



Background to my position, the program, and the importance of the topic to the Governor and Director.

Supports and expands upon the work of environmental professionals in the agency and their efforts.



Overview

- Sustainability at ODOT
- Internal Operations
- System Operations
- Planning for Climate Change
- Project Delivery



- Setting the Context
- Sustainability Plan and performance Metrics and reporting
- Maintenance Activities and Solar Highway Program
- Mitigation and Adaptation
- Sustainable Design and Construction



Setting the Context

- Oregon Sustainability Act
- Executive Orders
- ODOT's Sustainability Plan
- Sustainability added to ODOT's Mission and Value statement



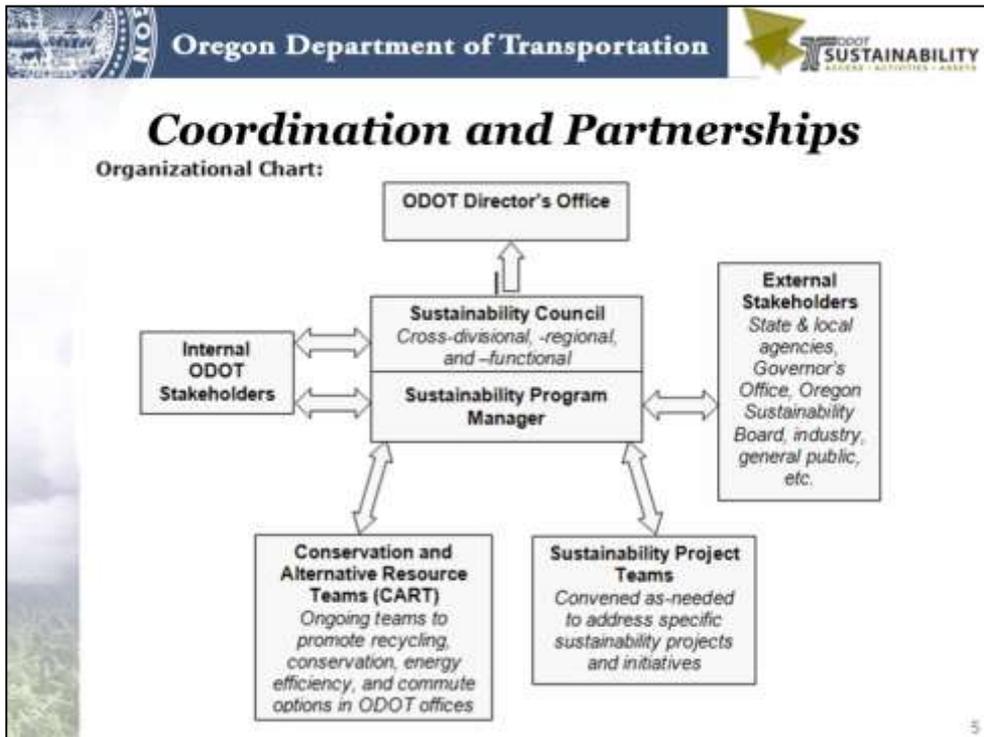


ODOT's Core Mission and Values

Mission: To provide a safe, efficient transportation system that supports economic opportunity and livable communities for Oregonians.

Values: These are the values that guide our decision making and which we follow in implementing ODOT's mission and goals.

Sustainability: We balance economic, environmental and community well-being in a manner that protects the needs of current and future generations.



As Oregon's first state agency to have a full-time sustainability coordinator, ODOT is committed to being a leader in this critical effort.

Internal

- ODOT Sustainability Executive Committee
- ODOT Sustainability Council
- Climate Change Adaptation Workgroup
- Regions, Leadership Teams, Transp. Commission

External

- Governor's Office
- Oregon Sustainability Board
- Oregon Global Warming Commission
- State agency partners
- Public utilities and private sector



Strategic Plan for Sustainability

- Volume I: Vision for ODOT's Sustainability
- Volume II: Sustainable Management for ODOT's Internal Operations
- Environmental Management System for Maintenance and Operations
- Sustainability in Project Delivery

We also have a Sustainability Plan. ODOT first Transportation agency to have a Sustainability Plan- 2004 .

The adopted Volume 1 describes challenges, legal mandates, and a vision for sustainability; it frames seven focus areas.

Volume 2, contains sustainability Goals, 26 Performance Measures, and implementation strategies in areas involving **internal operations such as with Fleet, Facilities and Maintenance**

Project Delivery covered mostly through a program-level approach- contract management and specifications. And we've piloted various sustainability tools and ratings approach and in 2013 - we did a Projects audits that looked at what we do well and where we can improve- WE DO MANY THINGS WELL - recommendations to take a program-level approach such as changes to specifications.

We piloted the CS3 piloted on the OTIA III Bridge program

And piloted project-level Ratings systems, Greenroads and early version of FHWA's INVEST tool

Oregon Department of Transportation

GOVERNMENT SUSTAINABILITY
RESPECT • INTEGRITY • EXCELLENCE



Sustainability Focus Areas

- (1) Health And Safety
- (2) Social Responsibility
- (3) Environmental Stewardship
- (4) Land Use And Infrastructure
- (5) Energy And Climate Change
- (6) Material Resource Flows
- (7) Economic Health

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Health and Safety - A healthy, safe workforce and population is a fundamental need to sustain our society

Social Responsibility –

Environmental Stewardship

Land Use and Infrastructure – siting of new facilities

Energy and Climate Change

Material Resource Flows

Economy

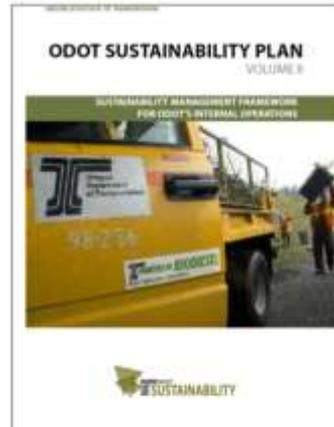


Plan Updates

First issued in
October 2010

-
Accepted by Director
and Transportation
Commission

-
Updated every three
years to reassess
goals and strategies





Progress Reports

Highlights program
success and
challenges

-

Feature stories

-

Performance
Measure tracking and
analysis

2014 ODOT Sustainability Progress Report





Sustainability in Internal Operations

ODOT Sustainability Plan Volume II
Central Services Division



Energy Use in Facilities

ODOT's major facilities have achieved **12% reduction** in electric energy usage (kWh) over the last two years (2014-15)



Facilities Management Section manages 1,112 ODOT owned and occupied structures and properties. ODOT facilities are office buildings, rest areas, DMV outlets, communication sites, employee-occupied housing, maintenance locations, and many other types of structures. The primary functions of the section are demand and preventative maintenance of buildings and building systems, space planning, lease negotiations, card access and security, new construction, remodels, and major maintenance and site-related environmental projects. The section also maintains a database of all owned and leased buildings and their condition.

Energy Use Intensity (EUI) will be tracked and reported to ODOE using Portfolio Manager on an annual basis.

ODOT Facilities has hired an Energy Analyst.

In support of the Governor's sustainability mandates and ODOT's Sustainability Program, the section's crews routinely look for ways to utilize recycled products, reduce energy consumption, recycle construction materials, and re-use surplus equipment or systems furniture.

The facilities electrician recently coordinated a retrofit for an entire floor of

lights located in the Region 1 Headquarters Building. The replacement lights will reduce electrical and maintenance costs while providing better lighting for the tenants. This type of lighting retrofit has been completed in several buildings.

ODOT's annual electricity usage appeared to be rising, however, so did its square footage of leased and owned buildings. By converting kilowatt (kWh) hours of usage into kWh per square foot of building space, annual electricity consumption has declined since 2004. Calendar year 2009 reflected nearly a 6% overall reduction using CY 2004 as baseline, and ODOT achieved a 10.1% reduction in 2010.

Short-term Goals:

- 1) Reduce ODOT's energy use 10% below 2004 levels by December 2010.
- 2) Reduce ODOT's energy use 20% by 2015.
- 3) Meet 25% of total electricity needs at ODOT facilities by new renewable energy sources by 2010.

Long-term Goals:

- 1) To meet Oregon's Statewide Energy Goals to reduce electricity use of facilities 50% below 2004 levels.
- 2) Meet 100% of total electricity needs at ODOT facilities by new renewable energy sources by 2025.



Oregon Department of Transportation



GOVERNMENT SUSTAINABILITY
AGENCY • ACTIVITIES • TASKS

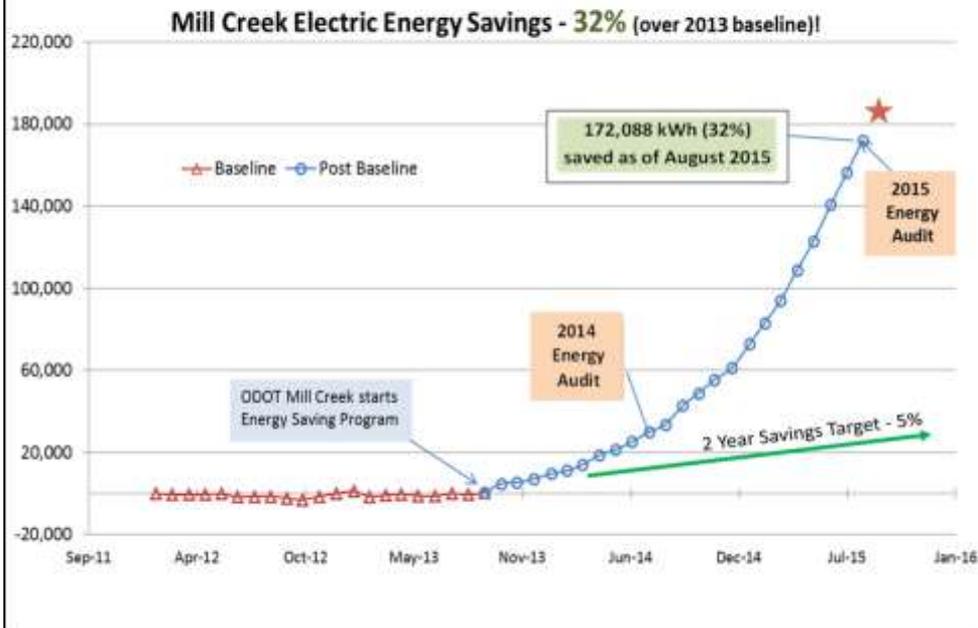
Strategic Energy Management

A comprehensive approach to energy management:

- ✓ Strategic investments
- ✓ Fine tune building operations
- ✓ Build employee awareness



- Operational assessments and audits
- Strategic facility upgrades
- Communications and outreach
- Track and report savings and results





Strategic Energy Management

- Phase 1 - (3 Major Facilities, 2013-15)
- Phase 2 - (7 Major Facilities, 2015-16)
- Phase 3 - (Major Facilities in the Regions, including Maintenance stations/ truck shops, 2017 and beyond)



- Mill Creek Building
- Region 2 Headquarters (Bldgs. A and
- DMV Headquarters
- Materials Lab
- Building K (Salem East Campus)
- Flanders Building (Portland)



Water Use in Facilities

Over 2015, ODOT's major facilities
have reduced water use by
3.7 million gallons.





Recycling and Waste Management

In 2014-15, ODOT's recycling ...

- Eliminated **2,542 cubic yards** of waste to regional landfills or incinerators



- Saved the equivalent of **7,523 trees**
- Removed annual greenhouse gas emissions equivalent to **713 cars.**



Sustainable Procurement

Response to Green Chemistry Executive Order 12-05

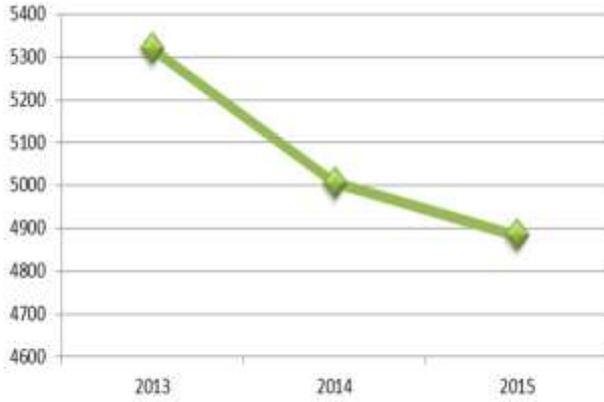
2015 Directive from ODOT Central Services:
***“Purchase papers with at least 30%
post-consumer recycled content.”***

- Develop Best Practices
- Education and Outreach
- DAS Statewide Price Agreements



Office Paper Use

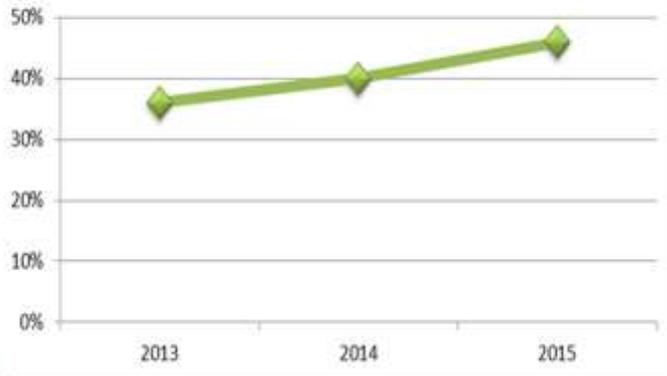
Cartons of Paper Used





Office Paper Use

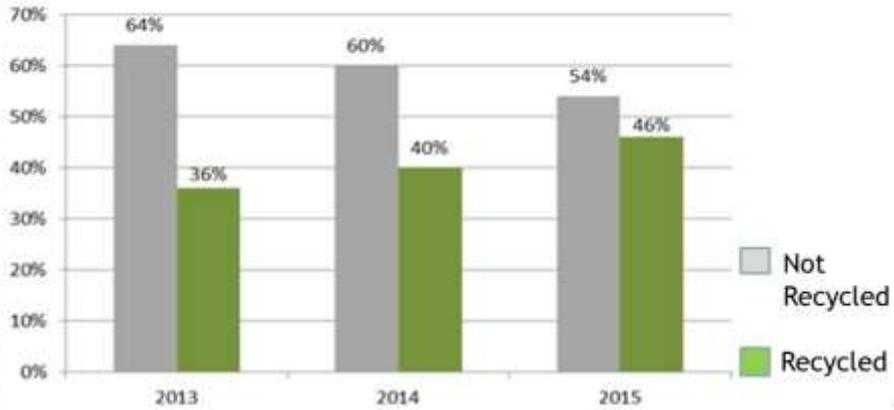
Percent of Paper with Post-Consumer Recycled Content



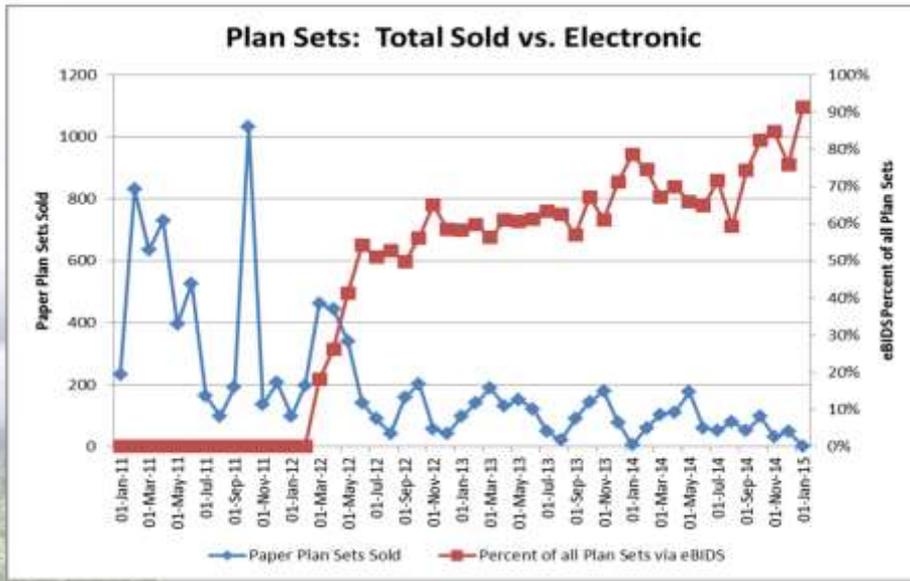


Office Paper Use

Percent of Paper with Post-Consumer Recycled Content Overtime



Electronic Bids and Plan Sets



Alternative Vehicles and Fuels

- 55% B-20 biodiesel equivalent in 2015
- ODOT owns:
 - 263 E-85 vehicles;
 - 29 hybrid and electric vehicles
 - 145 trucks using anti-idling technology.



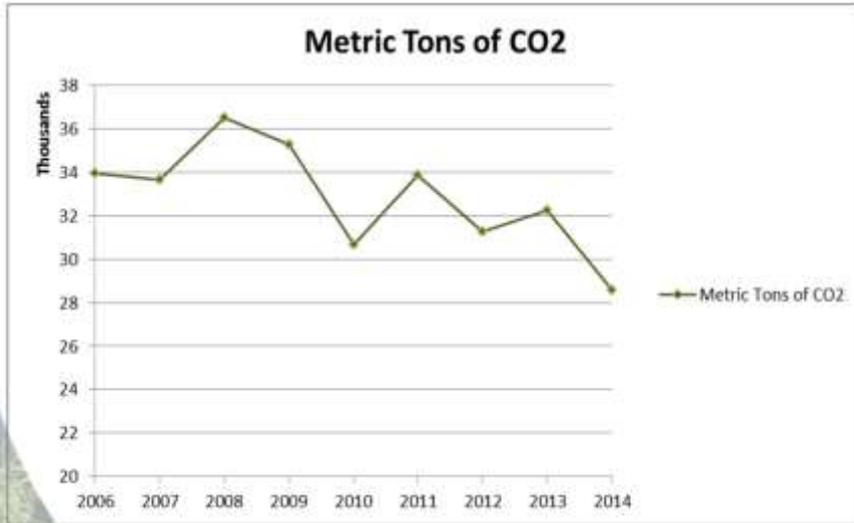
- Implemented the use of solar power instead of gasoline power on all trailer-mounted Variable Message Signs (VMS).
- ODOT currently owns 59 E-85^[1] vehicles and 12 Hybrid or Plug in Hybrid Electric Vehicles (PHEVs).
- Fleet is deploying a diesel hybrid electrical truck.
- ODOT currently uses 31% B-20^[2] biodiesel equivalent, surpassing the short-term goal of 25%.
- The ODOT SSB Fleet is purchasing five Nissan Electric Vehicles (Nissan Leafs) to be stationed at various ODOT buildings.
- ODOT used 13% E-85 equivalent in 2010 (through October), surpassing the short-term goal of 10%.
- ODOT owns and operates 81 trucks using anti-idling technology.

^[1] E-85 is a fuel blend of 85 percent ethanol and 15 percent gasoline.

^[2] B-20 is a fuel blend of 20 percent biodiesel and 80 percent petroleum.



Greenhouse Gas Emissions (Fleet)



Oregon Department of Transportation 

High Performance Major Facilities

- Headquarters Renovation **LEED Platinum** (Salem)
- Region 4 Technical Center **LEED Silver** (Bend)
- New Maintenance Stations constructed to **LEED and SEED equivalents** (Baker City, Sisters)



New major facilities meet high performance standards for air, water, and energy use.

Optimizing ODOT's major facilities' performance is essential to achieving economic and environmental benefits. Currently, sustainability efforts are being integrated into the design of all new facilities and into major renovations. Some of the key actions from 2010 include:

- ODOT is targeting the renovation of the T-Building in Salem for LEED Gold based on a cost-benefit study that showed a high performance environmentally-friendly design saved money over the building's future lifetime.
- All new maintenance yards are built as high performance sites (LEED or SEED equivalent) that include stormwater sediment containment and oil separation. New yards utilize a variety of sustainable materials, have reduced energy consumption, and are designed to contain spills.

Goals:

- 1) Build and/or retrofit 100% of new and existing major facilities to meet certified LEED or SEED performance standards.
- 2) Explicitly use life-cycle cost analysis in construction and major renovation decisions.
- 3) Consider requiring LEED or SEED equivalent high-performance criteria for major leased buildings in contract renewals.

T-building facts:

- The new T-Building will reflect ODOT's sustainability value, complete with solar panels, energy efficient systems, non-toxic materials and other elements that will contribute to the building becoming LEED-certified. The contract calls for 75% recycling, and Hoffman (contractor) is encouraging subcontractors to aim for 90%.
- Outside the building, arborists are evaluating the trees and other plants surrounding the structure. Work paths have been created to avoid damaging the landscape, as most of the trees are being preserved.
- When the renovation is complete, the T-building will contain energy efficient lighting, heating and air conditioning systems and rooftop solar panels generating power for the grid.
- It will be a safe and healthy building for employees and visitors with its seismic retrofits, improve ventilation and clean water.

- The rehabilitation and related efforts to consolidate facilities and co-locate groups of employees working in similar areas will help the state save money by reducing lease, maintenance and other expenses arising from outdated facilities.



Headquarters LEED Platinum Design

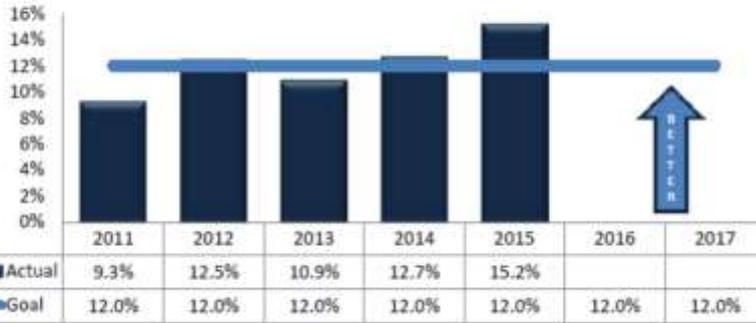


- Rooftop Photovoltaic-cells
- HVAC upgrades
- Rainwater harvesting system
- Bicycle storage, showers
- Stormwater management
- Drought tolerant, native plants



Contracts Awarded to Oregon Certified Small Businesses

Certified Firms - Percent of Contracts Awarded to Certified Small Businesses (Prime and Subcontracts)



Feb 2016

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Sustainability in System Operations

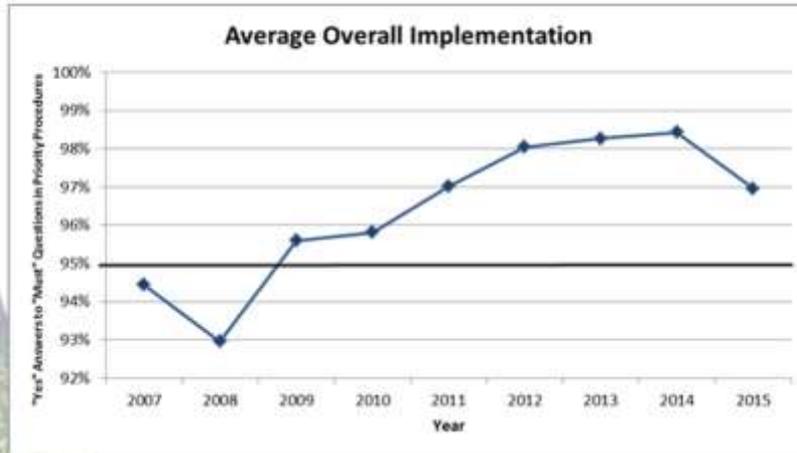
- Maintenance and Operations Branch
- Office of Innovative Partnerships





Environmental Management System

Audit Results: Percent measure of ODOT Maintenance yards in compliance with EMS priority procedures.





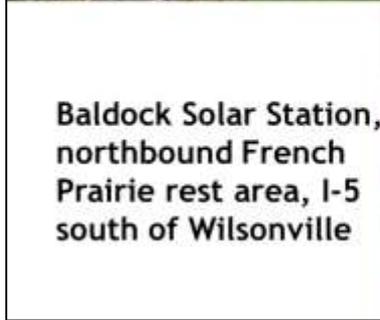
Herbicide Reduction Strategy

- **Goal:** to reduce statewide herbicide use by 25% over five years (2010 baseline)
- As of 2016, Maintenance Districts have reduced herbicide applications by over 57%.





PGE solar array
at the I-5/ I-205
interchange



Shifting gears:

Can't talk about Optimizing Opportunities in roadsides without talking about use of R/W for energy production

Oregon Solar Highway Program was first in country – innovative and collaborative program to produce renewable energy.

ODOT provides the land, but does not own the solar panels or directly provide capital for the projects -

2008 - ODOT collaborated with PGE to install about 600 solar panels. Powers back into the grid and offsets over 1/3rd of the energy needed to illuminate the freeway at this massive interchange

2012 – Baldock – ODOT worked with PGE to develop 7 acre site with nearly 7,000 panels, ENOUGH TO POWER 165 ELECTRIC HOMES

Renewable Energy Certificates used to offset ODOT's use of non-renewable energy sources.



Planning for Climate Change

- Oregon Sustainable Transportation Initiative (OSTI)
- Adaptation Planning





Oregon Sustainable Transportation Initiative

Reducing Transportation-Related GHG Emissions



Driven by Legislation



Has evolved over time

Through creating more livable, healthier and prosperous communities



OSTI a joint program between ODOT and DLCD

It is primarily comprised of four programs:

- 1) Scenario Planning and Strategic Assessments – includes planning work to identify policies and programs that reduce transportation-related GHG emissions. At the state level it includes the Statewide Transportation Strategy and at the local level, metropolitan efforts like Metro’s Climate Smart Communities and the Corvallis Area MPO who volunteered to assess GHG emissions and other outcomes
- 2) Rules and Regulations – DLCD has created GHG reduction targets across the State’s MPO areas. The targets will be updated later this year.
- 3) Guidance and Tools – A number of guidance documents have been developed for OSTI, including a Toolkit for ways local jurisdictions can reduce GHG emissions, and allowing people to search by policies or outcomes – see the sample of icons on this slide. Also ODOT provides modeling and analysis support to regional planning efforts.
- 4) Implementation Activities – there are many things ODOT is pursuing in the STS as well as helping to support local efforts.

Climate Change Adaptation

Actions to reduce the vulnerability of natural and human systems or to increase system resiliency in light of expected climate change or extreme weather events.



Adaptation is about reducing vulnerability and increasing resilience to climate change and extreme weather events.

New and rapidly evolving field. Most all sectors are looking at adaptation-natural resources, health and safety, public works.

For DOTs... no one solution or silo for addressing – cuts across all aspects of work from asset management, planning, design and construction and maintenance.

Impacts on Transportation



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- Impacts not only on INFRASTRUCTURE – roads, bridges and culverts, but on Maintenance and Ops functions including traffic flow and emergency response.

Benefits

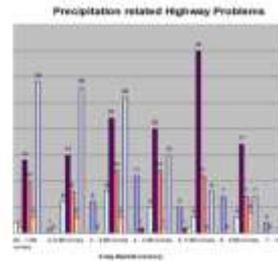
Proactive strategies that support ODOT's mission



Considers future hazards and risks



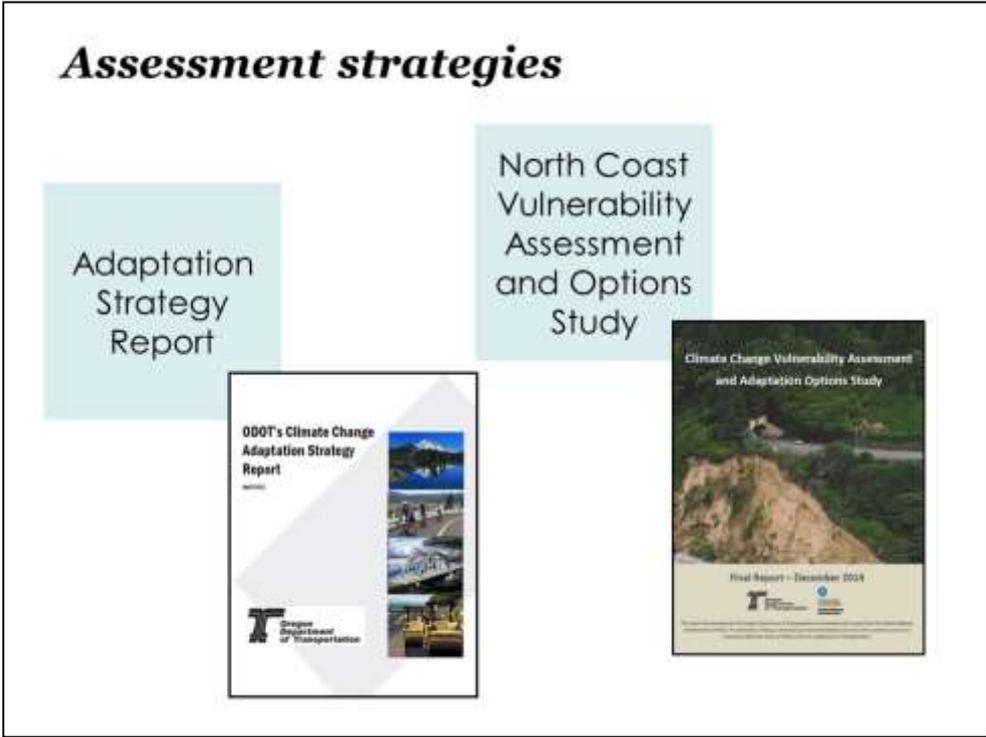
Lower maintenance and operations costs



Informs investment decisions

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Supports ODOT's mission and policies for protecting and maintaining the existing system



Global mean sea level will increase, possibly by 2-4 feet by 2100.

Research shows that wave heights are increasing and increase in frequency and magnitude of coastal flooding events

Research/ Implementation Priorities

Sea Level Rise
mapping and risk
assessments

Wildfire risks planning
and mitigation



Coastal landslide and bluff retreat monitoring and risk assessments (5 sites over 7-years)

Participate on national (NCHRP) research panel regarding use of climate models in hydraulic design

Wildfire risks planning and mitigation strategies

Research/ Implementation Priorities

Coastal landslide and
bluff retreat
monitoring

Integrated resilience
planning with Seismic
Lifeline Routes





Sustainability in Project Delivery

- Design
- Specification
- Construction





Outcome-based Design/Construction

Environmental Performance Standards

- Species avoidance
- Fluvial performance
- Bat habitat
- Storm water
- Site restoration



Use of Programmatic Permitting approach was a cornerstone of the bridge program and helped successful outcomes on WRB

14 regulations covering 11 state and federal agencies. One permit application- Joint programmatic BO the heart.

Proactive resource agency coordination and use of Environmental Performance Standards serve as the proposed action – the core – of the resulting programmatic agreements. They provide the certainty and flexibility desired and are applicable to nearly all the bridges.

The key to their success is the focus on outcome, which lets contractors find new ways to protect the environments instead of multiples agencies prescribing exact actions.

Many of the EPS were new or not well tested at the time... and found to be highly successful and raised the bar.

Fluvial Standards



Fluvial standards in action: I-5 Sodom Ditch bridge crossing

Willamette River Bridge: deck arch design minimizes riverine impacts

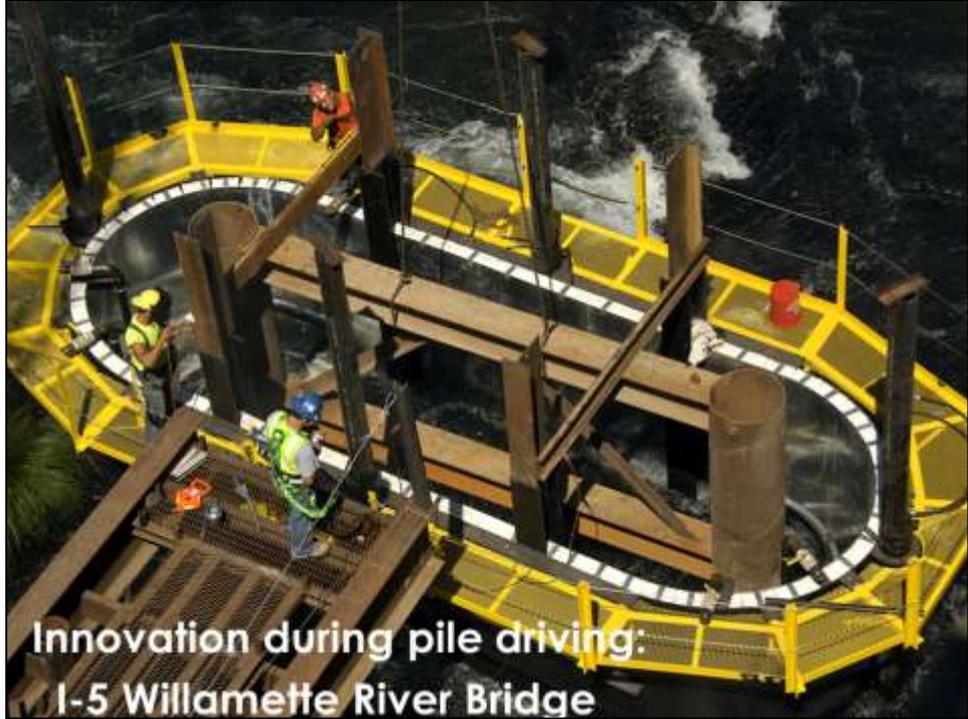


1) Fluvial performance huge concept- improve floodplain connectivity and get material out of the waterway.

Improves aquatic habitats and infrastructure resilience to higher flows.

2) WRB design minimizes impact with one touch down point in river.

3) The new design on the I-5 Sodom Ditch bridges replaced eight piers with three, decreasing the amount of debris that restricted water flow. Crews raised the roadway two feet to allow better flow during high water. And less maintenance with log jams and debris.



Innovation during pile driving:
I-5 Willamette River Bridge

Outcome based permitting gave the Interstate 5 Willamette River Bridge contractor, Hamilton Construction, the flexibility to decide how it would mitigate noise during pile driving to protect sensitive fish species.

Work over 3 IWWWs

Usually one pile addressed at a time – here several work efficiencies addressed at same time.

Hamilton developed an innovative noise attenuating bubble curtain, which it dubbed the “bubbleator” It’s a custom-made, circular device constructed of sheet metal and lined with high-density polystyrene foam. Aluminum pipes frame the piles to produce a thick wall of frothy bubbles that dampen sound from pile strikes. The frame of these devices is also large enough to serve as a safe, sturdy work platform for crews during pile driving.

Hydroacoustic monitoring on the project has shown attenuators are maintaining noise levels below required thresholds.



Site Restoration



Fish Passage Program

Stream restoration and fish passage improvements on Augusta Creek, south bank of Willamette River Bridge

Improving, enhancing and restoring roadside habitat is an increasing focus and expectation for our projects.

Site restoration was extensive on WRB – ranges from acres of basic roadside plantings and reseeding, to a full blown stream restoration providing stream habitat and fish passage for cutthroat trout.

The site was so large that restoration plans and closeout acceptance were phased in the contract. There was the parks restoration component. Water quality plantings, wetland restoration plantings, stream bank restoration efforts and overall site plantings in 10's of thousands.

We will monitor success of these for years to come.



Maximizing on-site reuse and recycling was a focus.

Beyond crushing concrete and sorting steel for recycling... Materials were reused where possible on-site **including bridge beams from the old detour bridge** as part of the cantilevered south bank viaduct bike ped path. On south bank of bridge

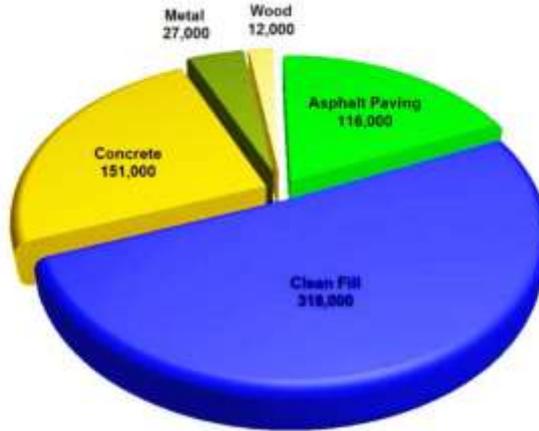
More than 200 concrete and steel beams were salvaged, with 50 of them reused on site for the path network.



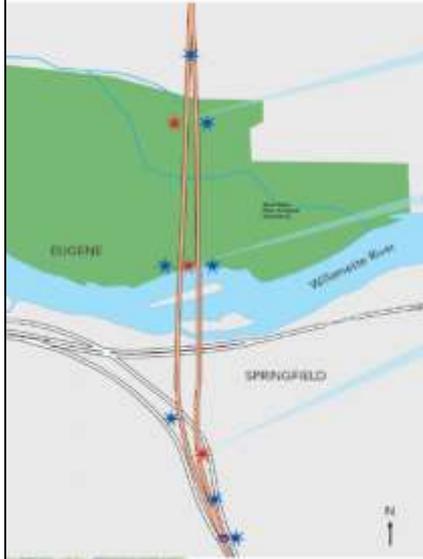
Reuse and Recycling: OTIA III Bridge Program (2006-2013)

Tons of Materials Diverted From Landfills

**Total
Program
Savings
of \$21.3
Million**



Design Enhancements



Active Transportation



- Community involvement and outreach a huge part of project.
- Community Advisory Committee... to advise on design of the bridge and public art
- Park paths and Bike and ped aspects woven into project site.
- Design enhancements brought in, both public art, and the coordination with area Tribes (the Conf. Tribes of the Grand Ronde and the Kalapuyaa) for input into naming the bridge and interpretive signage in the parks, etc.



Wildlife Crossings

U.S. 97 Lava Butte under crossing was designed for the exclusive use of wildlife

Rendering of a proposed crossing at MP 190 on U.S. 97, south of Crescent



Shout out to work Region 4 is doing on wildlife Crossing

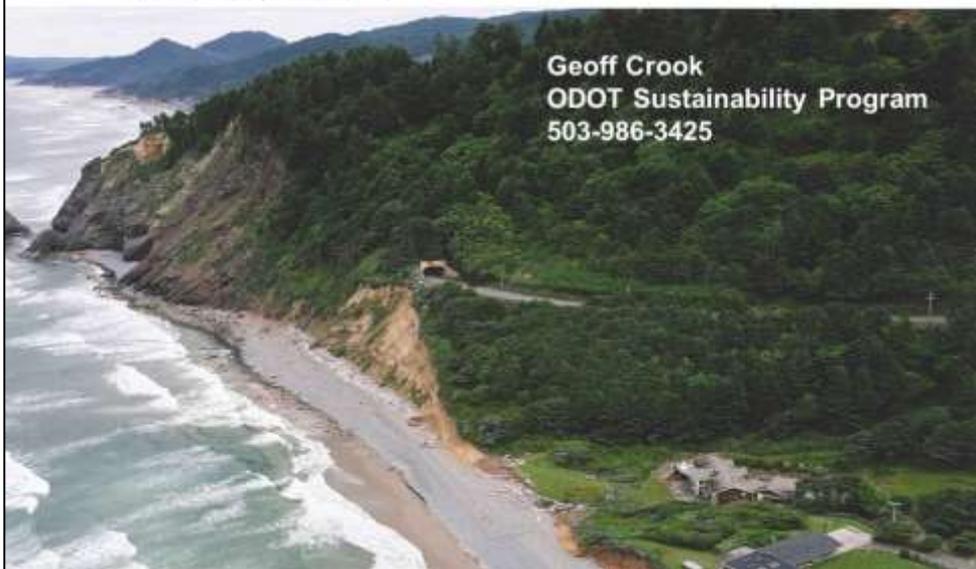
US 97 lava butte project- 2011/12 timeframe- was a Congestion and Safety project south of Bend. A part of the project designated to wildlife crossing. Areas fenced to channel migrating Mule deer through the underpass.

A proposed project south of Crescent would be an overpass – a first for ODOT

These projects are committing our roadsides to new uses that address both safety and landscape level ecological systems



Questions?



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