Delta Ponds Pedestrian Bridge

Presented by:
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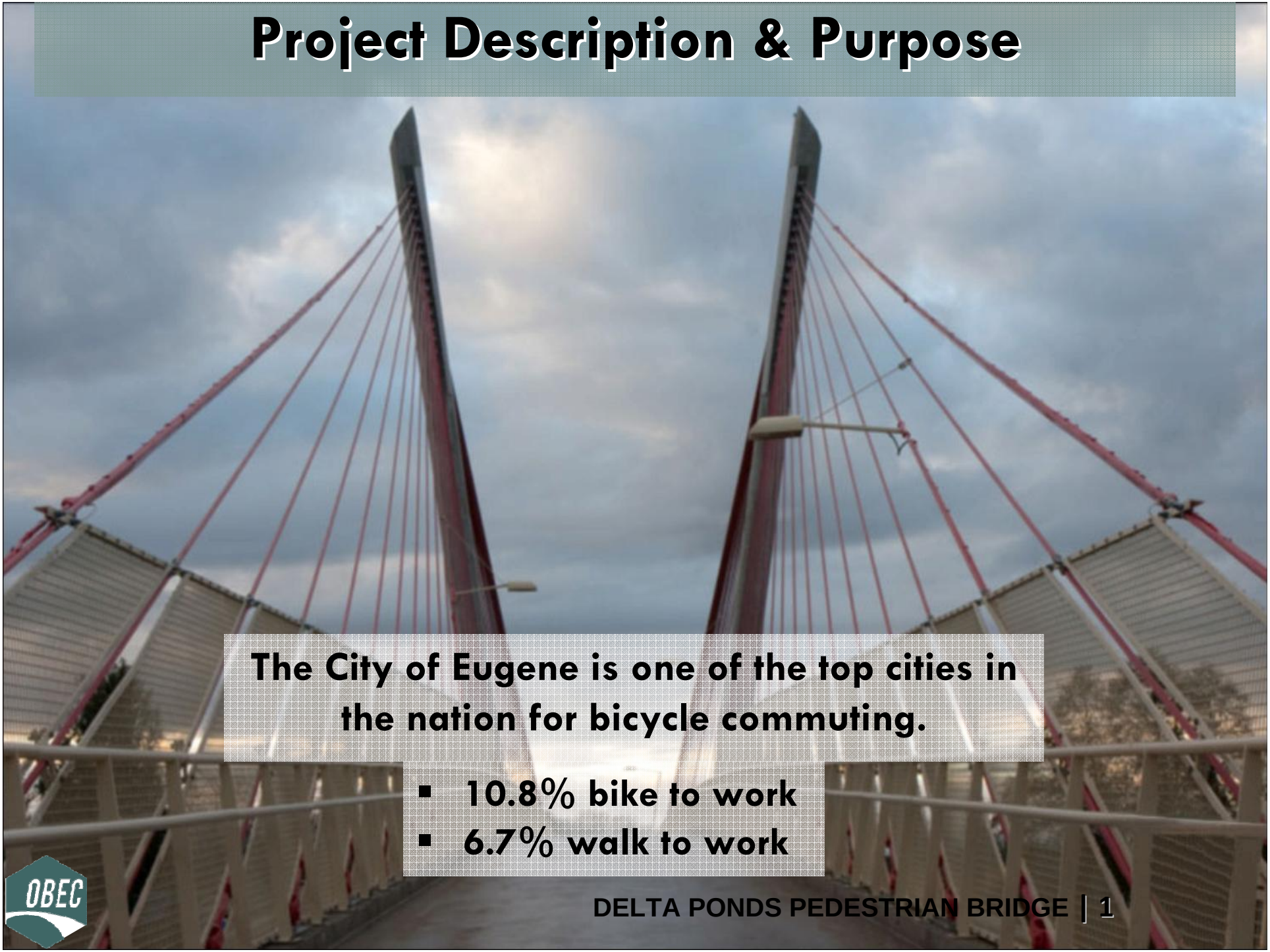
Project Description & Purpose



The City of Eugene is one of the top cities in the nation for bicycle commuting.

- 10.8% bike to work
- 6.7% walk to work

Long-term Transportation Vision

The City of Eugene's vision for this project:

- Accessible structure serving users by providing improved bike/ped path connectivity
- Environmentally responsible by encouraging non-fossil fuel commuting
- Be compatible with Delta Ponds

Team met the City's vision by providing:

Landmark pedestrian bridge that enhances recreational activities within natural setting & improved trail connectivity

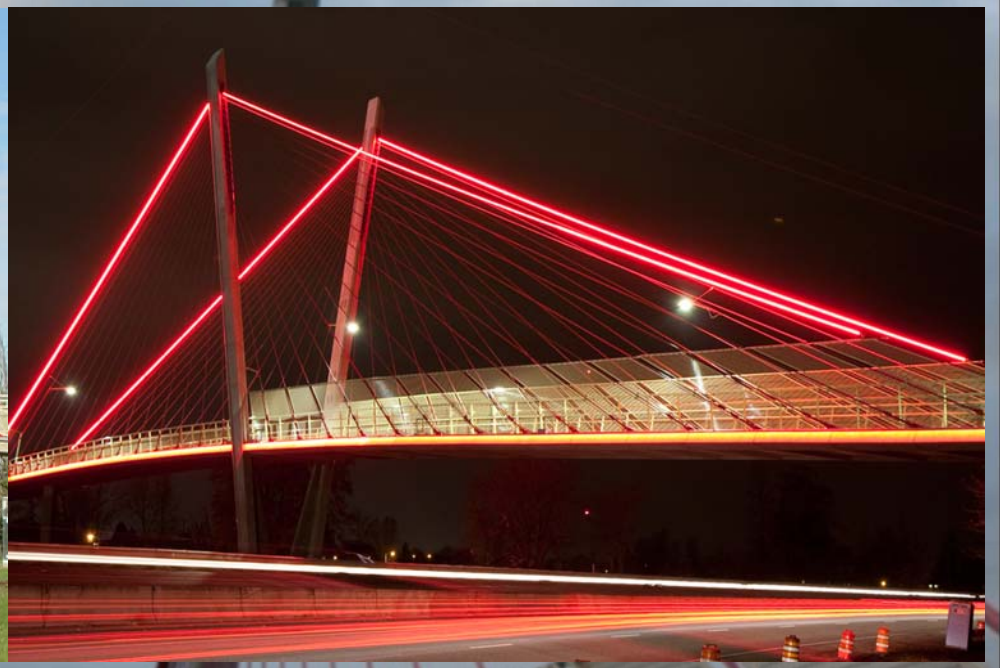
SP22 Suji Paek, 8/9/2011

Improved Safety & Path Connectivity

Existing Valley River Dr. Bridge:

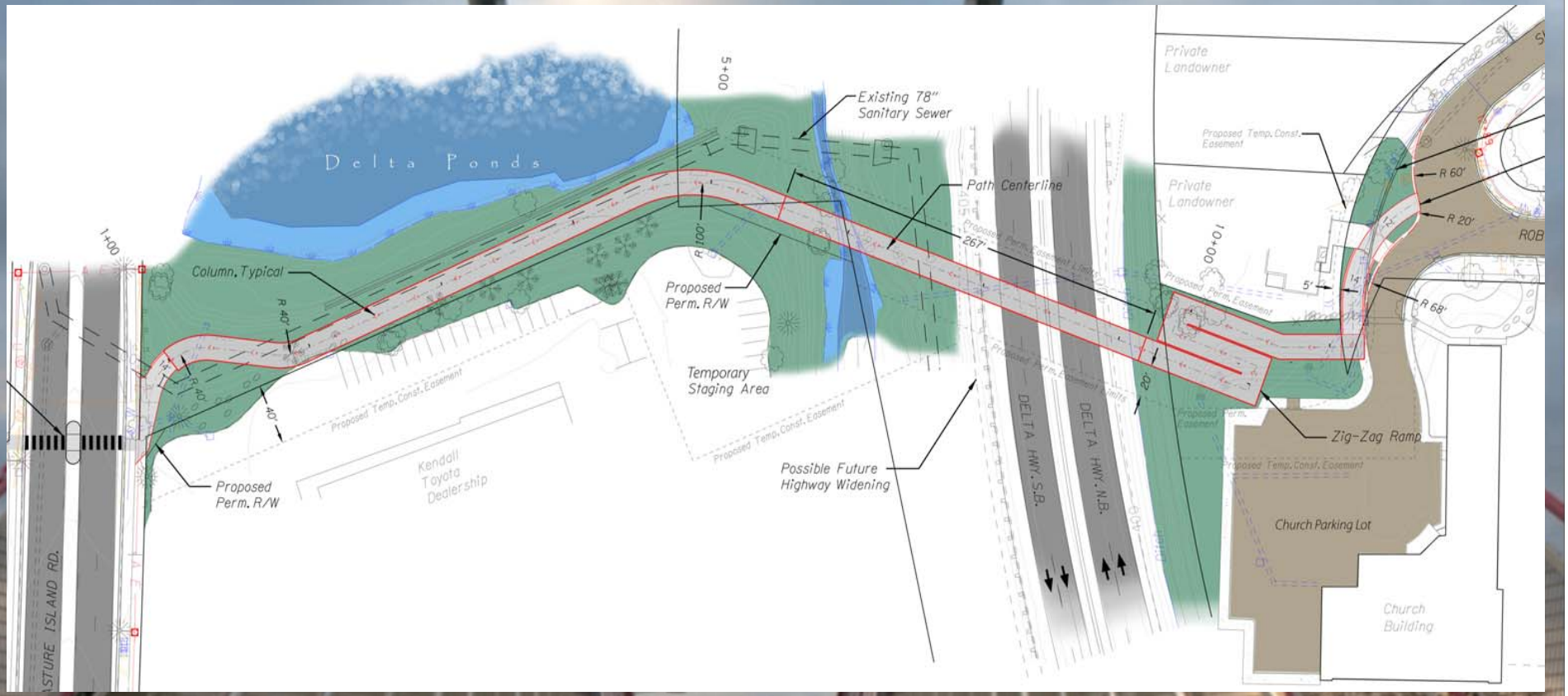
- Busy existing interchange
- Unsafe – Bike/peds required to cross ramps
- Unsafe turning movements between peds, cars & bikers through mall parking lot
- Poor connectivity to bike paths, neighborhoods and schools
- New bridge path connectivity

Chosen Solution: Delta Ponds Pedestrian Bridge



- New bridge safer with improved in-direction connectivity
- Located between two interchanges
- Safe east/west commuter crossing
- Key connection to river bank bike lanes and nearby neighborhoods & schools

Project Challenges & Constraints: Slab Alternative



- 36”-deep traditional precast slab superstructure alternative was investigated
- This deep of superstructure would have required non-bicycle-friendly switchback ramps as well as a pier in the center of highway

Chosen Alternative – West Approach

- 1,005 ft long landing to landing
- 5% west approach in line with existing bike trail
- 78-inch diameter sewer line between ponds & bridge needed to be avoided
- MSE walls & thirteen 30 ft long CIP spans on single CIP columns

Slide 7

SP27 show both landings

Suji Paek, 8/23/2011

Chosen Alternative – Main Span

- 340-ft. main cable-stayed span
- Vert. alignment accommodations for 17-ft clearance from soffit to hwy with potential future highway lane to the west – superstructure less than 15" deep
- 170-ft CIP westerly span
- 170-ft easterly span, two 10-ft CIP cantilever & fifteen 10-ft-long precast post-tensioned deck panels

Chosen Alternative – East Approach

- Horizon. alignment challenges between Church & car dealerships
- Max 8.33% ramps w/ 2% 5-ft landings east approach for touch down between church and house within City ROW
- 30-ft CIP span & MSE walls
- Favorable geometric factors leading to landmark bridge: Vert. align – Shallow structure – ADA compliance – ROW Horiz Align – Swooping curves – 78" sewer – Single column bents

Project Timeline & Funding

Funding:

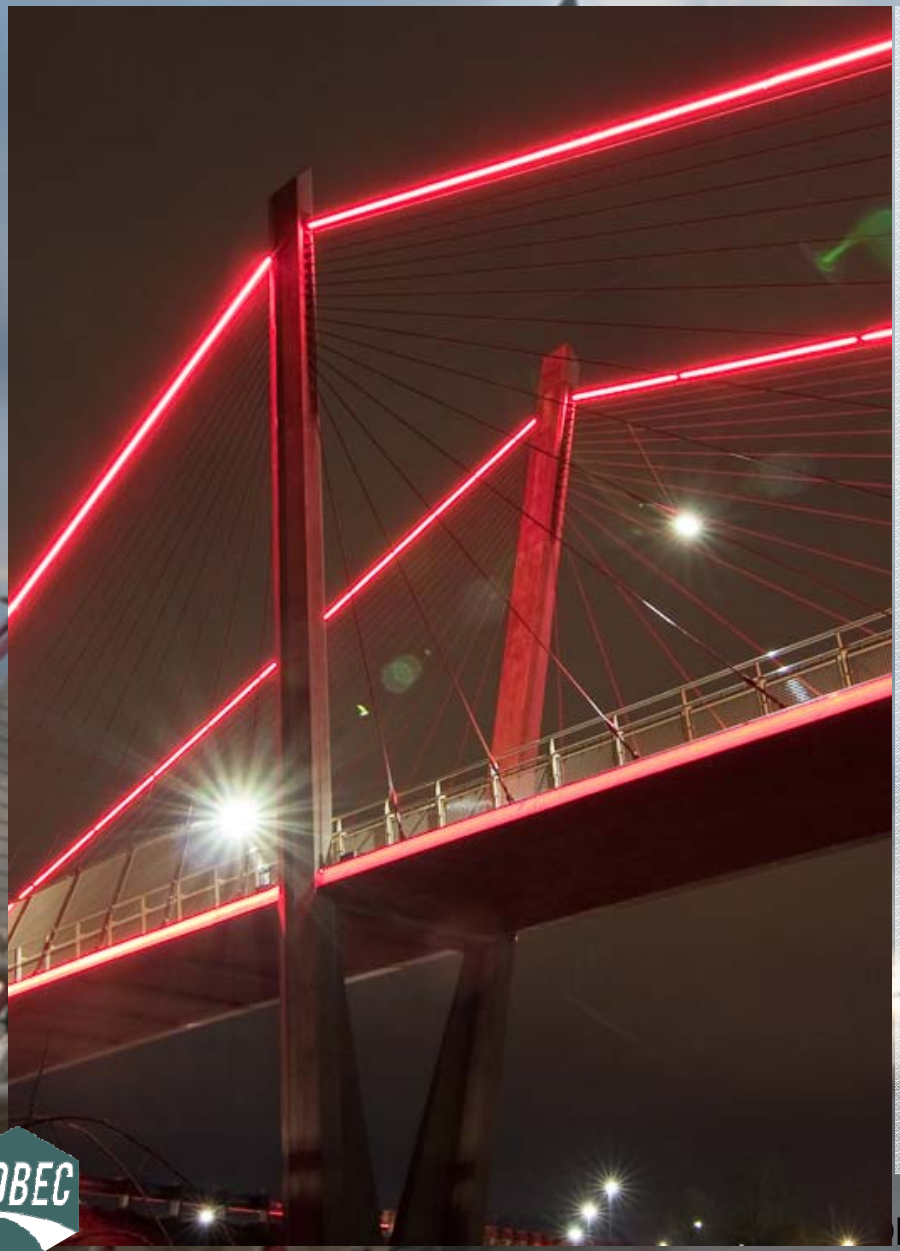
- Total Cost $5.6M
- 2006: $2.6M from federal transportation (SAFTEA-LU High Priority Projects) funds
- 2007: $1.0M from federal transportation enhancement (TE) funds
- 2009: $1.2M from federal stimulus (ARRA) funds (Actual $2.1M)
- $800K from the City matching funds

Timeline:

- Oct. 2007: NTP
- Jan-Feb 2008: Public Involvement (3 unique stakeholder groups)
- Mar. 2008 – Mar. 2009: Preliminary – Advance Design
- Mar. 2009 – May 2009: Accelerated Design (Post ARRA Funds)
- June 2009: Bid Opening
- Sept. 2010: Grand Opening

SP16 Suji Paek, 8/10/2011

Final Completed Project



Delta Ponds Pedestrian Bridge serves as a dramatic and central link to Eugene's popular bike/ped trail system.

OBEC design objectives:

- Striking & cost-effective bridge
- realizes Eugene's long-term transportation vision
- safe access for multi-modal transportation
- limited footprint & over highway
- full traffic mobility during construction over traffic lanes

Received a 2011 Environmental Excellence Award from Federal Hwy. Administration

Slide 11

SP17 Final Bridge image - is there a particular image you had in mid?
Suji Paek, 8/17/2011

Delta Ponds Pedestrian Bridge

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Public Art

"Bountiful" by Lee Imonen

"Swollen Catch" represented by reflective stainless steel disks

Courtesy of The Register-Guard

Delta Ponds Pedestrian Bridge

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SP30 Suji Paek, 8/10/2011

Delta Ponds Pedestrian Bridge

Courtesy of The Register-Guard

SP21 Suji Paek, 8/10/2011

Delta Ponds Pedestrian Bridge

SP20 Suji Paek, 8/10/2011

Delta Ponds Pedestrian Bridge

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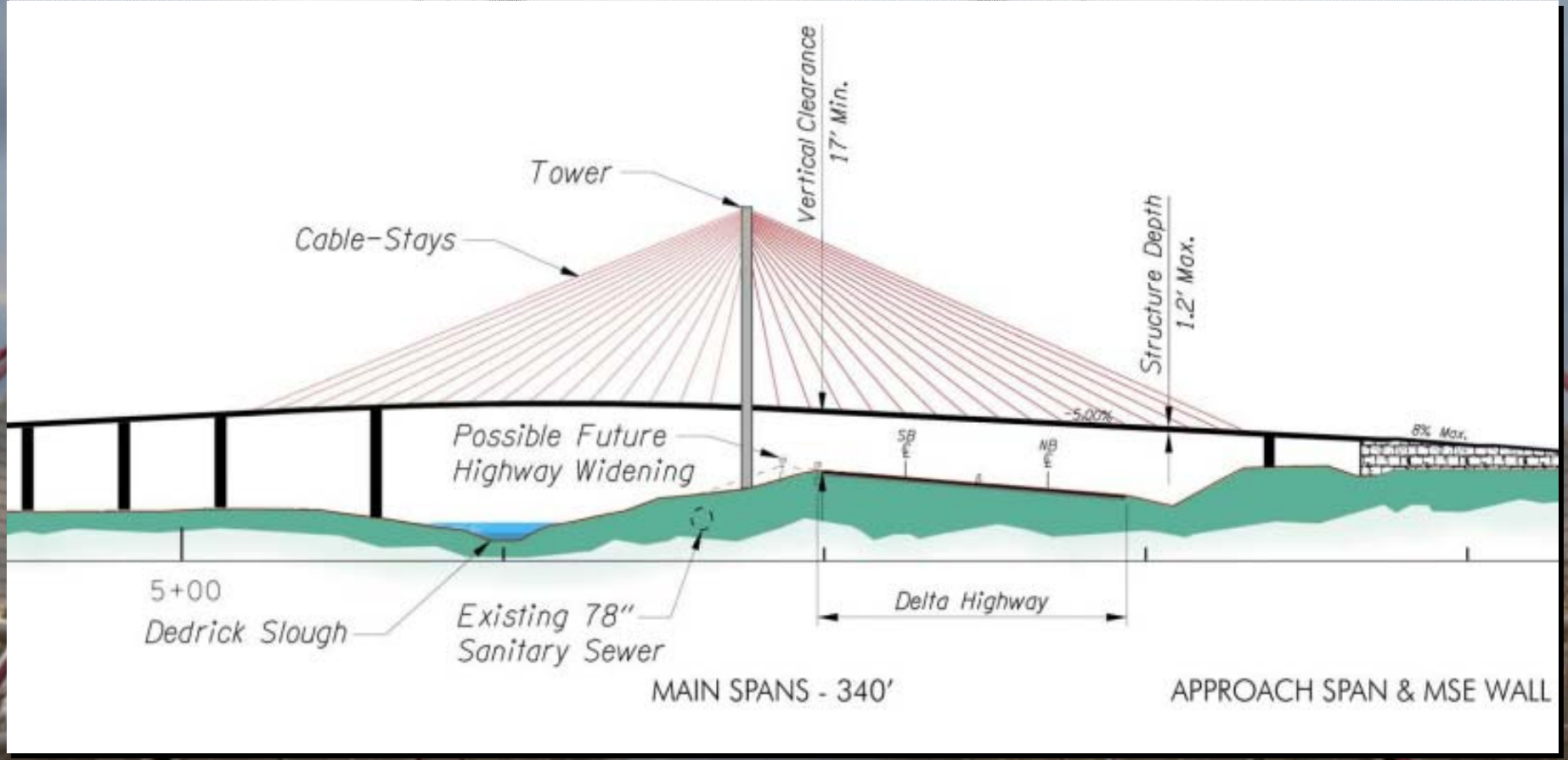
Project Challenges & Constraints

- Avoiding conflicts with existing underground utilities
- Requirement to maintain all lanes of Delta Highway during daytime



Background/History of Delta Ponds Bridge

- **There are few crossings of Delta Highway between I-105 and Beltline Highway**
  - Bicycle and pedestrian traffic need to cross at two busy interchanges
  - New link reduces interactions with traffic
- **Delta Ponds Path is a popular trail for northern Eugene population**

Resolutions – Vertical Clearance

Use the thinnest below deck structure possible

- Deck thickness of less than 15” from profile grade to soffit.
- Cable stays spaced 10 feet on center to allow thin deck.
- Maximum pedestrian grades on structure.

Resolutions – Underground Conflicts

- **Close proximity to utilities required single-shaft foundations**
  - 78” diameter sanitary sewer parallel to Delta Highway
  - Stormwater facility crossing under Delta Highway
- **V-shaped Pylon to reduce footprint**

Resolutions – Falsework Restrictions

- Delta Highway traffic clearances prohibit construction on falsework
- No daytime lane closures are permitted
- Superstructure uses precast deck panels with bolted connections
- Panels function as formwork for cast in place deck

Construction

Cantilever over Delta Highway to avoid traffic

- Plan for pylon to rotate about base during deck panel erection
  - Steel cradle on concrete pedestal, minimal fixity to allow for rotation
- Cast deck in place with allowance for longitudinal movement
  - Blockout at Bent 15 column

Construction

Install Precast Deck Panels at Night

- Stays attached to pylons during the day
- Lane closed on Delta Highway for crane and panel delivery
- Panels lifted, male/female connection made
- Ahead end stays connected
- Bolted connection to previous panel is made with bolts left “snug” tight

Construction

Panel Adjustments

- Panel is adjusted – grade is set based on segmental erection analysis with future deflections considered. Stay lengths adjusted with threaded rods and coupling nuts

- Panel elevations are verified periodically all along cantilever
  - Verify erection analysis
  - Verify that adequate vertical clearance is provided over Delta Highway

Construction

No daytime lane closures were required.

Construction

Topping Slab and Closure to Bent 17

- Deck panels act as stay in place "form" for the pour
- Pour causes significant deflections in cantilever span
  - Cantilever is graded to anticipated camber prior to pour
- Temperature and sun affect camber
- Falsework for closure pour is suspended from end of cantilever to assure smooth shape

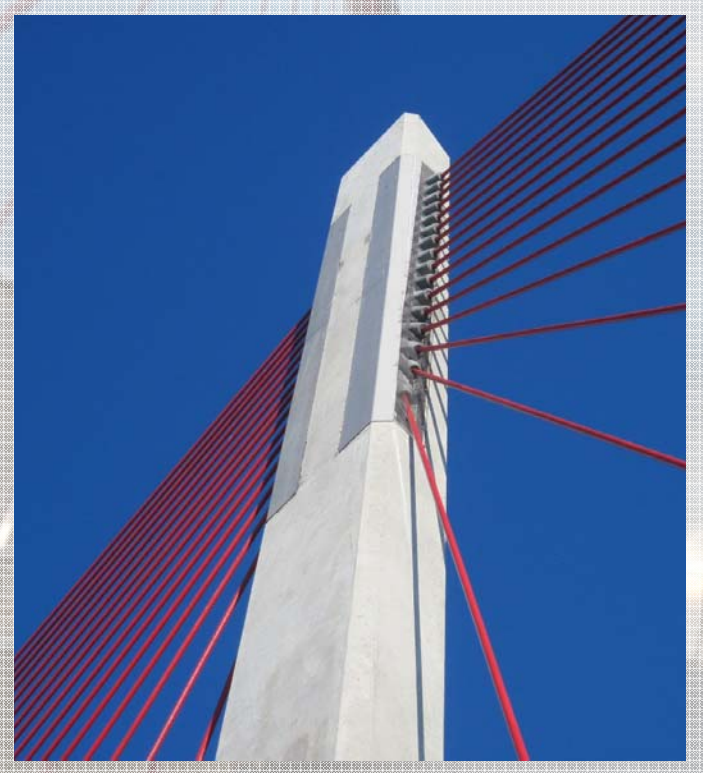
Construction

The Remainder

- Post-tensioning the deck
- Adjusting stay forces to match desired forces at end of construction
- Fix Pylon base and construct infill between columns
- Closure pours at columns
- Deck joints
- Bridge rails and protective fence

Finishing Touches

- Painting of stays
- Screening of upper stay anchorage
- Illumination
  - LED rope lights along deck edge (shielded) and on stays



Finished Project