## 2009 Preliminary Engineering Bridge Design Timeline

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<tr>
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<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
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<tbody>
<tr>
<td><strong>Design of Bridge Elements</strong></td>
<td>Towers</td>
<td>Greenway</td>
<td>Overhead Catenary System</td>
<td>Railings</td>
<td>Synthesis of design for all elements</td>
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<td></td>
<td>Piers</td>
<td>Connections</td>
<td>Lights</td>
<td>Cables</td>
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<td>Walkways</td>
<td>Portals</td>
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<td><strong>Bridge Design Meetings</strong></td>
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<td><strong>25% design on Dec. 2</strong></td>
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<td>Willamette River Bridge Working Group</td>
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<td>Citizens Advisory Committee</td>
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<td>Willamette River Bridge Advisory Committee</td>
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<td>Open House</td>
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Bridge District Artists

Anna Valentina Murch and Douglas Hollis

Willamette River Transit Bridge
Bridge District Artists

Willamette River Transit Bridge

WATER SCORES / MIAMI PERFORMING ARTS CENTER PLAZA, 2006
Willamette River Transit Bridge

ONCE UPON A TIME IN FRESNO
FRESNO FEDERAL COURTHOUSE, CALIFORNIA, 2005
Willamette River Transit Bridge
Willamette River Transit Bridge
WATERSCAPE, SAN JOSE CIVIC CENTER, SAN JOSE, CALIFORNIA, 2005
Willamette River Transit Bridge
Bridge District Artists

Willamette River Transit Bridge

SKYTONES / BENAROYA HALL, SEATTLE, 1998
Bridge District Artists

Willamette River Transit Bridge

SKYTONES / BENAROYA HALL, SEATTLE, 1998
Aesthetic Lighting Concept

Sensor sends the river's story to the lighting program.

Uplights illuminate the bridge cables and are programmed to change brightness and subtle color so that the bridge seems to be breathing.
Conceptual Framework

Willamette River Transit Bridge

SUSTAINABLE ENERGY DIAGRAM

SOLAR/WIND TURBINES

SOLAR PANELS ON STATION SHELTER ROOFS

POWER TO LIGHT THE BRIDGE
Willamette River Transit Bridge

Conceptual Framework

WATER CYCLE DIAGRAM

BIO-SWALES COLLECT RAIN FROM THE BRIDGE
THIS WATER IS THEN USED FOR VISIBLE WATER FEATURES
BEFORE RETURNING TO THE RIVER
Art Concept: Pier Cap
Art Concept: Sonic Bike Lane

Willamette River Transit Bridge

A bicycle traveling at 15 mph (164" per second) would produce a frequency of "E" 659 Hz.

Singing Bike Lane
Art Concept: Parabolic abutment wall  Willamette River Transit Bridge
Art Concept: Parabolic abutment wall

Willamette River Transit Bridge

SECTION AT UNDER-BRIDGE PASSAGES
N.T.S.
Art Concept: Parabolic abutment wall

Willamette River Transit Bridge

Bridge rain channel
Planted swale w/ area drain
Storm waterfall
Paving with dispersion channels to gabions
Lighting on wall
Parabolic wall
Section at under-bridge passages
N.T.S.
Art Concept: Parabolic abutment wall

Willamette River Transit Bridge
Art Concept: Gabion study

Willamette River Transit Bridge
Art Concept: Gabion study

Potential to remove beam under structural review

CONDUIT SHIELD

ACOUSTICAL DISH

Gabions

Underside of East Abutment

Facetted Surface

Underside of West Abutment

Abutment with No Decorative Screens
Telling the Story in Four Acts: Prologue

• Simple, Elegant, and Graceful
• Bridge unites a district identity
• Creating a commonly held vision
Telling the Story in Four Acts: Prologue

- Integrating variety of scales of transportation modes
  - On and off the bridge

- Respecting and responding to the river’s environment

- Art Program that reflects
  - District vision
  - Stations
  - Landside and future development
Act 1: Bridge Overview
Act 2: Landside Treatments
Act 3: On the Bridge
Act 4: Lighting
Epilogue: Ongoing Efforts
Act 1: Bridge Overview
Act 2: Landside Treatments
Act 3: On the Bridge
Act 4: Lighting
Epilogue: Ongoing Efforts
Overview of the Bridge

- Refined Cable Stayed
- Angular Tower
- Pathway & Trackway
- Abutments
- Piers
VIEW FROM THE SHORE
TOWER SECTION/ELEVATION
DECK SECTION NEAR TOWER

LEG SECTION

OCS TYP CATEGORICAL POLE @ 87'-6" O.C.

LIGHTING FOR OVERALL BRIDGE WIDTH

CATEGORICAL

ACCESS TO CONDUITS FROM TOP OF DECK, INTERVAL TO BE DETERMINED

HANDRAIL @ BELVEDERE

PAINTED METAL SCREENING. TYP

PROPOSED PGE CONDUITS

2'-6" WIDE TYP. FLOOR BEAM @ 18'-3" O.C.

PAINTED METAL SCREENING. TYP.

LEASE CONDUITS

HANDRAIL @ BELVEDERE

72
Act 1: Bridge Overview
Act 2: Landside Treatments
Act 3: On the Bridge
Act 4: Lighting
Epilogue: Ongoing Efforts
West Side Story

Willamette River Transit Bridge

WESTERN ABUTMENT CIRCULATION DIAGRAM
West Side Story

- Potential future connection as part of OHSU expansion
- Final configuration to be coordinate with OHSU Master Plan Work
• Potential future connection as part of Zidell expansion
• Final configuration to be coordinate with Zidell Master Plan Work
Act 2: Landside Treatments

West Side Story

- Creating a commonly held vision: follow-on projects
- Greenway bike and pedestrian routing
- Abutment refinements
Engineering Evaluation in Process

Willamette River Transit Bridge

WEST SIDE ABUTMENT
East Side Story

- Potential future connection as part of OMSI expansion
- Final configuration to be coordinate with OMSI Master Plan Work
East Side Story

Willamette River Transit Bridge

• Potential future connection as part of Opera expansion
• Final configuration to be coordinate with Opera Master Plan Work
East Side Story

- Creating a commonly held vision: follow-on projects
- Greenway bike and pedestrian routing
- Abutment refinements
Willamette River Transit Bridge

MESH SCREEN

TRANSPORTATION NODE

UNDERSIDE OF EAST ABUTMENT

EAST SIDE ABUTMENT
Engineering Evaluation in Process

Willamette River Transit Bridge

EAST SIDE ABUTMENT

MESH SCREEN

REMOVED BEAM

TRANSPORTATION NODE

UNDERSIDE OF EAST ABUTMENT

EAST SIDE ABUTMENT
Pathway: mid span

Feasibility of adding color to pathway under review
Pathway: Tower approaching

Willamette River Transit Bridge
Pathway & Trackway

Willamette River Transit Bridge
Railings

- Horizontal options
Railings

- Vertical options
Art Concept

- Sonic Bike Lane at Bridge Ends
Act 1: Bridge Overview
Act 2: Landside Treatments
Act 3: On the Bridge
Act 4: Lighting
Epilogue: Ongoing Efforts
Functional Bridge Lighting

Willamette River Transit Bridge

ROADWAY AND PEDESTRIAN SAFETY LIGHTING

"ROADSTAR" LED STREETLIGHT
Manufacturer: Philips Lumec

1 IESNA RP-33 Suggested standard light level for Special Pedestrian Security 0.5 fc

ROADWAY LIGHTING COVERAGE

AVG. 0.61 FC AT 6' ABOVE DECK FOR FACIAL RECOGNITION

BRIDGE SAFETY LIGHTING, DECORATIVE LIGHTING AT CABLES AND TOWERS

TYPICAL 10" OCS POLE

TRI-MET

macdonald architects
Functional & Aesthetic Lighting

Willamette River Transit Bridge

ELEVATION

VIEWING DECK

BRIDGE SAFETY LIGHTING. DECORATIVE LIGHTING FOR CABLES AND TOWERS
Functional & Aesthetic Lighting

Willamette River Transit Bridge
Art Concept: Aesthetic Lighting

Willamette River Transit Bridge

THREE PHASES OF AESTHETIC LIGHTING COLOR SEQUENCE
Art Concept: Abutment Lighting

ABUTMENT PASSAGE LIGHTING
Art Concept: Abutment Lighting

ABUTMENT PASSAGE LIGHTING PLAN

- Parabolic Wall
- Wall Washer Uplights
- Spot Light Above
- Path
- Ribs Above
- Pole with Path & Ceiling Lights
- Beams Above

Willamette River Transit Bridge
WRBAC Guidance:

- Railing design preference
- Aesthetic Lighting preference
- Landside - Greenway & Future Development Integration
Act 1: Bridge Overview
Act 2: Landside Treatments
Act 3: Lighting
Act 4: On the Bridge
Epilogue: Ongoing Efforts
Epilogue: Ongoing Efforts

- District Coordination
- Station Coordination
Epilogue: Ongoing Efforts

Architecture Refinements
• Pathway widths & delineation

Engineering
• Systems & civil coordination
Epilogue: Ongoing Efforts

Track way
  • Crash barrier
Epilogue: Ongoing Efforts

Art Refinements

• Lighting: functional and aesthetic coordination
• Pile Cap: within budget & construction constraints
Thank you

For more information, visit: trimet.org/pm