

Pedestrian Tunnels: Connect Safely



Photo Credit: The Columbian/Troy Wayrynen

Presented by:

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Pedestrian Tunnels: Connecting Safely

Discussion Topics:

- **Project Development**
- **Design Considerations**
- **SR 14 Cape Horn Pedestrian Undercrossing: Skamania County**
- **SR 14 Pedestrian Tunnel Project: Washougal**

Photo: Pedestrian tunnels
Lake Oswego, OR

Project Development

Project Development

- Project Motivation
- Project Stakeholders
- Stakeholder Responsibilities
- Engage Public Support
- Obtain Funding

Photo: Preliminary Model of Washougal Pedestrian Tunnel

Project Development

Project Motivation:

- Safety / Incidents
- Improved Access
- Connectivity

Typical Locations:

- Elevated Roadways
- Railroad Tracks
- Multi-Lane Arterials
- Highways



52,000 Pedestrians injured in Traffic Crashes

70,000 Bicyclists injured in Traffic Crashes

National statistics, 2010, U.S. Dept. of Transportation,
National Highway Traffic Safety Administration

Project Development

Identify Project Stakeholders

- **Federal Agencies**
- **DOT's**
- **County**
- **City**
- **Railroad**
- **Native American Tribes**
- **Neighborhood Association**
- **School District**
- **Conservancy Group**
- **Walking/Hiking/Biking Advocacy Groups**
- **Adjacent Landowners**
- **Local senator or representative**
- **Local businesses/associations**
- **Local artists**
- **Environmental Agencies**
- **Other key stakeholders**

Establish Clear Responsibilities for Lead Agencies

Project Development

Engage Public Support



Photo: Public Meeting for Main Street Improvements, Oregon City, OR

Project Development

Obtain Funding



Design Considerations

Common Design Concerns

- Budget
- Soil Conditions
- Environmental, ROW Limitations
- Tunnel Type
- Access
- Lighting
- Drainage
- Aesthetics
- Operation & Maintenance
- Construction feasibility and site constraints




Photo: Pedestrian Underpass, Lacey, WA

Design Considerations



Photo: Pedestrian Tunnel, Lake Oswego



Photo: Graffiti on Pedestrian Underpass, Czech Republic

Operation & Maintenance

- General Maintenance
 - Cleaning
 - Equipment Access
- Safety
 - Lighting
 - Security
- Aesthetic Concerns
 - Graffiti
 - Landscaping

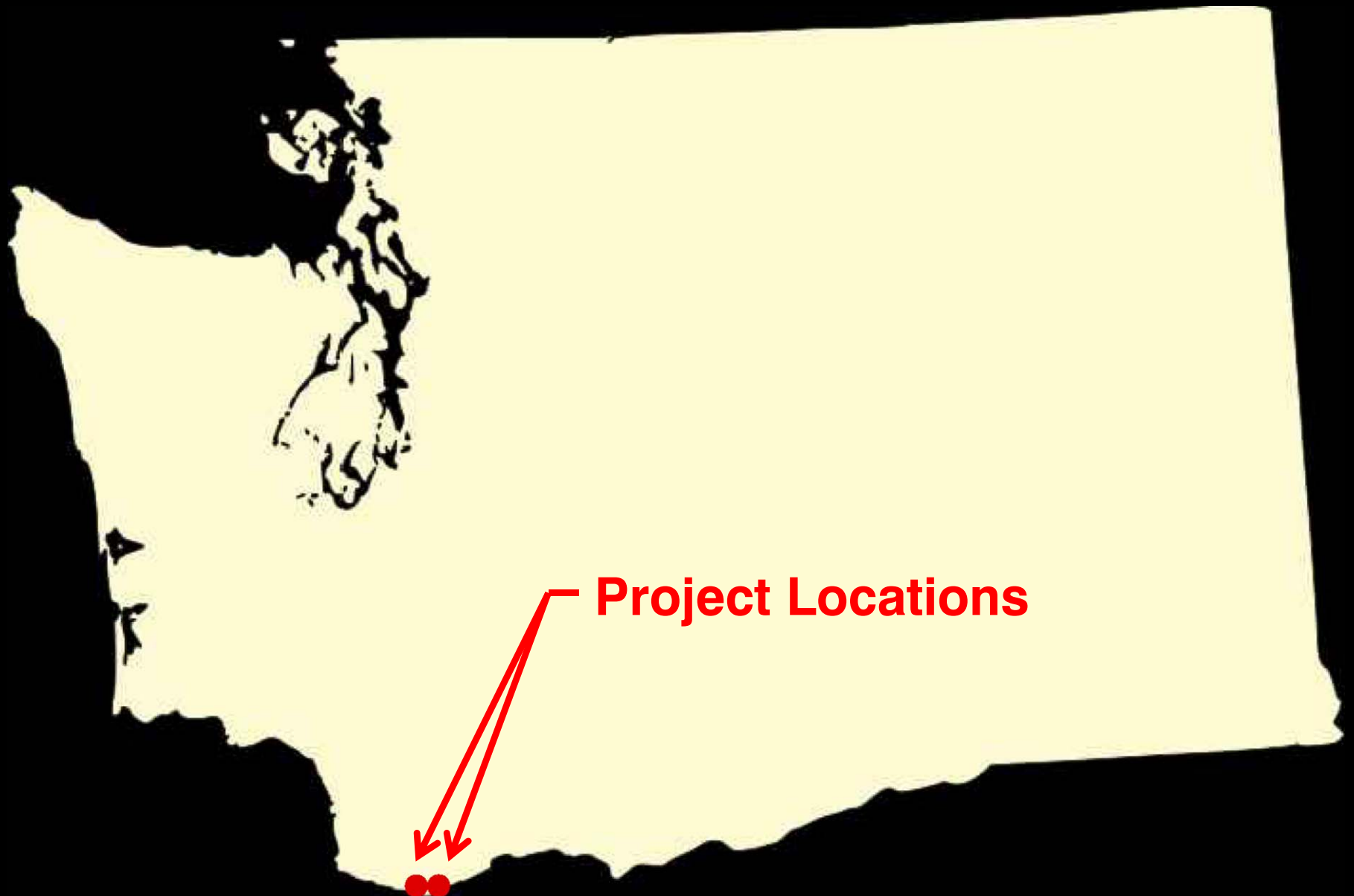
Design Considerations

Construction

- Schedule
- Minimizing Impacts on the Public
- Maintain Traffic Flow
- Geotechnical, Archaeological and Environmental
- Construction Methods



Recent Example Projects



Recent Example Projects



**SR 14 Cape Horn Pedestrian
Undercrossing: Skamania County**



**SR 14 Pedestrian Tunnel Project:
Washougal**

SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA



Tim Homann, P.E.
Skamania County Engineer

SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

- **Project Description & Motivation**
- **Concurrent Work**
- **Project Partners & Funding**
- **Project Partner Responsibilities**
- **Key Design Elements**
- **Design Team**
- **Construction**
- **Responsibility & Maintenance**



SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

Project Description

- **Salmon Falls Pedestrian Tunnel**
- **Cape Horn Pedestrian Tunnel**
- **Connections with 7-mile**
- **Cape Horn Loop Trail**

Project Motivation

- **Safe Highway Crossing**
- **Trail Connections**
- **Access to Scenic Overlook**



SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

Concurrent Work

- **US Forest Service Cape Horn Trail volunteer improvements**
- **US Forest Service Cape Horn Overlook project effort**
- **WSDOT SR-14 safety improvements in the vicinity of Salmon Falls Road**



SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

Project Partners & Funding



Washington State
DOT



Construction Cost - \$1.49 M

- **Two Structures – 10'W x 12'H, 56 LF and 64 LF**

Fully funded design and construction by FHWA's Western Federal Lands Division and Forest Highway Division

SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

Project Partner Responsibilities

- **WSDOT: funding, incorporation of undercrossing plans into SR-14 reconstruction design, construction inspection**
- **Skamania County: project administration, coordination**
- **US Forest Service: funding, land, community involvement**
- **Federal Highway Administration: funding of engineering and construction**
- **Other Key Players: Friends of the Gorge, Cape Horn Conservancy, Washington Trail Association and others**

SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

Key Design Elements

- **Two precast concrete tunnels faced with Columbia River basalt**
- **Design in the Columbia River Gorge National Scenic Area**
- **Fast-track design and contract documents**

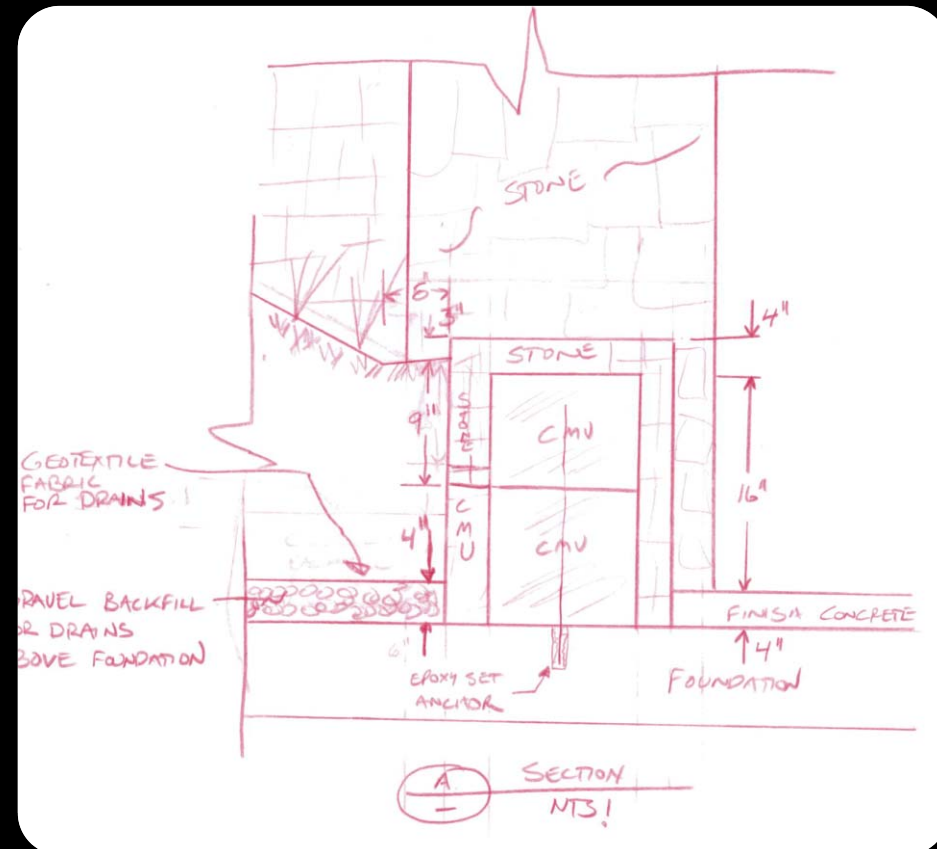


SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

Design Team

Wallis Engineering (PM & Civil Engineer) with:

- Kramer Gehlen & Associates (Structural Engineer)
- Ash Creek Associates (Geotechnical Engineer)
- Greenworks (Landscape Architect)
- Rommel Architectural Partnership (Architect)
- Minister & Glaeser Surveying (Surveyor)
- Archaeological Investigations NW (Archaeological/Historical Consultant)
- DKS & Associates (Traffic Engineer)



SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

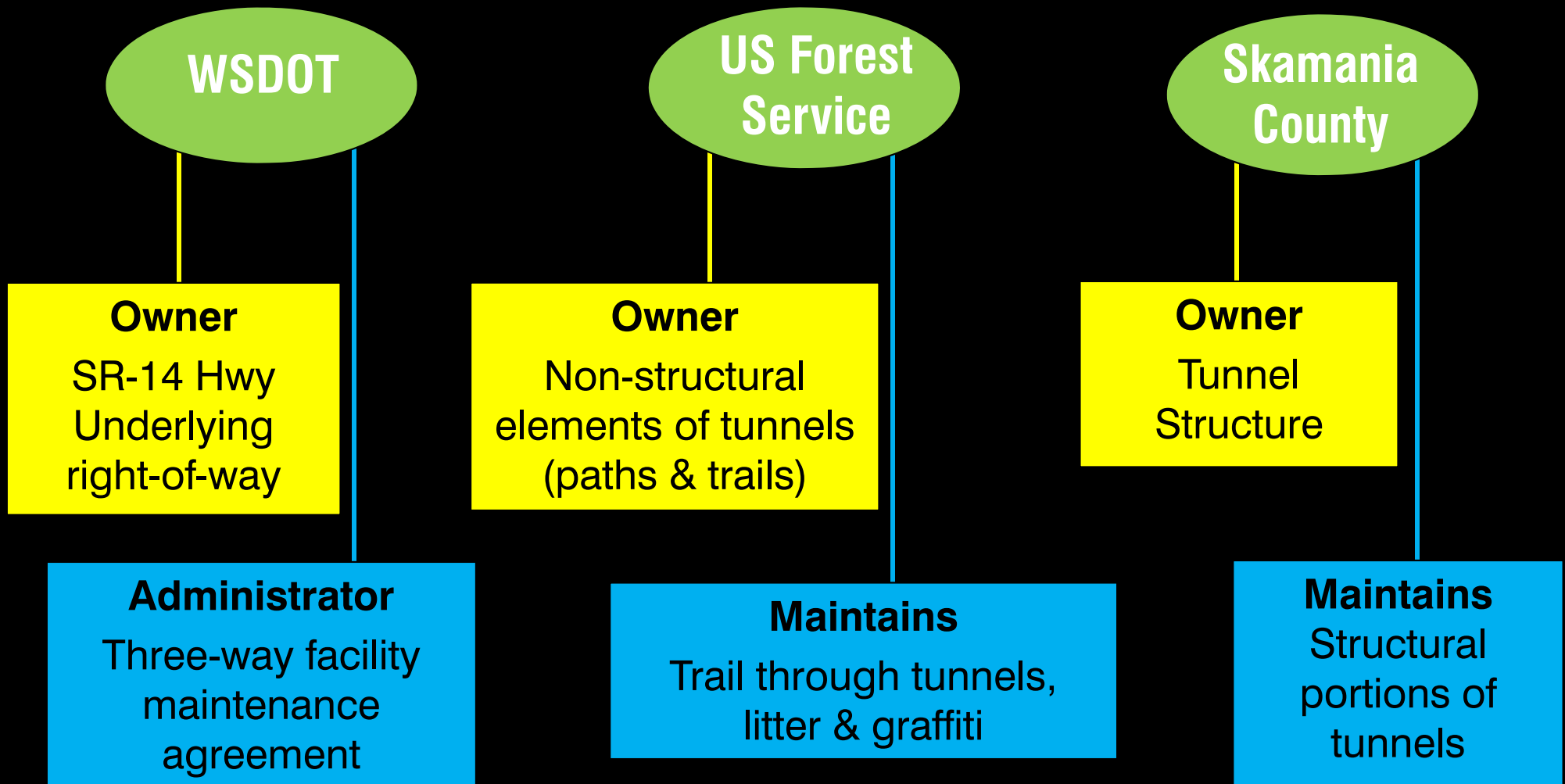
Construction

- Close collaboration between all project partners
- Pre-cast tunnel sections versus cast-in-place concrete
- Emphasis on safety
- Traffic control
- Extensive media and public involvement



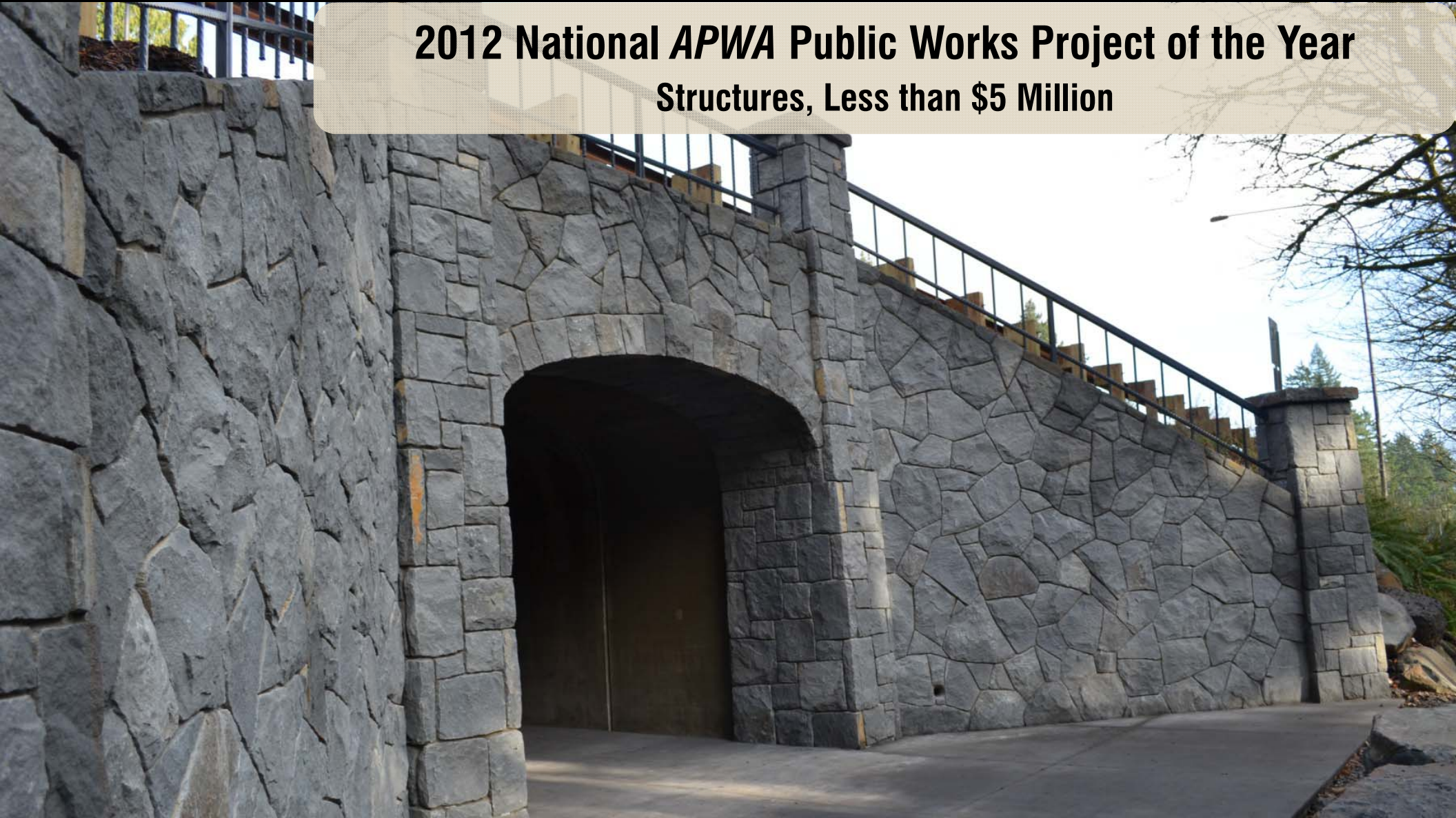
SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

Responsibility and Management:



SR 14 Cape Horn Pedestrian Undercrossing: Skamania Co., WA

**2012 National *APWA* Public Works Project of the Year
Structures, Less than \$5 Million**



SR 14 Pedestrian Tunnel Project: Washougal, WA



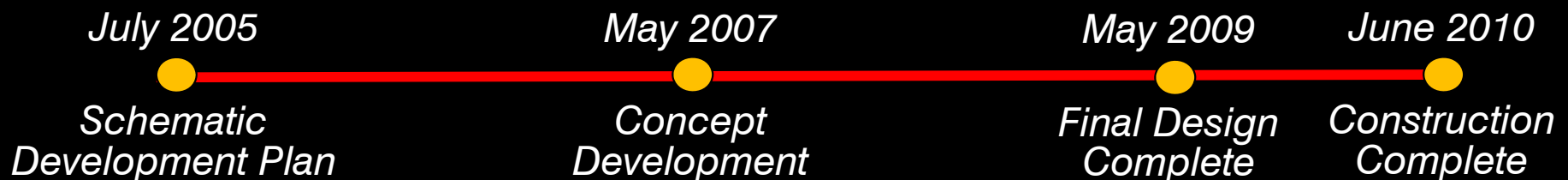
SR 14 Pedestrian Tunnel Project: Washougal, WA

- Project Overview
- Project Motivation
- Collaboration between Community Partners
- Funding
- Permitting
- Key Design Elements
- Design Team
- Construction



Concept drawing of tunnel

SR 14 Pedestrian Tunnel Project: Washougal, WA



SR 14 Pedestrian Tunnel Project: Washougal, WA

Project Motivation

- **Safe, desirable crossing of State Route (SR) 14 for multiple users**
- **Connection between revitalized downtown and popular regional waterfront trail linking two major parks along the Columbia River**



SR 14 Pedestrian Tunnel Project: Washougal, WA

Collaboration between Community Partners & Washougal

- **WSDOT Highways & Local Programs**
- **Pendleton Woolen Mills**
- **Port of Camas/Washougal**
- **Army Corp of Engineers**
- **Vancouver-Clark Parks & Recreation**
- **Bicycle Alliance of Washington**
- **Children's Home Society**
- **Washougal School District**



SR 14 Pedestrian Tunnel Project: Washougal, WA

Funding:


- **SAFETEA-LU Appropriation (High Priority):** **\$1.3 Million**
- **2006 Pedestrian & Bike Grant:** **\$1.3 Million**
- **ARRA Stimulus:** **\$0.6 Million**

Construction Cost - \$1.4 M:

- **12'W x 16'H x 110 LF**
- **Lighting at tunnel and plaza:** **\$65,000**
- **Video Surveillance:** **\$19,000**
- **Art:** **\$86,000**

SR 14 Pedestrian Tunnel Project: Washougal, WA

Required Permits:

- 
- **WSDOT General Construction**
 - **WSDOT Trail Lease**
 - **Franchise Utility**
 - **Hydraulic Project Approval (HPA)**
 - **US Corp of Engineers (USCOE) Levee**
 - **Critical Areas and Wetland Mitigation**
 - **Shorelines**
 - **National Environmental Policy Act (NEPA) (CE), State Environmental Policy Act (SEPA)**
 - **National Pollutant Discharge Elimination System (NPDES) Stormwater Pollution Prevention Plan (SWPPP)**

SR 14 Pedestrian Tunnel Project: Washougal, WA

Key Design Elements



SR 14 Pedestrian Tunnel Project: Washougal, WA

Design Team

Wallis Engineering (PM & Civil Engineer) with:

- **Chris Freshley Landscape Architects (Landscape Architect)**
- **Kramer Gehlen & Associates (Structural Engineer)**
- **Rommel Architectural Partnership (Architect)**
- **DKS Associates (Electrical/Traffic Engineer)**
- **Minister & Glaeser Surveying (Surveyor)**
- **Ash Creek Associates (Geotechnical Engineer)**
- **Archaeological Investigations NW (Archaeological/Historical Consultant)**
- **Ecological Land Services (Environmental)**
- **Assessment Associates Inc. (Phase 1 Environmental Site Assessment)**
- **GE Services (QC Testing)**
- **Rex Ziak (Artistry Consultant)**

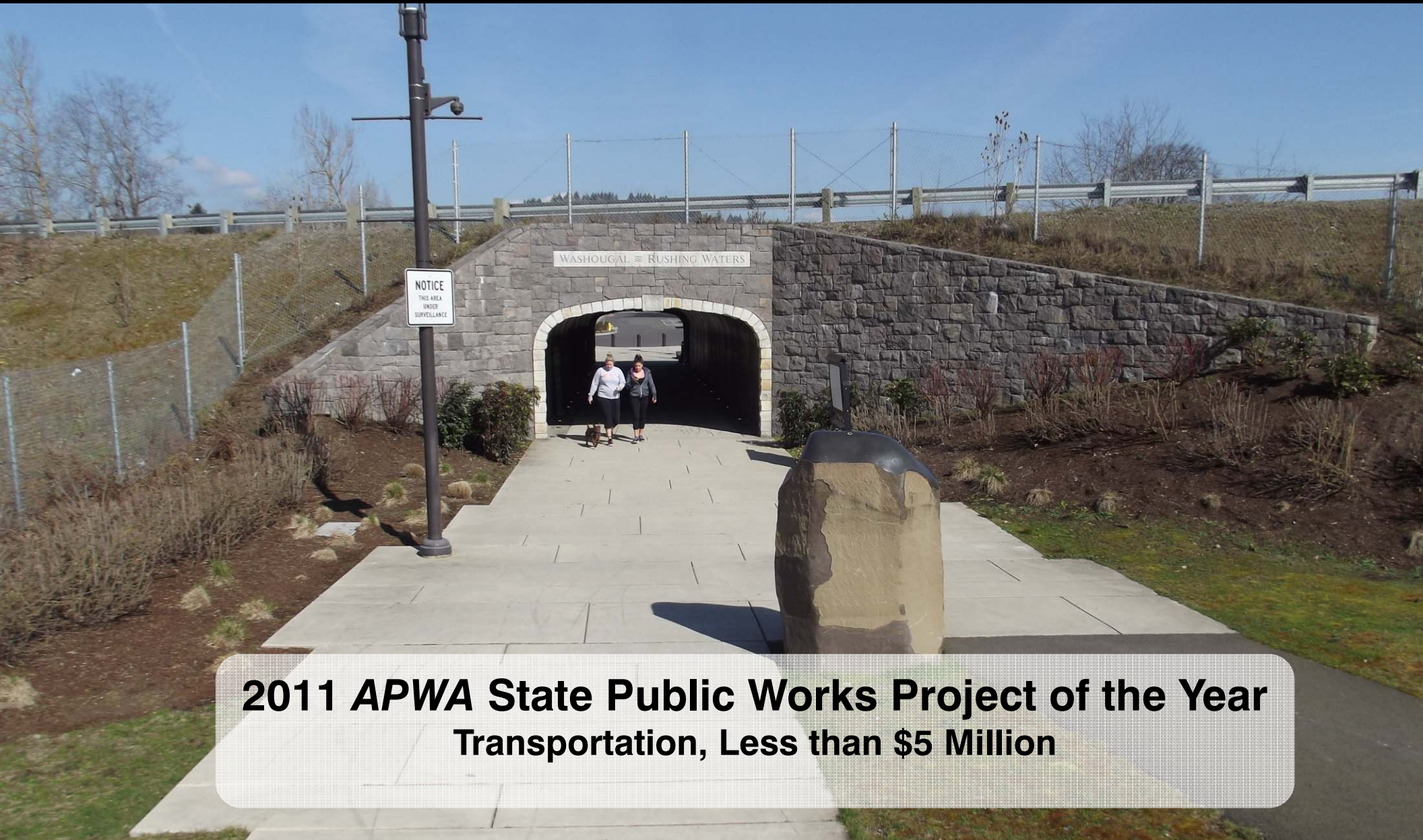
SR 14 Pedestrian Tunnel Project: Washougal, WA

Construction

- Coordination with WSDOT to keep SR-14 open
- Use of pre-cast tunnel sections
- Construction of a shoo-fly
- Slide-rail shoring system



SR 14 Pedestrian Tunnel Project: Washougal, WA



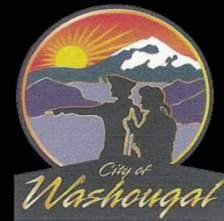
**2011 APWA State Public Works Project of the Year
Transportation, Less than \$5 Million**

Pedestrian Tunnels: Connect Safely

prepared by:



Skamania County



City of Washougal

Data and photograph sources:

- Slide 1 photo courtesy of The Columbian newspaper
- Photos of tunnels in Lacey, WA, Lake Oswego, OR, Chicago, IL, Washougal, WA and Skamania County, WA from Wallis Engineering
- Photos of Skamania County undercrossings from Rotschy, Inc.
- Photo of graffiti in tunnel courtesy of Pavel Ševela, wikimedia.org
- Aerial Photographs and Maps from Google Maps
- Traffic crash statistics from <http://www-nrd.nhtsa.dot.gov/Pubs/811552.pdf>

Questions?



Photo: Pedestrian Underpass, Chicago, IL