M A S S

INTERCHANGE

VOLUME 2 NUMBER 1 SPRING 1987

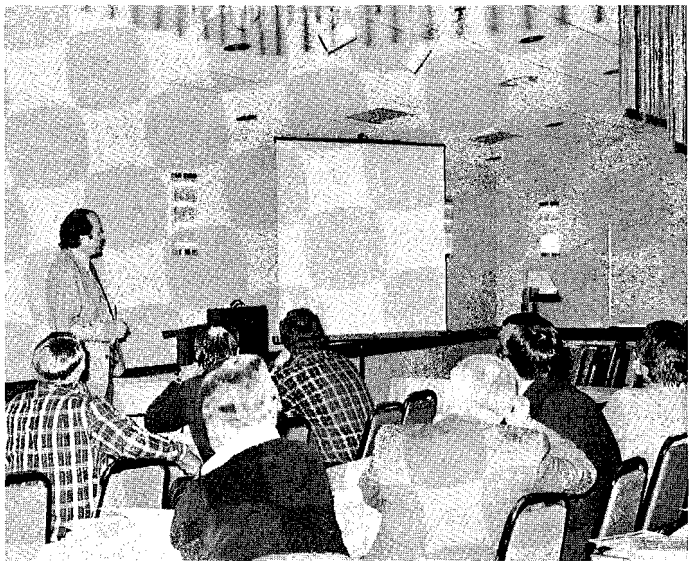
WORKSHOPS ..... WERE YOU THERE??? ..... WORKSHOPS

Winter Maintenance

On December 2nd and 3rd, the Baystate Roads Program presented their first set of workshops. The topic, **Winter Maintenance**, proved to be an excellent choice given this year's more than ample snowfall. Hosted successively in Amherst and Dedham, the audience consisted of local DPW officials and one selectwoman. A one day format provided coverage of the essentials of snow and ice control without keeping busy highway officials away from their towns too long. Given the good turnout, we plan to use the one day format for most programs.

After general introductions, Frank Carr, a 30 year veteran of the Massachusetts Department of Public Works (16 as head of the Department's Snow and Ice Program), spoke on how to plan and prepare for Winter. Among other things, he suggested that you should be getting ready for next Winter this Spring! Lynne Irwin, the Director of the Cornell Local Roads Program and a Highway Engineering Professor, followed with a presentation on materials applied to roadways during snow storms, and methods used to apply them. He discussed some of the pluses and minuses associated with road salt, and then looked at other chemicals on the market. After reviewing the melting and freezing properties of all deicing products on the market, Lynne suggested that currently no other chemical can accomplish what salt can for the price. However, when environmental impacts are an important consideration, then other chemicals become more attractive.

The afternoon sessions looked more closely at the environmental impacts of salting, and some of the liability considerations a community should take into account when it develops a winter storm policy. Well designed facilities for bulk salt storage curtail leaching into groundwater at the storage site. When town leaders decide that road salting is also becoming hazardous to the environment, then proposals for reduced salting must be carefully evaluated. Sizable sums have been paid out by communities that instituted reduced salt policies. A balance must be reached which provides safe roads for a community while protecting the local environment.



Speaker Richard Thompson showing slides of alternative pavement treatments.

Road Surface Management for Local Governments

On March 11th and 12th, workshops were held in Amherst and Dedham on **Road Surface Management for Local Governments**. This popular topic attracted local DPW officials, city and town engineers, and highway foremen. A capacity crowd registered for both locations, with 32 attending in Amherst and 49 coming to Dedham. The full day sessions were jam packed with ideas presented by the two speakers.

Richard Thompson, the primary speaker from Byrd, Tallamy, MacDonald and Lewis ,opened with a review of pavement engineering. He discussed subgrade and foundation requirements, wearing surface properties, the importance of drainage considerations, and the new AASHTO design guidelines. John Collura, the Co-Director of the Baystate Roads Program and a Civil Engineering Professor at the University of Massachusetts/Amherst, followed with a talk on the conduct of a road surface inventory. He stressed that

Workshops · · · cont. on p. 4

Pavement Management: The Seven Big Questions

– A concise explanation of pavement management and its benefits. –

We've all been hearing a lot about this. It's one of the latest and hottest highway topics across the nation. Talk is spreading to small rural towns, large metropolitan cities, and state and Federal transportation agencies. Consultants are bustling about, and people are asking questions. In response to your inqueries, we recently presented two seminars on Road Surface Management for Local Governments. The sellout crowds and positive evaluations indicate our success (see article on Workshops). For those of you who missed our informative sessions, this article will answer the following questions about Pavement Management: What is it? How does it work? What exactly is being managed? Why is it so popular? Who benefits? There are many questions to be answered. Let's look at some of them individually.

(1) *What is Pavement Management?* – It is an answer to a continually growing problem. In most towns and cities the individual responsible for the roads is running in leaps and bounds from one fire to another. He or she is trying desperately to maintain good roads, recondition some that are falling apart and others which may have failed. The responsible person is further frustrated by not being able to get what is believed to be the necessary financing to properly approach the problem. Pavement Management is one approach to addressing these problems. It is a method for maintaining roads by systematically analyzing pavement life cycles, determining when to do maintenance, determining the best and most cost effective software, and then budgeting accordingly to prevent any major road deterioration.

(2) *How does it work?* – Pavement Management works like any other business operation. It's the development and implementation of a sound plan and it starts by analyzing the current position. If you don't know where you stand, it's very hard to get to where you want to go. Just picture yourself in the woods with a map showing many pathways, but there's no mark on the map to show you where you are. It may be impossible to find a pathway out within your survival time. The same holds true with Pavement Management.

The first step is to inventory all roads to enable a systematic assessment of the road system's condition and any potential structural or material deterioration. The second step is to analyze all the information gathered and determine the best and most cost effective alternatives for meeting the maintenance and rehabilitation needs along with costs and potential benefits. This shows us how the planning pathways will link together as we go from one project to another to reach our goal. The third step is to set up a 5–10 year LRBP (Long Range Business Plan) outlining budget and funding requirements. After modification and approval, this becomes the final "road map", or strategy, to our objective. The work then begins and the process starts over.

(3) *What does it cost?* – The most startling costs come from our new awareness. Pavement Management practices will enable us to review the present condition of our roads and what to expect one and two years into the future. We will become aware of the monies required for complete maintenance and rehabilitation of the total road network. Most importantly, we will be able to determine the most economic manner in which to spend our monies (find the most affordable path).

There are many ways to go about implementing a Pavement Management System and the costs are directly related to the intricacy of the system that is chosen. A town may, or may not, wish to hire a consultant. They may, or may not, decide to invest in a small computer to assist in analyzing all the data being collected. Yet, no matter how elaborate or simple the program, it is worth investing the time to begin some form of Road Surface Management.

(4) *Who's the manager?* – An individual such as the Highway Superintendent, Town Engineer or Public Works Director is the front line manager. This person must play a key role when it comes to planning and implementing a Pavement Management program. It is their keen knowledge, their ability to acquire new information for solving new problems and their creativeness which supplies the ingredients necessary to build a strong base for such a program. The Selectmen, Town Managers, and other local government personnel serve as the behind the scenes second line managers. They are the financial controllers. A good Pavement Management System demands a cooperative effort from all involved parties.

(5) *What exactly is being managed?* – The bottom line is simple. Pavement Management manages both time and money. It tells us the best way in which to spend our time. Pavement Management looks at the service life of each road (time) and the most cost effective way to maintain it (money). If we can manage this...we will have managed well!

(6) *Why is it so popular?* – Because it works. It is said that 90% of solving any problem is being aware of it. Pavement Management not only makes everyone aware of a situation but it supplies an approach as well. It may be a long term plan, but it's something we can hold in our hand, implement and evaluate.

Pavement · · · cont. on p. 3

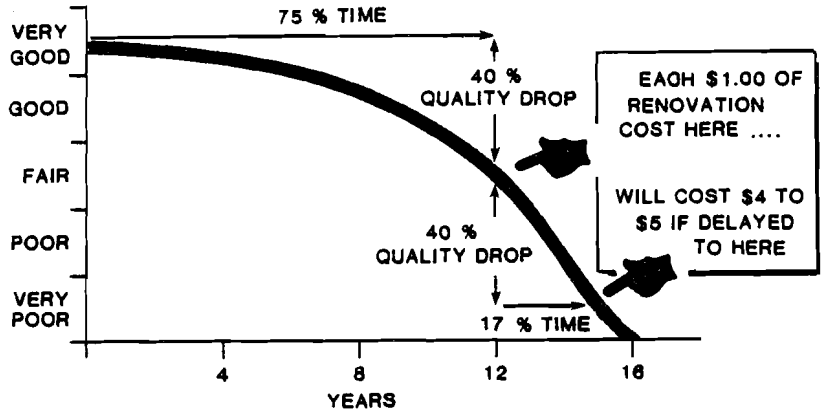
Pavement (cont.)

(7) *Who benefits?* – The nice thing about Pavement Management is that it has benefits for everyone. First, it involves more than just one person or department. An integrated management team is required for the system to work. This in turn builds important communications and mutual interest. Second, it provides a consistent and effective procedure for relating pavement performance to specific maintenance and rehabilitation treatments and costs (the reader is referred to the pavement deterioration/rehabilitation relationship graph). Third, it allows for a logical approach to budgeting, therefore, minimizing the amount of guess work and "gut feel" involved. Fourth, it provides an avenue for communicating needs to an elected body in a logical and concise manner so that the decision makers will be able to reasonably predict the outcome of their decisions. Fifth, it makes it easier to handle problems identified by citizens. When a citizen can be told what is being planned to correct the problem and how a specific road fits into the overall needs of the community, further compliications are quickly diffused. Sixth, and most important, it allows for priorities and needs to be defined so that the best results can be achieved with the monies that are available. In other words, it helps us get the "greatest bang for the buck".

Massachusetts cities and towns are right in the thick of things when it comes to Pavement Management. A number of communities have already implemented operational systems, while others are considering the available options. If you are interested in speaking with some of these folks, or just want to learn more about Pavement Management, please contact the Baystate Roads Program at (413) 545–2604.

(Adapted from "Road Business," the newsletter of the New Hampshire Technology Transfer Center.)

PAVEMENT DETERIORATION / REHABILITATION RELATIONSHIP



DEMONSTRATION PROJECT

-Volunteers Wanted-

Title: Mass. Slipbase Utility Pole Project

Sponsor: FHWA in cooperation with the MDPW and participating utility companies

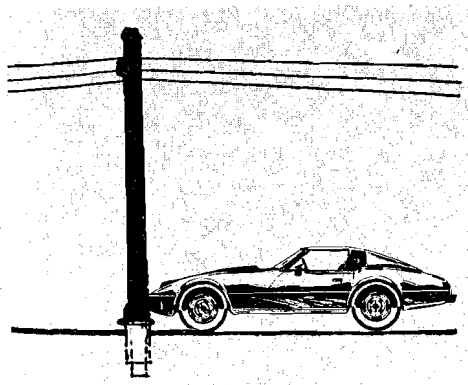
Description: FHWA and MDPW are looking for sites where they can install, monitor, and evaluate under field conditions a breakaway slipbase device for timber utility poles. They ask Massachusetts communities to advise them of locations experiencing repeated vehicle-pole collisions so that they can install these slipbases at such locations. The research will determine whether the slipbase device can reduce timber utility pole roadside hazards while maintaining sufficient strength to withstand ice and wind loads. Since the poles can readily be repaired, service interruption will be minimized.

Cost: None to the communities.

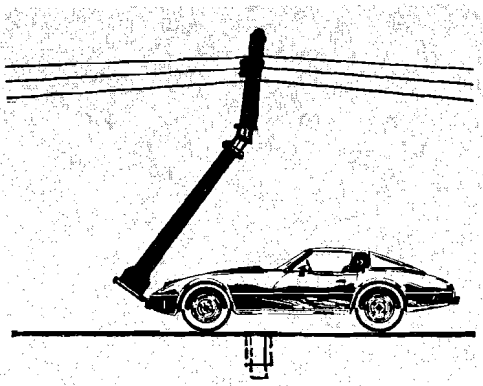
Contact: If you have a utility pole in your town that has been the site of repeated accidents, and you wish to participate in this study, write or call:

Mr. Richard Buser
Federal Highway Administration
55 Broadway
Cambridge, MA 02142
Tel. (617) 494-2316

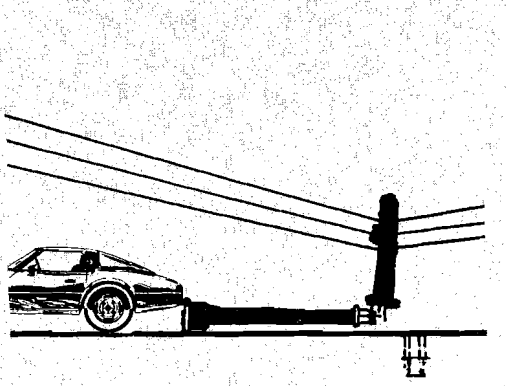
Note: The next issue of Mass Interchange will have a detailed article about this unique research.



IMPACT



POLE ACTIVATED



CLEARANCE

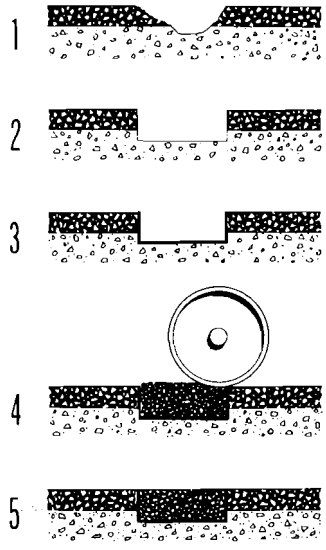
Potholes

Doing It Right the First Time

Do you find yourself repairing the same potholes again and again? If so, you may be repairing the expedient way rather than the correct way. Potholes repaired the correct way will not only last longer but will cost approximately one-fifth as much as the job done expediently. Five items must be taken into consideration:

1) WEATHER. Best results occur when repair work is scheduled during warm, dry weather.
2) TRAINING OF PERSONNEL. Even the best available materials will fail if improperly used. It is extremely important that all personnel have sufficient training.
3) PROBLEM IDENTIFICATION. The supervisor must be able to recognize the cause of the problem and must plan the repair to eliminate recurrence.
4) MATERIALS SELECTION. Patching may be done with hot and cold mix asphalts, portland cement concrete, or other suitable patching material.
5) SAFETY. The safety of personnel and the traveling public is of utmost importance.

1) Untreated pothole. 2) Surface and base removed to shape hole. 3) Tack coat applied. 4) Fulldepth asphalt mixture placed and leveled. 5) Finished patch compacted to level of surrounding pavement, edges sealed.



Two approaches to pothole repair:

Expedient Patch

Fill hole with mixture, compact by hitting patch with shovel, or for a "quality" repair, run the dump truck tires over the patch. (Life of patch: 1-2 months)

Durable Patch

Shape hole with axe, sledge and pick. Sweep hole clean. Tack all exposed surfaces. Fill hole with mixture and level material. Compact with small vibratory roller or tamper. Seal edges of patch with tack oil and stone. (life of patch: one year or more) (Adapted from "Interchange," the newsletter of the Nebraska Technology Transfer Center, February 1986.)

UPCOMING WORKSHOPS

DATE	TOPIC	LOCATION	TIME
MAY 13	*Managing Construction Contracts*	Belchertown	7-9:30pm
20	*Labor Relations*	Hadley	7-9:30pm
27	*Alternatives to Municipal Purchasing*	Granby	7-9:30pm
JUNE 2	*Gravel Road Maint. & Pothole Patching*	Amherst	8:30am-3pm
3	*Pothole Patching & Roadway Basics*	Dedham	8:30am-3pm
AUG. 4	*NACE Action and Training Guides*	Amherst	8:30am-3pm
5	*NACE Action and Training Guides*	Dedham	8:30am-3pm

Be watching your mailbox for more information about these workshops, and be sure to mark your calendars. For more information contact Meryl (413) 545-2604

Workshops (cont.)

inventory should be taken by as few people as possible to ensure consistent assessments. Different types of pavement rating forms were discussed as to their associated merits and drawbacks.

Mr. Thompson began the afternoon with a slide show on selected pavement treatments and their applications. Having covered the basic components of a roadway system, the "management" part was introduced by tying them all together. The condition assessments and maintenance strategies were examined within overall system needs. A prioritization process was introduced to help later determine which roads in the system should be repaired, and when. The suggestion was not to fix the worst roads first, but to maintain the best roads before they deteriorate, then selectively repair deteriorated road segments based on deterioration levels, bugetary constraints, and other considerations. Final presentations discussed data management, with an overview of available computer hardware and software options.

Many complicated topics were introduced at this workshop by the skilled speakers. To reinforce the presentations and provide follow up training, an excellent manual detailing the concepts of pavement management was distributed to all the participants. To obtain a copy of "Road Surface Management for Local Governments - Course Workbook," call Meryl Ann Mandell at (413) 545-2604 or write the Baystate Roads Program.

THE WORD ON THE STREET

Have you ever been frustrated by not being able to find information you need to do your job? We at the State Transportation Library can help you find it! The library provides information, reference/research, and bibliographic services relating to all aspects of transportation in Massachusetts and beyond. More importantly, our trained staff can guide your efforts in locating and securing information.

The Library houses three major collections: Transportation, Legal, and Periodical. The Transportation Collection encompasses management, planning, design, engineering, construction, and evaluation. We also collect materials from related fields such as statistics, economics, public administration, human resource development, demographics, and graphic arts. Recently, we started purchasing topical video and audio cassettes. The items in the Transportation Collection may be borrowed through inter-library loan, or by contacting us directly.

The two other collections do not circulate. The Legal Collection, covering both Massachusetts and Federal laws, is available for use at the Library. Areas of emphasis include labor, contracts, real estate, environmental, and administrative law. More than 100 magazine and newsletter subscriptions make up the Periodical Collection, and are available for your perusal. We will happily photocopy an article on request.

Feel free to call us at (617) 973-8000; write us at the State Transportation Library, Ten Park Plaza, Boston, MA 02116 ; or just drop in. The Library is open Monday through Friday from 9am to 5pm. In addition to my help, you can obtain assistance from: Ms Natalie Ridge - Technical Services Librarian, Mr. George Sanborn - Reference Librarian, Ms Lynn Matis - Law Librarian, and Ms Irene Guthrie - Library Secretary. We look forward to helping you find it!

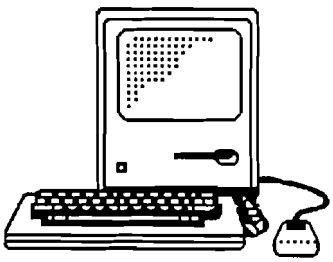
Sincerely,

Dr. Toby Pearlstein
Chief Librarian & Archivist

McTrans Offers Low Cost Microcomputer Software

In July, 1986, the Federal Highway Administration opened a new microcomputer user support center called the Center for Microcomputers in Transportation, or McTrans. Operated out of the University of Florida, McTrans distributes public domain microcomputer software, provides a technical assistance hotline, and publishes a quarterly newsletter. Software and support are offered in the areas of safety, traffic engineering, urban and statewide planning, and many areas of highway engineering so that a broad segment of the user community can benefit. Prices for software are minimal, ranging from free to $30.

McTrans has a diverse team of engineers who are experts in all areas of highway transportation and have extensive experience in microcomputer applications. The support staff includes specialists in such areas as traffic engineering, hydraulics, construction management, rural and urban planning, pavements, safety and highway design.

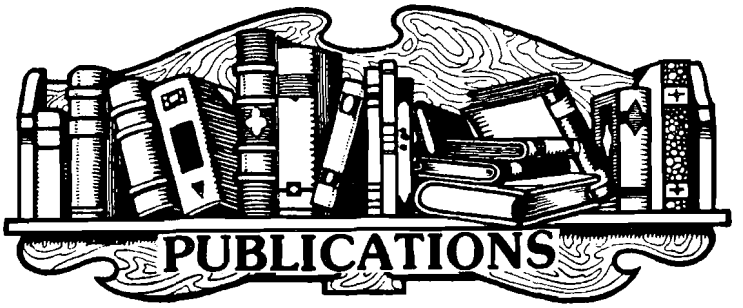


One publication now available through McTrans is the latest version of the Microcomputers in Transportation Software and Source Book. This publication contains about 200 descriptions of microcomputer software packages along with their sources (these sources include public and private agencies alike). The Software and Source Book (product #MTPS86) is available FREE from the McTrans Center. A mailing fee of $1.75 plus 25 cents per copy is required.

Persons wishing to order this book, or wishing to be put on the mailing list for the McTrans newsletter (which will include notices of available software), should write to:

The Center for Microcomputers
in Transportation
University of Florida
346 Weil Hall
Gainsville, Florida 32611
(904) 392-0378

Feel free to contact the Baystate Roads Program (413) 545-2604 to find out more about McTrans or microcomputers. Watch for future articles on microcomputer applications for public works agencies.



Safety/Environmental

- "Manual on Countermeasures for Sign Vandalism," Federal Highway Administration (USDOT) (159 pages – 1986)
- "Roadside Improvements for Local Roads and Streets," Federal Highway Administration (USDOT) (31 pages - 1986)
- "Guide to Management of Roadside Trees," Federal Highway Administration (USDOT) (75 pages - 1986)
- "Inspector's Manual for Traffic Signal Construction," Texas Department of Highways and Public Transportation (USDOT) (70 pages - 1985)
- "The Road Salt Management Handbook: Introducing a Reliable Strategy to Safeguard People & Water Resources," Pioneer Valley Planning Commission (47 pages - 1986) $7.00 fee. Contact: Chris Curtis, PVPC, (413) 781-6045

Drainage

- "Drainage of Highway Pavements," Federal Highway Administration (USDOT) (151 pages - 1984)
- "Highway Subdrainage Design," Federal Highway Administration (USDOT) (162 pages - 1980)
- "Culvert Inspection Manual," Federal Highway Administration (USDOT) (215 pages - 1986)

Roadway Maintenance

- "Pavement and Shoulder Maintenance Performance Guides," Federal Highway Administration (USDOT) (42 pages - 1984)
- "Pavement Patching Guidelines," Federal Highway Administration (USDOT) (78 pages - 1983)
- "Principles of Construction of Quality Hot-Mix Asphalt Pavements," by The Asphalt Institute for the Federal Highway Administration (USDOT) (274 pages - 1982)

Soil Stabilization

- "Soil Stabilization in Pavement Structures - Volume 1: Pavement Design and Construction Considerations," Federal Highway Administration (USDOT) (190 pages - 1979)
- "Soil Stabilizations in Pavement Structures - Volume 2: Mixture Design Considerations," Federal Highway Administration (USDOT) (36 pages - 1986)

General

- "America Runs on Local Roads - Position Statement for Local Roads," from the National Symposium on Local Roads - Idaho (29 pages - 1986)
- "State and Local Highway Training and Technology Resources," Federal Highway Administration (USDOT) (188 pages - 1986)
- "Quality Assurance for Local Governments," Federal Highway Administration (USDOT) (105 pages - 1983)

BRP Bulletin Series

B-01-86 "Recycling Asphalt Pavement," 4pages

B-02-86 "Using Salt and Sand for Winter Road Maintenance," 4 pages

B-03-86 "Road Drainage," 4 pages

B-04-86 "Effects of Drainage Design on Road Performance," 4 pages

B-05-87 "Selecting a Consulting Engineer," 4 pages

B-06-87 "Maintaining Gravel Road Surfaces," 4 pages

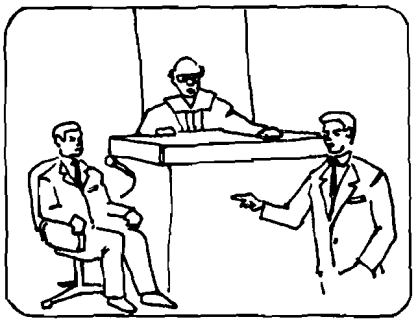
Repeat Performances

- "Pavement Management: A Manual for Communities," Metropolitan Area Planning Council (104 pages - 1986)
- "Pothole Primer: A Public Administrator's Guide to Understanding and Managing the Pothole Problem," U.S. Army Corps of Engineers (28 pages - 1985)
- "Drainage," New York State Department of Transportation (107 pages - 1981)
- "Work Zone Traffic Control: Standards and Guidelines," Federal Highway Administration (USDOT) (152 pages - 1980)
- "Local Highway Safety Improvement Program: Users' Guide," Federal Highway Administration (USDOT) (94 pages - 1986)
- "Local Highway Safety Studies: Users' Guide," Federal Highway Administration (USDOT) (215 pages - 1986)
- "The Massachusetts Infrastructure Project - Volume I," University of Massachusetts/Amherst (124 pages - 1986)
- "The Massachusetts Infrastructure Project - Volume II," University of Massachusetts/Amherst (125 pages - 1986)

Unless indicated, these reports can be obtained at no cost, while supplies last, from the Baystate Roads Program.

Reports listed in previous issues of "Mass Interchange" are also still available. To obtain a copy, or to find out more about a specific report, indicate your choice(s) in a letter to the program, or call Meryl Ann Mandell at (413)545-2604.

Tips for Reducing Tort Liability



In a time of increasing insurance premiums and lawsuits, local agencies need to know how to protect themselves from tort liability. Listed below are thirteen practical tips for reducing tort liability.

1. Define duties, responsibilities and authority of your staff.
2. Understand and perform duties satisfactorily.
3. Use competent professionals to assist in decision making.
4. Maintain adequate records.
   Establish adequate record systems to provide facts about existing conditions. These systems should include: traffic accident records and procedures for identifying high-accident locations, and inventory procedures which will provide reasonable current information about the physical features and conditions of existing transportation facilities and control devices.
5. Provide an inspection system.
   Establish and maintain a system of regular inspection. These inspections should cover the physical conditions of facilities and traffic control devices. Check traffic signs and signals at least twice a year both day and night; check traffic markings as needed, particularly in winter and early spring; check temporary traffic control device(s) on a daily basis; and establish a chain of command for inspections so that defects can be reported and promptly corrected.
6. Establish a complaint response system.
   Develop and maintain a procedure for handling complaints and reports. Designate one person to receive all such reports and to take appropriate action. Effective handling of complaints has legal and public relations benefits.
7. Keep good maintenance records.
   Complete and current maintenance records can provide information about the character of a repair including what the trouble was, repairs made, and materials used.
8. Use current design criteria.
   Make sure the designs of facilities or traffic control devices are consistent with currently adopted policies, guidelines, standards, and manual specifications.
9. Develop standards of performance.
   Adopt standards of performance in the areas of design, construction, operations and maintenance.
10. Follow rational procedures for priority setting.
    Establish procedures for deciding what improvements should be made. This would include the cost effectiveness of alternatives.
11. Conduct design and operational reviews.
    Review the design and operation of new facilities or traffic control changes. Inspect both active and completed projects.
12. Inform employees of "reasonable care."
    Impress all employees with the importance of reasonable care in doing their jobs.
13. Avoid false economies.
    Foolishly cutting necessary expenditures in order to appear fiscally responsible to the taxpayer inevitably leads to careless and negligent work.

(Adapted from "Technology Exchange," Winter 1986, Louisiana State University.)

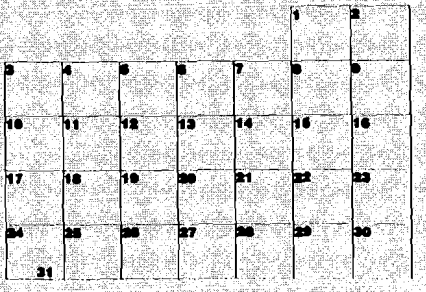
CALENDAR

NOTE: See page 4 for Upcoming Baystate Roads Program Workshops

May 7
Spring Meeting
Massachusetts Highway Association
Wachusett Country Club, W. Boylston
Contact: Harry Loftus
MHA Secretary
(617) 485-1973

May 13-15
District 1 Meeting
Institute of Transportation Engineers
Canandaigua, New York
Contact: John P. Thompson
Program Chairman, NEITE
(203) 865-2191

May 17-23
National Public Works Week



May 20
National Public Works Week Luncheon
Pier 4, Boston
Contact: S. Robert Pryzby
Secretary-Treasurer, NE Chapter APWA
(203) 659-2711

May 27-29
Advanced Seminar on Public Works Administration
New England Chapter - APWA
University of Massachusetts/Amherst
Contact: S. Robert Pryzby

June 29-July 1
The N. American Conference on Microcomputers in Transportation
American Society of Civil Engineers
Sheraton, Boston
Contact: Elizabeth Yee, ASCE
345 East 47th St.
New York, NY 10017-2398

August 16-20
TRB Low Volume Roads Conference
Ithaca, New York
Contact: Neil F. Hawks
(202) 334-2957

Massachusetts Department of Public Works
Federal Highway Administration
University of Massachusetts/Amherst

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University of Massachusetts
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IN THIS ISSUE

The Baystate Roads Program, which publishes *Mass Interchange* each quarter, is a Technology Transfer (T^2) Center created under the Federal Highway Administration's (FHWA) Rural Technical Assistance Program (RTAP). FHWA is joined by the Massachusetts Department of Public Works, the Department of Civil Engineering at the University of Massachusetts/Amherst, and local public works departments in an effort to share and apply the best in transportation technologies.

In addition to publishing *Mass Interchange*, the Baystate Roads Program facilitates information exchange by conducting workshops, providing reports and publications on request, and offering one–to–one technical assistance on specific roadway issues. Because the program relies on input from many sources, inquires, articles and ideas are encouraged.

To contact Baystate Roads staff to receive future copies of this newsletter at no cost, or to submit ideas or articles to *Mass Interchange*, call Meryl Ann Mandell at (413) 545–2604.