



Road Business

Vol. 18 No. 1

Spring 2003

A University of New Hampshire Technology Transfer Center Publication



4H students stencil catch basins as part of the production of the video.

On the Road in New Hampshire

Seacoast Coalition Makes a Video

Wondering, how municipalities will inform the public about water run-off problems? The Seacoast Coalition might have an answer. The coalition is a group of seacoast public works professions that addressed this problem before anyone heard of the EPA's NHPDES Phase II. They have created an informational video about stormwater for the public. The City of Rochester and Weston and Sampson wrote a grant proposal to the Department of Environmental Services requesting 319 funds to this informational stormwater runoff video. Melodie Esterberg, Public Works Director, Rochester, was the project manager for the video.

At the beginning of the project, Rochester contacted other seacoast communities asking them to join in the process of creating the video. At first, Durham, Somersworth and Portsmouth

joined initially later Dover, Exeter and UNH became part of the Coalition.

With the cooperation of neighboring communities, the next question was who could produce the video. Peter Goodwin from Weston and Sampson, studied the option. UNH did the production that began in the spring of 2002 and ended in January 2003.

The coalition was quite happy with the results of this 30-minute video narrated by Gordon Carlisle, a local actor. The video had to be ½ hour long to fit into a segment of public access television. The grant stipulates that it be shown seven times a week for 12 weeks.

The video, made with children in mind, as the coalition members thought if they could teach the children about the stormwater system, they would teach their parents. Children are in the video spray painting catch basins.

The Coalition does not have a new project planned; they want to continue working together. The UNH T² Center has copies of the video to borrow or purchase.

<http://www.des.state.nh.us/stormwater/video/video.htm>

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Road Business is a quarterly publication of the

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The Technology Transfer Center at the University of New Hampshire (UNH) is supported by the Federal Highway Administration (FHWA), the New Hampshire Department of Transportation (NHDOT), and UNH. Any opinions, findings, conclusions, or recommendations presented in this newsletter are those of the authors and do not necessarily reflect the views of the FHWA, NHDOT, or UNH.

Any product mentioned in *Road Business* is for information only and should not be considered a product endorsement.



Virus Update: File Attachment Rules

by Martin England,

UNH Computing & Information Services

E-mail file attachments frequently carry dangerous virus, variant, and Trojan horse payloads. They are a leading cause of computer virus infections. E-mail recipients should apply the following practices when receiving e-mail fitted with attachments:

1. Setup Windows to show file extensions. (For Windows XP, follow this path: Control Panel>Performance and Maintenance>File Types. Click on the 'View' tab. Uncheck 'Hide Extensions For Known File Types' box. Visit www.Microsoft.com for information on how to show file extensions on other Windows environments).
2. Never open any attachment you are not completely familiar with. Always contact the sender to ensure they (a) sent the attachment and (b) checked the file for viruses before sending it.
3. Once confirmed with the sender, save the file to disk. Scan the file for viruses before opening.
4. Never double-click on an attachment with a two-name file extension, for example Harold.jpeg.pif or Maude.doc.scr. Important: Windows-based machines not set up to view file extensions will not show the second extension. The second extension controls which program opens the attachment; in the previous examples, the doc.scr file is handled the same way as a .scr file, and jpg.pif runs as a .pif file. Both of these extensions are known to contain dangerous payloads.
5. Files with three file extensions are just as dangerous. Clients using Microsoft Outlook Express should be wary: the program uses the last file extension name to determine the appropriate icon, but the second file extension rule still applies. Beware of three-name extension files.

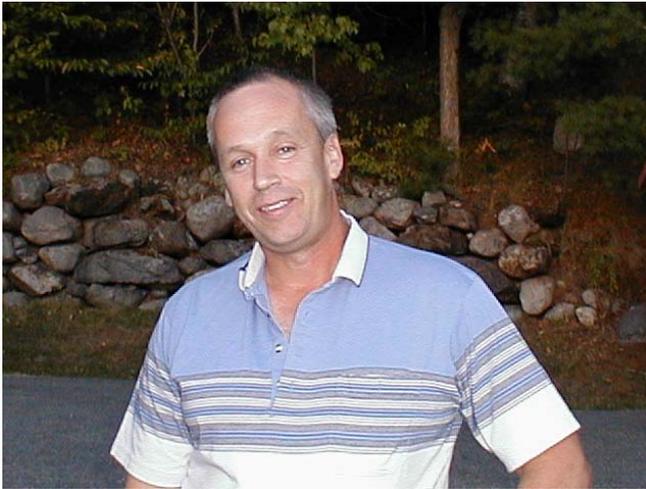
Prevention

UNH CIS recommends adhering to the following practices in order to safeguard machines from virus attacks:

1. Install and update virus protection on all desktop and laptop machines. UNH recommends McAfee VirusScan for their faculty, staff, and students.
2. Update Microsoft Security Patches on a regular basis. To check for the latest updates (Windows 98 or higher only), type windowsupdate.mircosoft.com into the Address (IE) or location (Netscape) browser bar and follow instructions.
3. MS IE 6.0 clients only: Download and install the latest VirusScan Service Pack 1. Check with local IT support groups if uncertainty exists on how to download and install this file.

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Master Road Scholars



Master Road Scholar Mark Bucklin

Mark Bucklin has been the Town of Bristol Highway Supervisor for the past ten years. Before working for Bristol he worked for ten years in private construction and in the Army Corp of Engineers for seven

Mark takes classes to keep up to date with all the new information and technology generated in the transportation field. He likes to bring information from the workshops back to Bristol. Mark is always looking for a better way to do things. He also enjoys meeting people from other towns.

His supervisors are glad that he has worked hard to reach the Master Road Scholar level.

Mark and his wife, Linda, have been married for 21 years. They have two children. Mark likes to hunt and he especially enjoys working on his house and garden. He grows several varieties of apples.

Congratulations to Master Road Scholar Mark Bucklin!



Master Road Scholar Mike Hillhouse

Mike Hillhouse is the Utility Superintendent with the Goffstown Department of Public Works, where he has worked since 1991. Prior to this, he worked with Maine Drilling and Blasting.

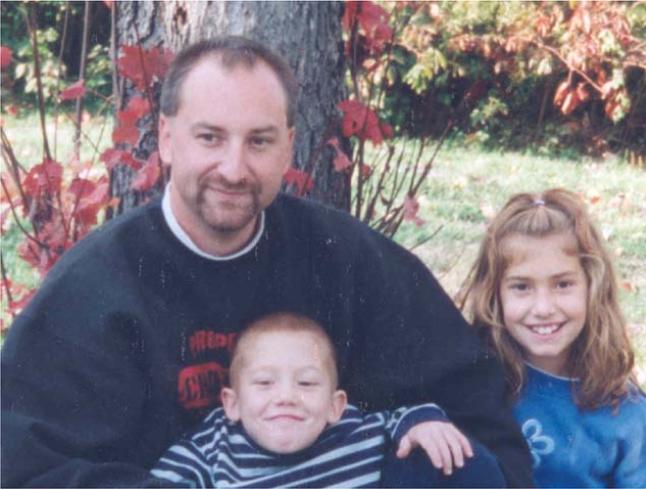
Mike believes it is beneficial to stay on the leading edge of technology, which is the motivation behind his obtaining the Master Roads Scholar level. He says he is always looking for better ways to do what the public works department does. He said he has learned a lot from the workshops both directly and indirectly. Recently, Goffstown obtained a \$15,000 grant to correct an ongoing flooding problem. He learned about the grant through colleagues in the workshops.

Mike says that the Public Works Director and the Selectmen have been supportive and are pro-education and training.

Mike and Susan have been married 19 year and have an eleven-year-old daughter, Kayla. As a family, they enjoy traveling. They are also involved with the Garden Railroad Society and are in the process of building an outdoor garden railroad in their yard



More Master Road Scholars



Master Road Scholar Greg Hatfield

Greg Hatfield is the Superintendent of the Public Works Department in Whitefield. Greg has been at this position for five years. He's been with Whitefield for 11 years previously he was an equipment operator and highway foreman. He worked for the State of NH's Bureau of Off-Highway Vehicles a division of DRED doing trail maintenance and building bridges.

Greg takes classes to benefit the town and himself. Classes allow him to stay current by keeping up with the latest and newest ideas. They allow him to expand his knowledge of older information, too. He feels that, just when you think you don't have anything else to learn, there's always some new, valuable information to be found.

Greg's supervisors are very pleased with his achievement of Master Road Scholar status. He likes to send his crew to classes as well, and feels that the Technology Transfer Center is a valuable asset to all towns.

Greg has two children, a son and a daughter. He enjoys hunting, fishing and four wheeling with his kids.

Congratulations to Master Road Scholar Greg Hatfield!

Culvert Maintenance

Poorly working culverts can cause flooding that significantly damages roads and bridges.

A crushed or plugged culvert allows water to back up in roadside ditches, even during normal wet weather. This contributes to road deterioration because standing water prevents drainage from the road base and subgrade.

Municipalities should inspect culverts at least once a year. They should prioritize the needed repair and maintenance, and schedule it through the spring, summer, and fall.

A guide to culvert repair is included below, and a general maintenance schedule is outlined in the sidebar.

Summer

- Remove blockages.
- Clean and flush the length of the pipe.
- Repair, improve or install head walls, pipe ends, and splash pads.
- Trim and remove brush at pipe ends and mow grass and weeds
- Cut and remove trees and limbs that threaten to fall and block upstream ditches.
- Establish vegetation on bare slopes at pipe ends.
- Add fill to cover pipe more thoroughly.

Fall

- Remove blockages.

Spring

- Inspect inside as well as both ends of the pipe.
- Remove blockages (trash, brush, etc.).
- Mark head walls or pipe ends for snowplow operators.

*Source:
Nevada Milepost, Vol. 12, No. 1 Spring 2002, page 7*

Guide to Culvert Repair

<i>CULVERT ENDS</i>		
<i>What you observe</i>	<i>What may be the reason</i>	<i>How to fix it</i>
Scouring or erosion at the inlet	Ditch is too steeply graded. Pipe is poorly located or aligned. No headwalls. Pipe is clogged.	Line the inlet with stone. Realign the pipe. Install headwalls. Clean and flush the pipe.
Scouring or erosion at the outlet	Pipe is sloped too much. No endwalls or aprons. Outlet velocity is too high.	Build a stone splash pad. Install endwalls or aprons. Check design and replace pipe.
“Ponded” water	Inlet is too high. Ditch grade is too flat.	Match the inlet to the channel bottom. Reset the pipe and/or raise the channel. Regrade the ditch to maintain correct flow.
Dented or crushed ends	Vehicles or snowplows are hitting the ends.	Fix, mark, and protect the pipe ends.
Heavy corrosion	Water flowing through the pipe is acidic.	Install a sleeve of PVC in the pipe, or replace with a PVC or concrete pipe.
“Piping” around outlet	Pipe is incorrectly installed, causing water to flow along the outside surface of pipe.	Reinstall the pipe on suitable, properly compacted bedding. Install a headwall or entrance device.
<i>INSIDE CULVERTS</i>		
Sediment buildup	Pipe carrying sediment inefficiently. Objects blocking the pipe to the culvert.	Determine sediment source and install erosion prevention measure to reduce sediment. Redesign and install pipe to carry sediments through it. Debris is traveling from the ditch. Remove the blockage. Install check dams upstream of the culvert.
Sagging bottom	Foundation material has settled or has low bearing capacity.	Reinstall the pipe on suitable, properly compacted bedding.
Crushed top	Cover is inadequate. Soil around pipe isn't compacted sufficiently and/or traffic load is too great.	Do one or more of the following: Add cover. Reinstall the pipe more deeply, and use suitable, properly compacted bedding and backfill. Install multiple small pipes or a pipe with a different shape. Replace pipe with a stronger one.
Heavy corrosion	Water flowing through the pipe is acidic.	Install a sleeve of PVC in the pipe, or replace with a PVC or concrete pipe.

Source:

Nevada Milepost, Vol. 12, No. 1 Spring 2002, page 7



Pulverized Glass Aggregate

by Beth Terney, Project Assistant



Pulverized recycled glass after processing ready to be used in roadway projects.

Pulverized Glass Aggregate (PGA) is an environmentally conscious method to recycle glass. This article will outline approaches for the manufacture and use of PGA.

What is PGA?

PGA is crushed post-consumer glass used in New Hampshire since the late 1980's. To create PGA, recycled glass is ground, in a homemade or a commercially available crusher. Particles are usually less than a half inch in diameter. Screening is necessary to remove contaminants, and often to sort by particle size.

Factors for Increased Use

The recycling market is flooded with unwanted glass. Recent market specifications and regulations result in glass being rejected, and then land-filled or stockpiled. Municipalities can process PGA for all rejected glass. Anything can be recycled, from broken bottles to a sink or bath tub, depending upon the strength of the crusher.

Uses for PGA

PGA is safe, easy to use, and inexpensive building material. Many applications for PGA make glass collection worthwhile. Cities and towns can use it alone or with aggregate. Place PGA at sites that will not be disturbed later. Its three main uses are:

1. As fill

2. As a base aggregate substitute, or supplement
3. In drainage projects.

Fill

The most common applications are as sand or gravel, such as fill around water and sewer pipes, electric conduits, and fiber optic lines and as utility trench bedding. It works as fill around culverts if headwalls prevent flow through the PGA.

Base Aggregate Substitute or Supplement

Many agencies use PGA as a substitute for gravel, sand, and crushed stone in a number of roadway applications. Like all aggregates, compaction is essential. In roadway applications, PGA should make up less than 10% of the mix. Used as a sub-base, such mixes effectively supports the base and road surface. PGA works well in embankments between the existing ground and the sub-grade. PGA should not be used in surface applications or as glassphalt, because increases stopping distance and has the potential for striping.

Experience has shown that PGA in roadways retains its shape for years. In New York, PGA has been applied to public works projects for years. It is financially beneficial where gravel is expensive and glass is recycled free. It can reduce maintenance costs especially when used as fill.

Drainage Applications

PGA used for drainage often works better than sand and gravel. Examples include: drainage fill behind retaining walls, in foundation drains, draining blankets, and in French drains.

PGA is more permeable than sand making it ideal for use in drainage projects. PGA compacts more easily than sand over a wider range of moisture conditions. PGA holds a



grade and doesn't heave. It is dense, absorbs no water (unlike sand and gravel), and is relatively inert.

Other uses for PGA are as decorative gravel in landscaping and in septic systems and sewer connections.

Application in New London

Richard Lee Director of Public Works in New London has used PGA for many years. His crew built a crusher to grind glass. They use PGA straight or mixed 50/50 with gravel. Then they use it in place of gravel and sand in various projects. New London has found that PGA works well under sidewalks, as backfill, and in road reconstruction as a base material. They have found no drawbacks to PGA use, and continue to find new approaches for it.

Other Pros to PGA Use

Not only are there many uses for PGA, but there are many benefits to using glass to make PGA. PGA allows for the removal of up to 50% more material from the waste stream because it puts discarded material to new uses. This helps to decrease air and water pollution by replacing resources (e.g. sand) that require excavation and by decreasing land filling (which also extends the life of landfills). It will not biodegrade nor corrode, so will not leach contaminants into ground or surface water. It can, therefore be stored or stockpiled indefinitely.

Processing glass does drive up costs; however the economic benefit of this technique comes from avoiding disposal, landfill, and transportation costs. PGA use saves on the cost of glass shipping, storage, and road construction.

Using PGA decreases recycling costs. There is less labor required in collection because the colors don't need to be separated and collection is safer because workers handle broken glass less.

PGA provides many benefits to its users. It can be used in many applications and has often been found to work better than the material it is replacing. It also provides a significant economic, as well as environmental, benefit. It is a free method to divert waste products from ending up in a landfill to being a useful building material.

There is NHDOT specification, call the UNH T² Center for a copy or look on-line <http://webster.state.nh.us/dot/specifications/2002/pdf/supplementals/304%20suppl.pdf>

Sources

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Evaluation of Recycled Glass/Ceramic Product as an Aggregate Substitute for MDOT Project. Final Report, University of Maine, April 1994.

Processed Glass Aggregate: An Alternative Reuse for Post-Consumer Glass. NRRRA Educational Bulletin, 2002.

The Andela Pulverizer, Andela Products, Ltd: www.recycle.net/andela.

Northeast Resource Recovery Association: www.recyclewithus.com.

Kirby, Bob. *Construction Aggregate from Scrap Glass*. Resource Recycling, May 1998, pp 48-49.

8th Annual Eastern Winter Road Maintenance Expo



Save the Date; September 3-4, 2003

The 8th Annual Eastern Winter Road Maintenance Expo is sponsored by the Federal Highway Administration (FHWA). This year the NHDOT is a co-sponsor and the UNH T² Center is involved with the training component. There will be 3 training tracks: environmental, safety and technical.

The event will be held at the Center of New Hampshire in Manchester, and features the latest in winter maintenance equipment, materials, technologies and strategies. The expo is held in a different state each year. In 2001, it was held in Worcester MA.

There is no registration fee for attendee. In late spring FHWA will mail a flyer to people on the UNH T² Center mailing list. It will ask participants to pre-register. See the website at www.easternsnowexpo.org and see you there!

Road Business Four Year Index

Call the UNH T²Center for Articles You Can't Find or Look up on the Web

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Safety. Working Safely Around Electricity, 1999, #1. Anti-Lock Braking Systems, 1999, #3. Pruning Trees, 1999, #4. Bloodborne Pathogens, 2000, #1. Edgeline Marking, 2000, #1. Storm Water Phase 2, 2000, #3. 2001, #1. RSA 265:3 Obedience to Flagpersons, 2001, #2. Traffic Calming, 2001, #2. How Potholes Form, 2001, #2. Signs at Pedestrian Crosswalks, 2001, #3. Pros and Cons of Sand on Ice and Snowpack, 2001, #3. Snow Disposal, 2001, #3. Installing the Correct Traffic Sign, 2001, #4. Traffic Signs to Restrict Trucks, 2001, #4. Public Works Mutual Aid, 2001, #4. Rumble Strips in Workzones, 2002, #1. Stop Sign & Supplemental Devices, 2002, #2. Setting and Posting Speed Limits, 2002, #3. Chainsaw Safety, 2002, #3. Crosswalk Placement, 2002, #3. Testing Winter Operations, 2002, #4.

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Publications

University of New Hampshire Technology Transfer Center

Copies of the following books and pamphlets, and our complete list of publications, are available through the UNH T² Center. The website has the most up-to-date list of publications. When requesting an item with a charge, please include the check with your form. If ordering by mail, follow the instructions below. To request by telephone, call 603-862-2826, or in NH, 800-423-0060. You can also request by fax to 603-862-2364, online at www.t2.unh.edu, or by e-mail to t2.center@unh.edu

The following materials are available free of charge.

_____ *Curb Cuts Information.* State of New Hampshire document from March 1997 about the regulations of driveways and other public access ways.

_____ *Flexibility in Highway Design.* A guide written for highway engineers and project managers who want to learn more about the flexibility available to them when designed roads. It illustrates successful approaches used in other highway projects.

_____ *Flowable Fill Packet.* This packet discusses different types of fills, covering specifications, materials, and construction recommendations.

_____ *Gravel Roads Maintenance and Design Manual*
This comprehensive manual was developed by the South Dakota LTAP Center.

_____ *Highway/Utility Guide.* A June 1993 publication, written by the Federal Highway Administration, that includes guidance on the better practices employed to address the issues that can rise from highway and utility facilities sharing common rights-of-way. This publication is useful for utility and highway professionals, educators, and government managers.

_____ *Maintenance of Small Traffic Signs.* A guide for maintaining small traffic signs geared toward maintenance personnel.

_____ *Problems Associated With Gravel Roads.* This handbook looks at the overall environment of gravel roads and the materials that are used to surface them. It also discusses common defects in the surface of these roads, their causes, prevention, and correction.

_____ *Measuring and Calculating Slopes.* Information on how to measure a roadway slope. Recommended guidelines for roadway slopes are also included.

_____ *Vegetation Control for Safety.* A guide for street and highway maintenance personnel that goes through site clearance and safety operations for vegetation control.

_____ *Work Zone Traffic Control Guide for New Hampshire Municipalities.* A flipbook designed for quick reference for municipalities all over, in addition to NH. Helpful charts, illustrations, and diagrams are included in the information about traffic control devices, parts of a work zone, flagger tips, and much more. One per customer.

To Request Material by Mail

Check the items you would like to receive. Fill out this form and include a check in the envelope, if necessary. Cut out this page and mail to the UNH T² Center.

Name: _____

Position: _____

Organization: _____

Address: _____

Town: _____ State: _____

Zip: _____

Videos

*University of New Hampshire Technology Transfer Center
Road Business, Spring 2003, Vol. 18, No.1*

The following videos are available from the UNH T² Center Video Library. You can have five videos for a two-week period with no charge. To request by mail, check the videos you would like to borrow (up to 5), fill out the mail request form, staple closed, affix stamp, and mail. To request by telephone, call (603) 862-2826 or in NH, (800) 423-0060. Visit our complete publication and video catalog on our website at <http://www.t2.unh.edu> or email us at t2.center@unh.edu

_____ **DC-214, Asphalt Pavement Applications**, 30 min. Shows application of various seals such as fog seals, sand seals, slurry seals, chip seals, penetrating prime, and other surface applications.

_____ **DC-225, Traffic Barriers**, 46 min. An overview of traffic barriers, how they work, why they're used, what factors cause them to fail, and installation of different systems: the cable barrier, the box beam barrier, W-beamwood and steel signpost, concrete barrier, and traffic barrier terminals.

_____ **DC-240, Modern Timber Bridges: A New Return for Old New England**, 15 min. Utilization of timber instead of concrete and steel to reduce maintenance costs.

_____ **DC-252, Roadway Design: Balancing Safety, Environment, and Cost**, 13 min. Emphasizes the importance of considering safety, environment, and cost when designing a road. It also explains how engineers must cooperate with the public in coming to a mutual agreement when constructing a roadway.

_____ **M-202, Upgrading Gravel Roads**, 20 min. Discusses how gravel and asphalt roads can be recycled using low-cost alternatives.

_____ **M-215, Guidelines for Spring Highway Use Restrictions**, 26 min. Shows where, how, and when to post limits on roads in the spring. Discusses criteria for placing and removing restrictions, where to apply them, how much to restrict loads, and when to apply and remove restrictions.

_____ **M-225, Crack Repair in Asphalt Concrete Pavement**, 12 min. Shows good procedures for crack sealing in asphalt pavement. It's particularly applicable to an area with extensive cracking severe enough to require work beyond normal crack sealing.

_____ **M-292, Low Volume Roads Series**, 20 min. Explains how to set maintenance priorities for low volume roads and managing their maintenance.

_____ Video Catalog.

Place
Stamp
Here

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Milestones:

Earle (Chip) Chesley, formerly the Director of Public Works in Merrimack, is now the Operations Manger in Concord.

Dave Duquette, is the new Director of Public Works in Charlestown.

Lee Murray, Road Agent in New Boston and former President of the New Hampshire Road Agents Association, has retired.

Nate Hadaway, of Bow, and his wife Melinda had a baby girl: Grace Katherine born February 2, 2003.

Stratham has joined Mutual Aid for Public Works.

Websites:

UNH T² Center: <http://www.t2.unh.edu>

8th Annual Eastern Winter Road Maintenance Symposium and Equipment Expo
<http://www.easternsnowexpo.org/>

Digsafe, submit requests to dig on-line
<http://www.digsafe.com/>

Manual of Uniform Traffic Control Devices (MUTCD)
<http://mutcd.fhwa.dot.gov/>

PW.NET

Want to know what is happening in other towns? Learn the very latest in regulations? Need a place to ask questions of other public works officials? Want to be the first to receive notifications of UNH T2 Center workshops? Then, subscribe to PW.NET. It's free. Send an email message to: kathy.desroches@unh.edu

In the body of the message type:
Add pw.net your name

For instance:

Add pw.net John Doe



**OK, Show of hands...
Who's tired of snow?**

continued from page 2

4. Do not open any e-mail attachments from unknown sources. The majority of viruses spread through the use of attachments, and play upon people's vulnerability of familiarity. If you are not certain whether an attached file is free of malicious content, do not open it, and contact the sender by phone to ask whether the sender is certain it is a clean file.
5. Clients using HTML formatted e-mail should turn off the Preview Pane, located under the MS Outlook View menu.
6. Backup important files onto external sources, such as zip drives, CD-RW, CD-R, floppy diskettes, and other computers.

For more information on viruses, virus software and protection, please visit www.virus.unh.edu.

Source:

England, Martin, *Signals*, Computing and Information Services Vol 2, no 5
pages 1 & 7 <http://www.unh.edu/signals/>
Woody's Office Watch www.woodyswatch.com

Road Business

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Calendar

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28	29	30—MUTCD, Lincoln	1	2
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12	13—Workzone Traffic Control, Lincoln	14	15 Drainage, Drainage, Drainage, Portsmouth	16
19	20	21	22	23
26	27	28	29—Mountain of Demos, Gilford	30
June				
2	3—Erosion Control, New London	4	5—Erosion Control, Lincoln	6
9	10—NHPWMEA Annual Meeting, Concord	11	12	13

Save the date: September 3-4, 2003 8th Annual Eastern Winter Road Maintenance Expo, in Manchester