

# INTERCHANGE

VOLUME 4 NUMBER 1

FALL 1989

## Baystate Roads is on the Go

Remember us? We have been on temporary hiatus (3 months), but are now back on the job. Before we tell you about the new projects we have planned for our next budget stage, we want to remind you of some of our efforts to date. So, if you don't mind reading facts, here goes:

- We provided training to 1174 people at BRP workshops .
- Over 197 different Massachusetts municipalities were represented at the BRP workshops (of 351 communities).)
- The workshops we have developed and offered include: 1) Winter Maintenance, 2) Road Surface Management for Local Governments, 3) Managing Construction Contracts, 4) Managing People: Labor Relations, 4) Managing Purchasing, 5) Managing Gravel Roads and Potholes, 6) Managing Potholes and Roadways, 7) NACE Action and Training Guides, 8) Local Highway Safety Improvements, 8) State Regulations, 9) Pavement Management Simplified, 10) Local Agency Maintenance and Equipment Management System, Drainage, 11) Training for Municipal Highway Personnel, 12) Personnel/Labor Relations, 13) New England Technology Transfer Conference on Roadway Pavements
- 8236 reports have been distributed, at little or no cost to the user;
- 355 videotapes have been borrowed from the videotape lending library;
- BRP has dubbed an additional 284 videotapes on request;
- 8 copies of Mass Interchange have been printed and distributed;
- an Inspector's Job Guide has been widely distributed;
- we have spoken at meetings and conferences across the State;
- AND LOTS MORE!!!!!!!

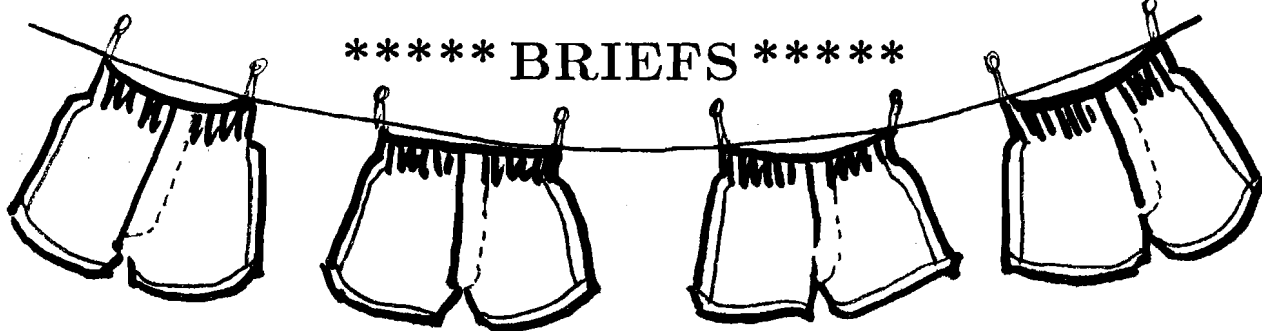


In addition to continuing our current efforts, we are planning some exciting new activities. We are developing a van roadshow program which will bring training directly to your highway garage. The "roadshow" will consist of short, 1-2 hour workshops on the topic of your choice. Your role will be to pick the topic, invite your staff and some surrounding towns, and tell us how it worked out. Let us know if you are interested in hosting a mini-workshop by dropping us a note — you can also list some topics that interest you, and some possible dates.

Also in this newsletter is an appeal for hiring some roadshow mini-trainers. We are looking for retired, or just plain interested, folk who will moderate the mini-workshops. You will benefit directly by helping us pass along the information to an interested party. We will be sending you more information about the van program as the planning progresses.

We also plan to offer more workshops than in the past. For the upcoming year, we are planning workshops on the following topics: All About Pavements, Winter Maintenance, Surface Treatment Alternatives, Project Level Pavement Management, Safety Issues, and Basic Computer Use. Be watching for a brochure announcing specifics of each workshop.

With the addition of the new and expanded activities we are planning, we shall be quite busy. NOTE: We always have time for you. Whenever you have a transportation concern, or are looking for a report or videotape, give us a call and we will help. Together we will make the upcoming BRP year a productive one.



**THE COMMERCIAL DRIVER'S LICENSE** – By April of 1992, every commercial driver in the U.S. will be required to have a Commercial Driver's License (CDL) issued by his or her home state. CDL's are to be issued under the terms of the Commercial Motor Vehicle Safety Act of 1986, which has 3 major objectives:

- ★ To ensure that each commercial driver has only one license, ending the practice by which some drivers spread violations or suspensions over several licenses in order to keep driving;
- ★ To ensure that all convictions for driving offenses are reported to the issuing state and then made part of the driver's record;
- ★ To establish uniform testing and licensing standards.

In order to effect these objectives, a clearinghouse is being established which will eventually contain identifying data on all commercial truck and bus drivers, now estimated to number about 5.5 million.

Every commercial driver must have a CDL, issued by his or her home state, by April of 1992. An applicant must pass a test demonstrating knowledge necessary to operate a commercial vehicle and a driving test in the type of equipment to be operated. The road test may be waived by individual states if the driver has a safe driving record. States must check with the clearinghouse before issuing a license to be certain the driver does not have other licenses.

Several states have begun to issue CDL's in advance of the 1992 deadline, and all states should be connected to the computerized clearinghouse by early 1991.

**HOW DANGEROUS IS ROAD SALT?** – A newspaper article in the January 27, 1989 edition of the Springfield Union-News reports that the U.S. Environmental Protection Agency is currently reviewing its sodium guidelines for water supplies, and the State of Massachusetts may do the same. Highways are often placed in lowland areas, beside lakes and stream beds and above underground aquifers, and road salt commonly finds its way into water supplies. Massachusetts has been following the EPA's guidelines for sodium in policing its water supplies. By state law, when water reaches a sodium level of 20 milligrams per liter or more, consumers must be notified.

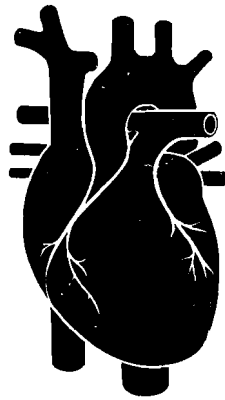
A new environmental impact study of roadsalt done for the Massachusetts Department of Public Works has found that health effects brought on by salt contamination of water supplies are a relatively low concern, although economic damage to cars, roads and bridges is still a major concern. Some health officials say the amount of sodium in drinking water is of little effect when compared to the amount of sodium in the rest of the American diet. There is a link between salt and high blood pressure, but it is not fully understood. A study released last summer found that although salt at low levels does raise blood pressure, once the salt intake exceeds those low levels, it appears to have little effect on blood pressure from then on. As a result of this evidence EPA is reconsidering the levels of sodium allowable in drinking water.

**CLARIFICATION** – Anthony J. Buccitelli, Deputy Chief Counsel for the MA Dept. of Public Works, added to his article in the Winter 1989 MASS INTERCHANGE, "Prequalification of Contractors for Chapter 90 Projects." His comment addressed Chapter 90 project value, stating that prequalification is required only when project value exceeds \$50,000. Attorney Buccitelli's statement is as follows: "In accordance with MGL Chapter 29 Section 8B, Prequalification Requirements do not apply to any prospective bidder, the aggregate amount of whose work with the MDPW, including the amount of its proposal, is less than \$50,000."

**JURY FINDS TOWN LIABLE IN ROAD DEATH** – A Superior Court jury has found a Worcester County town responsible for a tree-covered stop sign blamed in a motorcyclist's death and ordered it to pay \$506,000 to the victim's family. The Worcester Superior Court jury returned the verdict Wednesday in a case filed by a father whose son died in the accident in July 1984. The young man died after his motorcycle was hit by a car driven past the stop sign at the street intersection. A state trooper presented photographs showing the stop sign almost totally obscured by trees and other growth. Despite the jury award of \$506,000, the town is only liable under state law for up to \$100,000, officials said. **SOURCE:** Daily Hampshire Gazette, July 8, 1989.

# HAVE

# A (HEALTHY) HEART



– Heart disease is a serious problem among Americans. It is the No. 1 cause of death in the United States, outnumbering deaths from cancer and accidents combined. A blood cholesterol level of over 200 mg/dL is considered too high for the long-term health of your heart.

Factors that increase the risk of heart disease can be divided into those the individual cannot control and those he can. Factors that can not be controlled include a family history of heart disease, male sex, and age over 40. Factors that can be controlled include high blood cholesterol, smoking, high blood pressure and overweight. Many people with high blood cholesterol can lower it by reducing their intake of saturated fat. The most important things to do if you find your blood cholesterol level too high are to eat less fat and to lose weight if you are overweight.

The American Heart Association recommends that no more than 10 percent of your calories come from saturated fat. Table 1 gives some examples of high and low saturated fat foods:

| Table 1                     |                        |                              |                        |
|-----------------------------|------------------------|------------------------------|------------------------|
| Foods High In Saturated Fat | Saturated Fat Calories | Low Saturated Fat Choices    | Saturated Fat Calories |
| <b>Beef</b>                 |                        | <b>Fruit</b>                 | 0-1                    |
| Round steak                 | 7/oz.                  | <b>Vegetables</b>            | 0-1                    |
| Roast                       | 11/oz.                 | Turkey breast, roasted,      |                        |
| Porterhouse steak           | 13/oz.                 | baked, broiled,              |                        |
| Ground beef, lean           | 25/oz.                 | without skin                 | 1/oz.                  |
| Whole milk                  | 45/cup                 | <b>Chicken breast,</b>       |                        |
| Most cheeses                | 50/oz.                 | roasted, baked,              |                        |
| Hot dogs                    | 60/frank               | broiled, without skin        | 3/oz.                  |
| Lunchmeats                  | 30/oz.                 | <b>Fish, broiled, baked,</b> |                        |
| Doughnuts                   | 11-24/doughnut         | poached                      | 0.3-5/oz.              |
| Cake                        | 8-16/slice             | Skim milk                    | 0                      |
| <b>Pork</b>                 |                        | <b>Low fat yogurt</b>        | 3/doz.                 |
| Chops                       | 14/oz.                 | 1% cottage cheese            | 6/half cup             |
| Ham                         | 4-13/oz.               | Safflower oil                | 11/Tbsp.               |
| Sausage                     | 26/oz.                 | Corn oil                     | 15/Tbsp.               |
| Bacon                       | 45/oz.                 | Olive oil                    | 16/Tbsp.               |
| Butter                      | 64/Tbsp.               | <b>Margarines made with</b>  |                        |
| Ice cream                   | 80/cup                 | polyunsaturated oils         | 9-18/Tbsp.             |
| Fried potatoes              | 25/10 strips           | Dried peas and beans         | 0                      |
| 2% milk                     | 27/cup                 | Pasta, without cheese        |                        |
| Potato chips                | 19-30/oz.              | or meat                      | Trace                  |
| Nondairy coffee             |                        | Rice                         | 0                      |
| creamer (coconut            |                        | Popcorn, air popped          |                        |
| oil)                        | 26/oz.                 | without butter               | 0                      |
|                             |                        | Whole grain breads           | 1/slice                |

The good news is that low fat, low cholesterol foods are also low in calories. Eating more low fat foods will automatically cut your calorie count and help you lose weight.

It is easiest to make changes if you go about it gradually. Table 2 gives some suggestions for substituting lower fat foods for those high in fat:

Table 2  
Healthy Substitutes

| Instead of                   | Try  |
|------------------------------|--|
| Bacon                        | Canadian Bacon   |
| Frying                       | Baking, broiling or steaming   |
| Sour cream on a baked potato | Low fat yogurt or cottage cheese   |
| Buttering vegetables         | Vegetables with herbs and lemon, lime, or orange juice                               |
| A red meat main dish         | Pasta or rice with a little meat, skinless white meat poultry, or fish for seasoning |
| Meat every day               | Meat three times a week or less  |
| A fast food burger           | The salad bar  |
| Lean ground beef             | Lean trimmed round steak, white meat poultry without skin, or fish                   |
| Commercial baked goods       | Home baked treats, using polyunsaturated oils and margarine                          |
| Cream or butter sauces       | Sauces using wine or low fat broth   |
| Nondairy coffee creamer      | Nonfat milk  |
| Chocolate                    | Cocoa  |
| Butter                       | Tub or soft margarine  |
| Cooking with animal fats     | Cooking with vegetable oils such as sunflower, olive, or peanut oils                 |
| Whole milk                   | Skim or low fat milk   |

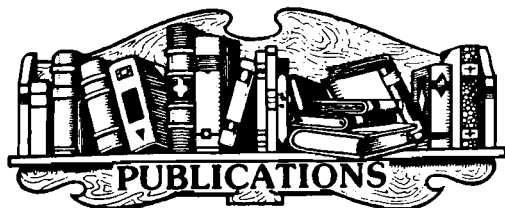
Make enough changes, and stay with them to reach your blood cholesterol goal of less than 200 mg/dL. Your new eating pattern is for life. (From: "Your Blood Cholesterol Level: What it Means for Your Heart")

## WANTED: RETIRED ENGINEERS AND PUBLIC WORKS OFFICIALS

The Baystate Roads Program (BRP) is developing a roster of retired engineers and public works personnel who are interested in serving as part-time trainers for the new Baystate Roads video-roadshow program. Their experience and education are valuable assets which the BRP would like to utilize. The 'mini-trainers' would work on an occasional basis, as fits their schedule, and would be paid an hourly rate.

The video-roadshow program is a new outreach effort of the Baystate Roads Program. Mini-workshop sessions will be scheduled by municipalities around the state. The trainers will use the Baystate Roads van to bring training directly to municipal highway garages and similar sites. The agency hosting the mini-workshop will choose the topic(s), with most sessions expected to last approximately two hours. The host community will be responsible for inviting the audience, providing refreshments, and determining the program length and content. We anticipate that BRP videotapes would be used to provide the body of the presentation, with the mini-trainer serving as moderator and discussion facilitator. Please contact the Program if you are interested in serving as a mini-trainer, or know of someone who might be interested.

If you want to keep active in the transportation arena, and help your fellow highway colleagues stretch their transportation dollars, then please sign up. For more information, call Meryl Ann Mandell, Baystate Roads Assistant Director, at (413) 545-2604, or write to the Program at the address listed on the newsletter. Please share this information with a retired friend or coworker who might be interested.



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 available while supplies last. To obtain a copy, indicate your choice(s) in a letter to the Program.

### New Listings

- The University of Kansas Transportation Center has produced a newsletter, the focus of which is "Microcomputers in Transportation—Part 2." Photo-copies are available.
- "Time-Based Coordination of Traffic Signals," FHWA (28 pages - 1984) reviews system alternatives available to engineers and provides a definition of time-based coordination.
- "Improving Operational Safety on Local Roads and Streets," FHWA (46 pages - 1988). This general guide to effective, low cost methods of improving and enhancing operational highway safety is based on actual situations and observations made nationwide.
- "Improving Highway Information at Hazardous Locations," FHWA (69 pages - 1985) provides a summary of the Positive Guidance process.
- "A Users' Guide to Positive Guidance" (2nd Edition), FHWA (198 pages - 1981). This volume, which consists of two parts, describes the Positive Guidance concept and the Engineering and Human Factors Procedure.
- "Investigation of Materials and Structural Properties of Asphalt-Rubber Paving Mixtures, Vol. 1: Technical Report," FHWA (116 pages - 1985). Ground tire rubber as an additive in asphalt pavement construction is investigated, including a design procedure and guidelines for preparation of specifications for construction of seal coats and interlayers.

- "Managing Small Towns, A Primer on Municipal Management for Towns with Populations under 20,000," Brent A. Wilkes, Editor, Massachusetts Municipal Association (MMA) (139 pages - 1986). This volume is aimed at present and aspiring local officials who seek to improve their understanding of town government. It covers a myriad of municipal issues, eg. improving the management capacity of small towns. Additional copies of this report are available directly from the MMA for a fee. Call (800) 426-7272 for more information.

- "Policy and Procedures for Assisting Employees with Alcohol or Other Drug Related Problems," Town of Danvers (3 pages - 1981). This brochure contains a description of an employee assistance program policy implemented by the Town of Danvers with respect to alcohol or drug related problems.

- "Safety Rule Book," National Safety Council, MIIA (28 pages - 1986). This booklet provides guidelines for development of safety policies and procedures for town governments.

- "Snow and Ice Removal Plan," Burlington Public Works Department for the City of Burlington, VT (15 pages - 1988). This Special Report to the People of Burlington includes a description of Department operations; statistics on equipment, labor and costs; goals and objectives of the snow removal program; and winter tips.

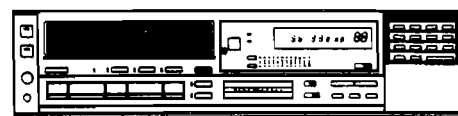
- "Snow and Ice Control '89, A Survey of Current Practice," by Tom Kuennen, Editor, Roads and Bridges Magazine (7 pages - 1989). This article, to be published in Roads and Bridges Magazine, outlines the results of a survey of snow and ice control techniques used by states, cities, counties, townships, and toll highway authorities.

- "Pavement Recycling Guidelines for Local Governments," FHWA (4 vols., 640 pages - 1987). These documents categorize the different types of recycling processes, and discuss the situations in which the different types are applicable.

- "Surface Design and Rehabilitation Guidelines for Low-Volume Roads," FHWA (228 pages - 1987). This manual is for use by owners, managers,

and engineers involved with the design, rehabilitation and maintenance of surfacing for low-volume road networks.

- "Computer Controlled Traffic Signal Systems," FHWA (343 pages - 1982). This book provides technical and management information for the development of an efficient computerized traffic signal system.



### Videotape Lending Library New Acquisitions

The videotapes listed below have been added to our Video Lending Library holdings. To borrow a copy, or to obtain a complete listing of our holdings, send a note to the BRP with your request. A Borrower's Registration Card must be on file before a tape can be borrowed.

- PA-119 Productivity; Productivity and the Manager's Role (20, 80 min)
- PA-120 Road to Happiness (30 min)
- PA-121 Ramp Metering: Signal for Success (17 min)
- PA-122 Wetlands Development Progress and Environmental Protection under Changing Law, Tapes 3 & 4 (113 min)
- PA-123 Wetlands Development Progress and Environmental Protection under Changing Law, Tapes 1 & 2 (98 min)
- PA-124 BRP Personnel Labor Relations Workshops (240 min)
- PA-125 Guidelines (7 min)
- PA-126 Idea Store (8 min)
- PA-127 Construction Workzone Liability (27 min)
- PA-128 Tort Liability: A New Perspective; Traffic Control Materials (20 min)
- PA-129 The Road Ahead (10 min)
- PA-131 Introduction to Street Scene Management (6 min)
- PA-132 Positive Signs of Life (18 min)
- PA-133 Sheeting Training Film (49 min)

# MDPW Bituminous Concrete Mix Guidelines

| MIX                 | USES  |   |
|---------------------|---|---|
| Top Course          | <ol style="list-style-type: none"> <li>1. Pavement wearing surface where ADT is 10000-15000. Usually placed in compacted lifts of 1-1/4 to 1-1/2 inches.</li> <li>2. Can also be used for thin lift resurfacing that calls for compacted 3/4-inch lifts.</li> <li>3. Suitable for sidewalk pavements if so specified.</li> </ol>  | Base Course                                   |
|                     |   | Dense Mix                                     |
| Modified Top Course | <ol style="list-style-type: none"> <li>1. Pavement wearing surface where ADT is greater than 10000. Place in compacted lifts of 1-1/2 to 1-3/4 inches.</li> </ol>   | Surface Treatment                             |
| Binder Course       | <ol style="list-style-type: none"> <li>1. Standard binder course placed as the substrate for all wearing surfaces except "popcorn" – open graded friction course – surfaces.</li> <li>Place in 1-1/2 to 1-3/4 inch compacted lifts.</li> <li>2. When construction shuts down during winter months and the binder course will serve as the temporary wearing surface, the job mix formula for the binder course should be revised to include a larger percentage of fine aggregate.</li> </ol> | Open-Graded Friction Course (OGFC)            |
| Dense Binder Course | <ol style="list-style-type: none"> <li>1. Primarily used as substrate for "popcorn" mix. Placed in 1-3/4 to 2 inch lifts.</li> <li>2. Use as a wearing surface where grades, curves, traffic signals, etc., will – due to vehicular stresses – cause severe</li> </ol>  | Open-Graded Friction Course Modified (OGFC-M) |

- pavement distortion, such as rutting, shoving, washboarding, etc.
3. Use as the protective course over waterproofing membrane on bridge decks.
    1. Used as substrate for Binder and Dense Binder where base course is required. Placed in 2-1/2 to 4 inch lifts.
    1. Used for Bituminous Concrete Curb and Paved Waterways.
    2. Should be used for sidewalks and wherever a dense smooth surface is required.
    3. Can be used as a leveling course where thin feathering is required.
      1. Use in lieu of chip seal treatment. Placed in 1 inch lifts.
  1. Used as a skid-resistant wearing surface. Placed in 3/4 to 1 inch lifts.
  2. This mix shall be used only when surface and ambient temperatures are 60 degrees F. and rising.
  1. Used as a skid-resistant wearing surface. Placed in 1 to 1-1/4 inch compacted lifts. This mix to be used in lieu of OGFC only when surface and ambient temperatures are less than 60 degrees F. and falling, but not below 40 degrees F.

NOTE: These definitions were compiled by Gino Bustanza, Research and Materials Engineer, MA Dept. of Public Works

## CALENDAR

September 7  
Equip. Show and Clambake  
Massachusetts Highway Association  
Topsfield Fairgrounds  
Topsfield, MA  
Contact: Harry Loftus  
(508) 485-1973

October 5, 11, 12  
All About Pavements Workshop  
Amherst, Dedham, Westboro  
Baystate Roads Program  
Contact: Meryl Ann Mandell  
Note: Brochure to follow

October 28  
New England Chapter APWA  
Fall Meeting  
Location: TBA  
Contact: Frank Lagrotteria  
(617) 337-5100

November 8  
Massachusetts Highway Association  
Fall Meeting  
Quality Inn  
Chicopee, MA  
Contact: Harry Loftus

### Videos (cont.)

- ST-125 Split Seconds: Split Lives (23 min)
- ST-126 Chainsaw Safety (21 min)
- ST-127 It Always Happens to the Other Guy (21 min)
- ST-128 Where Does the Road Go? (5 min)
- ST-129 Split Second Decisions (11 min)
- ST-130 Emergency Relief (17 min)
- ST-131 Mailboxes May Be Hazardous to Your Health (14 min)
- MO-163 The Only Front Spreader
- MO-164 UPM Cold Mix (13 min)
- MO-165 Modern Motor Grader Operation: Modern

- MO-166 Motor Grader Operation Made Better (26, 7 min)
- MO-167 Operational Tips and Techniques for Backhoe Loaders: Business of Backhoe Loader Operation (16, 19 min)
- MO-168 3M Pavement Marking Application (40 min)
- MO-168 Uses of Asphalt-Rubber (12 min)
- DC-123 Hardwood Anyone? (10 min)
- DC-124 Pavement Drainage Systems - Contractor
- DC-125 Pavement Luminaries (28 min)
- DC-126 Arc Welding Methods (27 min)
- DC-127 Signs, Markings and Delineators (58 min)
- DC-128 Special Barriers: Bridge Rails, Transition Barriers and Crash Attenuators (38 min)

NOTE: Videotapes of the New England Technology Transfer Conference on Roadway Pavements are now available. Call for details.

## Seven Business Computer Buying Blunders and How to Avoid Them

Whether you're looking for your first computer business system or you're upgrading an existing one, the following suggestions can make your life a little easier. The first blunder to avoid is not understanding your needs. How can you ever know for sure what the best computer system is for your particular agency? Questions you might ask include:

- What tasks do you expect your system to handle?
- Who on your staff will be using it, and how much training will they need?
- Where will you put the new equipment?
- Who will take care of maintenance?
- When do you think your agency will outgrow the system you buy today?
- How much of a budget will you need?

Once your needs are clearly established, finding the right computer can be easy.

A second consideration is that your new computer system, regardless of its size or sophistication, is nothing but empty machinery without the right software. Take the time to find the best possible match between available software and your needs. Be sure to ask the salesperson: "Are you familiar with most of the available software that can meet my needs for power and affordability? Can you teach my staff and me how to use it?"

No. 3. No single pre-packaged computer system can automatically meet the unique needs of your agency. There's a wide variety of computer equipment available. Be sure your salesperson can put together a custom computer system tailored to your individual needs, with major brand-name products that can be easily upgraded.

There's no lack of places you can go to buy a computer. The ideal place to find what you need will have a broad range of competitively-priced products and offer after-sale support and service as well. Make sure your retailer has a broad range of brand-name products to choose from and is authorized by the factories to service what they sell.

A fifth problem might be that not everyone who sells computers really understands them. Ask your salesperson, "What kind of training do you have that qualifies you to sell me a computer system?"

As a sixth consideration, the smartest computer system in the world will be worthless to you if your staff runs into problems trying to use it. Be sure whoever sells you a computer system has the necessary resources to teach you and your staff how to use all the support materials that come with your system. Ask if your retailer has training programs to help your staff use the new system.

The seventh and last problem you might encounter is that some computer dealers do not have adequate after-sale support. The extended care and feeding of your computer system should be handled by experts who understand your situation—preferably the same experts who helped configure and integrate the system in the first place. Make sure your dealer can help with after-sale support—including technical assistance, advanced training and upgrading.

(Based on a brochure from "Microgen" corporation)



### MCTRANS: A NATIONAL TECHNOLOGY RESOURCE

In May, 1986, the Federal Highway Administration (FHWA) established the Center for Microcomputers in Transportation (McTrans) to provide expert advice, information exchange, and a wide range of excellent transportation software at very reasonable costs. Areas represented by the software include construction management; environmental; highway design, pavements, bridges and hydraulics; maintenance; safety; surveying; traffic engineering; and urban transportation planning. McTrans distributes public domain software developed by FHWA, state DOTs, universities, local transportation agencies and private individuals. The Center also distributes both transportation and some general purpose "freeware/shareware/user-supported" programs and a number of privately developed software packages. McTrans even distributes a number of the more popular mainframe programs.

McTrans provides technical support for a wide range of this software, and in some cases even provides software maintenance, ensuring users of timely updates, user tips and the highest level of technical support. In short, McTrans is a full service software support center. Membership in McTrans is free, as are most of its services.

The McTrans catalog includes all the software, documentation, and other services available from McTrans and its "partners." McTrans accepts prepaid orders, purchase orders (one-time and "blanket"), and MasterCard or VISA. Anyone interested in becoming a member of McTrans can simply call (904) 392-0378 to receive a catalog and be added to the mailing list free of charge.

# MASSACHUSETTS' AGING CROWDED HIGHWAYS; The Effects of Stagnant Highway Spending

- Massachusetts is spending—in constant dollars—less than it spent in 1949 for road and bridge improvements.
- Massachusetts' main roads are deteriorating under increasing traffic and inadequate spending. In 1983, the Federal Highway Administration reported 24.4 percent of the state's arterial and collector road system was rated in poor or fair condition; by 1987, 74 percent was rated deficient.
- Also, Massachusetts has a total of 2,351 substandard bridges — 46.8 percent of the total 5,027 bridges over 20 feet in the state — according to the Department of Public Works.



## ROAD NEEDS IN MASSACHUSETTS

### Road Needs on the State Highway System

|  |                         |
|--|-------------------------|
| Total Miles: 2,906 miles (11,915 lane miles) |                         |
| 7.9 percent are in "poor" condition=         | 846 lane miles          |
| 66.9 percent are in "fair" condition=        | <u>7,971 lane miles</u> |
| <b>TOTAL</b>                                 | <b>8,817 lane miles</b> |
|  | deficient roads         |

### Road Needs on Locally Maintained Roads

|  |                     |
|--|---------------------|
| Total Miles: 29,211 miles under county and municipal and "other" jurisdiction. |                     |
| 7.1 percent are in "poor" condition=   | 2,074 miles         |
| 66.9 percent are in "fair" condition=  | <u>19,542 miles</u> |
| <b>TOTAL</b>   | <b>21,616 miles</b> |
|  | deficient roads     |

- As investments in roads decrease, the actual use of the system has increased. Since 1980, vehicle traffic on Massachusetts' roads has increased nearly 20 percent, from 35.39 billion vehicle miles to 42.31 billion vehicle miles. The number of licensed motorists and registered vehicles have increased 21.8 percent and 49.5 percent, respectively, in the same time.
- Massachusetts' state road system would be in even worse condition were it not for the efforts of the Department of Public Works to achieve maximum improvements within limited budgets.

## BRIDGE NEEDS IN MASSACHUSETTS

There are a total of 5,027 bridges in the state.

46% (2351) of Massachusetts' have been rated as substandard.

27% (1374) are structurally deficient

19% (977) are functionally obsolete

In the last 6 years, the number of structurally deficient bridges has increased by 44%.

in 1982. . . 951

in 1988. . . 1374 (an addition of 423 bridges)

Closed bridges—in the last 3 years, the number of closed bridges has increased by 37%.

1985. . . 115 bridges

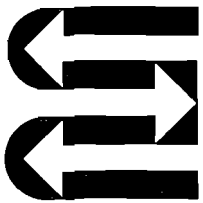
1988. . . 158 bridges (an addition of 43 bridges)

Posted for reduced weight limitations—18% (917) bridges are posted for lower weight restrictions than originally designed.

### Bridge Needs

|   |                            |
|---|----------------------------|
| Total bridges (over 20 feet in length):   | 5,027                      |
| Sufficiency Rating Scale:                 | 0 (worst)<br>to 100 (best) |
| Bridges with Sufficiency Rating 50:       | 1,384 (28.3%)              |
| Bridges with Sufficiency Rating 50 to 80: | 977 (19.4%)                |
| <b>TOTAL</b>                              | <b>2,351 (46.7%)</b>       |
|   | Substandard<br>Bridges     |

(Prepared by The Road Information Program, Washington, DC)



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



Route to:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

Baystate Roads Program  
Dept. of Civil Engineering  
University of Massachusetts  
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## IN THIS ISSUE

1 Baystate  
Roads on the  
Go

2 Briefs

3 Healthy Heart

4 Publications

5 MDPW Mix  
Guidelines

5 Calendar

6 Avoid  
Computer  
Blunders

6 McTrans

7 MA Crowded  
Highways

The Baystate Roads Program (BRP), 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 at 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 BRP facilitates information exchange by conducting workshops, providing publications and videotapes 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 the BRP to receive future copies of the newsletter at no cost, or to submit ideas or articles to *Mass Interchange*, call Meryl Ann Mandell at (413) 545-2604.