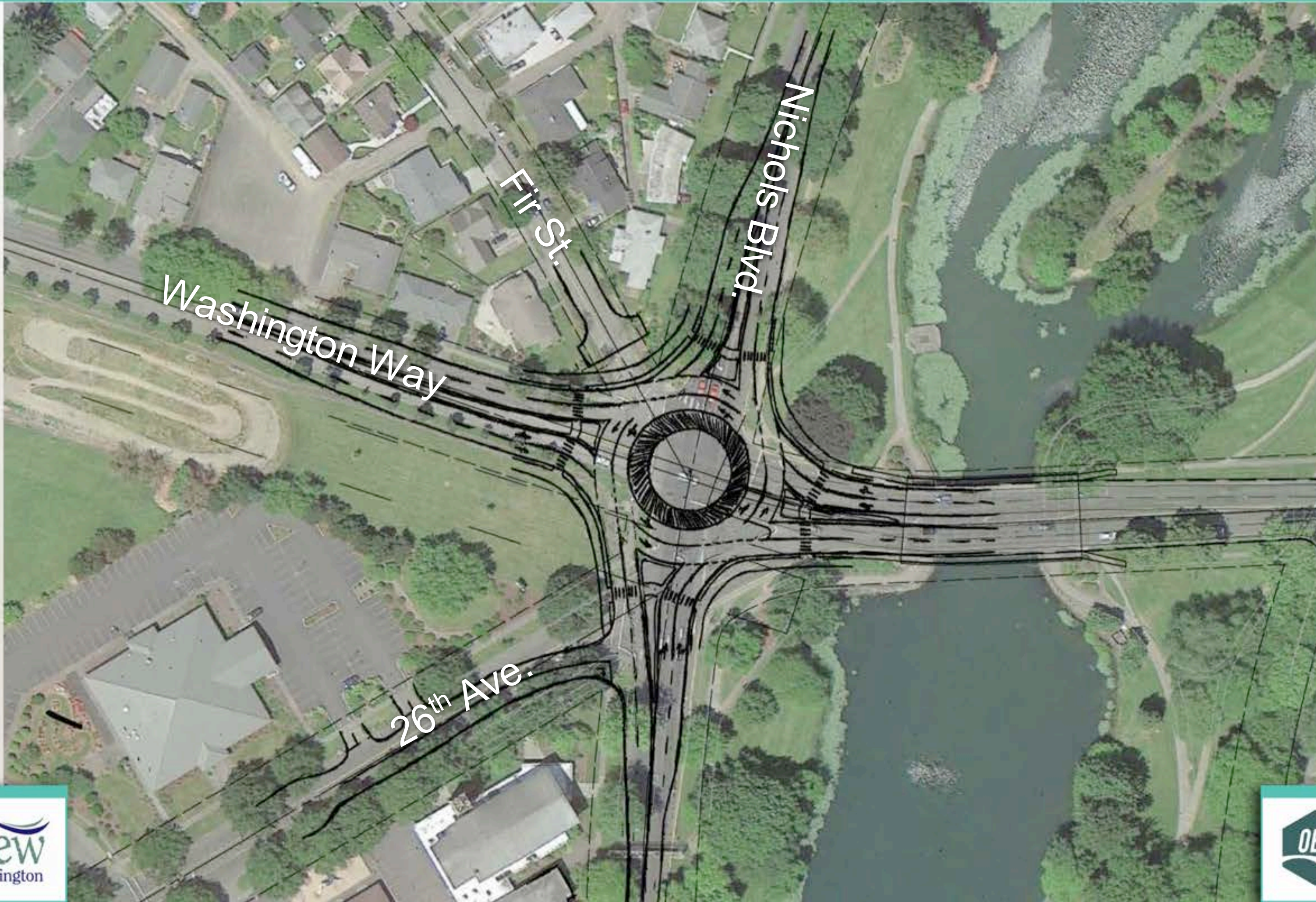
WASHINGTON WAY BRIDGE REPLACEMENT

WASHINGTON WAY/NICHOLS BLVD – Concept 2

- Signalized intersection is forecast to meet City operating standards (LOS D and v/c of 0.85 or less.
- Opportunities and Issues for Further Consideration
  - Provides for a more traditional intersection operation (versus existing conditions)
    - Driver expectations
  - Opportunity for traffic signal equipment upgrades
  - Serves pedestrian movements at all intersection legs
  - Maintains access to Fir Street
  - Access restrictions at 26th Avenue
    - Impacts to users of 26th Avenue
  - Constructability
  - Right-of-Way impacts
- Estimated Cost – $1.35 Million

WASHINGTON WAY BRIDGE REPLACEMENT

WASHINGTON WAY/NICHOLS BLVD – Concept 3



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WASHINGTON WAY/NICHOLS BLVD – Concept 3

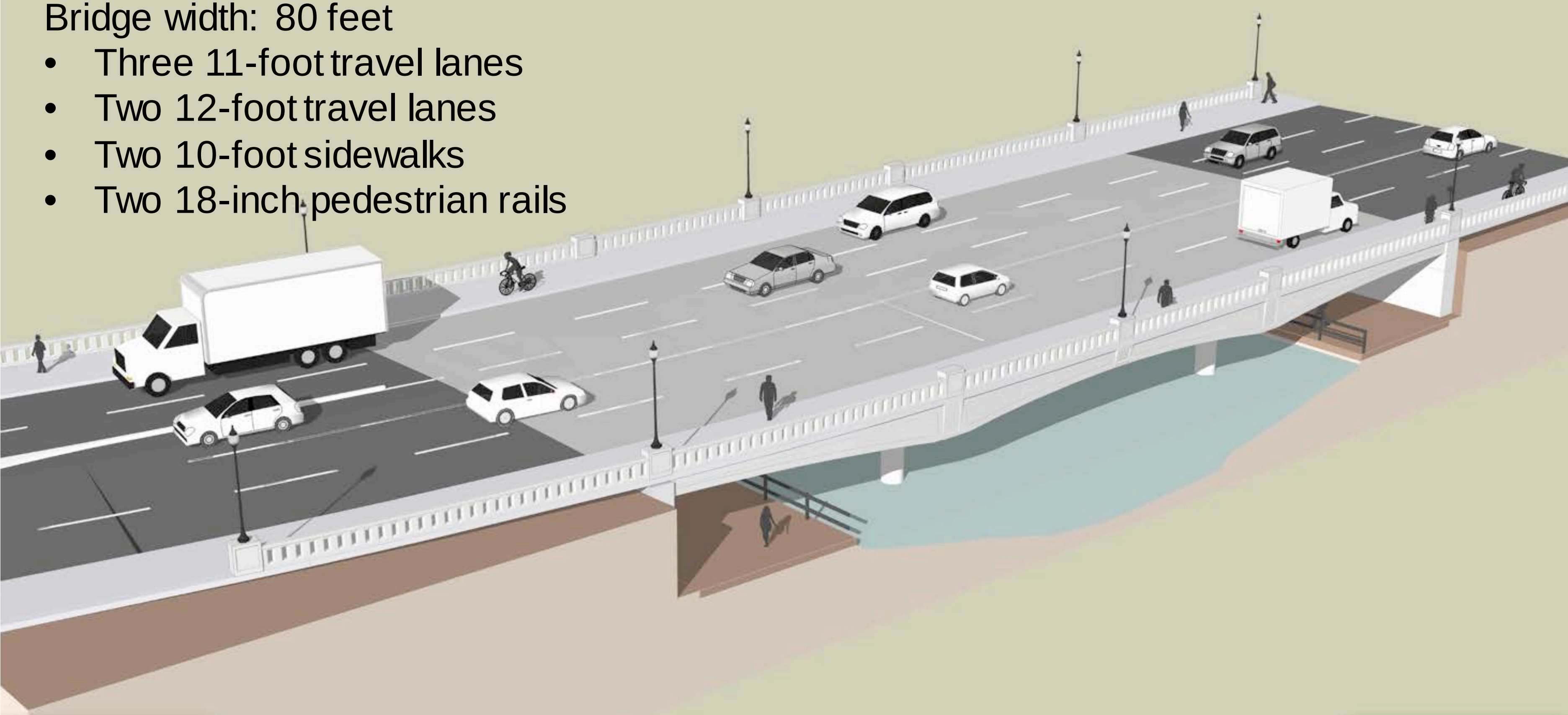
- Roundabout is forecast to meet City operating standards (LOS D and v/c of 0.85 or less.
- Opportunities and Issues for Further Consideration
  - Public outreach and education
  - Safety benefits of roundabouts
  - No access to Fir Street from the intersection
  - Access restrictions at 26th Avenue
    - Impacts to users of 26th Avenue
  - Right-of-way impacts
  - Constructability
  - Cost
- Estimated Cost – $1.95 Million

WASHINGTON WAY BRIDGE REPLACEMENT

PREFERRED DESIGN CONCEPT

Bridge width: 80 feet

- Three 11-foot travel lanes
- Two 12-foot travel lanes
- Two 10-foot sidewalks
- Two 18-inch pedestrian rails



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WASHINGTON WAY BRIDGE REPLACEMENT

PREFERRED DESIGN CONCEPT

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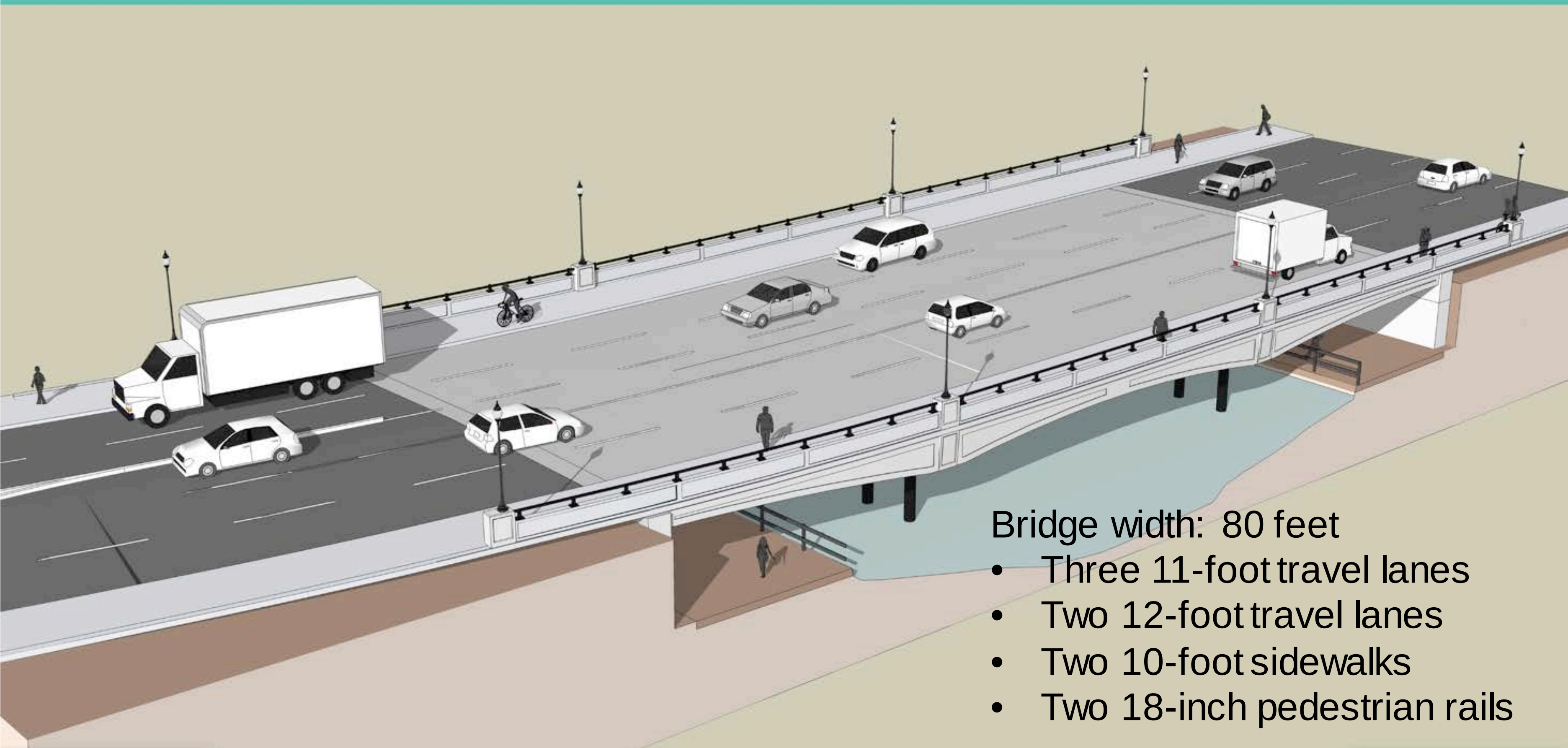

Bridge width: 80 feet

- Three 11-foot travel lanes
- Two 12-foot travel lanes
- Two 10-foot sidewalks
- Two 18-inch pedestrian rails

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WASHINGTON WAY BRIDGE REPLACEMENT

PREFERRED DESIGN CONCEPT

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WASHINGTON WAY BRIDGE REPLACEMENT

PREFERRED DESIGN CONCEPT

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WASHINGTON WAY BRIDGE REPLACEMENT

BRIDGE SUPERSTRUCTURE

Precast Concrete Slabs

Advantages:

- Less expensive (approximately $510,000)
- Shorter construction time
- No falsework required in the lake
- High level of quality control in the fabrication shop
- Fascia panel can hide utilities
- Slightly lighter than cast-in-place, reducing seismic loads on foundations
- Virtually crack- and maintenance-free

Disadvantages:

- Not historic in nature or appearance
- Architectural appearance less appealing
  - Fascia panels can look slightly "fake" or "pasted on" (comments from the open house)
  - Underside of slabs look more industrial

Cast-in-Place Concrete

Advantages:

- Historic in nature and appearance
- Architectural appearance very appealing
- Smooth lines from all vantage points
  - Architectural treatment incorporated into the structure
  - Haunched shape
    - Texture on the sides
    - Virtually crack- and maintenance-free (if properly field-cured)

Disadvantages:

- More expensive than precast
- Longer construction time than precast
- Falsework required in the lake
- Field construction has less quality control than shop-fabricated components
- Utilities would be visible (outside slab)
- Slightly heavier than precast, increasing seismic loads on the foundations.

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WASHINGTON WAY BRIDGE REPLACEMENT

BRIDGE SUPERSTRUCTURE

Precast Concrete Slabs

Cast-in-Place Concrete

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BRIDGE SUPERSTRUCTURE

Precast Concrete Slabs

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BRIDGE COLUMNS

Driven steel piles

Advantages:

- Quicker to construct than concrete columns
- Less expensive than concrete columns
- Less temporary disturbance to the lake (piles driven through the water)
- Easily constructible
- Can be designed to work well for seismic loads
  - Very ductile; May be filled with concrete for additional seismic resistance

Disadvantages:

- Typically more (smaller) vertical members required than if concrete
- Appearance is not as architecturally refined as concrete columns
- Corrosion of the steel pile must be considered
  - Increased wall thickness for weathering steel
  - Coating, which requires maintenance

Cast-in-Place Concrete

Advantages:

- Typically fewer (larger) vertical members required than if concrete
- More architecturally pleasing appearance
- Corrosion resistance is built into the system
  - Concrete cover over reinforcement
  - Selection of cementitious materials
- Can be designed to work well with seismic loads

Disadvantages:

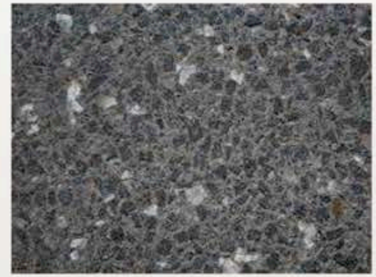
- Slower to construct
- More expensive
- Columns must be supported by either drilled shafts or pile-supported footings
  - The anticipated depth of the drilled shafts (i.e. greater than 100 feet) can be problematic to construction and more risk
  - Pile-supported footings would require cofferdams and dewatering
- Increased temporary disturbance to the lake due to drilled shaft or pile-supported footing construction
- Results in large quantities of drilling spoils that must be contained and hauled.

WASHINGTON WAY BRIDGE REPLACEMENT

ARCHITECTURAL FINISHES

Exposed aggregate or bush-hammered reveal





Estimated cost for architectural finish: $25,000

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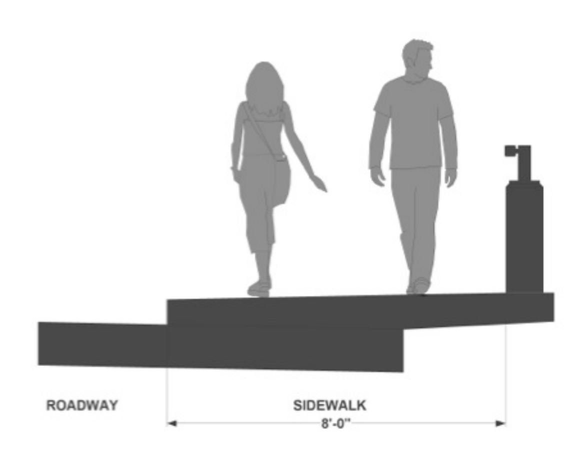
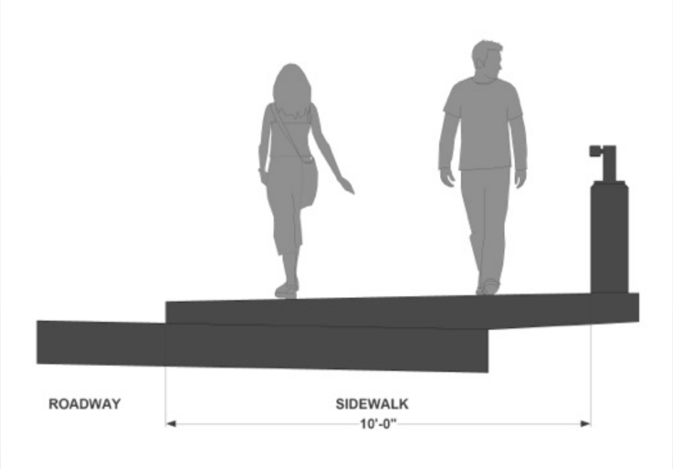
NARROWER SIDEWALKS

8′-wide sidewalks



10′-wide sidewalks



Estimated cost savings for narrower sidewalks: $100,000

WASHINGTON WAY BRIDGE REPLACEMENT

OTHER CONSIDERATIONS

- Preliminary Geotechnical Assessment
  - Highly liquefiable soils
  - Ground improvements are anticipated
  - Cost range of $450,000 – $650,000
- Funding of aesthetics
  - NEPA permitting may require aesthetic treatments
  - NEPA requirements are grant-funded at 80%
- Tree impacts
  - Hawthorne at NE corner will be removed
  - Oak tree at NE corner is not likely to be affected
  - American elms at SE corner are questionable

WASHINGTON WAY BRIDGE REPLACEMENT

POTENTIAL TREE IMPACTS

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WASHINGTON WAY BRIDGE REPLACEMENT

PROJECT COST SUMMARY

- Construction cost approved by grant: $4,541,000
- Current construction estimate: $4,536,000 (includes contingency costs)
- Other costs:
  - Ground improvements for soil liquefaction: $450,000 – $650,000
  - Architectural concrete bridge pedestrian rail: $140,000 (optional)
  - Cast-in-place concrete bridge: $510,000 (optional)
  - Concrete bridge columns: $150,000 (optional)
  - Architectural finishes: $25,000 (optional)
  - Narrower sidewalks: $100,000 (optional savings)

DISCUSSION AND DIRECTION