U.S. Department of Transportation
Federal Highway Administration

ROAD BUSINESS

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Above: From left to right are two of Madbury's selectmen, Jay Moriarity and Dick Houghton.

On the Road in New Hampshire

Madbury avoids being subject to substandard subdivisions

On Friday, January 9th of this year, Diane Hodgeson of the Madbury Town Hall made a call to the Technology Transfer Center. "We're looking for a second opinion on a road proposed for a new subdivision" she said. "Mostly, we want a quick evaluation of the design and to make sure that we're going to collect the right bond for the road."

Early the following week Diane and Selectman Dick Houghton brought the road plans to the T2 Center. Charlie Goodspeed, civil engineering professor at UNH and member of the T2 team, provided Madbury with a quick evaluation of a typical cross section of the road and a calculated cost per linear foot based on their road specifications. "This information will help us make a good decision at the up coming planning meeting", Dick said.

Dick Houghton's enthusiasm, positive attitude and sensible approach made us want to travel to Madbury and find out some of the things they were doing.

When I arrived at the Town Hall, Dick introduced me to Jay Moriarity, selectman and Madbury's resident road expert. I had a quick tour of the Town Hall, which Jay and Dick helped to design. "Just another example of Madbury's good sense", I thought. It was superbly laid out!

We started to talk about roads and planning boards. "One thing about a planning board," Dick said, "you can't go on the board for one year and expect to comprehend everything that's going on. Usually economics is the sole determining factor in a decision." What Dick was talking about was long term effects; as he puts it, "I want to make darn sure that a new development doesn't come back to haunt the town five to ten years down the road."

One of the ways Madbury stays on top of the booming developments that so many New Hampshire towns are experiencing is to assign a specific board member to each operation. Dick explains, "The assigned board member uses a check list to track the construction developments and to ensure that the town's interests are protected. By having one board member be the sole contact for a single subdivider or developer, there is a greater chance for avoiding any misunderstandings."

continued on p. 6

Timber Bridges

Timber offers real advantages to towns facing bridge replacements with limited funds

New Hampshire's efforts to upgrade its bridge stock could benefit from the use of modern, pressure-treated timber. While timber was once the most common bridge material, it has been largely replaced (at least in the minds of many bridge engineers) by concrete and steel. Timber, however, increasingly offers real advantages to towns facing bridge replacements with limited funds.

Timber offers many more advantages than its aesthetic qualities and renewable nature.

continued on p. 3

— ALSO IN THIS ISSUE —

Design Standards. . .
continued from p. 2

14. Asphalt Surface: The asphalt surface may be a Bituminous Surface Treatment, Specification Section 410, or Hot Bituminous Pavement, Section 403, as required by the Selectmen. The minimum width should be 20 feet for up to 300 vehicles per day, 22 feet for 300 to 600 vehicles per day and 24 feet for over 600 vehicles. A 44-foot wide pavement may be required in areas where on-street parking is expected. Angle parking shall not be allowed.

15. Gravel Surface: In unusual cases of low traffic volumes where the Selectmen feel an asphalt surface is not required, the total usable roadway width shall be a minimum of 28 feet so that the ultimate design may be a 20 foot asphalt surface with 4 foot gravel shoulders.

16. Gravel Shoulders: A four foot gravel shoulder, equal to the base course depth, shall be constructed adjacent to all 20-, 22- and 24-foot asphalt surfaces.

17. Bridges: On stream crossings with a span of 10 feet or more, the structure shall be designed to HS-20 loading (AASHTO Specifications). The minimum roadway width shall be 24 feet.

18. Sidewalks: Sidewalks of two inch thick asphalt, on a four-inch gravel base, not less than 4 feet in width and no closer than 22 feet to the street center line shall be constructed on one or both sides of the street when in the opinion of the Board such sidewalks are necessary.

19. Erosion Control: Erosion shall be controlled by placing mulch or matting on all surfaces disturbed by construction of the roadway and on all other surfaces where there is danger of eroded material being carried to the roadway area.

20. Utilities: Utility poles should be kept close to the right-of-way line, in no case closer than the ditch line and always well back of a curb. Water and sewer mains should be constructed outside the surface area and preferably outside the ditch line.

21. Safety: Safety is an important factor on all roadway improvements. On development roads it may not be possible or practical to obtain obstacle-free roadsides but every effort should be made to provide clear areas within the maintenance limits. The use of flatter slopes, the use of guard rail where necessary, and the use of warning signs are other safety factors to be considered.

22. Minimum Standards: The use of more liberal values than these minimum standards is recommended. For additional guidance and design of local development roads and streets with high volumes of traffic, reference should be made to the American Association of State Highway and Transportation Officials, "A Policy on Geometric Design of Highways and Streets," 1984.

The above minimum standards were developed by the New Hampshire Department of Transportation and provided by Robert W. Greer, Administrator, Bureau of Municipal Highways ■

"Ware" Am I?

Computer Hardware and Software
by Dr. Dot

The last computer article discussed the widespread availability of computers and how they have become a major part of our everyday experiences. It is now time for us to meet this beast face to face and learn how to tame it.

There are two commonly used terms associated with computers; hardware and software. Hardware refers to the parts of the computer that you can touch and feel. The keyboard, printer, monitor and disk drives are examples of hardware. Software refers to any program or logic instructions (usually written on magnetic disks) that control the operation of the hardware. Word processing, spreadsheet, and pavement management programs are examples of software.

There are many types and brands of computers on the market. The best way to find out what's right for you is to determine your software needs and then to match the hardware to the specs dictated by the software.

How do you identify your software needs? Computers are basically used to handle tasks that are repetitious and burdensome in nature. The idea is to find activities that you do routinely or jobs that are too time-consuming and computerize them.

There are many different software packages available for the highway professional. Programs have been designed to handle such highway related tasks as pavement management, equipment maintenance, parts inventory, bridge ratings, budgeting, truck routing, and sign inventories.

Once your needs have been identified it's time to search for available software. Association journals, computer publications, your peers, and the Technology Transfer Center are major sources of information.

In the next Road Business article we'll take a closer look at some of the computer software packages now on the market.

Do you have any specific questions about computers? We would be glad to assist you in finding out the answer. Just call us on our toll free number (1-800-423-0060) or write to the following address:

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Timber Bridges. . .
continued from p. 1

Timber bridges are not damaged by freeze-thaw cycles, and are impervious to the action of deicing agents. Timber absorbs energy well, and can withstand severe short term overloads. Lightweight timber is more readily installed with smaller equipment than are steel and concrete. Timber's light weight also means that existing abutments can often be reused, sometimes even with an allowable load increase because of the structure's lighter imposed loading. Initial maintenance and life cycle costs are often smaller with timber bridges than with steel and concrete spans.

Timber bridges do, of course, have certain shortcomings. Wood, an organic material, is subject to damage from fire, insects, fungus (rot), and accidental impact. However, modern pressure treatment with preservatives can prevent most of these problems indefinitely. Timber bridges often have deeper sections than would their steel or concrete counterparts. This can mean a decreased hydraulic opening. Finally, procuring the larger timber members is for many a new experience, and may involve delays and supplier searches.

A recent search of the Federal Highway Administration's National Bridge Inventory[1] revealed some interesting data on existing timber bridges. There are more than 65,000 timber bridges in the country, not including those spans shorter than 20 feet, the Forest Service's 8,000+ timber bridges, or the railroads' 1,500 miles of timber bridges and trestles. The great majority of these bridges are owned by local governments and are subject to fewer than 100 vehicles a day. Most are 40 feet long. Impressively, the majority of the timber bridges are not only open, but carry no load posting at all. Analysis of the age and estimated remaining service life is more than fifty years. This figure speaks particularly well of timber bridges durability when one considers that many of the inventoried timber spans predated modern pressure treatment procedures.

When people think of timber bridges, they often conjure up an image of a picturesque covered bridge. Actually, the vast majority of the nation's (and the state's) timber bridges are simple girder/deck spans. The girders can be solid-sawn or glulam timber, steel or even concrete. Most timber decks are laminated planks on edge, running transverse to the bridge axis and main members. The planks used to be simply spiked to each other (nail-laminated), but are now almost always laminated with glue (glulam) into panels. The glulam panels tend to develop better load sharing and reduced reflective cracking in the asphaltic overlays. New timber decks are readily available and can be installed by most town road crews.

continued on p. 4

Why Did It Happen To Me?

by Harvey Kuester

It is a human trait for anyone who has had an accident to ask, "Why did it happen to me?" There are probably two reasons an individual will ask such a question: (1) to feel sorry for himself and to get sympathy from others, or (2) to objectively analyze what happened and try to determine what could have been done differently to prevent the accident.

There is nothing wrong with either reason. We all need sympathy and reassurance, but when we stop at that point, there is a tendency to place the blame on another person or to charge it to fate. Objectively analyzing the factors which lead up to the accident is more rewarding in the long run because it can help us to avoid getting into another accident.

If the accident was vehicular, we might ask ourselves some of the following questions:

- Was the vehicle or equipment I was operating in good mechanical and physical condition?
- Was I practicing good defensive driving techniques?
- Did I react to the situation in the best possible manner?
- Was I wearing the safety belts which were provided?

On the other hand we might ask ourselves the following questions if it was a non-vehicular accident:

- Was I wearing the proper personal protective equipment?
- Was I using the right tools for the work I was doing?
- Was I wearing the proper attire for the work I was engaged in?
- Was I following the accepted safe standards for the work I was performing?

When we ask ourselves these questions, we are performing our own accident investigation.

While we can all benefit from accident investigation, all of us will agree that preventing an accident is the best approach. Job training, protective equipment, teamwork, a cooperative attitude, and open discussion of the safety aspects of our work at safety meetings are some of the accident prevention tools which are available.

Accident prevention then, is the key to avoiding accidents. If we keep this in mind during the course of our work and other daily activities, we can substantially reduce the need for both sympathy and accident analysis. We can instead say, "it doesn't have to happen to me." In addition, we can be proud of our ability to perform work safely and efficiently within our work environment.

The above article appeared in the Vermont Local Roads News, Issue 19, February 1987. ■

Timber Bridges. . .
continued from p. 3

A relatively new, and very simple, timber bridge layout is becoming increasingly popular. The so-called longitudinal deck bridge dispenses with the spanning girders, and supports the load solely with the deck itself. Clear spans of up to 48 feet have been achieved, even carrying heavy logging trucks. There are several ways to interconnect the separate spanning deck components. Four foot wide glulam panels can be held together by a simple transverse beam suspended under the deck. This joining member will get all the deck panels to resist the applied loads, not just those under the tires. Some companies simply supply large (8x14, for example) members and bolt them together on the site.

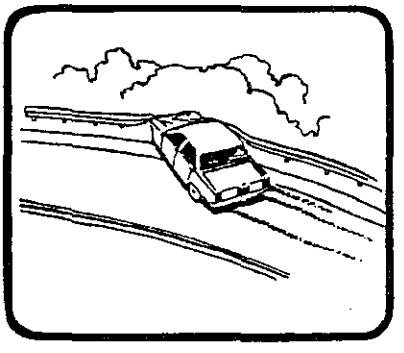
The Canadians are having much success with a "post-tensioned" timber deck system, wherein the deck planks are squeezed together with high strength steel through-rods[2]. This clamping force means that all the deck members deflect together, sharing and distributing the wheel point loadings. The post-tensioning rods have been used in retrofits on loosened nail-laminated decks, replacement decks in rehabilitation jobs, and in completely new bridge construction.

An increasing number of locally built bridges are using modern treated timber in the principal structural elements. If your steel and concrete bridges have not been enduring the rigors of the New Hampshire winters and de-icing agents as well as you might hope, a closer look at the timber alternative could be a money saver for you.

References

1. Brungraber, Gutkowski, Kindya, McWilliams, "Timber Bridges: Part of the Solution for Rural America," submitted to TRB Steering Committee for presentation at 4th Low Volume Road Conference.
2. Csagoly, Taylor, "A Structural Wood System for Highway Bridges," IABSE Proceedings p-35/80, November, 1980.

The preceeding article, by R.L. Brungraber, Assistant Professor at the University of Connecticut and Chairman of the ASCE Committee on Timber Bridges, was modified and reprinted with permission from Technology Transfer, Vol. 4, No. 4, Fall 1986. ■



Did You Know?

What is of interest to your peers and colleagues

In the Fall of '86 The Technology Transfer Center sent out an interest survey to Road Agents, Public Works Directors, Town Managers and Selectmen. We would like to thank you for your responses and share the results with you.

To start with, about 65% of New Hampshire's roads are paved. Certainly, some towns have more gravel roads than others so this number should only be thought of as a general overall figure.

50% of the estimated road condition ratings that we received fell in the fair to poor categories. 33% of the respondents estimated roads to be in good condition, 16% in very good condition and only 1% in excellent condition.

We also asked our survey respondents which areas of Public Works were of greatest interest. The following top 10 subjects were selected: (1) pavement maintenance, (2) construction of roads, (3) design of roads, (4) snow & ice control, (5) solid waste disposal, (6) materials & aggregates, (7) bridges, (8) equipment management, (9) administration and regulations; and (10) highway safety.

Four areas were found to be posing the most difficult problems for our towns: (1) maintenance—not including winter maintenance; (2) rapid expansion and increased traffic; (3) personnel; and (4) road design and construction. Three areas were singled out as areas reflecting success: (1) maintenance—not including winter maintenance; (2) personnel; and (3) finance.

It's good to know that our towns have been attacking some of the more difficult problems and arriving at working solutions. ■

The 7 Year Winter

From the editor

You may have noticed the date of our last newsletter. Instead of reading Fall 1980 it should have read Fall 1986. Of course, there are those who don't believe this was a typographical error. I've been told it was more like a prediction or a warning. "Certainly," they said, "we've had about seven years of snow!"

Thank you for the vote of confidence, but at least we could have spelled Canaan correctly. ■