

# INTERCHANGE

VOLUME 2 NUMBER 3/4

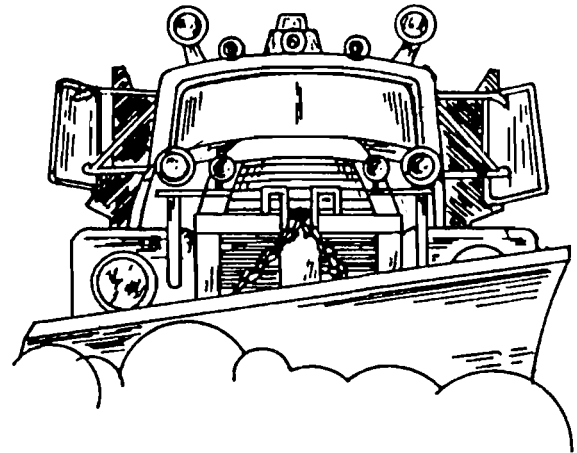
FALL 1987/WINTER 1988

## Winter Road Maintenance Snow Planning vs Chaos

An effective winter snow control program requires year-around work and planning. To make sure your town's snow control operation is comprehensive and well planned, refer to this checklist.

### Pre-winter Planning

- \* Develop a policy statement, which can range from "we will do nothing regardless of the amount of snow and ice" to "we will maintain a clear pavement on major roads or streets at all times".
- \* Develop a separate performance budget based upon needs. Use "storm log" data from past years to determine the number and severity of storms. Use such data to project needs and costs for subsequent seasons. A budget separate from other maintenance activities for snow and ice control will help eliminate the proverbial approach of "robbing Peter to pay Paul".
- \* Establish designated snow routes where needed. While establishment of snow routes may not be necessary in small or rural communities, they are, however, necessary in the more populated areas where there is considerable traffic. During such emergencies, enforcement of snow routed criteria (regulations) is vital in order to keep the main routes open and keep traffic moving. This may include towing offending vehicles.
- \* Plan plowing routes to bring trucks back to storage facilities when they are almost empty of deicing material. This saves time and fuel. Keep plowing routes short so they can be completed in two hours or less at a maximum speed of 25 miles per hour.
- \* Plan to keep routes for fire and other emergency vehicles plowed at all times, no matter what the weather.
- \* Have employees make trial runs of their routes before winter to familiarize themselves with routes, road conditions, obstacles and problem areas. Remember that roads conditions vary from year to year and obstacles may be present now that were not there in the past. Plan fall meetings to familiarize road crews with their winter duties and all routes in case someone becomes ill and another crew member must take over the route.



- \* New operators should be trained and tested for their manual abilities and understanding of plowing procedures, routes to be plowed, and sequencing of priorities of plowing. The seasoned operators likewise should be periodically re-trained and annually informed of changes in procedures, etc. The operators need to be trained to be sure they are not a hazard to the traveling public or to themselves.
- \* Utilize resources of local contractors to supplement one's own forces when needed. It is not feasible or cost effective for a governmental entity to staff up with personnel, buy enough equipment and stockpile enough materials to handle those unusually severe storms. Negotiate pertinent contracts with appropriate contractors prior to beginning of the season. Be sure that the contracts provide for timely response by the contractors once they are notified.
- \* During trial runs, pinpoint drains and waterways that must be opened after every storm. Mark other structures that will be hidden from a plow, including fire hydrants, guardrails, drop inlets, catch basins and curbing ends.
- \* Train operators thoroughly in the use of their equipment. This will ensure that operators are more effective and that equipment will last longer and cost less to maintain.

*Winter ..... cont. on p. 3*

## Commissioner Designate Garvey

### Reports on Bond Bill

#### Gives Keynote Luncheon Address at Baystate Roads Workshop

Commissioner Designate Jane Garvey addressed workshop attendees at the NACE Action and Training Guides Workshop on August 4th in Amherst, and August 5th in Dedham, on the 1987 Proposed MDPW Transportation Bond Bill. She reported on the current status of individual categories in the Bill, and answered questions of particular concern to attendees. Since her report, the Transportation Bond Bill has undergone revision in the State Legislature. As the Bill currently stands, proposed funding in some of the most popular categories is as follows:

- Local Aid Chapter 90: \$80 million for local aid highway improvements with up-front funding; the State Treasurer will set up a trust fund to disburse funds to each city or town.

- PWED: \$30 Million to cities or towns to fund projects encouraging or stimulating local employment and economic development.

- STRAP: \$5 million to towns with a population of 2500 or less. Each award can be up to \$200,000, with one award per town. The STRAP program, which provides grants to small towns for capital construction projects promoting public safety and economic development, is now intended to be a continuing part of the Transportation Bond Legislation.

- SALT SHEDS: \$5 million earmarked for cities and towns to construct salt storage sheds. It is anticipated that each shed will cost approximately \$75,000.

- ACCESS TO STATE OWNED LAND: \$1 million to towns of 15,000 or less population for the development or improvement of access to State owned lands.

- SECTION 3(T): Proposed amendment to add up to \$500,000 to Regional Planning Agencies for local



community assistance in pavement management activities as they apply to the use of Chapter 90 monies.

Note that the above mentioned funding levels are part of the proposed Bond Bill, and are subject to change by the Legislature. If you would like an update on the current status of the Bill or any of its provisions, call the Baystate Roads Program.

## VISION 20/20

A day-long meeting will be held on March 1, 1988 at the Transportation Building (10 Park Place, Boston) to address current and anticipated transportation needs in the Commonwealth. Sponsored jointly by the Massachusetts Department of Public Works and the national Advisory Committee on Highway Policy, this hearing will provide a forum to which interested groups and individuals may address their views on what direction future federal transportation legislation should take in meeting transportation concerns through the year 2020.

The Advisory Committee on Highway Policy, led by the Highway Users Federation, is directing this first phase of an ongoing effort by a large num-

ber of public and private agencies to help shape federal highway and public transportation policy. This major effort, called the "Transportation 2020 Consensus Program," is being spearheaded by the American Association of State Highway and Transportation Officials (AASHTO). Its purpose is to enable state and local officials, private industry, and public interest groups to work together to:

- Assess the nation's surface transportation requirements through the year 2020.
- Develop alternative proposals for meeting those requirements at the federal, state, and local levels.
- Achieve a consensus on the best means of doing the job.

The needs and interests of local highway agencies are best expressed by you – the people who struggle with limited budgets and unlimited demands; who fill the potholes and plow the roads; who, in short, are on the firing line, serving their communities day-in, day-out, year after year. This is your chance to be heard.

For more information about the March 1 meeting, call Meryl Ann Mandell, Baystate Roads Program, (413) 545-2604. To arrange to make a statement at the hearing, call Raymond Murphy, (617) 973-7850, at the Mass. Dept. of Public Works.

## Winter (cont.)

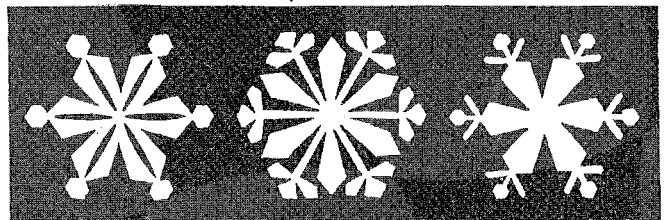
- \* Check all equipment, including wing and plow hydraulic systems, repairing, replacing and painting where necessary. Inspect the condition of moldboards and cutting edges on all snowplows. Order an adequate stock of spare parts for plows. Inspect snowplow hoists and underbody blades. Check air and hydraulic hoses and other critical parts of power units.
- \* Mount, load and test all spreaders. Make necessary repairs to spreaders and order critical parts. Calibrate all spreaders and place a calibration card on the visor or in the compartment of each truck. Keep copies of all calibration cards on file. Make sure all personnel are familiar with spreader controls, whether automatic or manual.
- \* Inventory and order all equipment parts in the summer or fall, so that when the time comes that they are needed, they will be on hand. It's difficult to obtain parts with a bizzard in progress.
- \* By the beginning of winter, you should have stockpiled one-half to three-fourths of the amount of deicing material you expect to use that winter. Reserve piles and "self-help" barrels for motorists to use at trouble spots are also good to have on hand.
- \* Properly store salt and other chloride compounds to prevent leaching, which harms the environment and may endanger the health of residents.
- \* Let the media, police, fire, and other officials know about your winter snow control plans. Provide citizens with a telephone number at which they can reach the road crew in an emergency.
- \* Consider contracting with a private weather forecasting firm which gives localized coverage for your area.

### Winter Operations

- \* As soon as a snow warning is received, get equipment ready and into location to start the snow removal process. You'll save time and prevent traffic tie-ups.
- \* Turn the cinder spreader around and mount it to the truck frame so that cinders fall in front of the rear tires. This will provide instant traction and eliminate the need for chains.
- \* Make sure plows are set at the correct angle both vertically and transversely. If they are set at the wrong angles, plows can require more effort to push, resulting in greater fuel consumption.
- \* If you are only plowing, your truck should be no more than one-half loaded with deicer and the truck bed should never be raised.
- \* To save fuel, use the optimum gear ratio when plowing.
- \* Begin deicing as soon as snow starts to accumulate to keep snow and ice from bonding to the pavement. When spreading deicing materials on two-lane roads, make sure the truck straddles the center line of the road. This saves time and fuel because the spreader has to make only one pass on these roads.

- \* Take advantage of nature when deicing. Let the wind help to spread salt and cinders over the roads. On elevated curves, let gravity work by spreading on the high part of the curve.
- \* To know when to reapply deicer to the road, watch the tires of cars traveling along the road. If snow falls directly behind the tires, it is time to reapply salt or cinders. If snow fans out under the tires, however, the deicer is still working.
- \* When spreading deicer or plowing and spreading simultaneously, never raise the truck bed higher than the top of the cab. Always stop the truck, raise the bed, shift the material to the spreader, and then lower the bed.
- \* Consider continuous plowing of both roads and road shoulders during a snow storm. That way, if another storm occurs within a few days, only fresh snow has to be plowed.
- \* Once the snow has stopped and plowing is finished, return to areas where drifting has occurred. Take two trucks on tandem and clear out the excess snow before it has time to harden. It is easier to push the drifts away from the road or cut down drifts when the snow is still fresh.
- \* Clear drains and catch basins to allow melting snow and ice to run off. Clear snow from barrier walls and traffic dividers to reduce later melting and refreezing of snow and to increase driver visibility. Also, plow and haul snow away from sharp corners and bends to increase visibility.
- \* Remove the windrows on the sides of bridges to prevent drifting. If windrows are allowed to remain, available roadway will be reduced and snow will later melt and form ice.
- \* Clear snow from raised medians to prevent drifting. If drifting does require roads to be closed, use a front end loader to shove banks back as far from the road as possible to keep them from building up near road shoulders.
- \* After returning to the garage, check the trucks, including wipers, light, oil, antifreeze, blades and hydraulic systems. Make sure to fuel and load trucks so they are ready to go at the next sign of snow.
- \* Use fencing to prevent drifts and reduce the need for snow and ice control.
- \* Preventive maintenance of equipment should be performed throughout the winter months after every 100 hours of service. This will add years to the life of the equipment and keep "downtime" to a minimum.

(Adaped from The Wheel, Colorado T2, and The Center Line, North Dakota).





As Superintendent of Streets for the Town of Lunenburg, my role is to keep local roads in the best condition possible. Over the years I have noticed the impact to the road surface caused by indiscriminate utility cuts. In order to minimize roadway damage, we have set up a mechanism requiring coordination with the Highway Department. I proposed to the Board of Selectmen, and aided passage of, a permitting process to regulate road cuts within a town way. This process has proven very successful, for it requires notification to the Highway Department of any roadwork, thereby facilitating coordination of maintenance and repair activities.

Utility companies are now usually the only people allowed to dig on our roads, but on some occasions private contractors are allowed to do some work. In order for contractors to do any work, they must be bonded for two years for the total amount of the project. With this commitment, I find that there is little or no maintenance required in the area they worked. What follows is a permit application form, and the regulations for the roadway "cross/alter" permit. If you have additional questions about the permit, or how we got the Town to adopt it, you can call me at (617) 584-4232.

#### TOWN OF LUNENBURG

Application for Permit  
Within a Town Way

To: Highway Superintendent \_\_\_\_\_, 1987

#### TOWN OF LUNENBURG

The undersigned \_\_\_\_\_  
of \_\_\_\_\_ hereby applies for permission to

\_\_\_\_\_  
\_\_\_\_\_

at No: \_\_\_\_\_ Street in the Town of Lunenburg.

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

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#### PERMIT

\_\_\_\_\_, 1987

PERMISSION IS HEREBY GRANTED FOR ABOVE REQUEST.  
CONDITIONS ON PAGE TWO OF THIS PERMIT MUST BE FOLLOWED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ALL UTILITY COMPANIES INVOLVED.

SAID PERMIT FOR THE ABOVE SHALL BE UNDER THE DIRECT SUPERVISION OF THE HIGHWAY SUPERINTENDENT AND SAID WAY SHALL BE REPLACED TO ITS ORIGINAL CONDITION BEFORE THE ABOVE MENTIONED PERMIT WILL BE PROPERLY RELEASED.  
HIGHWAY SUPERINTENDENT TO BE NOTIFIED 24 HOURS BEFORE CONSTRUCTION IS COMMENCED.

\_\_\_\_\_  
Highway Superintendent

This permit to be exercised within 30 days of above date.  
cc: Board of Selectmen

Town of Lunenburg  
Cross/Alter Permit  
Page 2

Highway Superintendent to be notified 24 hours before construction is commenced.

Unless otherwise authorized highway shall be drilled under and surfaces not to be disturbed. When approval is given for surfaces to be disturbed the following specifications shall be complied with:

**EXCAVATION:** When excavation is to be done within the limits of the bituminous surface, the surface shall be cut to a straight and vertical edge. Care shall be taken not to disturb or in any way damage the surface beyond these edges. Any equipment working on the project which may, in the opinion of the Highway Superintendent, damage the surface, shall work or be propelled on suitable platforms to prevent any marking or other damage to the roadway surface. Care shall be taken in stacking excavated materials on the surface, not to mark or in any way damage the roadway surface.

**BACKFILLING TRENCHES:** Backfill materials shall be placed by hand shovellers in layers not to exceed six (6) inches in depth. Each layer shall be compacted by hand tamping or by any other approved method. No material shall be excavated from the banks of the trench to backfill around the pipe or for any other purpose. Backfill material shall be brought to a true plane fourteen (14) inches below and parallel to the finished surface. Fourteen (14)

# Why Use a Minimum Four Inch Pavement Thickness Design?

by

Meryl Ann Mandell, Program Manager, The Baystate Roads Program

*based on a paper/presentation by Mr. Robert Joubert, P.E., R.L.S., District Engineer, The Asphalt Institute.*

This article offers research results discussed by Mr. Robert Joubert, District Engineer for The Asphalt Institute, at a recent Baystate Roads workshop on Managing Roadways and Potholes, and in an accompanying paper he authored. After many years of research, observation, and collaboration with other pavement engineers, Mr. Joubert's highly illustrative presentation identified a significant difference in pavement performance that can be associated with pavements that are a minimum of 3-1/2 to 4" in thickness. The major difference in performance is that the thicker pavements do not pothole, whereas thinner pavements pothole readily.

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*This notable characteristic in performance of thin pavements can have important implications for new subdivision street designs .....*

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When cracking progresses on thin pavements, the pieces are small enough and thin enough to be turned out by traffic, exposing the unbound granular base. This initiates the pothole. Traffic action can then easily enlarge and deepen it, and weaken the base in the surrounding area. This notable characteristic in performance of thin pavements can have important implications for new subdivision street designs, for subdivision streets are often built to poor minimum standards and become a continual maintenance problem for a community.

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*The major difference in performance is that the thicker pavements do not pothole, whereas thinner pavements pothole readily.*

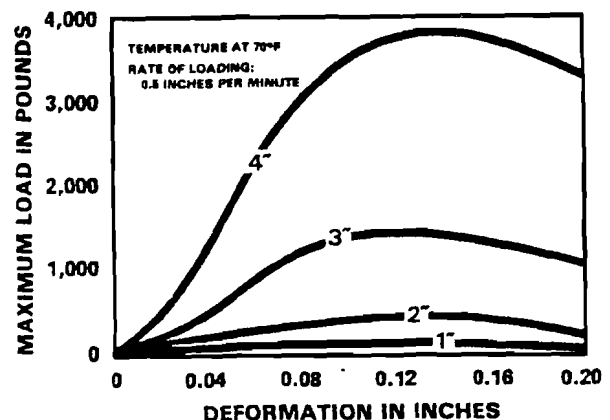
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At 4", the pavement can not pothole in the strict classical sense (the bowl shape type pothole that loses pavement and is deepened and enlarged as the granular base is eroded away by traffic.) Instead what happens when distress occurs due to overloading is that large cracks may appear, but the cracked pieces (even when an alligator pattern develops) are too large to be dislodged under traffic. If distress is occurring, it will be evident for several years, yet the roadway will still be safe and serviceable. Long term total neglect and minimal maintenance will eventually cause surface ravelling; however, ravelling and/or delamination principally impact rideability and appearance, not safety.

Support of these findings are detailed in three major references: 1) a paper by Martin Ekse, Volume 29 AAPT, 1960; 2) a paper by W. Phang, Volume 50 AAPT, 1981; and 3) WASHO Test Road Report, Part 2 Test Data, Analyses, & Findings. From these sources, it is clear that:

1. The 4" minimum pavement has much greater strength than AASHTO or other criteria would indicate by straightline coefficient useage, and in slab strength tests show substantially greater performance than that of a 2, 2-1/2, or 3" pavement.
2. The 4" thick pavement is virtually pothole proof.
3. Surface distress, notably breaking and cracking into many small pieces, is expanded and multiplied on thinner pavements. Resistance to surface distortion caused by freeze/thaw cycles is greatly increased. This is reflected in less surface rutting and waviness.
4. With a 4" design, a 2-1/2" pavement layer can carry construction traffic adequately, with a final 1-1/2" layer for the wearing surface. This becomes a substantial strengthening course that provides much more permanence to the pavement. A pavement that is 4" thick versus one that is only 2-1/2" thick is much stronger than the 30% increase in pavement thickness. Refer to the chart by Ekse to see that a 2-1/2" thickness supports only an 800 pound load prior to failure, whereas a 4" thickness will support 3800 pounds before failure. In contrast, during site-work or subdivision construction where a 2-1/2" total design generally has 1-1/2" of the thickness carrying all of the construction traffic for several years, the pavement gets easily overstressed, and even cracked on the underside, and eventually receives only an additional inch of wearing surface. This initial distress is what often leads to shorter performance periods prior to the first major maintenance or overlay.

## LOAD VS DEFORMATION OF ASPHALTIC CONCRETE SLABS



Source AAPT Proceedings Vol. 29  
paper by Martin Ekse.



# *The Commonwealth of Massachusetts*

*Executive Office of Transportation and Construction*

*Department of Public Works*

*Office of the Commissioner*

*Ten Park Plaza, Boston 02116-3973*

Dear Reader:

We have made great strides during the past 50 years in developing a road system in the Commonwealth that we can be most proud of. The challenge now facing us is managing this system in a way that best utilizes the limited resources we have available to keep our highways in an acceptable condition. One of the important techniques for providing this capability is pavement management. We have instituted a comprehensive pavement management program in the Department of Public Works designed to monitor and evaluate the state highway's pavement condition on a periodic basis. This program has become an important source of information for decisions relating to project priorities and types of improvements needed on deficient sections of the state highway system.

Several cities and towns have also initiated pavement management programs. I have been told that the experience so far with these programs has been very favorable. We have received several requests to include pavement management as an allowable activity in the Chapter 90 program. Because of the importance of pavement management to today's public works manager, I have concluded that pavement management can be included in the Chapter 90 program. It will provide important information to local officials on how best to improve their road system.

As we enter into the 1990's, the public will expect public officials to produce more results with less resources. No where is this more important than in transportation, an activity that daily affects the lives of every citizen in the Commonwealth. With techniques like pavement management, we will be able to meet this challenge.

Sincerely,

A handwritten signature in dark ink, appearing to read "Robert T. Tierney".

Robert T. Tierney  
Commissioner

The Baystate Roads Program, which publishes *Mass Interchange* each quarter, is a Technology Transfer (T<sup>2</sup>) 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, inquiries, 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.

## Videotape Library Established

Over one hundred videotape titles have been acquired by the Baystate Roads Program as the basis of a lending videotape library. Sample tape topics include: Snow Plow and Spreader Operation, Engine Preventive Maintenance, Suggestions for Speech Preparation and Delivery, and Traffic Control for Short Term Work Zones. These videotapes are available to local municipalities at no charge, and to private organizations for a small fee. The tapes can be either borrowed for a two week period, or requesters can send the Program a blank 1/2" VHS cassette tape for copying of non-copywrite tapes. Up to five tapes can be borrowed at one time, with additional tapes sent after return of the initial batch.

For a full listing of available videotapes, and more information on borrowing procedures, see the booklet enclosed with this newsletter. If you have additional questions, call Meryl Ann Mandell, Program Manager, Baystate Roads Program, at (413) 545-2604.

## Pavement Management Workshop for Regional Planners

On November 23, 1987, the Federal Highway Administration (FHWA) and the Massachusetts Department of Public Works (MDPW) conducted a workshop on pavement management system software in collaboration with the Baystate Roads Program. The workshop was held at the USDOT Transportation Systems Center in Cambridge.

The workshop was attended by over forty professionals employed with the thirteen regional planning agencies in Massachusetts, MDPW personnel, and FHWA representatives from the Division, Region, and National offices. The overall intent of the workshop was to offer technical assistance to regional planners regarding the subject of local pavement management. One workshop objective was to review the application of pavement management principles to roads under local jurisdiction. Another was to familiarize the RPA staffs with the various micro-computer software programs available for local pavement management.

The workshop consisted of two major sessions. In the morning session, developers of software programs gave brief descriptions of their systems; in the afternoon session, users of the software shared their experiences with the others.

The morning session opened with a welcome from Mr. James A. Walsh, Division 1 Administrator for the FHWA, followed by a brief review of pavement management principles by Dr. John Collura, Co-Director of the Baystate Roads Program. Mr. Robert C. Smith of Public Works Software, Mr. James D'Angelo of Vanasse Hangen Brustlin, and Mr. Richard Michael of Dufresne-Henry, discussed the use and capabilities of their programs. In addition, there was a presentation of the MAPC pavement management software program by Ms. Carol Blair.

The post lunch session included three software user presentations: Mr. Frank Lambert, Town Engineer for Barnstable; Mr. Steve Olsen, Town Engineer, Burlington; and Mr. Anthony Celli, Di-

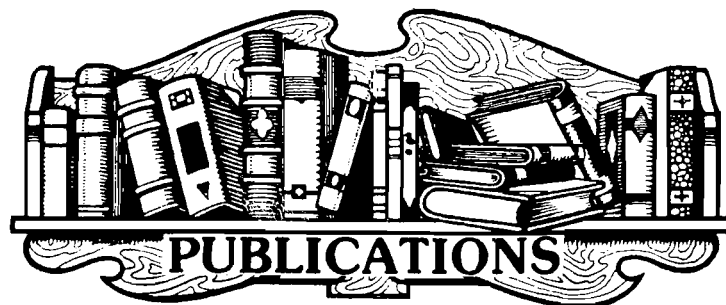
rector of Public Works for the Town of Walpole. The workshop ended with an open discussion moderated by Dr. Paul Shuldiner, Director of the Baystate Roads Program.

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### *Minimum (cont.)*

5. Pavement strength adjacent to utility cuts and castings is more substantial.
6. The additional strength offered by a 4" minimum provides a factor of safety when traffic growth and occasional overload situations have not yet been addressed.
7. Minimum 4" pavements are much easier to maintain, and generally require surface maintenance only. Treatment can be limited to individual crack sealing, liquid seals, and very thin overlays (unless significant traffic growth requires a thicker pavement).
8. A 4" minimum provides sufficient thickness for recycling by milling.
9. Better overall pavement quality and density can be achieved by using more compactible layer thicknesses, leading to less embrittlement and greater retention of flexibility with time.

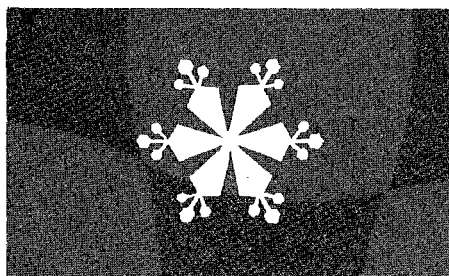
By bringing these findings to light as summarized presented in this article, Mr. Joubert has provided both practical performance observations and theoretical research support for the Asphalt Institute's designs that recommend a minimum of 4" for most all paving situations (including low volume roads with more than 350 heavy trucks per year.) Exceptions to this rule are automobile parking lots, driveways, very light traffic residential streets, e.g., cul-de-sacs, and very low trafficked farm roads with less than 350 heavy trucks per year. In these cases, a minimum of 3" is generally recommended. Consideration of factors such as the presence of utilities, frost severity, etc., should influence the decision to use 3" or 4". More information on this topic is available from Mr. Robert Joubert by phoning (617) 681-0455, or writing: The Asphalt Institute, 101 Amesbury Street - Room LL9, Lawrence, MA, 01841.



Unless indicated, these reports are available to public agencies at no cost, while supplies last, from the Baystate Roads Program. There is a small fee for private agency requests. 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

### Winter Maintenance

- Sample Contract Specifications: "Furnishing Sodium Chloride as required by the Massachusetts Department of Public Works," Mass. Dept. Public Works (36 pages - 1987).
- "The Snowfighter's Handbook: A Practical Guide for Snow and Ice Control," The Salt Institute (18 pages - 1982).
- "Snow and Ice Control Operations: Combined State Studies of Selected Maintenance Activities," Federal Highway Administration (USDOT)(37 pages - 1980).
- "Alternate Highway Deicing Chemicals - Executive Summary," Federal Highway Administration (USDOT)(16 pages - 1980).
- "Ice - Melting Characteristics of Calcium Magnesium Acetate Executive Summary," Federal Highway Administration (USDOT)(11 pages - 1986).



### Safety/Environmental

- "Ecological Effects of Highway Fills on Wetlands," University of Massachusetts at Amherst (121 pages - 1987).
- "Flagging Handbook," American Traffic Safety Services Association (25 pages - 1987).
- "The Massachusetts Amendments to the Manual on Uniform Traffic Control Devices and the Standard Municipal Traffic Code," Mass. Dept. of Public Works (62 pages - 1987).
- "Work Zone Traffic Control," Federal Highway Administration (USDOT)(165 pages - 1986).
- "Maintenance and Highway Safety Handbook," Federal Highway Administration (USDOT)(66 pages - 1977).
- "Guidelines for Signalized Left Turn Treatments," Federal Highway Administration (USDOT)(37 pages - 1981).
- "Synthesis of Safety Research Related to Traffic Control and Roadway Elements Vol.1," Federal Highway Administration (USDOT)(168 pages - 1982).
- "Traffic Control Devices Handbook - Part IV Signals," Federal Highway Administration (USDOT)(151 pages - 1983).

### Pavements

- "Basic Asphalt Emulsion Manual - Vol. 1," Federal Highway Administration (USDOT)(189 pages - 1980).
- "Installation Manual for Corrugated Steel Drainage Structures," NCSPA (93 pages - 1984).
- "Recycling Asphalt Pavements," Federal Highway Administration (USDOT)(132 pages - 1979).

- "Soil Stabilization For Low - Volume Roads Vol.1: Executive Summary," Federal Highway Administration (USDOT)(36 pages - 1986).

### BRP Bulletin Series

- B-07-88 "Private Weather Forecasting for Winter Highway Maintenance," 9 pages.
- B-08-88 "Do I need a Traffic Signal?" 7 pages.
- B-09-88 "What is a Highway Safety Improvement Program?" 5 pages.
- B-02-86 "Using Salt and Sand for Winter Road Maintenance," 4 pages.

Unless indicated, these reports are available to public agencies at no cost, while supplies last, from the Baystate

### Tips from the Field

The Iowa Technology Transfer Center has developed a series of one page "Tips From the Field", which describes examples of tool and equipment innovations developed and fabricated by local highway agency personnel in Iowa. Some of the topics are: bituminous storage cover lifter, truck-mounted hoist, blade cart, bridge inspection scaffold, sign storage rack, tailgate rack, and many other practical items.

For a copy of any or all of these practical hints, contact the Baystate Roads Program at (413) 545-2604. These tips include simple, effective means for a highway agency to work more productively. The Iowa Technology Transfer Center and Iowa highway agency personnel continue to add new tips, and we ask that you consider doing the same. If you have innovations that you would be willing to share, Program staff will be happy to help you spread your ideas.



# CALENDAR

					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

February 11 (Snow Date: 2/18)  
Winter Meeting  
Massachusetts Highway Association  
Lantana Restaurant, Randolph  
Contact: Harry Loftus  
MHA Secretary  
(617) 485-1973

February 27  
NE Inst. of Trans. Engineers  
Dinner Meeting  
Contact: John Thompson  
Program Chairman, NEITE  
(203) 865-2191

March 1  
Transportation 2020 Meeting  
Transportation Building  
10 Park Plaza, Boston  
Contact: Meryl Ann Mandell  
Baystate Roads Program Manager  
(413) 545-2604 or  
Contact: Raymond Murphy  
Mass. Dept. of Public Works  
(617) 973-7850

March 2 - Central New England  
College (Westborough)  
March 3 - Bridgewater State College  
March 4 - Univ. of MA at Amherst  
State Regulations Workshop  
Baystate Roads Program  
\* State Bid Regulations  
\* Chapter 689 Traffic Signal and  
Sign Law  
\* Acceptance, Abandonment, & Dis-  
continuance of Local Roads  
Contact: Meryl Ann Mandell

April 10-13  
APWA North American Snow Confer-  
ence  
Des Moines, Iowa  
Contact: F. Worth Landers  
APWA Director, Region 1  
(617) 799-1430

April 27-29  
District 1 Annual Meeting  
Institute of Trans. Engineers  
Mystic, Connecticut  
Contact: John Thompson

May 15-21  
National Public Works Week

May (Day not yet set)  
Annual Meeting  
Massachusetts Highway Association  
Wachusett Country Club, W. Boylston  
Contact: Harry Loftus

## TENTATIVE 1988 BRP WORKSHOP SCHEDULE

March 2,3,4: State Regulations  
June 7,8: Drainage  
August 2 - 4: Local Agency Main-  
tenance Management System and  
Equipment Management System (3  
day course)  
October 4,5: Labor Relations/ Man-  
agement  
Contact: Meryl Ann Mandell

### Permit (cont.)

inches of gravel shall be placed in lay-  
ers not to exceed seven (7) inches in  
depth and each layer compacted by an  
approved method. The top surface shall  
be Type 1 or cold patch.

REPLACING SURFACE: Surface shall  
not be replaced for at least sixty (60)  
days after the above work has been  
completed. Surface shall be replaced  
no later than six (6) months after work  
has been completed. The gravel backfill  
shall be excavated to a depth of two (2)  
inches. Two (2) inches of compacted  
bituminous concrete Type 1 shall be  
placed and rolled so that the finished  
surface shall be level with the roadway  
surface. Finished Type 1 patch that is  
applied is to extend a minimum of ten  
(10) feet on both sides of the cut with  
minimum of two (2) inch diagonal cuts  
by jack hammer on ends. The person  
or persons applying for permit to be  
responsible for two (2) years after the  
completion of the surface, to the satis-  
faction of the Superintendent of Streets.

CLEAN-UP: All ledge, boulders or other  
debris left from construction shall be  
removed from within the roadway lay-  
out by the contractor before project is  
accepted by the Town of Lunenburg.

## Wanted: Retired Engineers and Public Works Officials

The Baystate Roads Program is de-  
veloping a roster of retired engineers  
and public works officials who are in-  
terested in providing assistance to local  
transportation and public works agen-  
cies. We are looking for retired engi-  
neers who would like to work only on  
an occasional basis. Their experience  
and education are valuable assets which  
can and should be utilized. If you know  
of such a person, please give them this  
information, and have them contact the  
Program.

It is not our intention to compete in  
any way with consulting companies;  
on the contrary, we want to provide a  
service to locals that is effective and  
which is not presently being provided by  
consultants, nor is likely to be of interest  
to them. We visualize the provided help  
to be rather short term and quite often  
basic in nature. It is anticipated that a  
preliminary assessment of this type may  
very well lead to a recommendation that  
a consultant be retained.

The program is looking at this tech-  
nology sharing effort as a "clearing  
house" and not as an "employment  
agency". As we get requests for help,  
we will compare these requests within  
our roster of available engineers and  
public works officials. The resulting list  
of retired engineers will be furnished to  
the requesting agency. It will be up to  
the requesting agency to make the nec-  
essary contacts, selection of engineer,  
agreement on compensation, etc.

If you want to keep active in the trans-  
portation arena and help the locals  
stretch that transportation dollar,  
please sign up. If you are interested,  
call Meryl Ann Mandell, Baystate Roads  
Program Manager, at (413) 545-2604,  
or write to the Program at the address  
listed on this newsletter. Please share  
this information with a retired friend  
or coworker who might be eligible. In-  
cluded in this newsletter is a biograph-  
ical data sheet that must be completed  
in order to participate in this Program.

(Adapted from the Colorado T2 Pro-  
gram)

# BIO-DATA SHEET

Name: \_\_\_\_\_ Home Phone: \_\_\_\_\_  
Address: \_\_\_\_\_ Business Phone: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Present Employer (if applicable): \_\_\_\_\_  
Previous Employer: \_\_\_\_\_ Years of Service: \_\_\_\_\_  
Job Title at Time of Retirement: \_\_\_\_\_

## Areas of Expertise

*Check only those areas in which you plan to offer assistance*

### Administration

- ☐ Legislative Process
- ☐ Finance & Budgeting
- ☐ Purchasing
- ☐ Personnel & Supervision
- ☐ EEO
- ☐ MBE
- ☐ Training
- ☐ Other (specify) \_\_\_\_\_

### Transportation Planning

- ☐ System Planning (St/Rd)
- ☐ Land Use
- ☐ Rural Transit Systems
- ☐ Mass Transit Systems
- ☐ Handicapped & Elderly
- ☐ Environmental
- ☐ Other (specify) \_\_\_\_\_

### Pavement Design/Performance

- ☐ Design Criteria
- ☐ Pavement Management Systems
- ☐ Road Condition Survey
- ☐ Rutting
- ☐ Rehabilitation
- ☐ Recycling
- ☐ Geotextiles
- ☐ Other (specify) \_\_\_\_\_

### Maintenance

- ☐ Maintenance Mgmt. Systems
- ☐ Equipment Mgmt. Systems
- ☐ Bridge
- ☐ Roadway
- ☐ Pavement
- ☐ Snow & Ice Control
- ☐ Other (specify) \_\_\_\_\_

### Right-of-Way

- ☐ Mapping
- ☐ Appraisal
- ☐ Negotiation
- ☐ Access Control
- ☐ Other (specify) \_\_\_\_\_

### Hydraulics/Hydrology

- ☐ Roadside Drainage
- ☐ Erosion Control
- ☐ Other (specify) \_\_\_\_\_

### Structures

- ☐ Culvert Design
- ☐ Bridge Design
- ☐ Nat'l. Bridge Insp. Stds.
- ☐ Bridge Inventory
- ☐ Load Limit Posting
- ☐ Retaining Walls
- ☐ Other (specify) \_\_\_\_\_

### Materials

- ☐ Specifications
- ☐ Test Procedures
- ☐ Base Stabilization
- ☐ Asphalts & Emulsions
- ☐ Sulphur Extended Asphalt
- ☐ Cement
- ☐ Concrete
- ☐ Concrete Additives
- ☐ Fly Ash
- ☐ Other (specify) \_\_\_\_\_

### Utilities

- ☐ Agreements
- ☐ Adjustments
- ☐ Other (specify) \_\_\_\_\_

### Design

- ☐ Geometrics
- ☐ Capacity
- ☐ Value Engineering
- ☐ Other (specify) \_\_\_\_\_

### Construction

- ☐ Contract Administration
- ☐ Inspection Procedures
- ☐ Utility Cuts
- ☐ Other (specify) \_\_\_\_\_

### Operations & Safety

- ☐ Signs & Supports
- ☐ Pavement Markings
- ☐ Traffic Barriers
- ☐ Accident Data Collection
- ☐ Driver Expectancy
- ☐ Crash Testing
- ☐ Hazardous Spills Control
- ☐ Rail/Hwy Grade Crossings
- ☐ Vehicle Size & Weight
- ☐ Tort Liability
- ☐ MUTCD
- ☐ Flagging
- ☐ Work Zones Traffic Control
- ☐ Other (specify) \_\_\_\_\_

### Computers

- ☐ Microcomputers
- ☐ Pavement Management Software
- ☐ Lotus 1-2-3 Software
- ☐ DBMS Software
- ☐ Transportation Planning Software
- ☐ Traffic Engineering Software
- ☐ Highway Engineering Software
- ☐ Project Management Software
- ☐ Other (specify) \_\_\_\_\_

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Winter 1987 - Winter 1988

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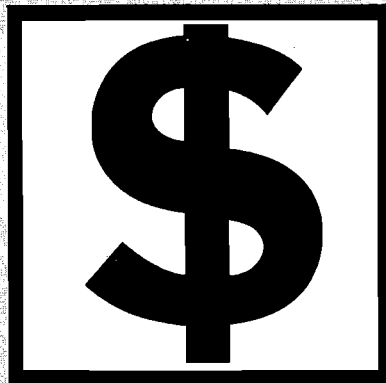
### Ten Commandments For Good Roads

People who build roads best and keep them in top condition abide by the following rules:

1. Get Water Away From the Roads.
2. Build on a Firm Foundation.
3. Use the Best Soils Available.
4. Compact Soils Well.
5. Design for Winter Maintenance.
6. Design for Traffic Loads and Volumes.
7. Pave Only Those Roads that are Ready.
8. Build from the Bottom Up.
9. Protect Your Investment.
10. Keep Good Records.

(From: Vermont T2 newsletter)

### Flood Disaster Assistance Funding



The Federal Highway Administration, in a letter to Governor Michael Dukakis dated September 16, 1987, announced an allocation to the State of Massachusetts for five million dollars of Emergency Relief (ER) Funds. Responding to damage assessment reports prepared by the Massachusetts Department

of Public Works (MDPW) and municipal engineers, this funding action will assist in the repair and restoration of roads and streets - under both State and local jurisdictions - affected by the severe flooding which occurred April 1987 in Franklin, Berkshire, Hampshire, Worcester, Middlesex, and Essex counties.

The FHWA Emergency Relief funds are available for damaged routes on the Federal-Aid highway system, and are in addition to funds provided by the Federal Emergency Management Agency (FEMA) for roads off the Federal-Aid system.

Through the ER program, costs incurred by the cities and towns for temporary and permanent repairs will be reimbursed by MDPW. For more information contact Mr. Richard Buser, Federal Highway Administration - Cambridge at (617) 494-2316.

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 Amherst, MA 01003

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