



T² Roads on the Range

2011: Issue 2

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From the Desk of the Director

By Khaled Ksaibati

It is hard to believe that 2011 is already behind us. Looking back, the year was full of accomplishments for us here at the WYT²/LTAP Center. In the safety area, we are still helping counties in the state implement the Wyoming Rural Roads Safety Program. That program has been implemented in more than half of the counties so far. The state wide sign program is in full swing. Ten counties participated in this program which will provide signs and posts for eligible high crash locations on local rural roads. WYDOT provided funding to order about 2000 signs. Some of these signs have already been delivered and the rest of them will be delivered in the near future. It is important that counties would install these signs and inform the center after installation so that we can do the final inspection.

In the speed management area, the center worked closely with the counties, WYDOT, WACERS and the WCCA to establish guidelines for setting speed limits on local roads. These guidelines will help counties in establishing speed limits on paved and unpaved roads. Following uniform guidelines statewide to establish speed limits will make local roads safer for the driving public. County engineers can follow these guidelines, hire consultants, or request help from the WYT²/LTAP center when setting speed limits. Several training sessions were held in 2011 for setting speed limits on unpaved roads.

Additional training sessions for paved roads will be developed and presented in the near future.

In the infrastructural area, the center has begun working with the counties in the southeastern corner of the state to develop strategies for mitigating the impact of oil and gas drilling activities. The report of the first phase of this study has been completed and it will be shared with the Wyoming legislature in their 2012 session.

The Local Project Administration (LPA) Certification has been implemented in cooperation with local governments, WYDOT and FHWA. Four certification sessions have already been presented and over 100 individuals have been certified. Each local agency requesting federal funding must have a certified individual before signing an MOU with WYDOT. There will be another certification session in conjunction with our safety congress early in April. Our web site contains valuable information on this certification and the names of all certified individuals.

Late in 2011, we presented training on the new County Road Funds Manual. That training helped in highlighting the changes and the updates in the new manual. Last year was full of challenges and accomplishments and we are looking forward to working with all of you for years to come. Please feel free to call if you have any questions about any of our ongoing or new programs.

Livable Streets

by Jeff Purdy, FHWA

Considerable emphasis is being placed on livable streets and how they fit into building sustainable communities. Sustainable communities coordinate transportation, land use, housing and the environment. They give people transportation choices – from roads and highways, to rail and transit, to bike paths and walkways. Ultimately, economic growth and quality of life are central to creation of livable communities. Sustainable communities are the kind of places where families want to live and – and where businesses want to locate.

Livable Streets

- Deliver transportation projects that improve quality of life in rural and urban areas
- Improve safety and efficiency of surface transportation system
- Reduce impacts of transportation on environment
- Reduce need for costly future transportation infrastructure
- Ensure efficient access to jobs, education and essential services
- Encourage private sector development patterns that support livability goals

There are a wide variety of elements that contribute towards building sustainable communities. Investment in transportation and infrastructure improvements can support revitalization of existing urban places and create vibrant mixed-use communities, while conserving natural features, particularly in rural areas. Open space can be preserved for active and passive recreational facilities. Water quality can be protected through proper management of stormwater runoff. Impacts to air quality can be minimized and efficient energy use/production encouraged. Transportation improvements should include enhancement to safe and



Streetscape, Downtown Casper

efficient multi-modal transportation networks for communities.

An important component of a sustainable transportation system is developing livable streets that integrate the quality, location and type of transportation facilities with other community programs to achieve local quality of life goals. Streets within cities and towns should be designed to accommodating a range of modes within more balanced multimodal transportation networks based upon the needs of the community. Transportation investment should



Plaza, Downtown Casper

support economic development by providing economic benefits to communities, businesses and consumers. And finally, transportation improvements should be done in a manner that supports more sustainable and efficient land use patterns.

Rural communities have specific transportation needs. In a livable rural community, no one should be isolated from safe, reliable access to essential services, like jobs, health care or schools. Because of the distances people sometimes have to travel for goods and services, there may be a greater need for regional or inter-city bus service. There is a special emphasis in many rural communities on being able to ship agricultural goods, which requires an efficient freight or rail infrastructure. Livable rural communities have a unique need for strong, well-planned town centers that give people convenient access to jobs and services in one centralized location, that encourage foot traffic around locally-owned small businesses and that protect open spaces and valuable farmland. The goal is to make sure transportation supports and respects the unique character and livability of rural communities.

Livability in the Context of Wyoming

- Safe, reliable and economical transportation choices
- Access to affordable housing
- Enhance economic competitiveness through access to employment & markets
- Re-investment in existing communities
- Preserving qualities of small towns
- Growth of sustainable, energy efficient communities
- Minimize impact on environment
- Healthy, safe and walkable neighborhoods
- Unique characteristics of rural and urban communities

The types of elements that can enhance the livability of transportation include pedestrian and bicycle facilities to provide residents with safe and healthy mobility choices. Strategic roadway improvements can relieve traffic congestion that reduce emissions and improve air quality. Streetscape improvements and context sensitive

solutions can improve the human environment by preserving neighborhood and community character while mitigating transportation impacts on the environment.

Livable streets should accommodate multi-modal transportation based upon the needs and context of the community. Safety can be enhanced through consideration of users, design consistency, appropriate design speed and design elements. System-wide capacity can be achieved through high level of network connectivity and multiple travel modes. Design should capitalize on development patterns to supports human and economic activities. Streets should fit within the context of the community with design that complements buildings, public spaces, streetscape and landscape.



Plaza, Downtown Laramie

For rural communities, a one-size-fits-all approach doesn't work. Livability principles need to incorporate place-based strategies that fit small towns. Context sensitive solutions can focus on design solutions that reflect a community's context or setting. Context sensitive solutions through traditional downtowns should focus on rightsizing Main Street to meet the transportation needs of the community as well as the traveling public.

In designing walkable/multi-modal streets, the land use context, needed streetside amenities and travelway design all need to be taken into consideration. The land use context should to

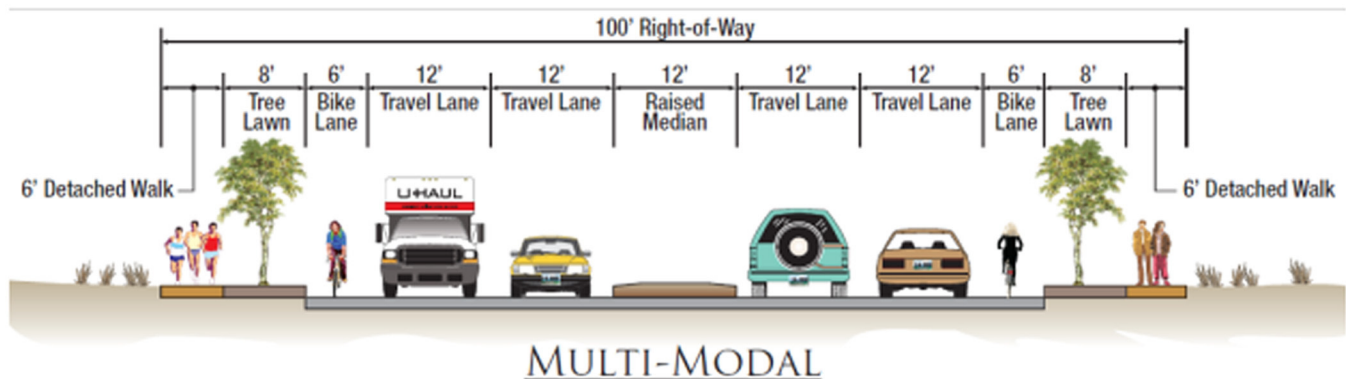
consider building orientation, building setback, off-street parking location. The streetside amenities should serve the adjacent land use should consider width of pedestrian throughway, frontage zone adjacent to buildings, street trees, street lights and roadside clear zone. The traveled way should be designed to accommodate traffic at a targeted speed. On-street parking and bike lanes should be accommodated where needed.

In addition to street design, there are a number of other elements that contribute to walkable communities. Convenient and compatible mixture of land uses in close proximity can

onto the sidewalk. Building, landscape and street design should be at a pedestrian-scale.

A vital element to building walkable communities is a highly-connected street network with relatively small block sizes. This reduces burden on arterials for local traffic, increases efficiency of network performance, makes neighborhoods more walkable by shortening walking distances and improves emergency vehicle response times.

Sustainability and livable streets are seen as a partnership between federal, state and local



South Greeley Highway Corridor Concept Plan, Cheyenne MPO, Felsburg Holt & Ullevig, Inc.



Multi-Modal Street, Cheyenne

provide destinations for non-motorized travel. In downtown settings, buildings should be built close to the sidewalk to create street enclosure with parking lots located to the side or rear of the building. This allows building entries to front

communities. Many agencies have implemented livability in transportation by creating safer multimodal roadway networks, incorporating context sensitive solutions and improved design elements, such as complete streets. A majority of implementation projects occur at the local scale, which is why the partnership between state and local communities is so important. Partnerships created from ground-up translate visions and goals into realistic projects and facilitate feedback. Public involvement can broaden stakeholder buy-in and maximize resources. Public-private partnerships can also be used to leverage investment and integrate sustainable development patterns with infrastructure investment.

FHWA will continue to work with WYDOT and local communities to improve implementation of livability programs. Through transportation

Highway programs to support livability

- Bicycle and Pedestrian Program
- Congestion Mitigation and Air Quality Improvement (CMAQ)
- National Scenic Byways
- Recreational Trails
- Safe Routes to School
- Transportation, Community and System Preservation (TCSP)
- Transportation Enhancement Activities
- Federal Lands Highways
- Indian Reservation Roads
- Context Sensitive Solutions

programs, we can help to ensure that livability efforts related to urban, suburban, small town and rural contexts of Wyoming. Local goals for community character and quality of life are important in identifying objectives and set targets for achieving livability. Working in partnership with WYDOT and local communities, we can continue to integrate policies and plans to leverage transportation investments in support of community goals.

Highways and Sustainability

by Joe Dailey, FHWA

When writing about a subject it's usually a good idea to ensure that you and your audience both have a common understanding about the subject. So when asked to write an article about "Sustainability" I started by looking up the word at the Merriam-Webster online dictionary (<http://www.merriam-webster.com/dictionary>.) Not surprisingly despite common use of the term it's not listed so I looked up sustainable instead:

"SUSTAINABLE

1: capable of being sustained

2a : of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged <sustainable techniques> <sustainable agriculture> b : of or relating to a lifestyle involving the use of sustainable methods <sustainable society>"

Since the definition referred to the word sustain I looked that up too:

"SUSTAIN

1: to give support or relief to

2: to supply with sustenance : nourish

3: keep up, prolong

4: to support the weight of : prop; also : to carry or withstand (a weight or pressure)

5: to buoy up <sustained by hope>

6a : to bear up under b : suffer, undergo <sustained heavy losses>

7a : to support as true, legal, or just b : to allow or admit as valid <the court sustained the motion>

8: to support by adequate proof : confirm <testimony that sustains our contention>"

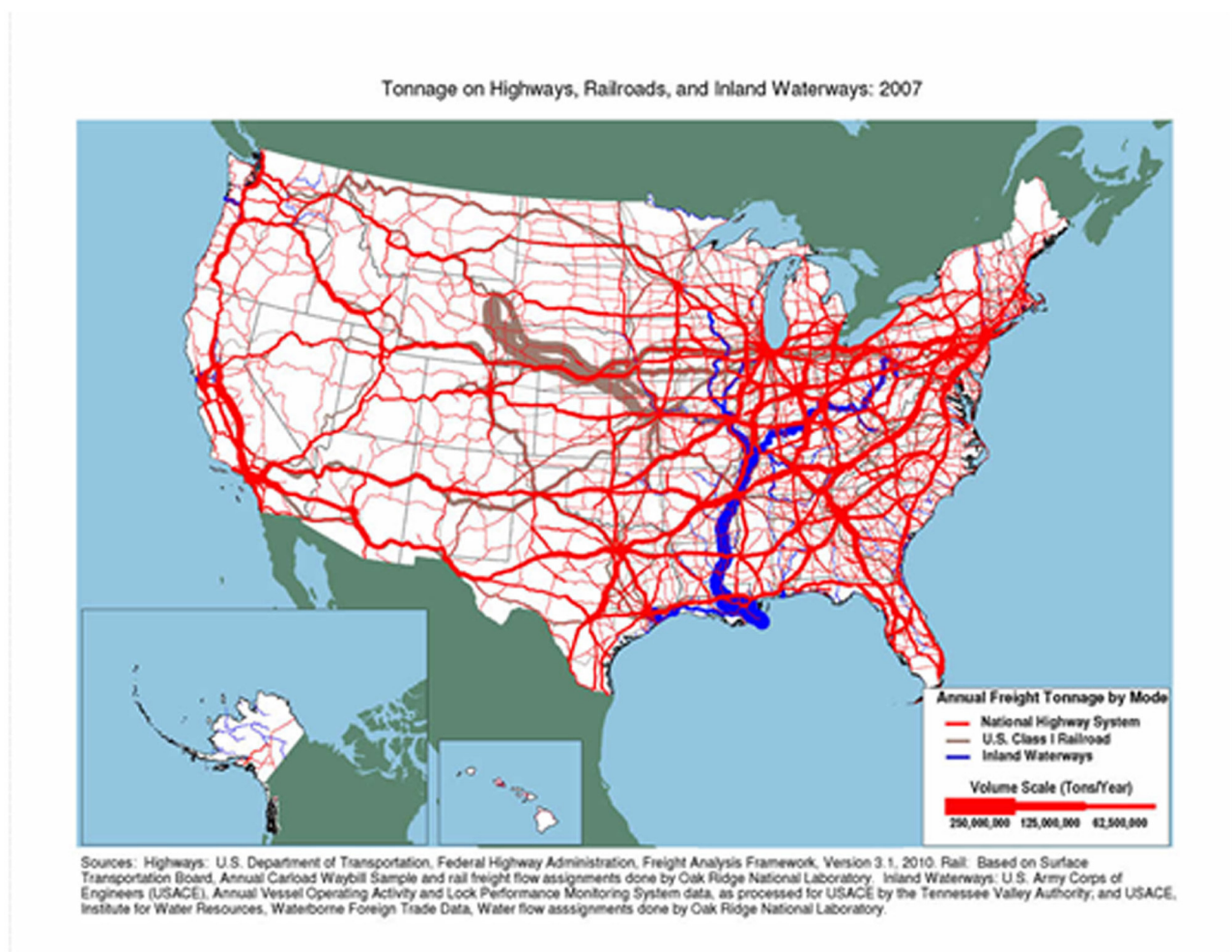
So, if we are talking about sustainable roads we're talking about road construction and maintenance practices that minimize the amount of materials and labor as well as the impact the road has on the environment while at the same time promoting both economic growth and sustainable community development. It is common to talk about a triple bottom line when discussing sustainable roads. The three pillars of the "triple bottom line" upon which sustainability is based—social, economic, and environmental—capture the broad range of transportation goals and objectives.

Okay, if you made it this far you're asking yourself what does this have to do with highways in Wyoming?! Actually quite a lot...

Interstate 80 (I-80) is both boon and bane of the State. It brings vital commerce along with an increasing maintenance burden. As you can clearly see below, I-80 is the major East to West freight corridor connecting the Pacific Northwest to the Midwestern United States. US Department of Transportation advocates rail and water as more sustainable alternatives to move freight. Wyoming is ahead of the curve in this area and already moves the majority of freight by rail (these numbers are from 2007). So shifting freight from highway to rail won't help Wyoming reduce traffic on I-80.

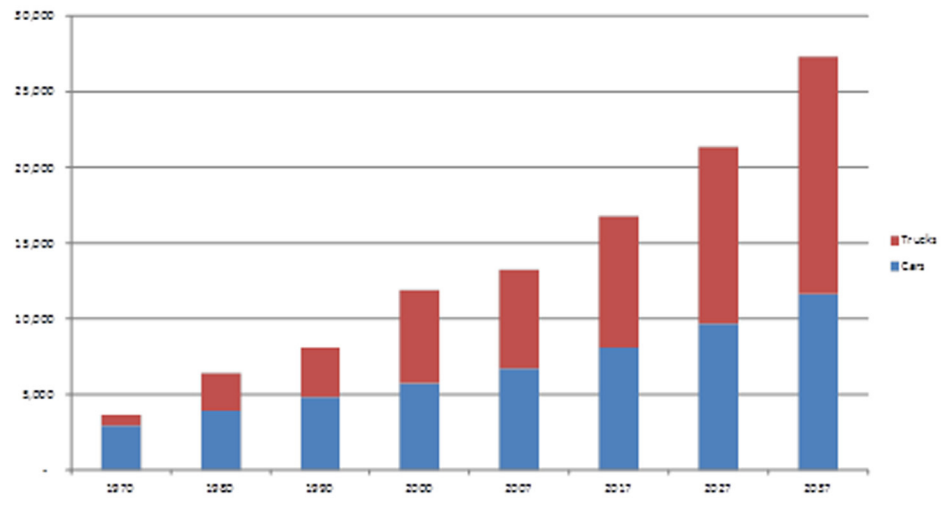
per year) is expected to cause the proportion of trucks on I-80 to rise from just under 50% in 2007 to 57% in 2037. Using AASHTO design guide data, WYDOT staff calculated that one fully loaded 80,000 pound truck has the same impact on a roadway as 4,000 passenger vehicles. So the 27,357 vehicles projected in 2037 (11,675 cars, 15,682 trucks) equates to over 62.7 million car equivalents.

The same study states that current funding levels are insufficient to properly maintain Wyoming's stretch of I-80 based on these same



Due to the recent tolling feasibility study conducted by WYDOT, we know a lot about current and future trends on this major freight corridor. The composition of traffic on I-80 is changing. Robust truck traffic growth (3% per year) in excess of passenger car growth (1.8%

traffic projections. Congestion on I-80 even at these increasing traffic levels isn't predicted to be an issue, so the traditional answer of adding additional capacity won't work -- we need some way to reduce the cost of operating and maintaining the highway – sustainability could be the answer.



You may be saying to yourself that I-80 isn't representative of every road in the Cowboy State. True, but in these times of decreasing resources the maintenance requirements of existing road networks are exceeding the funding available to the state and local governments. This impacts these same state and local governments' ability to maintain the current network while at the same time supporting economic development and maintain or enhance the quality of life of their citizens. Again, sustainability might be a solution.

Luckily, there are initiatives under development to assist road owners/operators adopt sustainable practices. The Federal Highway Administration is developing INVEST, the FHWA Sustainable Highways Self-Evaluation Tool (www.sustainablehighways.org). "Greenroads" is another tool being developed jointly by the University of Washington (UW) and CH2M HILL (www.greenroads.org). Both of these tools provide a way for road owners/operators to evaluate their transportation projects and to encourage progress in the sustainability arena. These tools are similar to the LEED program (www.usgbc.org) used for building construction and operation. Like the LEED program both INVEST and Greenroads provide road owners and operators with an evolving methodology to identify and implement practical and measurable

sustainable roadway design, construction, operations, and maintenance solutions. The theory behind all of these systems is that if you measure and quantify the costs, benefits, and tradeoffs of various techniques and practices, this will allow owners/operators to make choices that will optimize the cost of constructing, operating, and maintaining facilities -- with the additional benefit of minimizing impact on the environment. In 2011 the Wyoming Division and WYDOT staff tested the INVEST tool using a project in SE Wyoming and provided feedback to its developers ensuring that it will serve the needs of rural states.

Highways serve many different and sometimes competing objectives. "Sustainability" is a concept that enables decision-makers to make balanced choices around these different objectives. The three pillars of the "triple bottom line" upon which sustainability is based—social, economic, and environmental—capture the broad range of transportation goals and objectives. In these times of diminishing economic and natural resources, using sustainable approaches in transportation will allow us to continue to enhance quality of life, support community and economic development, and serve the transportation needs of the present and future without compromising the ability of future generations to meet their own needs.

Welcome to Wyoming!

Dave Cough, the assistant FHWA Division Administrator in Wyoming, recently visited with Khaled Ksaibati, Director of the Wyoming Technology Transfer Center. Khaled provided an overview of the WYT² Center and the



Khaled Ksaibati and Dave Cough

current activities undertaken by the University of Wyoming within the framework of their Local Technology Assistance Program (LTAP). Khaled discussed the High Risk Rural Road Program which was jointly developed by the Center and WYDOT and funded by the Federal Highway Administration.

Dave supervises the FHWA Division engineers and program specialists who work closely with WYDOT and consultants in the development of Federal aid highway projects. He is originally from Bar Harbor Maine, graduated from the University of Maine and is a registered PE. Dave has worked for FHWA since 1978 in various assignments including Montana, Washington, D.C., and Pennsylvania. He moved to Cheyenne from Harrisburg, Pennsylvania in June of 2011. Dave is also serving as the interim FHWA safety specialist until that position is filled.

Local Project Administration (LPA) Certification

Beginning with fiscal year 2012, WYDOT will require that federally funded local projects be overseen by a certified representative of the local agency. Federal requirements can be overwhelming to local agencies, especially if federal funds are infrequently used.

The T²/LTAP Center recently offered four seminars on Local Project Administration (LPA) Certification. The first four sessions of certification, held in Jackson, Buffalo, Casper and Rawlins, resulted in 109 individuals being certified in the State of Wyoming. The goal of these seminars is to assist local agencies in bringing projects to

successful completion. Certification will be valid for three years, after which recertification will be required.

A fifth certification seminar will be held in Casper on April 3, 2012, the day before our annual Transportation and Safety Congress. WYDOT and FHWA are providing the instructors for these seminars.

The names of certified individuals, their employer, their location and the date required for recertification renewal is available on the Center's web site: www.eng.uwyo.edu/wyt2. Just click on the tab called "Certifications."

2nd Road Dust Best Management Practices Conference

by Josh Jones

The road dust institute conducted their second conference on road dust best management practices on November 7-9, 2011. The conference brought together local, state and county road practitioners, as well as researchers and federal agencies to discuss current practices and lessons learned to assist practitioners. The themes of the 2011 conference were environmental compatibility and sustainability, general and international best practices, and unique and extreme conditions. On their website, roaddustinstitute.org, all of the presentations and papers from the 2008 conference and the 2011 conference are located in the archives.

The Wyoming T²/LTAP Center presented the findings of a recently completed study that examined the use of reclaimed and recycled asphalt pavement (RAP) millings on unpaved roads, assessing both dust emissions and overall performance. Gravel loss in the form of dust is a problem on many of Wyoming's unpaved roads. As asphalt is milled from Wyoming's state highways, yielding RAP, its use as a roadway material on Wyoming Department of Transportation (WYDOT) projects is usually in plant mix pavement (PMP) or as a road base. T² studied the performance of RAP in unpaved roads, emphasizing dust loss and surface performance, along with an economic comparison between its use on unpaved roads and its use in PMP or in road base.

The conference began with opening remarks from David James – University of Nevada welcoming all the attendees to the 2nd road dust conference. The keynote speeches included presentations from Steve Albert, Western Transportation Institute; Roger Surdahl, FHWA Central Federal Lands Highway; and Dave Jones, University of California Pavement Research Center. Dave Jones presented the highlights from the gravel

roads tour and survey. They received 287 surveys back; 73% of the respondents use chemical dust control mainly for public safety, health, complaints, to reduce road maintenance and preserve the gravel. The most commonly used additives included chlorides, lignosulfonate and ligno blends, asphalt emulsions, and synthetic polymer emulsions. Some of the reasons for limited use or not using dust control include funding, cost-effectiveness, environmental issues, equipment limitations, and insufficient information to make informed decisions.

Twelve vendors gave presentations on their different dust abatement chemicals and techniques. All of the different vendors and products are shown in the archives. Another session concentrated on the evaluation of the performance of materials and addressed different dust control methods and materials currently available. The performance of polymer-based products was compared to traditional hygroscopic products in Canada and infused applications. Next came a presentation by the US Army Engineer Research and Development Center about the results of an ongoing research project that has allowed them to compile a set of best practices, in terms of the method of application, application rate, and laboratory testing of dust palliatives for military dust abatement. Their dust abatement handbook provides guidance for selecting dust palliatives and application methods. A PDF of the handbook can be downloaded at <http://www.soilworks.com/docs/soilworks-usmc-dust-abatement-handbook.pdf>.

Bethany Williams from the USGS Columbia Environmental Research Center presented ongoing research about potential impacts of different products on the environment surrounding gravel roads. They tested five different types of products: electrochemical, organic, hydrocarbon,

polymer, and chloride. Of the five products tested, only electrochemical products tested at slightly toxic to moderately toxic. Polymer and chloride products tested the best at practically nontoxic.

Steve Monlux from LVR Consultants LLC presented a chloride optimization study for the USDA Forest Service. They considered two different techniques for chloride treatments: annual dust treatments and heavy “mixed in-place” treatment. They found that for annual dust treatment more chloride at the road surface was good for light traffic but had a greater long term cost associated with it. Stabilization with light treatment every three to five years had less dusting, raveling, and wash boarding, required less blading and rock replacement and had greater public satisfaction. The cons were a higher initial cost and only suitable for good gravel gradations. When different percentages of clay were added to the road surface, it was concluded that 1.5% calcium chloride and 3.5% bentonite produced the best compaction.

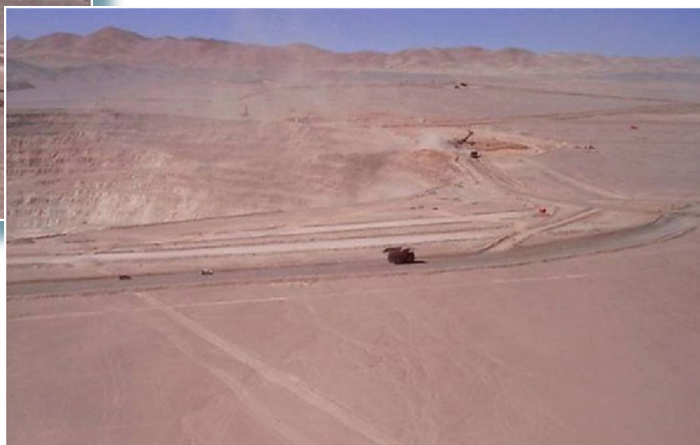
Another interesting presentation was on an unpaved road management system for mining

operations in Chile. Before they started using magnesium chloride as dust abatement the mines, they were using 2000 m³ of water each day for dust suppressant. Currently, over 80% of the mines are using magnesium chloride and have reduced the amount of water needed by 90%. The two pictures below show a mining vehicle on an untreated road and on a treated road. It definitely passes the eye test when looking at the results. Some general conclusions were: add water while rotary mixing, do not exceed optimum moisture, use <2% pure salt, shape to 4% crown to reduce pothole formation, and compact to reduce permeability and improve chloride retention.

The conference proved to be very informative about techniques practitioners are using around the world. The main conclusion was that there is no “silver bullet” for all roads and each product will perform differently depending on the material type, climate and type of maintenance. It was recommended that practitioners try out different test segments on their road networks to see what works best. Road dust abatement is still a relatively new field and much more work/studies need to be done to find the best solutions.



Before treatment with magnesium chloride



After treatment with magnesium chloride

FHWA's Online Maintenance Training Series

It's training at your convenience. Ready to go at the time and place that best suits your schedule, the Federal Highway Administrations' (FHWA) free online Maintenance Training Series covers topics ranging from pavement preservation concepts to weather-related operations to the practicalities of work-zone traffic control. Each of the 11 self-paced training courses takes approximately one hour to complete.

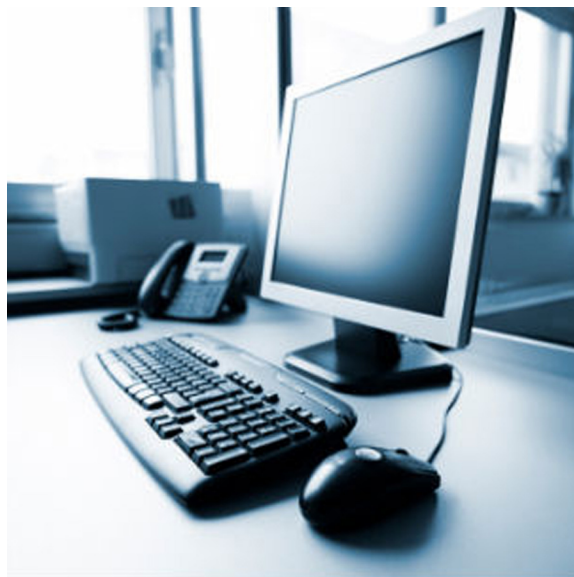
"The Maintenance Training Series was created to respond to the needs of those individuals responsible for the maintenance of the Nation's infrastructure. The series allows them to access the training they need, any time anywhere," notes Christopher Newman of FHWA.

Participants are encouraged to register for the entire series (Course No. FHWA-NHI-134109), so that they can access all 11 training courses. However, those interested in specific training that fits their needs can also register for courses individually.

Training modules included in the series are:

- Pavement Preservation Programs (Course No. FHWA-NHI-134109A)
- Shoulders and Shaping (Course No. FHWA-NHI-134109B)
- Thin HMA (Hot-Mix Asphalt) Overlays and Leveling (Course No. FHWA-NHI-134109C)

- Base and Subbase Stabilization and Repair (Course No. FHWA-NHI-134109D)
- Drainage (Course No. FHWA-NHI-134109E)
- Outdoor Advertising and Litter Control (Course No. FHWA-NHI-134109F)
- Roadside Vegetation Management (Course No. FHWA-NHI-134109G)
- Weather-Related Operations (Course No. FHWA-NHI-134109H)
- Basics of Work-Zone Traffic Control (Course No. FHWA-NHI-134109I)
- Underground Storage Tanks (Course No. FHWA-NHI-134109J)
- Cultural and Historic Preservation (Course No. FHWA-NHI-134109K)



The courses are designed for state, county, or regional agency personnel who manage transportation maintenance and operations programs and handle oversight, quality assurance, materials, scheduling, budgeting, or planning.

For more information on the Maintenance Training Series or to register, visit www.nhi.fhwa.dot.gov (click on "Register for a Course"). Information on the series is also available by contacting Christopher Newman at FHWA, 202-366-2023 (email: Christopher.newman@fhwa.dot.gov).

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Change Service Requested

Mark your calendar!

**17th Annual
Transportation &
Safety Congress**

**April 4 -5, 2012
Parkway Plaza Hotel
Casper, WY**

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The national Local Technical Assistance Program mission is to foster a safe, efficient, and environmentally sound surface transportation system by improving skills and increasing knowledge of the transportation workforce and decision makers.



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