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# Utah Technology Transfer Center Newsletter

# **TA** ON THE MOVE

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The Direction in Transportation Progress

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Brought to you by Utah's LTAP (Local Technical Assistance Program)

Volume 15, Number 1

Winter (January) 2002

## Asset Management--A Potential Tool to Assist in Homeland Security and Emergency Preparedness

by Doyt Y. Bolling, P.E., Director

The terrorist attacks of September 11, 2001 have laid an additional task at the doorstep of transportation and public works agencies. Not only do these agencies have to pick up the pieces and make major repairs to various infrastructure elements after natural disasters, now they are charged with addressing the threat and damage of terrorist attacks.

In addition to the principal task of constructing, maintaining, and preserving transportation systems and critical infrastructure elements, these agencies will most likely be charged with carrying out proposed homeland security measures. These duties will likely involve develop-

ing and maintaining improved security systems, designing and constructing infrastructure systems that are resistant to damage from terrorist attacks, and developing and carrying out improved emergency response plans.

The tool of asset management coupled with GPS & GIS technologies has the potential for enhancing emergency preparedness and homeland security measures. The major elements of asset management as shown in the system diagram (see page 4) provide the opportunity for rapid identification of critical infrastructure elements and early response to both natural disasters and terrorist damage.

The inventory element provides detailed information (design, physical features, age, location, etc.) of each infrastructure element. The condition assessment element offers a defined procedure for evaluating current conditions. The performance objective element defines and sets forth the functional and structural capacity requirements. The asset evaluation element establishes the monetary and functional value of each infrastructure elements.

The analysis of alternate strategies provides a structured means of determining the most efficient and cost effective strategy of repair or replacement. The resource allocation element provides a means to optimize the use of limited resources. The implementation element sets forth a defined plan of execution. The performance measurement element assesses the achievement of performance objectives. The last element, feedback, enables continuous improvement and refinements to be made.

Numerous actions have been taken by local, state, and Federal agencies to improve homeland security as a result of the September 11th attacks. Recently, the National Association of County Officials (NACo) held a meeting of their Home-

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## About *On the Move*

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## About the *Utah T<sup>2</sup> Center*

The Transportation Technology Transfer Program is an integral part of a nationwide Local Technical Assistance Program (LTAP) financed by the Federal Highway Administration, state departments of transportation and local transportation agencies. The Center bridges the gap between research and practice by translating the latest state-of-the-art technology in transportation into implementable products and information for the special use of local transportation agencies and personnel.

For more information about the LTAP program or items in this newsletter, please call us at 1-800-822-8878.



# Legislative & Regulatory Update

## APWA Urges Members to Ask Congress to Include Infrastructure Investment in Vital Economic Stimulus Package

If you log onto the APWA Web site [[www.apwa.net](http://www.apwa.net)] you can check out the latest in legislative issues being tracked by APWA. One of these issues is the importance of including infrastructure investment in the economic stimulus package now being considered by Congress. At the Web site you can sign-up to send a prepared e-mail to your senators about this important issue or write your own letter--as someone who works in the field of public works--about why this is important to you. Excerpts from the prepared e-mail can be found below.

"As Congress considers measures to address the current economic slow-down, [we] urge you to ensure that the economic stimulus package under consideration in Congress include investment in our nation's public infrastructure.

Investment in public infrastructure--roads, bridges, mass transit, drinking water and waste water systems, aviation, rail and energy--is a proven economic stimulus. It creates a significant number of jobs and generates immediate and sustained economic growth in our communities and throughout the country. For every \$1 billion invested in infrastructure tens of thousands of jobs are generated. Moreover, these investments yield significant near-term as well as long-term benefits in the form of improved efficiencies, security, safety and reliability.

State and local agencies have indicated that, with the availability of federal funding, they have priority projects which are ready for construction and capable of delivering the needed stimulus immediately. While also helping invigorate the economy, federal investment in public infrastructure through a stimulus package is a suitable and appropriate way to help close the funding shortfall that hinders our ability to make needed improvements to modernize and repair deteriorating and aging infrastructure. Not addressing the shortfall comes at great cost to our economy, our safety and our quality of life."

Log on today and check out other pending issues before the U.S. Congress, or find out about issues pending in your own area of the country. You can use the APWA Web site as a valuable tool to keep informed on current issues and get involved in helping our public officials find workable solutions to the problems facing public works.

The National Association of County Engineers (NACE) and the National Association of County Officials (NACo) also provide valuable legislative information and updates on their Web sites: NACE [[www.naco.org/affils/nace/](http://www.naco.org/affils/nace/)] and NACo [[www.naco.org](http://www.naco.org)]. As members of the public works community, your input given to our elected politicians can go a long way to ensuring better service and products for the public we are entrusted to serve.

Links to these Web pages are also found on-line at our Web site [[www.utaht2.usu.edu](http://www.utaht2.usu.edu)].

# Heads Up!

## MUTCD Compliance Dates

Below is a list of compliance dates for your information.

Please consult the Federal Register for detailed information regarding the sections you are interested in.

Section 2B.04	<u>STOP Sign</u> . Compliance period of 3 years (January 17, 2004)
Section 2B.16	<u>Reduced Speed ahead Sign</u> . Compliance period of 7 years (January 17, 2008)
Section 2B.32	<u>ONE WAY Sign</u> . Compliance period of 7 years (January 17, 2008)
Section 2B.49	<u>High Occupancy Vehicle Lanes</u> . Compliance period of 6 years (January 17, 2007)
Section 2B.50	<u>High Occupancy Vehicle Sign Applications and Placement</u> . Compliance period of 6 years (January 17, 2007)
Section 2C.02	<u>Application of Warning Signs</u> . Compliance period of 7 years (January 17, 2008)
Section 2C.24	<u>Shoulder Signs</u> . Compliance period of 10 years (January 17, 2011)
Section 2C.37	<u>Crossing Signs</u> . Compliance period of 10 years (January 17, 2011)
Section 2D.38	<u>Letter Size of Street Name Signs</u> . Compliance period of 15 years from January 9, 1997 (January 9, 2012)
Section 2E.29	<u>Interchange Exit Numbering</u> . Compliance period of 10 years (January 17, 2011)
Section 2E.31	<u>Advance Guide Signs</u> . Compliance period of 7 years (January 17, 2008)
Section 2F.05	<u>Size of Lettering</u> . Compliance period of 10 years (January 17, 2011)
Section 3B.01	<u>Yellow Centerline and Left Edge Line Pavement Markings and Warrants</u> . Compliance date of January 3, 2003
Section 3B.07	<u>Warrants for Use of Edge Lines</u> . Compliance date of January 3, 2003
Section 4E.06	<u>Accessible Pedestrian Signals</u> . Compliance period of 4 years (January 17, 2005)
Section 4E.08	<u>Accessible Pedestrian Signal Detectors</u> . Compliance period of 4 years (January 17, 2005)
Section 8B.02	<u>Highway-Rail Grade Crossing (Crossbuck) Sign</u> . Compliance period of 10 years (January 17, 2011)
Section 9B.04	<u>Bicycle Lane Signs</u> . Compliance period of 5 years (January 17, 2006)
Section 9B.15	<u>Bicycle Crossing Warning Signs</u> . Compliance period of 7 years (January 17, 2008)
Section 9	<u>Deletion of Preferential Lane Symbol (Diamond) for Bicycles and Pavement Markings</u> . Compliance period of 6 years (January 17, 2007)
Section 10	<u>Automatic Gates, Flashing-Light Signals, and Blank-Out Signs</u> . Compliance period of 5 years (January 17, 2006)
Section 10C.11	<u>Highway-Rail Advance Warning Signs: Removal of existing W10-6 Series Signs</u> . Compliance period of 5 years (January 17, 2006)

## Advisory Board

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Utah Local Governments Trust

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Utah Department of Transportation

**Jon Ruiz**

Ogden City

**Dean Steele**

Utah Risk Management Mutual  
Association

The T<sup>2</sup> Center Advisory Board meets twice annually (and as needed) to make recommendations and evaluate the effectiveness of the program.

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land Security Task Force. The meeting spotlighted new technology that local governments can use to safeguard citizens. Presentations from industry leaders such as IBM, Microsoft, ESRI, Oracle and Accenture were made.

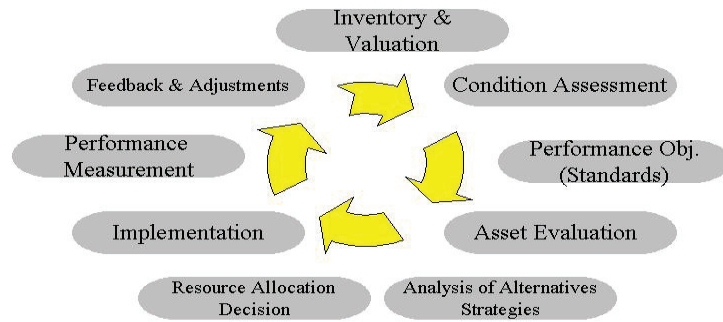
In addition, NACo participated in the introduction of the Homeland Emergency Response Operations (HERO) Act sponsored by Reps. Jane Harman and Curt Weldon. At a special news conference on Capital Hill, NACo Executive Director Larry Naake stated, "It is critical for the 700 MHz band be made available in a timely manner. County public safety workers such as fire fighters and police officers need the tools and technology for better communication and cooperation among all departments. Counties are first responders to disaster and crisis situations. The 700 MHz spectrum will enhance our ability to safeguard our citizens by improving our ability to communicate and work together."

The National Emergency Management Association (NEMA), representing emergency management directors of 50 states, territories and the District of Columbia, has just completed a survey on terrorism preparedness. This survey reports on the latest organizational activities, public health issues, legislative initiatives, and actions that have been taken on key issues.

NEMA applauds President Bush's establishment of the Office of Homeland Security as the first step in coordinating the programs, budgets and activities of many agencies. NEMA reports that all states have completed a needs assessment and statewide strategic plan for terrorism preparedness. Further information on these activities may be obtained by logging on to their Web site at [[www.nemaweb.org](http://www.nemaweb.org)].

In Utah, the new Homeland Security Task Force has been established under the existing Comprehensive Emergency Management Office. The Utah State

## Basic Elements of Asset Management



Emergency Director is the key point of contact for terrorism preparedness with the Utah National Guard available to assist with large demands (i.e. SLC Winter Olympics).

Many have forgotten that the Interstate Highway System was primarily built for the purpose of national defense. The recent actions taken to protect critical structures on this system has reminded us of this purpose.

Transportation is critical to our way of life; therefore, transportation system security must be given the highest priority. The Transportation Research Board (TRB) and The National Academies have generated extensive information on this issue in recent years.

The TRB Task Force on Critical Infrastructure Protection is sponsoring a Web site that contains discussions of issues, actions that can be taken, guidance and training opportunities. In addition, TR News 211 (Nov-Dec 2000), presents several articles dealing with transportation security. All modes of transportation security (aviation, all forms of surface transportation, and seaport/maritime) are addressed by TRB. More than 50 sources of information on transportation security are listed through TRB's Web site [[www4.nas.edu/trb/homepage.nsf/web/security](http://www4.nas.edu/trb/homepage.nsf/web/security)]. These sources are too many to list

individually. The following, however, are highlighted and recommended for immediate reference:

1. Statewide Critical Infrastructure Protection: New Mexico's Model by Daniel J. O'Neil (TR News 211, Nov-Dec 2000)
2. "Protecting Surface Transportation Systems and Patrons from Terrorist Activities" Mineta Transportation Institute
3. Improving Surface Transportation Security: A research and Development Strategy (NRC Policy Study)
4. National Academy Press Terrorism and Security
5. Critical Infrastructure Assurance Office [[www.ciao.org](http://www.ciao.org)]
6. EmergencyNet News [[www.emergency.com](http://www.emergency.com)]
7. National Infrastructure Protection Center [[www.nipc.gov](http://www.nipc.gov)]

The Utah T<sup>2</sup> Center is endeavoring to stay apprised of the latest developments and information on homeland security and emergency preparedness. You may contact us at 1-800-822-8878 or on our Web site at [[www.utah2.usu.edu](http://www.utah2.usu.edu)] for additional information or assistance. Special links from our Web site are being made to such pertinent information.

# What Our Partners Are Doing

## You Need to Know

Our thanks to these important partners for sharing this information and working with us in our efforts to serve the local agencies of Utah.

### Utah League of Cities & Towns

If you desire more information on League activities, or to register for a League sponsored event, please call the Utah League of Cities & Towns directly at (801) 328-1601 or 1-800-852-8528 or go to their Web site [[www.ulct.org](http://www.ulct.org)].

**January 23--Local Officials Day at the Legislature.**

**March 8-12--National League of Cities (Washington DC).**

**April 24-26--Road School (St. George).** Plan now to attend. Further information will be available on-line and in our next newsletter.

### Utah Association of Counties

For more information on UAC activities, or to register for a UAC sponsored event, please call them directly at (801) 265-1331 or go to their Web site [[www.uacnet.org](http://www.uacnet.org)].

**February 11--County Officials Day at the Legislature.**

**April 10-12--UAC Annual Management Conference (Park City).**

### APWA, Utah Chapter

For more information on APWA activities, call Bob Davis with DMJM at (801) 484-9884 extension 5075.

**January 24--Monthly Luncheon (West Valley City Fitness Center).** The luncheon will be held from 12 noon until 2 pm. Olympic issues is the topic for discussion.

**February 28--Monthly Luncheon (West Valley City Hall--*please note the location change*).** The luncheon will be held from 12 noon until 2 pm. Human resource issues is the topic for discussion.

**March 28--Monthly Luncheon (West Valley City Fitness Center).** The luncheon will be held from 12 noon until 2 pm. Storm water facilities is the topic for discussion.

### ITE, Utah Chapter

For information on ITE activities, please call Lee Cabell with Horrocks Engineers at (801) 763-5183. All monthly luncheons will be held at the Shanghai Restaurant (7200 South 300 West, Salt Lake City) at 12 noon.

**January 31--Annual Seminar (Hilda B. Jones Center, Salt Lake City).** Contact Jason Davis at (801) 965-4018 for more information or to register.

**February 19--Monthly Luncheon.**

**March 19--Monthly Luncheon.**

### Utah Local Governments Insurance Trust

For information on these and other Trust activities, please call Craig Bott at 1-800-748-4440 extension 310. (Please leave a message if Craig is not available.) You can also e-mail Craig at [[cbott@ulgt.org](mailto:cbott@ulgt.org)]. Also, check out their Web site at [[www.ulgt.org](http://www.ulgt.org)]. Please note that some of the training (safety, etc.) on our calendar is being presented in cooperation with the Trust as part of their training activities.

**January 5--Newly Elected Officials Training (Cedar City).** This training is provided in cooperation with the League of Cities & Towns, and will be held from 8 am to 1 pm for newly elected officials in the surrounding area.

**January 12--Newly Elected Officials Training (Heber City).** This training is provided in cooperation with the League of Cities & Towns, and will be held from 8 am to 1 pm for newly elected officials in the surrounding area.

**January 19--Newly Elected Officials Training (Ruby's Inn).** This training is provided in cooperation with the League of Cities & Towns, and will be held from 8 am to 1 pm for newly elected officials in the surrounding area.

**January 26--Newly Elected Officials Training (Provo).** This training is provided in cooperation with the League of Cities & Towns, and will be held from 8 am to 1 pm for newly elected officials in the surrounding area.

### Utah Risk Management Mutual Association

For information or to register for these and other URMMA training activities, please call Joanne Glantz at (801) 225-6692 extension 18. You can also check out their Web site at [[www.urmma.org](http://www.urmma.org)].

**January 9--Flagger Training (West Jordan).** This training is being presented by T<sup>2</sup> Center instructors. Time is 4 hours. Cost is \$28.00 per person for members and non-members.

**January 15--Training for librarians on new state law to keep children from pornography on the internet (West Valley City).** The presenter will be Paula Houston. The training will be held from 9 am to 10:30 am. There is no charge for this training.

**January 16--Roundtable discussion on sewer backups (Ogden).** The training will be held from 10 am to 11:30 am.

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# FYI: For Your Information

## 44th Annual Concrete Conference

Eccles Conference Center  
Utah State University, Logan, Utah  
March 7, 2002

Plan now to attend the 44th annual Concrete Conference on Thursday, March 7 at the Eccles Conference Center on the USU Campus. The cost is \$35 and includes lunch and materials.

Presenters are drawn from research and industry to discuss cutting-edge topics in concrete applications. This is a once-a-year chance to get up-to-date on the improvements in the concrete field.

For more information or to register, please call 1-800-538-2663 or (435) 797-0043. You can also receive registration information by e-mail at [\[reg\\_info@ext.usu.edu\]](mailto:reg_info@ext.usu.edu).

## Looking Ahead! Heavy Equipment Operation Training

Tooele, Utah  
April 1-5, 2002

Plan now to attend this important classroom and field training in heavy equipment operation. Space is limited and the course will fill up fast, so call now to reserve your space.

Section I (classroom and in-the-field work) will be held April 1-3. This section is open to all interested persons. It will cover OSHA, trenching, equipment, job site safety, basic equipment maintenance, and equipment pre-shift and post-shift (walk around) inspections.

Section 2, "techniques of equipment operation" (further intensive and one-on-one, in-the-field work), will be offered April 4-5. Registration for this section is limited and by invitation/eligibility only. This helps us to assure that all participants

get the one-on-one instruction needed to become fully proficient on the equipment. Those taking Section 2 must have successfully completed Section 1 training or have permission from the instructor to register.

The cost is still being determined, but you are welcome to call and reserve your space, or request a brochure when it is available after the new year. Call Dee or Keri at 1-800-822-8878 or (435) 797-2931. Or go to the Utah T<sup>2</sup> Web Site at [\[www.utaht2.usu.edu\]](http://www.utaht2.usu.edu).

**Updates on these and other calendar items are available at the Utah LTAP/T<sup>2</sup> Web site [\[www.utaht2.usu.edu\]](http://www.utaht2.usu.edu)**

# January 2002

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 	2	3	4	5
6	7	8	9 WZTC/MUTCD (West Jordan)	10	11	12
13 Transportation Research	14	15 Board Annual Meeting (Washington DC)	16	17	18	19
20	21 	22 Safety Training (Ogden)	23 Safety Training (Logan)	24 WZTC (St. George)	25	26
27	28 Safety Training (St. George)	29 Construction Inspection Training (SLC)	30	31 WZTC (St. George)		

Remove this section and post to keep up with training opportunities & events!

# February 2002

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5 Safety Training (Ogden)	..... SALT LAKE CITY WINTER OLYMPIC GAMES .....			
10	11	12	13	14	15	16
..... SALT LAKE CITY WINTER OLYMPIC GAMES .....						
17	18 	19	20 WZTC, Flagging, Barricading, MUTCD (Logan)	21	22	23
..... SALT LAKE CITY WINTER OLYMPIC GAMES .....						
24	25 Safety Training (Nephi)	26 Construction	Inspection Training (St. George)			

For more information about any of these activities, please call the Utah T<sup>2</sup> Center at 1-800-822-8878.

# March 2002

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6 Utah Asphalt Conference (SLC)	7 Concrete Conference (Logan)	8	9
10	11 Safety Training (Woods Cross)	12 Gravel Roads (Richfield) WZTC/MUTCD (SLC)	13 Safety Training (St. George)	14 Gravel Rds (Vernal) WZTC/MUTCD (Provo)	15	16
17	18	19 MUTCD (Price)	20	21 Concrete Conf (SLC)	22	23
Heavy Equipment Operation Section I (St. George)		Heavy Equipment Oper Section II (St. George)				
24 31	25 Safety Training (Vernal)	26 Hot Mix Asphalt	Pavement Construction (SLC)			

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There is no charge for this members-only training.

**January 29--Roundtable discussion on sewer backups (Springville).** The training will be held from 10 am to 11:30 am. There is no charge for this members-only training.

**February--Defensive Driver Training.** This training from the National Safety Council is available upon request for URMMA cities. The training will take either 2 or 4 hours depending on the course chosen by the requesting agency. The cost will be determined based on the cost for materials and snacks.

**March 12--Roundtable discussion on Parks and Recreation (South Jordan).** This training will be held from 10 am to 11:30 am. There is no charge for this members-only training.

**Land Use Seminar for Elected and Appointed Officials.** This training is available upon request for URMMA cities for a combined Friday evening/Saturday morning session. Cost to be determined.

**March 29--Roundtable discussion on the use of volunteers (Roy).** This training will be held from 10 am to 11:30 am. There is no charge for this members-only training.

### Utah Operation Lifesaver

For information on Utah Operation Lifesaver activities, please contact Bret Barney at (801) 489-8041.

### Need More Information?

For our continuously updated workshop and training calendar, please go on-line [[www.utaht2.usu.edu](http://www.utaht2.usu.edu)]. To request a workshop, please call us at 1-800-822-8878.

# Focus on the Field

## Words of Warning on Winter Maintenance

by N. Dee Hadfield, Field Projects Manager

As each of us look at the tragedy that occurred in Delta, Utah on November 29, 2001, we all ask how could this kind of thing (a snowplow hitting a school bus) have happened. What could have caused this accident? The tragedy of losing life is a soul shaking test, but the loss of a child is even more so.

To learn from what happened, we looked at the conditions leading up to the accident. As reported by the Millard County Road Superintendent, Thayne Henrie, the wind had been blowing for 24 hours before the storm started and continued to blow throughout the entire storm. These winds blow as fast as 60 mph with 6-8" of new snow. This created drifting snow and white-out conditions. These conditions make it difficult to drive, much less try to keep a road open and safe for the traveling public.

Mr. Henrie said, "Our crews had been out since 3 am, and when they went home at the end of the day, it looked like the days work had been in vain." Under these conditions, snowplow operators struggle to see the road because of the blowing snow. Obstructions (i.e. heavily-drifted or hard-packed snow, ice, frozen piles of snow or dirt, manhole covers, water valves, or any other objects that may be frozen down to the pavement) lie unseen under the cover of snow and can send the operator and the snowplow (truck, motor grader, loader, backhoe) in the opposite direction of the angle of the plow.

This sideways movement happens because of the weight and momentum needed to break through the snowdrift; and it all happens in a heartbeat. Such conditions leave the snowplow operators with no time to react. Circumstances like these and other factors such as equipment problems, motorists on the roadway, wildlife, and black ice put these operators on the

edge of their seats for their complete shift.

Every manager or supervisor should ask:

1. *Have I prepared our people to be out working under these conditions (emergency equipment, flares, coats, gloves, food)?*
2. *Have the operators had an opportunity to go over their plow area (new roads, changes in roads, changes in ditching and roadway shoulders, new curb and gutter, and improvement in utilities)?*
3. *Have the operators reviewed your snow removal plan or policy (so responsibility and routing are well defined for each)?*
4. *Do the snowplow operators have a way to communicate with others (radio, cell phone)?*
5. *Is the equipment ready for this challenge (pre-season inspection and operational function checked well in advance)?*
6. *Is the equipment the best equipment for this application that you can fund at this time?*
7. *Have you, as a manager, set policies to allow the operator to take breaks or other mid-shift time away from the stress?*
8. *Have considerations been made in policies to help with the reduction of stress?*

Then there are the hand gestures and complaints from the people you try to serve. The majority of the public thinks that these operators only go by and push snow into their driveway or sidewalk! Has the public ever stopped to think what

(continued on next page)



would happen if these snow plow operators did not do this necessary job? Would emergency service vehicles be able to get to their homes, car accidents, schools, or businesses to save the lives of the people they serve? Would they be able to put the fires out that may destroy the property that people have worked so hard to build over their lifetimes?

**To help educate the public about these issues, public works managers should make sure that the snow removal plan been made available to the public; the public knows your snow removal routes; the public understands why these routes are set up the way they are; and that the public understands what the snowplow operator goes through to do this job.**

So what are you going to tell the public? Can you effectively answer the question, "Why do the snowplow operators plow snow the way they do?"

The snowplow operators try to move the snow off the roadway and onto the shoulder or planter strip past the drainage ditches. These shoulders and planter strips are part of the road right of way and are designed to be used for the utilities for each of our homes and for other needs of the municipality such as storage of snow during the winter, solid waste pickups, traffic control signs, and public transportation. By plowing snow in this way it keeps the snow or water from refreezing on the road surface (as plowing to the center of the roadway would do), and it keeps the waterways open for drainage during the worst times of the year to prevent water damage to someone's home or business.

**Are we doing our part to make sure the public understands what the goals of snow removal are?** (This will make it easier to understand why the snow is deposited where it is). To do this you can make sure that the information in the snow removal plan has been advertised in the newspaper, on the radio, or on TV. You can also include material with your utility billing or on a handout available at your

city offices or local library for the public to read.

How can we as citizens of our city, state, and country help with this problem? Thirty four years experience in working with the Public Works Dept of the City of Logan has taught me that local citizens can do many small things to help these public servants who are trying to make it safe for you and your families.

It is our responsibility to let the traveling public know what they can do! For example, the traveling public can give the right of way to the snowplow or move over and give them just a little more room to make it easier for the snowplow operator to cover their area. Another way the public can alleviate the problem is to stop pushing back snow onto the roadway. This snow can pack or freeze down to the pavement surface and can cause the same conditions that existed when the snowplow hit the school bus in the Delta area on November 29, 2001.

This was also the cause of an accident in Logan about 15 years ago; a resident pushed the snow from their driveway back into the street and it packed down and caught the snowplows cutting edge and sent it across the road into the side of a new pickup. This condition also creates a raised hump, bump, and slick hazard for the traveling public that could interfere with the control of the vehicle they are driving.

**We need to make sure that the public knows where to pile the snow. This should include an explanation of why these locations are better than others.**

We need the public to stop and think about the critical service that is provided with snow removal. It's our job, as those who serve the traveling public, to make sure we and they understand our part. With help from the entire community, the roadways will be safer, and we can avoid any further tragedies.

For any question or more information on including the public in making winter maintenance a success, call Dee at 1-800-822-8878.

*Portions of this article could be suitable for reprint in community newsletters to help educate the public about their role in winter maintenance and safety. To request permission to reprint, just call our office at 1-800-822-8878.*

## Snow Removal Driveway Problems: A Possible Solution



The picture above shows a snow restrictor, made by Root Spring Manufacturing, currently in use by the City of Vernal. They are installed on their truck snowplows, graders, and loaders. The restrictor is engaged when plows encounter a driveway and disengaged when the driveway area is finished being plowed. This helps keep snow from piling up in the driveways.

This is most effective to use in smaller communities where the number of streets and driveways is limited and providing this service does not significantly increase the time needed to keep the streets cleared.

Glade Allred reported that the Vernal Street Department had a significant reduction in the number of complaints received from their citizens about snow removal by providing this service.

# Utah Asphalt Conference Returns to Salt Lake City

## March 6, 2002

Be sure to mark your calendars now for the 27th annual Utah Asphalt Conference, March 6, 2002. A change this year is the new one-day format. We anticipate that this will make the conference more convenient for participants.

**The cost to register is \$75 per person before February 15th and \$90 if received after February 15th.**

The conference will be broken into general and breakout sessions. General session topics include: meeting road user expectations and needs; triple AAA; what's new with the national truck association; and an update from our local roads representative.

For the construction and maintenance session, participants can expect to learn more about the I-15 rubblization project; paving under traffic; QC/QA of hot mix

asphalt construction and preventative maintenance treatments.

For the design and materials breakout sessions, participants will learn more about thinking outside the box -warranties, statewide contracts and privatization; pavement ride criteria; long-life pavements; and the timing of preservation treatments and life cycle costs.

In addition, making the best use of recycled asphalt pavements; dealing with utility cuts; pavement design and materials selection; and pavement preservation for local roads and airport runways will be covered in the local roads breakout sessions.

Speakers for the conference will come from state DOTs, FHWA and industry. The conference will be an excellent opportunity for participants to meet with

experts in the field of asphalt pavements, and to share their own experience with their colleagues.

Vendors sponsorship are available. For more information, or to register, please contact Keri Shoemaker at the Utah T<sup>2</sup> Center by calling 1-800-822-8878. You can also complete the registration form (on this page) and fax it to Keri at (435) 797-1582.

The conference will be held at the Hilton Salt Lake City Center (255 South West Temple, Salt Lake City). A block of rooms is being held until February 7th for conference participants. Just call 1-800-HILTONS and mention you're with the Utah Asphalt Conference to get the special conference room rate.

More information about this conference will be on-line at our website: [\[www.utaht2.usu.edu\]](http://www.utaht2.usu.edu).

### REGISTRATION FORM

#### 27th Annual Utah Asphalt Conference

#### March 6, 2002, Hilton Salt Lake City Center, Salt Lake City, Utah

Name(s): \_\_\_\_\_

Title(s): \_\_\_\_\_

Agency: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

E-mail(s): \_\_\_\_\_

Payment (please check one):  Purchase Order (# \_\_\_\_\_ )

Check Enclosed

*Please make purchase order/check payable to the Utah Technology Transfer Center.  
Please include information about additional registrants from your agency on the back.*

Utah Technology Transfer Center

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# Focus on Engineering & New Technology

## Street Sweepers and PM10

by G. Stuart Thompson, Field Engineer

PM10 is one of the seven air pollutants the Environmental Protection Agency (EPA) regulates under the National Ambient Air Quality Standards (NAAQS). Concentrations of PM10 are expressed in the weight of particulate matter found in a cubic meter of air. The current EPA standard for PM10 is actually composed of both an acute (24 hour allowable average) and chronic component (annual allowable average):

- A 24-hour average not to exceed 150 micrograms per cubic meter of air (ug/m<sup>3</sup>) more than three times in three years.
- An annual arithmetic average not to exceed 50 ug/m<sup>3</sup>.

PM10 is defined as particulate matter (PM) with a mass median aerodynamic diameter less than 10 micrometers (um)- PM10. In other words, these are the (smaller) particles that make it through some type of pre-separator (removes large particles) and are collected on a sampling medium (filter). PM10 is therefore particulate matter, which (1) is very small, (2) remains suspended in the air for periods of time, and (3) is easily inhaled deep into our lungs. Increased death (mortality) and disease (morbidity) have been linked to periods of high outdoor PM10 concentrations.

The more effective the sweeper is in removing dust, the less there is for cars to kick up into the atmosphere. The newest types of sweepers are achieving incredible efficiency in removing particulates before they can pollute the air and water. It is imperative to begin using new technology because the older machines have been found to actually create more PM10 with the dust they stir up than they actually prevent.

Currently, there are four different categories of sweepers on the market.

These are mechanical broom sweepers, vacuums, regenerative air machines, and dry vacuum technology. Each kind of sweeper has some advantages over another, but some disadvantages as well.

Mechanical Broom Sweepers are the traditional sweepers. These machines have been around since the 1960's and the technology is still quite similar. Ninety (90) percent of all sweepers still used in the U.S. are mechanical broom sweepers.

The system is fairly simple--the sweeper sprays water down in front of it to create a veil of water to contain the dust. Then the brooms sweep up the material. This process however has been found to create a large amount of dust. In some studies, mechanical sweepers were found to leave behind 5% more dust than was there before they started. They are more effective at picking up large debris than any other machine, but are virtually ineffective at removing particles 60 microns and smaller.

Vacuum sweepers are very much like a traditional household vacuum. The equipment powers a fan, which creates suction. Most vacuum sweepers use a broom to sweep debris to the vacuum head. Vacuum sweepers exhaust high levels of particulates into the atmosphere on a continual basis. Vacuums are effective in cleaning near the curb line, but are much less effective in cleaning an entire roadway.

While the vacuum system does create less dust than a mechanical sweeper, the exhaust of particulates is a huge downside to this type of system. There is a wide range of efficiencies for vacuum sweepers, but they are significantly better at collection of material and reduction of

particulates than are mechanical sweepers.

Regenerative air sweepers are much more environmentally friendly than mechanical or vacuum. They operate basically as a closed loop. There is a sweeping head that creates a seal with the pavement, just like with a vacuum machine. The difference is that instead of shooting the air right out as exhaust, regenerative air machines re-circulate that air supply internally. They are also able to pick up larger materials by utilizing larger intake tubes. The system works by blasting air at an incredibly high pressure onto the ground and then on the other side of the suction head, sucking it back up with an equally high pressure and force. Regenerative air machines are generally considered to be the best all-around machine available.

There are two types of Dry Vacuum Machines--the Envirowhirl made by Schwarze and the Tennant 830. The Schwarze machine uses the patented envirowhirl technology in its EV-I and EV-II machines. The largest difference between the Schwarze and the regenerative air machines is that its self-cleaning filtration system filters dust down to 2.5 microns. This means that the machine is picking up nearly all PM10, as is PM2.5. The Schwarze system requires no water in any operating mode--making it usable under any weather conditions. Studies have shown it to be the most thorough in removing PM10 of all sweepers.

Our thanks to Lynn Molding for questioning the impact of street sweeping on PM10 contents. Also, thanks to Justin Segall of the Colorado Department of Environmental Health; Ross, Ranger Kidwell; American Sweeper Magazine, An overview of Sweeping Equipment Technology, 2001; and the Rocky Mountain Center of Utah for information found in this article.

# Concrete Pavement Conference Being Held in Salt Lake City, March 21, 2002

Plan now to attend the 1st Annual Concrete Pavement Conference at the Grand America Hotel on March 21, 2002. This conference, sponsored by the Utah Chapter of the American Concrete Paving Association (ACPA), will feature speakers from industry and the public sector who work with all levels of concrete pavement applications. Some of the topics to be included are texturing vs. tining, smoothness, maturity meter, concrete pavement rehabilitation, and many others!

The cost to register for this must-attend, one-day conference is \$65 which includes lunch and all handouts. Registration must be received by March 15 to qualify for the early registration rate. Rooms are available at the Little America and Grand America Hotels for those who need them. If you are interested in the room block, please call the Little America Hotel directly at 1-800-453-9450. Be sure to ask for the American Concrete Paving Association room rate.

If you would like more information on this conference, please contact Mitzi McIntire with the Utah Chapter of ACPA by calling 1-866-647-5935.

## Happy New Year from the Utah Technology Transfer Center!



We look forward to serving you in the coming year, and wish you and yours happiness in the coming year!

Doyt Y. Bolling, P.E., Director  
Keri Shoemaker, Program Coordinator  
N. Dee Hadfield, Field Projects Manager  
G. Stuart Thompson, Field Engineer  
Brian Birch, Network Administrator

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