pipe and easily assembled. The building was erected on a level surface covered with a geotextile fabric, a foot of bank run gravel, 4 inches of crushed grave, and a paved 50' x 120' area to a depth of 3 inches.

A crew then built a six-foot high wall on three sides with 120 2'x 2' x 6' concrete blocks. They backfilled the end wall to a depth of 5' so the wall would not be pushed out during salt loading operations.

They assembled the frame and trusses using a crane and scissors lift. They anchored the bottom rails to the concrete blocks with hilti bolts. Then the membrane cover was installed using a bucket truck and laced into place.

The building is large enough for salt trailers to dump inside the building. The costs were $21,160, which included the building and all other construction costs, except labor.

For more information on the salt shed, contact David Quint at Dover Community Services, 743-6070.


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On the Road in New Hampshire

Another Approach to Salt Storage

The City of Dover needed a new salt storage facility. With plans to relocate the highway facility within a few years, it didn’t make sense to spend a lot of money to construct a permanent building. Instead, they purchased a prefabricated and custom ordered-relocatable structure. The building could be resold if the city desires.

Prefabricated shelters have been used throughout the world in harsh climates for over twenty-five years. They can have a long life with fairly low maintenance costs.

The main components are an engineered steel frame and PVC coated polyester fabric cover. The cover is tensioned over the frame and sealed to the foundation to provide a tight fitting shell. All welded joints are hot dipped galvanized after fabrication.

The five-person highway crew constructed the building in a week. The building is manufactured in Sanford Maine. The frame is built of galvanized steel and covered with a 9 oz. coated polyester fabric. The end walls were constructed of 2'x 2'x 6' concrete blocks, and backfilled to a depth of 5'.

Also in this issue
Master Road Scholar

Michael Smith has been the Director of Public Works in Milton for the past seven years. Previously, he worked with private contractors as an equipment operator.

Mike takes many classes because he believes “a person should not place limitations on themselves. Someone in public works needs to keep up with market changes and material usage.” Also, “it’s important to keep aware of the legal issues such as liability issues which a department must deal with on a regular basis.”

The Selectmen are supportive of Mike’s achievements. They like town employees to take education seriously. Mike believes that education is an investment and sends his people to training. He knows that the operation runs smoothly because they are all educated not just one person. He also believes the education is vital to improving the safety of the operation.

Mike has lived in Milton all his life and has a great personal investment in the town. He is always “happy to get out to help people in need.” Mike has been married to Brenda for 13 years. They have 3 children. As a family they spend a lot of time participating in town activities such as sports, car washes and other fund raising activities.

Congratulations to Master road Scholar Mike Smith!
New Hampshire Road Scholars

We are pleased to recognize the individuals who, during the Spring of 1998, have achieved the following levels in the UNH T² Center Road Scholar Program.

**Master Road Scholar.** Participated in UNH T² Center training activities totaling 100 contact hours and covered the range of topics required for Road Scholar II.

<table>
<thead>
<tr>
<th>Road Scholar</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Cross</td>
<td>Northfield</td>
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</table>

**Senior Road Scholar.** Participated in UNH T² Center training activities, which totaled 70 contact hours and covered the range of topics required for Road Scholar II.

<table>
<thead>
<tr>
<th>Road Scholar</th>
<th>Affiliation</th>
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</thead>
<tbody>
<tr>
<td>Mike Chase</td>
<td>Hanover</td>
</tr>
<tr>
<td>Thomas Saari</td>
<td>New Ipswich</td>
</tr>
<tr>
<td>Randy Stevens</td>
<td>Lee</td>
</tr>
</tbody>
</table>

**Road Scholar II.** Participated in UNH T² Center training activities which totaled 50 contact hours and covered a set of minimum subject areas including road design and construction basics, other technical, tort liability or safety, and supervision or personal development.

<table>
<thead>
<tr>
<th>Road Scholar</th>
<th>Affiliation</th>
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</thead>
<tbody>
<tr>
<td>William Byrne</td>
<td>Keene</td>
</tr>
<tr>
<td>Alan Cote</td>
<td>Derry</td>
</tr>
<tr>
<td>Frank Hoyle</td>
<td>Keene</td>
</tr>
<tr>
<td>Pierre Lavoie</td>
<td>Dover</td>
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</table>

Road Business, Summer 1998, Vol. 13, No. 2
Electronic Mail for Public Works

Electronic mail (email) is one of the most useful tools for business. Email allows one to send and receive message from almost anywhere in the world. It is relatively simple and user-friendly and is usually immediate and reliable. Email allows users to avoid chitchat and deal with situations on their own time.

Mail is sent via an email address. The mostly widely used addressing system has the form user@host.domain. An example is john.doe@fhwa.dot.gov. The user, “John Doe,” has an account on the host “fhwa” (Federal Highway Administration) at the domain “dot.gov” (within the Department of Transportation, a governmental institution).

With email, messages can be sent to many people simultaneously. The recipients can be separated by thousands of miles and receive the mail at virtually the same time.

Mailing Lists

A convenient way of corresponding with many others is to join a mailing list. Lists allow people to communicate with a group of people who have similar interests and concerns. They can collaborate on work, and ask for help with problems or assist others. Mailing lists are generally free. PW NET is an example of a mailing list.

To initiate a subscription to the mailing list, the user sends a message to the list, known as a listserve. Directions to subscribe to PW NET are in the box on this page. (Most listserves follow the same format).

When the list manager receives the subscription request, they will send the user a welcome message. It is good practice to save this message. It usually contains valuable information, such as who to contact if the user is has problems using the list.

To use a list, the user writes a message to the listserve address and sends it. The listserve automatically directs the mail messages to all the subscribers.

Rules for Writing Email Messages

Unwritten rules for using email make it effective and efficient.

Users should write a relevant subject line. Some people receive hundreds of email messages a day and cannot possibly take the time to read every message. The subject line determines if they will look at the message.

Messages should be concise and to the point. The people who receive hundreds of email messages a day, probably won’t read long messages. They may delete the message without fully reading it.

One should not reply to an email message by including a complete copy of the original and then saying yes or I agree at the bottom. Include only the relevant text of the original message, commenting where appropriate.

Text written with the caps lock on means, in the email world, the sender is yelling. It may seem like a small point, but people are sensitive.

Users should include the same information at the bottom of the email that would normally be included in a standard letter. For instance, name, title, and company name.

Email makes doing business easier. It’s nice to be able to answer mail at your own convenience or to put a quick question out on a listserve.

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Some material from:
Nevada Milepost, the Quarterly Newsletter of the Nevada Technology Transfer Center, Winter 1997.

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PW.NET

Want to know what is happening in other towns? Need a place to ask questions of other Public Works Officials? Then, subscribe to PW.NET! It’s free. Send an email message to kathy.desroches@unr.edu

In the body of the message type:

Add PW.NET your name
For instance:
Add PW.NET John Doe

Road Business, Summer 1998, Vol. 13, No. 2
Mutual Aid for Public Works

Mutual aid for public works will soon be a reality. Since the beginning of this year, at least two situations have occurred where mutual aid would have been helpful: the ice storms in January and the flooding shortly after.

A mutual aid committee has formed to create a program for public works. Currently, the agreement that provides for mutual aid is at the Attorney General’s office awaiting approval. After it is approved by the Attorney General, the mutual aid agreement form will be mailed to municipalities.

The plan for mutual aid is similar to that of the fire and police departments however, a Public Works mutual aid agreement must be different for two reasons.

- Public Works disasters are geographically located, assistance most often would come from farther than the next community.
- Public Works Departments are rarely staffed 24 hours a day.

These differences make a public works mutual aid agreement more complicated than the fire and police department programs. With police and fire, municipal assistance occurs frequently and municipalities are certain they will receive aid as often as they provide aid. This probably will not be true for public works.

History of Mutual Aid in NH

The idea of mutual aid for public works was developed by Chum Cleverly, Public Works Director in Bow and a Master Road Scholar. He developed a structure for how the plan would work a year and a half ago (see Road Business, Spring 1997). Since the inception of his idea, he has gotten others to see the benefits of such a plan.

In February a committee formed to take Chum’s vision out of the idea phase and implement it. The committee is represented by 3 road agents: Brian Barden, Richard Lee, and Kevin McKinnon and 3 public works directors: Mike Bobinsky, Chum Cleverly, and John Starkey. Also, serving on the committee are: Heather Anderson and John Andrews, New Hampshire Municipal Association; Gregg Champlain and Woodbury Fogg, Office of Emergency Management: Kathy DesRoches, UNH T2 Center; Ed Kyle, NHDOT; Timothy Russell, Police Chief, Town of Henniker; David Stack, Town Administrator Pembroke; and Dick Wright, Chief Coordinator Capital Area Fire Compact. These committee members were chosen for specific areas of expertise and are all highly supportive of the plan.

A Summary of the Plan

The committee used Chum’s vision for what mutual aid should entail. Below is a brief overview of the plan.

1) A road agent or public works director determines they have an emergency.
2) They use a resource list, compiled by the UNH T2 Center, to call any participating community they believe can offer the assistance they require.
3) The community that is called determines if they can provide the assistance.
   a) If they can, the provider sends equipment and personnel agreed upon and a person to act as a supervisor. The responding town must document all assistance given to the town, (hours worked, equipment used, supplies, etc...).
   b) If they can not provide assistance, then the Road Agent or Public Works Director of community is distress calls another town.

Mutual Aid Agreement

The initial package sent along to towns with the agreement there will include an equipment and personnel inventory form.

The UNH T2 Center will rely on the inventory

Continued on page 8
RAP! What is it good for?

By Paul Brown

Stockpiled RAP is a valuable resource for many highway projects.

Asphalt pavement is one of the few products that is 100% recyclable. Highway agencies generate recycled asphalt products or RAP, from cold planing or milling pavements and from utility cuts. Many have found RAP to be a valuable resource for hot asphalt mixes, cold asphalt mixes, full-depth recycling and aggregate replacement. This article summarizes these uses of RAP.

RAP in Hot Mix

RAP is useful for hot asphalt overlays if the agency develops a mix design that meets criteria established by State and Federal specifications. The limiting factor is the percentage of RAP which asphalt companies are able to use to produce high performance asphalt mixes. The New Hampshire DOT allows from 15% to 35% RAP. Many engineering firms and some asphalt suppliers can analyze an agency’s RAP and develop a mix design.

RAP in Cold Mix

Other common uses of RAP require less engineering and are lower in cost. Cold mix made with 100% RAP can perform as well as hot mix if road managers consider gradation, residual asphalt content, curing time, and compaction are considered. Cold mixes perform well when gradation is controlled. The RAP is crushed and sized to meet the typical hot mix gradation requirements.

The residual asphalt content determines the amount of emulsion added to the material to create a stable mix. The content can vary based on the origin of the RAP. If the road was old and oxidized, the residual asphalt content could be quite low. Because of the variable asphalt content, the resulting mix could require from 3-10 gallons of asphalt emulsions to create a stable cold mix. It is therefore recommended that cold mix be made only from tested materials.

To have a long-lasting asphalt surface, the mix should have sufficient time to cure. Emulsions, used with RAP, are made from soap and water. Adequate curing time is vital to allow the moisture to evaporate from the mix.

The millings should be of uniform size. Cold mix is typically laid in 2"-3" lifts. Larger lifts are difficult to compact. Good compaction is critical for cold mix performance. Heavy rollers are a must for proper cold mix compaction. A properly compacted mix will have 10-15% voids content. All cold mixes must be sealed before the winter to prevent water penetration into the voids.

On low volume roads cold mixes that are done correctly have the same performance and structural capacity as hot mix asphalt. Placing cold mix on roads that have excessive heavy and/or turning traffic is generally not recommended the key to success is to do it right.

Full-Depth Recycling

Full-depth recycling generates RAP. It utilizes 100% of the existing asphalt by grinding up and mixing the whole asphalt surface with the underlying (base) material. The resulting mix should have a gradation similar to crushed gravel. It then serves as the base material for a new pavement surface.

The RAP gravel base material will produce a mixture that has 30% to 50% more load-bearing capacities than virgin aggregate. This means that 6
inches of asphalt reclaimed base can have the equivalent strength of 9 inches of virgin gravel. These results will vary depending on the materials are mixed with the RAP.

This can provide a valuable resource to regrade the subbase, correct drainage problems, and add more aggregate to the road base. These advantages provide municipalities with less expensive methods of reconstruction.

Full depth recycling is a relatively inexpensive method of reconstruction that can provide 10-15 years of service life for the road.

To achieve long service life agencies must pay close attention to material gradation, subbase material, compaction and moisture content.

Material gradation depends on the speed of the reclaiming. When it moves too fast, the resulting aggregate mixture will contain chunks and large pieces. An uneven mixture is difficult to grade and usually leads to long-term compaction problems. A well-graded aggregate and evenly sized mixture is easy to compact to achieve maximum density. Proper graduation is vital to achieve a long life cycle.

The agency must pay close attention to pre-existing problems in the subbase. RAP mixed with unsuitable material might provide short-term results, but the problems will reappear and have to be addressed later only if the subbase contains suitable materials will the RAP mixture provide an adequate road base.

Local road managers must ensure adequate compaction and optimum moisture content. Soil additives can improve compaction because they attract moisture that will help attain optimum moisture content. Additives allow contractors to meet compaction requirements with less job site effort and cost.

Conclusion

RAP is viable replacement for virgin aggregate. With depleting natural resources municipalities should consider RAP as an alternative product. Aggregates in older pavements contain some of the best materials available today. Future municipal budgets may dictate that highway departments look to lower-cost alternatives such as RAP for overlays.
Promoting Safety

Do you care?
By Chum Cleverly, Director of Public Works, Town of Bow

As I traveled around the state teaching work zone safety for the UNH T² Center, the most frequent complaints I heard, "they won’t provide us with the right equipment," or, "they won’t give us the time to set up the work zone properly." If "they" is you then you should think about the message you are sending your employees. Not providing safety equipment or the time to use it gives the impression that you don’t care about them and their safety.

When employees don’t feel that their leaders give a hoot about them, they won’t be motivated to do their best when asked to perform assigned tasks. Safety should be the main concern of supervisors, administrators and elected officials. Keeping your employees safe is good business and shows your staff that you care.

Town employees tied up in court or in labor hearings, because of the town’s negligence, are not doing what they were hired to do. This results in increased cost for worker’s compensation, or liability insurance, and is not a wise investment for the taxpayer.

People who attend training would like to use the skills and knowledge they gain during the training. If not allowed to, then everyone loses. The cost for training and safety equipment costs less than a preventable accident. Employees know that safety equipment is relatively inexpensive and how little time is needed to do a job safely. It is important to provide the equipment they need to ensure safety and the time to use it.

There are dozens of safety courses available from several organizations promoting safety. OHSA, the New Hampshire Department of Labor, and the municipality’s insurance companies want safe working conditions for employees. These companies would be happy to let community leaders know that safety is more cost effective than cutting safety equipment from their budgets. The potential loss in time and human suffering should be enough incentive to promote safety at any expense.

Mayors, Selectmen, Managers, and specifically public works supervisors should not need to be reminded how important safety is but they do. The people on the road, at the transfer station, working around the lagoon, and pushing lawn mowers know what they need to be safe. If they do not know, then you should, and you should share that information. The safety seminars offered by the UNH T² Center, New Hampshire Municipal Association and Compensation Funds are not just for “hands on” folks. They are for everyone. Why not attend one or two safety courses?

Keep your employees safe because it’s good for them, it’s good for morale, and it’s good for the community.

Continued from page 5

The UNH T² Center will conduct orientation in the fall for the mutual aid program. For further information, contact the UNH T² Center.

form compile a complete listing of equipment and personnel available to call upon. Accurate completion of the form is necessary to ensure the program is successful. Each municipality that participates will receive a complete listing of all equipment and personnel available in the other participating municipalities.

Road Business, Summer 1998, Vol. 13, No. 2
The following materials are available free of charge.

- **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 designing roads. With many colored pictures and easy-to-read tables, it clearly illustrates successful approaches used in other highway projects.

- **Call Dig Safe Before You Dig.** An information pamphlet with regulations and official and helpful laws regarding digging.

- **A Series of Quick Guides for New Hampshire Towns.** Includes pamphlets for quick reference on ten different topics such as snow and ice control, erosion, and brush control.

- **Updated Video Catalog.** Revised in June, 1998, this is the complete list of UNH T² Center videos available for free two-week loan.

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

The following materials involve an extra cost. Please send a check with the form if requesting one of these materials.

- **Drainage, Drainage, Drainage.** A manual featuring various drainage concepts and features. Problems with drainage and proper maintenance to ensure good drainage are also discussed. A UNH T² Center workshop notebook. **$15**

- **Participant's Manual for Preventive Maintenance Treatments Workshops.** A UNH T² Center Publication. Describes the elements of a preventive maintenance program for local roads, the methods and materials for effective preventive maintenance treatments, and the road conditions which should receive them. Comes in a plastic binder. **$15**

The following materials are available for a two-week loan.

- **A Policy on Geometric Design of Highways and Streets, 1994.** This book covers highways and streets of high and low volumes. It reviews elements of design, cross-section elements, and grade changes.

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**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: __________

Check is enclosed

$15 _____  $30 _____

*Road Business, Summer 1998, Vol. 13, No. 2*
The following videos are available from the UNH T2-Center Video Library. You can have five videos out for a two-week period with no charge. To request by mail, check the videos you would like to have (up to 5 at a time), fill out the mail request form, staple closed, and mail. To request by telephone, call (603) 862-2826 or (800)423-0060 (in NH). Visit our complete publication and video catalog on our website at http://www.t2.unh.edu.

DC-251 The Importance of Road Drainage 19 min.
The basis for this film is that if you do not plan the drainage of water that way you want, nature will drain it for you. Describes surface and subsurface drainage, drainage systems, and procedures for their inspection and repair.

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

NEW! DC-253 Understanding Superpave Mix Design 13 min. This video describes the characteristics of the Superpave mix design. It shows how binder grade, aggregate type, and temperature all affect the design of pavements. Specifically, the tape details how certain Superpave equipment and tests are performed and used to obtain optimum performance from the asphalt.

NEW! DC-254 Soil Erosion and Sediment Control 28 min. This video shows how soil erosion and sedimentation are related. It describes in detail various types of erosion and erosion prevention/control procedures. It also stresses the need for adequate control of erosion in order to minimize the amount of soil lost each year.

NEW! M-295 Protecting our Pavements: Preventive Maintenance 14 min. Five veteran chief engineers relay the message of preventive maintenance to establish funding, improve strategic planning, and to know how to apply the right treatment at the right time.

M-296 Asphalt Crack Sealing 20 min. Describes how pavement cracks form, various methods for sealing and filling, and when each method should be used.

M-297 Using Snow Plows on Motorgraders 16 min. Describes the types of plows and conditions for their use, how to connect each type, and how to plow using the proper plow type.

NEW! M-298 Crack Sealing Flexible Asphalt Pavement 8 min. This video explains the fundamentals of crack sealing. It gives the advantages and disadvantages to many different crack sealing techniques. It also reviews some basic safety aspects involving the sealing of cracks.

NEW! PA-231 Unsurfaced Road Management 9 min. This tape shows how to use the unsurfaced road management system. It outlines the necessary steps for managing unpaved roads: gathering the proper information and then translating that information into an orderly data set for use in the evaluation and possible repair strategy of a given roadway.

NEW! PA-232 Inspecting Unsurfaced Roads 8 min. This video describes one of the first steps in the Unsurfaced Road Management System--Inspection. It briefly explains what defects to look for in an unsurfaced road and also how to measure them.

NEW! PA-233 Shooting Good Video 8 min. This tape explains the basic rules for properly filming a video of construction work.
**Milestones:**

*Scott Clark* is the Highway Coordinator in Epping.  
*Curtis Coleman* is the new Road Agent in Albany.  
*Carl Coulombe* is the Road Agent in Stark.  
*Thomas Dorman* is the Road Agent in Pittsburg.  
*Donald Doucette* is the Road Agent in Milan.  
*David Kenison* is the new Road Agent in Randolph.  
*George Laney* is the acting Director of Public Works in Newarket.  
*David Leone* is the new Road Agent in Groton.  
*Greg Mack*, Director of Public Works in Somersworth passed away.  
*Stewart McLeod* is the new Road Agent in Andover.  
*Charles O’Sullivan* is the Road Agent in Ossipee.  
*Richard Perkins*, the City Engineer in Concord, is retiring on July 31, 1998.  
*David Wadleigh*, Town of Tilton Road Agent, retired on June 30, 1998.  
*David Walker*, former Public Works Director in Newmarket, is a Senior Project Manager at Bedford Design Consultants in Londonderry.  
*Charles Waterbury* is the Road Agent in Orford.  
*Frederick Palmer* is the new Road agent in Deerfield.

**Websites:**

There are many helpful websites for Public Works employees. Here are just a few. If you have others that your colleagues could benefit from, send the urls to kathy.desroches@ unh.edu. We’ll publish the site and your name in *Road Business* *(no commercial sites please).*

UNH T² Center: http://www.t2.unh.edu

Compensation Funds of New Hampshire:  
http://www.cfnh.com site information provided by Bill Herman, Town Administrator in New Durham.

New Office of State Planning  
http://webster.state.nh.us/osp/nhrestnet

Eastern Winter Road Maintenance Symposium  
September 9-11, 1998  
http://www.ota fhwa.dot.gov/winter/

**In the News:**

The May/June 1998 issue of *Walking Magazine* saluted the most walkable communities in the United States. Exeter was voted as one of the six most walkable small communities (population under 50,000). What makes Exeter so walkable? "Miles of walking and hiking trails, the river crossing, and the well-maintained sidewalks" are just a part of what makes Exeter one of the most walkable communities. Congratulations!

**Congratulations Lauren and Ashley**

Lauren Chaffee and Ashley Pierson graduated from UNH in May. Lauren, a UNH T² Center Project Assistant for three years, was responsible for our videos and publications library and their distribution. Ashley, a Project Assistant for two years, prepared several lengthy workshop manuals. Both registered participants and assembled workshop materials. They wrote and edited articles for *Road Business*. In fulfilling these and other responsibilities, they were consistently reliable and professional, and a lot of fun to work with.

Lauren and Ashley,

Congratulations and best wishes for continued success and happy lives. We, and the many people you served in New Hampshire municipalities, will miss you very much.

Kathy, Dave, and Charlie
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http://www.t2.unh.edu

Calendar
UNH T^2 Center workshops
Summer & Fall '98
For additional information or registrations,
call the UNH T^2 Center
or check the web-site.

Basics of a Good Road
2 Locations

Bridge Repair
2 Locations

MEMS
August 5, 1998—Lebanon
August 6, 1998—Durham
August 11, 1998—Lebanon

Mutual Aid Introduction
3 Locations

Preparing and Presenting Municipal Budgets
2 Locations

Public Relations
2 Locations

SIMS
2 Locations

RSMS
2 Locations

Tort Liability and Risk Management
2 Locations

Winter Operations
3 Locations