

**2011 Workshop  
Transportation Research Board  
Waste Management & Resource Efficiency  
“Sustainability & Liability in Transportation”**



**Hosted by:  
Oregon Department of Transportation**

**Sponsored by:**



**Kennedy/Jenks Consultants**

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THE Louis Berger Group, INC.



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# Monday, July 25

**7:00 a.m. – 8:00 a.m. Breakfast (Provided by NRC Environmental Services) - Plaza Foyer**

**8:00 a.m. – 8:45 a.m. Welcome and Key Note Speakers – Pavilion Ballroom**

Welcome: Matthew Garrett, Director, Oregon Department of Transportation

Key Note: Gail Achterman, Chair, Oregon Transportation Commission and  
Director, Oregon State University Institute for Natural Resources

**8:45 a.m. – 10:00 a.m.**

**Session 1 – Sustainability in Construction – Pavilion Ballroom**

Life Cycle Greenhouse Gas (GHG) Analysis	Joshua Skov and Joshua Proudfoot, Good Company
Role of Recycled Material in Sustainable Roadway Construction	Tuncer Edil & Craig Benson, Recycled Materials Resource Center

**10:00 a.m. – 10:30 a.m. – BREAK (Refreshment provided by ARCADIS) Plaza Foyer**

**10:30 a.m. – Noon**

**Session 2 – Superfund Liability and Transportation Projects – Pavilion Ballroom**

The Portland Harbor Superfund Site and ODOT	Kathy Lincoln, Oregon Department of Justice
Portland Harbor Natural Resources Damage Assessment	Diane Lloyd, Oregon Department of Justice & Erin Madden, Cascadia Law, P.C.
Critical Liability Questions for Washington DOT in the Commencement Bay Superfund Site	Deborah Cade, Washington Attorney General's Office

**Noon – 1:00 p.m. – LUNCH (On Your Own)**

**1:00 p.m. – 2:30 p.m. (Concurrent Sessions)**

**Session 3 – Environmental Management Programs - Plaza Foyer**

10 Years of Environmental Management Success – A PennDOT Perspective	James Heeren & Ileana Ivanciu, Dewberry & Kenneth Thornton, Pennsylvania DOT
Proactive Environmental Management System: Illinois Department of Transportation's EMIS Implementation	Michael Yesconis & S. Babusukumar, Weston Solutions & Steve Gobelman, Illinois DOT
Creating a Sustainable SPCC Program	Shawna Secord, Oregon DOT

**Session 4 – Brownfields and Contaminated Site Redevelopment – Pavilion East**

Gaines Street/Cascades Park Brownfields Redevelopment	Mark E. White & Koren Taylor, WRScompass
Acquiring Liability and Avoiding It at the Same Time	Steven Gobelman, Illinois DOT
Storm Water Pond on Brownfield Site	Mark White, Scott Lehr & Diane Anderson, WRScompass

**2:30 p.m. – 3:00 p.m. – BREAK (Refreshment provided by Staton Companies) – Plaza Foyer**

**3:00 p.m. – 4:30 p.m. (Concurrent Sessions)**

Session 5 – Operations & Winter Maintenance Initiatives – Pavilion West


Sustainable Sediment Control Action Plan Strategies for Winter Highway Maintenance	Art Hirsch, TerraLogic Sustainable Solutions
Managing Winter Materials to Save Money and Protect the Environment	Jim Hereen, Dewberry
Roadkill Management - Issues and Solutions	Jeff Moore, Oregon DOT

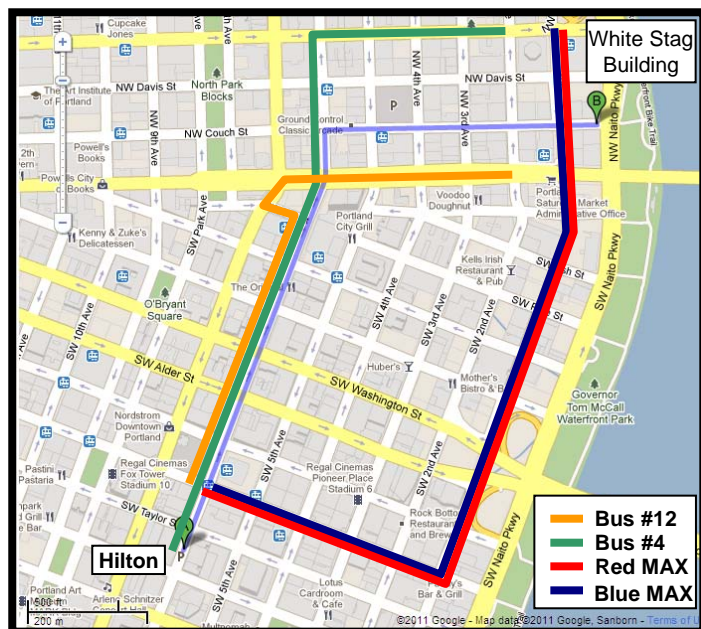
Session 6 – Evaluating and Managing Hazardous Materials in the Environment – Pavilion East

Assessment and Management of Background Chemicals in Soil	Chris Breemer, Ash Creek Associates & Paul Seidel, Oregon Department of Environmental Quality
Health Risk Exposure to Naturally Occurring Hazardous Minerals During Construction	Clark A. Niewendorp, Oregon Department of Geology and Mineral Industries
Fifteenmile Creek Oxyfluorfen Spill Site - Bridge Construction Challenges	Mike Darling & Robert Townsend, Oregon DOT

**5:00 p.m. – 7:00 p.m. – RECEPTION**

**White Stag Building, 70 NW Couch Street, Portland (bus or walk)**

Sponsored by  a sustainability consulting firm that provides analysis, strategy and implementation services to help clients better their performance and by **Kennedy/Jenks Consultants** offering Complete engineering, environmental science, and architectural services, with an unusually strong commitment to tailored solutions.



The White Stag Building is a stunning LEED certified warehouse renovation owned by Oregon State University. The Light Court Lobby is currently featuring an exhibit on “The Electric Local: New Visions in Vehicle Design” Featuring the results of student research to investigate and envision a positive and compelling user experience to encourage consumers to use two new environmentally friendly vehicles being developed in Oregon by Arcimoto and Green Lite Motors. The resulting posters and the two seatbuck prototypes on display are a result of the students work..

The reception, hosted by Good Company and Kennedy/Jenks Consultants, will be held in the Light Court Lobby and will feature local sustainable food and micro brewed beers – what Oregon is famous for.

## Tuesday, July 26

**7:00 a.m. – 8:00 a.m. Breakfast (Provided by **The Louis Berger Group**) – *Plaza Foyer***

**8:00 a.m. – 10:00 a.m. (Concurrent Sessions)**

***Session 7 – Road Waste Management Initiatives – Pavilion West***

ODOT Road Waste Management – Tribulations and Revelations	Jeff Moore, Oregon DOT
Street Waste Management System	Ronald Berg, David Goff, Air Water Soil Technologies
Research Overview from the Hinckley Center for Solid and Hazardous Waste Management	John Schert, Hinckley Center for Solid and Hazardous Waste Management
Potential Application of Green Technology for Converting Typical Solid Waste Streams from Transportation Facilities and Operations to Gas for Fuel or Power	Tom Lewis, Louis Berger Group & Dave Soltis, Independent Consultant

***Session 8 – Sustainable Transportation Projects – Pavilion East***

Innovative Financing Mechanisms for Implementing Green Infrastructure Projects	Steve Eget, Independent Consultant
ODOT JTA Section 18: Better, Faster, Cheaper for Highway Construction Projects	Jennifer Sellers & Ken Franklin, Oregon DOT
FHWA Sustainable Highways Self-Evaluation Tool	Constance Hill Galloway, FHWA
NYCT Sustainability/Designing for the Environment	Thomas Abdallah & Yekaterina Alglitsky, MTA New York City Transit

**10:00 a.m. – 10:30 a.m. – BREAK (Refreshment provided by **Belfor Environmental**) – *Plaza Foyer***

**10:30 a.m. – Noon (Concurrent Sessions)**

***Session 9 – Sustainability in Operations and Maintenance – Pavilion West***

Sustainable Rest Area Design and Operation	Art Hirsch, TerraLogic Sustainable Solutions
Recycling at Oregon Rest Areas	Shawna Secord, Oregon DOT
Solar Roadways	Scott Brusaw, Solar Roadways

***Session 10 – Materials Reuse and Recycling in Construction – Pavilion East***

Mechanical and Chemical Reliability of Mine Waste Material for Road Embankment and Subgrade	Francesca Maltinti, Silvia Portas, Alessandro Lippi, Fabrizio Pisanu, Mauro Coni, University of Cagliari
Specifications for Balancing Pavement Quality with Use of Recycled Shingles in RAP	Larry Ilg, Oregon DOT
Chemical and Mechanical Evaluation of Construction & Demolition Waste as an Alternative Aggregate for Road Embankments	Francesca Maltinti, Silvia Portas; Mauro Coni, University of Cagliari

**Noon – 1:00 p.m. – LUNCH (On Your Own)**

**1:00 p.m. – 2:30 p.m.**

Session 11 – Transportation Projects On Contaminated Military Sites - Pavilion Ballroom

Maryland Department of Transportation Experience Dealing with Superfund Liabilities on Military Bases	Denise Ferguson, Maryland DOT
Fairfax County Parkway: Liability Concerns Affecting a Design/Build Project	Doug Fraser, EEE Consulting & Ed Wallingford, Virginia DOT
Practical Application of Green Remediation Techniques at Former Small Arms Ranges Located Within the Proposed Sunrise Project Area	Leonard Farr, Jr., AMEC Earth & Environmental

**2:30 p.m. – 2:50 p.m. – BREAK (Provided by **Air Water Soil Technologies**) – Plaza Foyer**

**2:50 p.m. – 3:50 p.m.**

Session 12 – Construction and Operations Sustainability – Pavilion Ballroom

ODOT Construction Waste Management Program	Geoff Crook, Oregon DOT
Beneficial Use of Solid Waste	Tom Roick, Oregon Department of Environmental Quality

**3:50 p.m. – 4:20 p.m.**

Session 13 – Portland Engineers Without Borders – Pavilion Ballroom

Engineers without Borders - Portland Professionals Chapter	Steve Adams, Portland Engineers Without Borders & City of Wilsonville
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**4:30 p.m. – 6:30 p.m.** ADC60 Committee Business Meeting – Forum Suite

Everyone interested is invited to attend the business meeting of the National Transportation Research Board Committee on Waste Management and Resource Efficiency. This committee focuses on sharing information and promoting research regarding reuse and recycling opportunities, waste management options, minimizing liability for contaminated sites and other sustainability issues in construction, maintenance and operation of transportation infrastructure.

## **Wednesday – July 27**

**7:00 a.m. – 8:00 a.m. Breakfast - Plaza Foyer**

**9:00 a.m. – Noon Portland Harbor Superfund Site Boat Tour**

This tour will provide insight into the history, nature and extent, early remedial actions and source control efforts for the Portland Harbor Superfund Site. It will provide an excellent follow up on the legal information provided in Session 2, on Monday. Our tour guides will be:

- Jim Anderson, Oregon Department of Environmental Quality
- Judy Smith, U.S. Environmental Protection Agency
- Dawn Sanders, City of Portland
- Jim McKenna, Lower Willamette Group (and formerly Port of Portland)

**Meet in the Hilton Foyer at 8 am (where breakfast is served).**

**Additional details provided separately.**

# Abstracts

## Session 1 – Sustainability in Construction

### **Life Cycle Greenhouse Gas (GHG) Analysis**

By **Joshua Skov** and **Joshua Proudfoot, Good Company**



Life-cycle greenhouse gas (GHG) analysis methods and boundaries were used to study two major infrastructure projects: construction of a new bridge and a 3-megaWatt ground-mounted solar array. The life-cycle approach captures the upstream and downstream GHG impacts and benefits of these projects, as well as the direct emissions from construction, to determine the overall net project emissions. This presentation will highlight the major findings of these studies.

### **Role of Recycled Material in Sustainable Roadway Construction**

By **Tuncer Edil**, **Craig Benson, Recycled Materials Resource Center**



Major issues caused by rapidly growing global economy include global warming, energy constraints, and resource availability (metals, cement, oil etc.). To make infrastructure construction more sustainable, we need to:

- Reduce energy consumed in construction and rehabilitation
- Reduce emissions emitted in construction and rehabilitation
- Reduce consumption of natural resources
- Increase service life.

A widespread, large-scale recycling and reuse application would utilize otherwise wasted resources while clearing landfill space and creating new business opportunities, in addition to avoiding energy and emissions associated with mining and processing construction materials. Often recycled materials allow an increase of service life. Their use in roadways should not be looked as creating "linear landfill," but better and longer lasting infrastructure. Wise use condition ensures that the recycled material is suitable for the highway environment and provides procedures for appropriate use. Safe use condition ensures that material will not have an adverse impact on the environment or users.

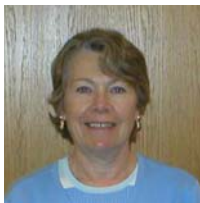
Examples that meet these criteria will be provided along with the results of a life cycle assessment (LCA) to determine variety of sustainability metrics (energy, GHG emissions, water use, hazardous waste generation, etc.), undertaken using PALATE model. A life cycle cost analysis (LCCA) was also performed to evaluate life cycle cost of design alternatives. These analyses show that perception and reality are different and conducting quantitative analysis to assess alternatives for recycled materials is of utmost importance.

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## Session 2 – Superfund Liability and Transportation Projects

### **The Portland Harbor Superfund Site and the Oregon Department of Transportation**

By **Kathy Lincoln**, **Oregon Department of Justice**



Portland Harbor is a heavily industrialized stretch of the Willamette River north of downtown Portland, Oregon, that was listed on the National Priorities List ("Superfund") in December 2000. Sediments in the river are contaminated with various toxic compounds. This presentation will provide background information on the Portland Harbor Superfund Site and the Oregon Department of Transportation's involvement.

### **Portland Harbor Natural Resources Damage Assessment**

By **Diane Lloyd**, **Oregon Department of Justice, and Erica Madden, Cascadia Law, P.C.**



A general discussion of the Portland Harbor natural resource damage assessment and how natural resource damage injury assessment differs from a CERLA RI/FS investigation

## **Critical Liability Questions for Washington State Department of Transportation in the Commencement Bay Superfund Site**

**By Deborah Cade, Assistant Attorney General, State of Washington**



A federal district judge recently held that the Washington State Department of Transportation (WSDOT) is jointly and severally liable for CERCLA response costs incurred by EPA at the Thea Foss Waterway in Tacoma, Washington, based on WSDOT's design and construction of state highways and associated storm drains that ultimately drain into the waterway through the local storm sewer system. The court agreed with WSDOT that contaminants found in highway stormwater runoff originate with third parties, including vehicle drivers, operators of industries with air emissions, and those who use woodstoves. This decision raises the legal issue of whether the degree of control that a state highway agency typically has over disposal of highway stormwater runoff is enough for the agency to be considered an "arranger for disposal of hazardous substances" or an "operator of a facility" at which hazardous substances have been disposed.

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### Session 3 – Environmental Management Programs

## **10 Years of Environmental Management Success - A Pennsylvania Department of Transportation Perspective**

**By James Heeren, Ileana Ivanciu, Dewberry and Kenneth Thornton, Pennsylvania Department of Transportation**



Pennsylvania Department of Transportation (PennDOT), a national champion in environmental stewardship, developed their Strategic Environmental Management Program (SEMP) pursuant to Governor's Executive Order 1998-1, requiring all Commonwealth agencies to develop a Green Plan. The SEMP functions as PennDOT's Green Plan, setting the Department's environmental policy and describing PennDOT's commitment to responsible environmental management. Its major tenants are practicing resource conservation, ensuring regulatory compliance and continually improving performance. The SEMP includes PennDOT's Strategic

Recycling Program, the performance of environmental investigations and cleanup, PennDOT's Waste Management Guidelines and Tank Management Program. Another major component of the SEMP is PennDOT's registered Environmental Management System that covers PennDOT District Maintenance Operations. All eleven districts, covering 67 counties, are individually ISO-14001 registered. This presentation will provide an update on the status of current implementation efforts of PennDOT's ISO 14001 Environmental Management Program. We will discuss the progress made by PennDOT over the last decade under their ISO-certified program and will share the experiences and lessons learned that can be of benefit to similar transportation agencies.

## **Proactive Environmental Management System: Illinois Department of Transportation's EMIS Implementation**

**By Michael Yesconis & S. Babusukumar, Weston Solutions, and Steve Gobelman, Illinois Department of Transportation**



The Illinois Department of Transportation (IDOT) has a statewide infrastructure of over 300 facilities to support the maintenance of state roadways. These facilities require effective management of environmental issues due to the activities conducted there. To date IDOT has completed environmental reviews and assessments at over 150 of these facilities in order to identify high-risk issues, develop corrective action plans and implement mitigation and improvement plans. These assessments were also designed to: identify all potential non-compliance with State and Federal environmental regulations and best management practices (BMPs), recommend methods to address these potential non-compliance issues, and provide

an estimated cost to address them. IDOT has also developed Environmental Management System (EMS) procedures to ensure the highest degree of environmental stewardship at their maintenance facilities. IDOT uses a Web-based Environmental Management Information System (EMIS) to automate tracking and communication, and to proactively manage environmental compliance. This initiative provides IDOT with the opportunity to enhance the efficiency of its existing environmental programs, to further align them with IDOT objectives and strategic goals, incorporate continuous improvement principles, and minimize and manage the environmental liabilities associated with the ownership and operation of IDOT facilities and their surroundings. The EMIS is currently in use at IDOT District 8 and will be rolled out to three more districts in 2011 and statewide in 2012.

## **Creating a Sustainable Spill Prevention Control and Countermeasure Program By Shawna Secord, Oregon Department of Transportation**



The Oregon Department of Transportation (ODOT) is responsible for the maintenance and operation of over 8,000 center lane miles of Oregon roads. ODOT maintenance yards are used to store equipment and products required to perform road maintenance activities. The agency recognizes that materials and activities at maintenance yards have the potential to impact Oregon's environment. The Clean Water Act requires the preparation and implementation of Spill Prevention Control and Countermeasure (SPCC) Plans at facilities that have a reasonable expectation of discharging oil into navigable water. The rules apply to public facilities, such as maintenance yards, that store oil or fuel.

One of ODOT's goals is the creation of a sustainable transportation system. For ODOT this means the system meets present needs without compromising the ability of future generations to meet their needs. In order to be sustainable, a program has to be functional, fair, and feasible. In other words, the program has to be practical as well as meeting the requirements of the regulations. ODOT has implemented an SPCC program that balances the environmental requirements, economic limitations, and community objectives. This presentation summarizes ODOT efforts in creating and maintaining a successful, sustainable, SPCC program at maintenance yards.

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### ***Session 4 – Brownfields and Contaminated Site Redevelopment***

#### **Gaines Street/Cascades Park Brownfields Redevelopment By Mark E. White & Koren Taylor, WRScompass**



EPA's Brownfields Program empowers states, communities, and other stakeholders to work together to prevent, assess, safely cleanup, and sustainably reuse brownfields effected by identified or perceived contamination. The EPA selected the City of Tallahassee for three brownfield cleanup grants connected with the Gaines Street/Cascades Park (GSCP) Brownfields Corridor. The GSCP Corridor was once a bustling mix of residential, commercial, and industrial facilities. Today, it is characterized as a low-income, minority community with older industrial sites including existing and former rail corridors, chemical warehouses, and petroleum distribution centers. The GSCP Corridor is composed of over 465 individual parcels, of which 24 have been identified as contaminated and 49 as perceived contaminated. This presentation will summarize the planning, interagency, redevelopment, roadway expansion, assessment, and remediation activities that have been conducted to date in an effort to revitalize this corridor. The remediation and redevelopment of Cascades Park (12-acre brownfield located in downtown Tallahassee) and the assessment, remediation, and redevelopment of land parcels located within the Gaines Street corridor will be the primary focus of the presentation. The effects of identified and perceived contamination on utility, roadway, and related infrastructure will also be presented.

#### **Acquiring Liability and Avoiding It at the Same Time By Steven Gobelman, Illinois Department of Transportation**



Illinois Department of Transportation (IDOT) began a limited environmental investigation on property which we intended to take in dedication (not a full fee take) for purposes of roadway improvements. It was later decided that we should do a full take of a property, a CERCLIS site. Contact was made with Illinois EPA (IEPA) regarding the status of the property in the Superfund database, CERCLIS. Based on the initial investigation and in coordination with IEPA, IDOT started a remedial investigation/feasibility study (RI/FS). After on-site sampling, IDOT notified the IEPA that there appeared to be an organic solvent plume in the groundwater -- which has not apparently impacted the water supply or any private wells. Additional investigations were conducted to determine the impacts to the surrounding community. Based on this information, IEPA started the Community Right to Know provisions and conducted a public meeting. Working closely with IEPA from the beginning allowed the department to formulate a plan to remediate the site and reduce our liability to an acceptable level. The Department committed to remediating the entire site to remove all impacted soils and IEPA would monitor and further investigate the off-site groundwater impacts and public health impacts via vapor intrusion.



## **Storm Water Pond on Brownfield Site**

By Mark White, Scott Lehr and Diane Anderson, WRscompass



The Florida Department of Transportation (FDOT) purchased an approximate 2.5 acre parcel of land for the purpose of constructing a lined storm water evaporation pond to support the widening of US Highway 301 in Sarasota, Florida. The parcel was part of the 16 acre Marion Anderson Brownfield Site owned by the City of Sarasota. The site served as a landfill for the City from the 1940's to the 1960's. WRscompass collected over 1,500 soil samples in order to identify contaminants present in the footprint of the proposed pond. Areas of arsenic and lead contaminated soil above Florida Department of Environmental Protection (FDEP) Soil Cleanup

Target Levels (SCTLs) were identified. With approval of the Brownfields coordinator at FDEP, WRscompass excavated and removed a total of approximately 45,000 tons of arsenic and lead contaminated soil. Approximately 25,000 tons of soil with concentrations above FDEP Commercial SCTLs were loaded and transported to a Subtitle D landfill for proper disposal. With FDEP approval, 20,000 tons of soil with concentrations above FDEP Residential but below Commercial SCTLs was transported to various county landfills in south central Florida to be used as daily cover, saving the State of Florida over \$500,000 in disposal costs.

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## Session 5 – Operations & Winter Maintenance Initiatives

### **Sustainable Sediment Control Action Plan Strategies for Winter Highway Maintenance**

By Art Hirsch, TerraLogic



One of the main sustainable transportation challenges associated with highway operations is the use of traction sand and excess application of chemical de-icing/anti-icing agents. State and local municipalities using traction sand for winter maintenance carry an environmental risk related to the environmental regulations such as Section 404 of the Clean Water Act, EPA Municipal Separate Storm Sewer System (MS4) requirements, and the Endangered Species Act.

This presentation provides details on a Highway Maintenance-Sediment Control Action Plans that adopt pro-active actions, complement this sustainability concept by identifying cost effective actions that will reduce environmental impacts, while maintaining the driving public's safety and meeting the aesthetic expectations of the community. Benefits achieved include: life-cycle material and maintenance cost savings, improved air quality, reduced environmental risks and liabilities, enhanced roadside aesthetics, and improved safety.

### **Managing Winter Materials to Save Money and Protect the Environment**

By Jim Hereen, Dewberry



Presenting the pros and cons of using salt for highway deicing and managing application rates to minimize waste and environmental impacts, thereby conserving resources.

### **Roadkill Management – Issues and Solutions**

By Jeff Moore, Oregon Department of Transportation



Clearing roadkill from the highway is no longer the simple chore that it once was. There are a variety of health and environmental concerns associated with managing animal carcasses and many environmental rules now regulate how this special waste can be managed. Most traditional options for disposal of animal carcasses, such as animal rendering plants, are now a thing of the past. This makes disposal of highway roadkill difficult and problematic.

## Session 6 – Evaluating and Managing Hazardous Materials in the Environment

### **Assessment and Management of Background Chemicals in Soil**

By **Chris Breemer**, Ash Creek Associates & **Paul Seidel**, Oregon Dept. Environmental Quality



Metals, pesticides, and herbicides from non-point sources are widespread in soil, often at concentrations that exceed default human or ecological health screening levels. The presence of these compounds can add significant costs and liabilities to construction and redevelopment projects. This discussion will identify environments where soil has elevated background concentrations, approaches for assessing whether background concentrations are natural or anthropogenic, and cost-effective methods for

managing soil with background concentrations. The presentation includes case studies and a summary of new Oregon Department of Environmental Quality default background metals concentrations. Methods for calculating default background concentrations statewide and based on physiographic provinces will be reviewed, along with site-specific applications.

### **Health Risk Exposure to Naturally Occurring Hazardous Minerals During Construction**

By **Clark A. Niewendorp**, Oregon Department of Geology and Mineral Industries



Oregon Department of Transportation (ODOT) sponsored a study of Health Risk Exposure to Naturally Occurring Hazardous Minerals to enable the agency to take naturally occurring hazardous minerals (NOHM) into account during maintenance and construction activities. The NOHM include elements, minerals, and materials of a varied geologic nature found in natural deposits that could have consequences on the well-being of those exposed.

The research objectives are three-fold: Identification & knowledge, detection, and control & management. In Oregon, 42 possible NOHM were identified, and 16 were picked for the project.

Ten ODOT sites across Oregon were sampled for the presence (or absence) of selected NOHM. A NOHM-GIS interpretative layer, called NGIL, was developed to convey the NOHM information to ODOT personnel.

### **Fifteenmile Creek Oxyfluorfen Spill Site - Bridge Construction Challenges**

By **Mike Darling** & **Robert Townsend**, Oregon Department of Transportation



In August of 2000, truck on Interstate 84 crashed and spilled a herbicide containing Oxyfluorfen into Fifteenmile Creek, tributary of Columbia River, killing over 5,000 fish. After cleanup actions were completed by the Responsible Party, Oxyfluorfen remained in upland area soils and rock adjacent to the stream. In 2010, ODOT began construction of a new bridge over Fifteenmile Creek, necessitating the excavation of soil and rock from the contaminated upland area. Because of the toxicity of Oxyfluorfen to aquatic

organisms, ODOT undertook extraordinary construction measures to prevent Oxyfluorfen from entering the stream. These measures have included construction of a containment platform, close contractor oversight, quarterly stream sediment sampling, and outreach to cultural and natural resource regulatory partners. Although Oxyfluorfen levels in the stream sediments have increased since construction began, the levels in the creek do not pose a significant ecological risk, and the bridge is scheduled to be completed on-time.

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## Session 7 –Road Waste Management Initiatives

### **Oregon Department of Transportation Road Waste Management - Tribulations and Revelations**

By **Jeff Moore**, Oregon Department of Transportation



Road waste materials are generated as the result of various highway maintenance activities. Street sweepings, storm drain and sump cleanout material, ditchings, stormwater treatment waste are just a few examples. Oregon Department of Transportation (ODOT) has been investigating various road waste materials and their management for over ten years. This presentation will discuss some of the key ODOT road waste findings made during this time, including: What are ODOT's primary driving waste management regulations? What does ODOT actually know about its road waste materials? What ODOT waste management

methods actually work and which ones would ODOT just like to work? This overall survey will provide answers about ODOT road waste materials, but it is also likely to generate more questions than it answers.

## **Street Waste Management System**

**By Ronald Berg and David Goff, Air Water and Soil Technologies**



Disposal and management of road waste materials such as street sweepings and vector clean out material collected from highway drainage sumps, catch basins, and storm water treatment facilities is difficult and expensive. For most DOTs, management of this waste means paying to haul and dump at the local landfill or sewerage treatment plant. AWS Technologies specializes in processing road waste materials using sorting and management techniques familiar to the mining industry. These techniques can be used to process this special waste and produce recyclable and reusable material. AWS will discuss the operations of its road waste processing

plant located in Tacoma, Washington and how to turn road waste into valuable reusable material.

The targeted goals are focused on landfill diversion, reuse and recycling, green house gas reduction, and research and data collection for future rule making use. Additional significant gains are made in landfill life extension, reduction in fossil fuel consumption, new material procurement reduction and reductions in overall department costs resulting from efficiencies of the process. AWS will discuss its testing protocols, research and data collection goals and the immediate environmental benefits derived from this unique approach to the road waste and storm water related waste streams.

## **Research Overview from the Hinkley Center for Solid and Hazardous Waste Management**

**By John Schert, Hinkley Center for Solid and Hazardous Waste Management**



The Bill Hinkley Center for Solid and Hazardous Waste Management is a Statewide Research Center hosted by the University of Florida. The Center has conducted and sponsored various research projects regarding street sweepings, ditch cleanout soils, road millings, yard waste, etc. An overview of relevant research will be presented.

## **Potential Application of Green Technology for Converting Typical Solid Waste Streams from Transportation Facilities and Operations to Gas for Fuel or Power**

**By Tom Lewis, The Louis Berger Group, and Dave Soltis, Independent Consultant**



Agencies for all modes of transportation and at all levels of government face ever growing pressures to reduce their environmental footprint while, at the same time, limiting expenditures, waste generation and fuel/power resource needs. A number of ideas have surfaced that address one of these pressures but there is an ongoing need to find solutions that address them all. This presentation will provide information on a technology that has been proven in other countries that could use available waste streams from

transportation facilities and operations to produce gas for fuel and/or producing energy. This technology is based on gasification of virtually all organic matter in typical waste feedstock to generate fuel or power. This technology is based on converting the organic matter to a fully captured fuel gas without the gas by-product toxics that accompany incineration and require much more extensive and expensive air pollution control technologies.

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### Session 8 – Sustainable Transportation Projects

## **Innovative Financing Mechanisms for Implementing Green Infrastructure Projects**

**By Steve Eget, PE, CEM, Independent Consultant**



Your organization's vision for greener infrastructure doesn't have to be put on hold while the country addresses pressing economic concerns. In fact, sustainability solutions often bring economic benefits along with their environmental and social benefits. While much of the attention is paid to large public-private partnerships, innovative financing mechanisms exist for small to medium size projects as well. This presentation will provide a general overview of these mechanisms (since each state may have differing requirements), potential benefits for State DOTs and Transportation Agencies in meeting their sustainability goals and examples of successful projects.

## **Oregon Department of Transportation – Jobs and Transportation Act Section 18: Better, Faster, Cheaper for Highway Construction Projects**

**By Jennifer Sellers and Ken Franklin, Oregon Department of Transportation**



The 2009 Oregon Legislature passed the Oregon Jobs and Transportation Act (JTA) to support transportation infrastructure. JTA Section 18 requires ODOT to adopt an Oregon Administrative Rule that (a) considers environmental performance standards (EPS) for all ODOT and local agency highway construction projects funded by ODOT and (b) seeks to improve the environmental permitting process for state highway construction projects. This effort is aimed at reducing the time to design projects and obtain environmental permits; reducing redesign costs and delays due to environmental requirements; and, maintaining a strong commitment to environmental stewardship.

ODOT's long-term goal is to develop outcome-based EPS that meet both regulatory requirements and ODOT needs for permitting certainty, design flexibility, and cost-effectiveness. We intend the EPS to be the technical basis for programmatic permits, which take routine and predictable highway construction projects off the project delivery critical path due to environmental permitting. Ultimately, we want the EPS to provide a single set of terms and conditions that meet the needs of multiple agencies and ODOT.

## **Federal Highway Administration Sustainable Highways Self-Evaluation Tool**

**By Constance Hill Galloway, Federal Highway Administration**



The Federal Highway Administration has developed a voluntary tool that will assist State Departments of Transportation and Metropolitan Planning Organizations to identify best practices and evaluate the level of sustainability of transportation projects, plans, and programs. Designed as a self-evaluation instrument, the tool may be applied to transportation activities from planning through operations and maintenance. It will allow practitioners to set sustainability goals, and analyze how well they are doing in reaching them.

## **New York City Transit Sustainability/Designing for the Environment**

**By Thomas Abdallah, Yekaterina Alglitsky, MTA New York City Transit**



MTA New York City Transit's (NYCT) Department of Capital Program Management incorporates sustainability elements in all of its design and construction projects. This presentation provides information on and results of NYCT's sustainability initiatives that: maximize energy efficiency, improve indoor environment, use recycled and reusable materials, achieve waste reduction by diverting construction and demolition debris from landfills, prevent pollution, and conserve water and natural resources.

NYCT is an icon and worldwide leader in mass transportation in both size and history. NYCT reaches an infinite audience, through its ridership, its website its Transit Museum, and the numerous outreach programs, including many conferences, seminars and numerous mass media outlets.

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### Session 9 –Sustainability in Operations and Maintenance

## **Sustainable Rest Area Design and Operation**

**By Art Hirsch, TerraLogic**



In ongoing efforts to constrain spending State DOTs have been targeting rest area operations for elimination due to high maintenance and operation costs. In addition, many rest areas are old resulting in costly operating procedures, generation of greenhouse gases, and poor public perception. To address these challenges TerraLogic has teamed with Colorado State University-Pueblo (CSU-Pueblo) to evaluate sustainable rest area designs and operations for the Colorado DOT (CDOT). This presentation will showcase the methodologies, observations, and recommendations used to address the following goals for CDOT rest areas:

- Reduce life cycle cost for energy, materials, resources and CDOT manpower;
- Improve the visitor experience in Colorado;
- Develop broadly-applicable sustainable and renewable actions and features for rest areas;
- Reduce long term rest area operation and maintenance costs and avoid large manpower-commitments for CDOT;
- Improve the environmental footprint by reducing carbon emissions and reusing & recycling to conserve resources.

## Recycling at Oregon Rest Areas

By Shawna Secord, Oregon Department of Transportation



The Oregon Legislature expressed an interest in adding recycling facilities in Oregon Rest Areas. The Oregon Department of Transportation (ODOT), in coordination with State Parks and the Oregon Travel Information Centers, responded by establishing a pilot project to explore the option of adding recycling services in Oregon Rest Areas. The pilot began on July 1, 2009 and concluded on September 30, 2010. ODOT gathered data throughout the pilot to help the agency determine the feasibility of recycling at all Oregon rest areas. Data was collected on the following topics: start-up and continuing costs to operate the pilot; amount of recycled material collected; contamination levels from inappropriate mixing; impact to visitors (positive and negative); and increased calls to law enforcement. This presentation summarizes the finding and costs associated with the pilot.

## Solar Roadways

By Scott Brusaw, Solar Roadways, Inc.



The solar roadway is a system of structurally engineered solar panels that are driven upon. This new highway infrastructure becomes not only the nation's source of 100% clean renewable energy, but doubles as the nation's power grid: an intelligent, self-healing, decentralized (secure) power grid. It will allow the all-electric vehicle to recharge anywhere, making internal combustion engines obsolete. Coal-fired and nuclear power plants will become a thing of the past. So will our dependency on oil.

Each solar road panel contains a microprocessor for monitoring, control, and communications. The panels are networked together and report to central command stations, located in every city and town. Energy production and distribution is monitored in real time. The solar roadway is a conduit for the energy that it produces. Conduit for data signals such as cable TV, telephone, high-speed internet access, etc., is also available in the road, eliminating the need for overhead or underground lines.

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## *Session 10 – Materials Reuse and Recycling in Construction*

**Mechanical and Chemical Reliability of Mine Waste Material for Road Embankment and Subgrade**  
By Francesca Maltinti, Silvia Portas, Alessandro Lippi, Fabrizio Pisanu & Mauro Coni, University of Cagliari



This presentation provides the results of studies that examined the mechanical behavior of mine waste materials used to build road embankment and subgrade layers. Mine waste materials are mostly waste rock and mill tailings. Coal processing generates large quantities of residual wastes that are, for the most part, earth- or rock-like in nature, and cover a range of sizes (from very large boulders or blocks to fine sand-size particles and dust).

The research proceeded in two phases. The first phase studied chemical and physical properties in laboratory. In particular, different leaching tests were conducted - the results obtained were satisfactory. During the second phase an experimental road was built in order to evaluate in situ mechanical behavior. The experimental road, 335 meters long, was built with the embankment and the subgrade layer made with mine waste materials. In situ Plate Tests (PLT) and Light Falling Weight Dropping tests (LFWDT) were performed to evaluate mechanical behavior.

**Specifications for Balancing Pavement Quality with Use of Recycled Asphalt Shingles in RAP**  
By Larry Ilg, Oregon Department of Transportation



Oregon Department of Transportation is completing modifications to its hot mix asphalt specifications that will allow the use of recycled asphalt shingles (RAS) in asphalt pavements. The specifications are supported by research performed by Oregon State University and other states that allow the use of RAS in pavement asphalt mixes. This presentation will summarize the research results that facilitate use of RAS and describe the specification changes that permit use of RAS.

## **Chemical and Mechanical Evaluation of Construction & Demolition Waste as an Alternative Aggregate for Road Embankments**

By **Francesca Maltinti**, **Silvia Portas** and **Mauro Coni**, **University of Cagliari**



This presentation provides the results of studies that examined the chemical behavior of construction and demolition (C&D) wastes in building road embankment and base layers. This research evaluated the physical, chemical, and mechanical characteristics of C&D wastes that could be used to address two main issues: the need to find non-conventional aggregates without using non-renewable sources; and to reuse waste materials which otherwise would be discarded (increasing the use/expansion of landfills).

C&D waste production and characteristics vary from region to region and from country to country, and are dependent on the level of industrialization, on the type of primary materials available, and in construction techniques. In accordance with the European Standard EN 13242:2002+A1, aggregates used in road construction may be natural, originate from mineral sources, manufactured, from mineral origin resulting from an industrial process involving thermal or other modification, or recycled, resulting from the processing of inorganic material previously used in construction. Regardless of aggregate origin, the European Standard establishes requirements for chemical and geotechnical tests. This presentation provides details on the results of laboratory and full scale tests that were used to evaluate chemical and mechanical characteristics of C&D waste-derived aggregates. The results from chemical and mechanical tests are encouraging.

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### **Session 11 –Transportation Projects on Contaminated Military Sites**

#### **Maryland Department of Transportation Experience Dealing with Superfund Liabilities on Military Bases**

By **Denise Ferguson**, **Maryland Department of Transportation/SHA**



Maryland Department of Transportation has been working on several transportation projects that impact federal military facilities. This presentation will focus on hazardous waste and cleanup liability issues encountered on two army bases, both prospectively and retroactively. The first, prospective example involves a commuter rail facility that MDOT desired to locate on a contaminated area of a military base, adjacent to the railroad right-of-way. The second, retroactive example involves right-of way that had already been acquired to build a highway, at the military's request, on what later became a superfund site.

#### **Fairfax County Parkway: Liability Concerns Affecting a Design / Build Project**

By **Doug Fraser**, **EEE Consulting** and **Ed Wallingford**, **Virginia Department of Transportation**



The transfer of potentially contaminated federal property is addressed under Section 120(h) of CERCLA which assigns continuing liability on the transferring federal agency and requires an assessment of suitability of the property for transfer. The first part of this presentation will focus on the process of federal property transfer in context of the delivery of the Fairfax County Parkway – a 2-mile 4-lane divided highway that that was designed to address traffic capacity needs at Fort Belvoir which is undergoing expansion

due to Base Realignment and Closure (BRAC). Complicating and conflicting issues that led to a decision to transfer project responsibilities from the Virginia Department of Transportation to FHWA will be discussed. The second half of the presentation will cover the complexities of preparing the right-of-way for construction through management of contamination issues associated with a historic release of 30,000 to 100,000 gallons of gasoline, waste ordnance pits and facility-wide corrective action related to a RCRA Consent Order.

## **Practical Application of Green Remediation Techniques at Former Small Arms Ranges Located Within the Proposed Sunrise Project Area**

By **Leonard Farr, Jr., AMEC Earth & Environmental, Inc.**



Oregon Department of Transportation is building a new, limited-access highway known as the Sunrise Corridor. A portion of the Sunrise Project transects Camp Withycombe and its former small arms firing ranges. Prior to initiation of the Sunrise Project, remediation of the small arms firing ranges was performed.

Physical particle separation and gravity separation followed by soil amendment processes were used at the former small arms firing ranges located at Camp Withycombe to remove 270 tons of lead from approximately 30,000 tons of soil. The separation and amendment technologies avoided the need to transport the 30,000 tons of soil to a hazardous waste landfill, with a cost savings of about \$5M, and preventing 355,200 truck miles and 1.9 million pounds of CO<sub>2</sub> from being discharged. In addition, much of the soil was reused beneficially on-site. Water from the treatment plant was re-used for irrigation of new vegetation during restoration activities. The project earned the 2009 Secretary of the Army Environmental Restoration Award.

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### Session 12 – Construction and Operations Sustainability

## **Oregon Department of Transportation Construction Waste Management Program**

By **Geoff Crook, Oregon Department of Transportation**



The Oregon Transportation Investment Act III State Bridge Delivery Program (Program) is part of the Oregon Department of Transportation's (ODOT) 10-year, \$3 billion program to repair or replace hundreds of state-owned bridges. Managing construction waste is important to meeting the Program's environmental stewardship and sustainability goals. The Construction Waste Management reporting process was implemented in 2008 and requires contractors to plan for and track reuse, recycling and disposal for a variety of waste streams. As of 2010, the Program has successfully accounted for tens of thousands of tons of recycled asphalt paving, clean fill, concrete, metal and wood-all diverted from landfills statewide. The Construction Waste Management program was developed in collaboration with the Oregon Department of Environmental Quality, and the Association of General Contractors. ODOT has successfully maintained a collaborative approach with regulatory partners and implemented environmental performance standards and contract specifications for effective project management. These elements have been critical to our success in data capture and enhancement reuse and recycling statewide.

## **Beneficial Use of Solid Waste**

By **Tom Roick, Craig Filip, Oregon Department of Environmental Quality**



In April 2010 the Oregon Department of Environmental Quality (DEQ) adopted Beneficial Use of Solid Waste rules. The rules list "standing" beneficial uses that include highway materials such as asphalt, concrete and construction fill. The rules also have a process for review of other "case-specific" beneficial use proposals. Representatives from DEQ will talk about the new rules and how they may apply to transportation projects in Oregon.

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### Session 13 – Portland Engineers Without Borders

## **Engineers Without Borders - Portland Professionals Chapter**

By **Steve Adams, Portland Engineers Without Borders and City of Wilsonville**



Engineers Without Borders (EWB) partners with developing communities to improve their quality of life through implementations of environmentally sustainable, equitable, and economical engineering projects. EWB has over 350 projects throughout the world. Engineers Without Borders' Portland Professionals Chapter has active projects in Haiti, Ecuador and Tanzania; hear how their efforts have made a difference in these communities.