M A S S

INTERCHANGE

VOLUME 3 NUMBER 1/2 SPRING/SUMMER 1988

BAYSTATE ROADS PROGRAM OFFERS PAVEMENT MANAGEMENT WORKSHOP

The Baystate Roads Program organized and presented a local pavement workshop on June 14 and 15 in Dedham and Northampton, MA, respectively. The workshop attracted over 100 roadway superintendents and engineers from local, state, and regional highway and planning agencies as well as pavement management consultants.

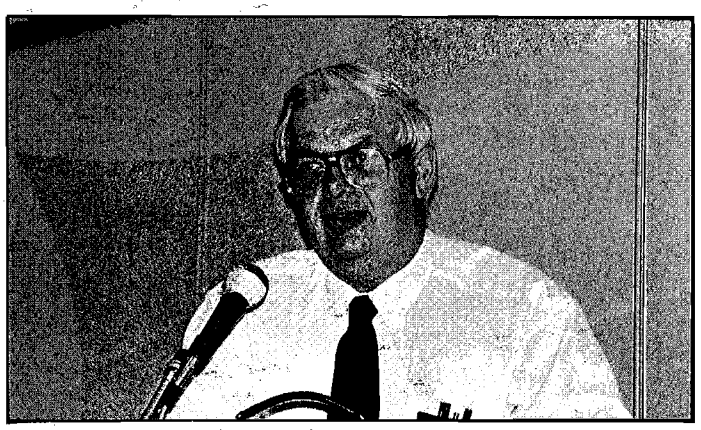
Professors Paul W. Shuldiner and John Collura were featured morning speakers. In the afternoon, case studies of pavement management programs developed for the towns of Montague and Westhampton were presented by Silvio Baruzzi, Highway Superintendent for Montague, and Ronald Downing, senior planner with the Pioneer Valley Planning Commission.

The aim of the morning session was to review the use of distress surveys and treatment selection processes for small communities. The speakers did not propose a universal solution in this area of pavement management but provided those local communities wishing to implement pavement management programs with new techniques and other methods that have proved satisfactory elsewhere. Of special interest was a new approach for rating unpaved roads as a function of the severity and extent of the distress types. The workshop also focused on the use of distress surveys and other relevant factors in the selection of treatments for paved roads. Many of the techniques highlighted were applied in the Montague and Westhampton examples.

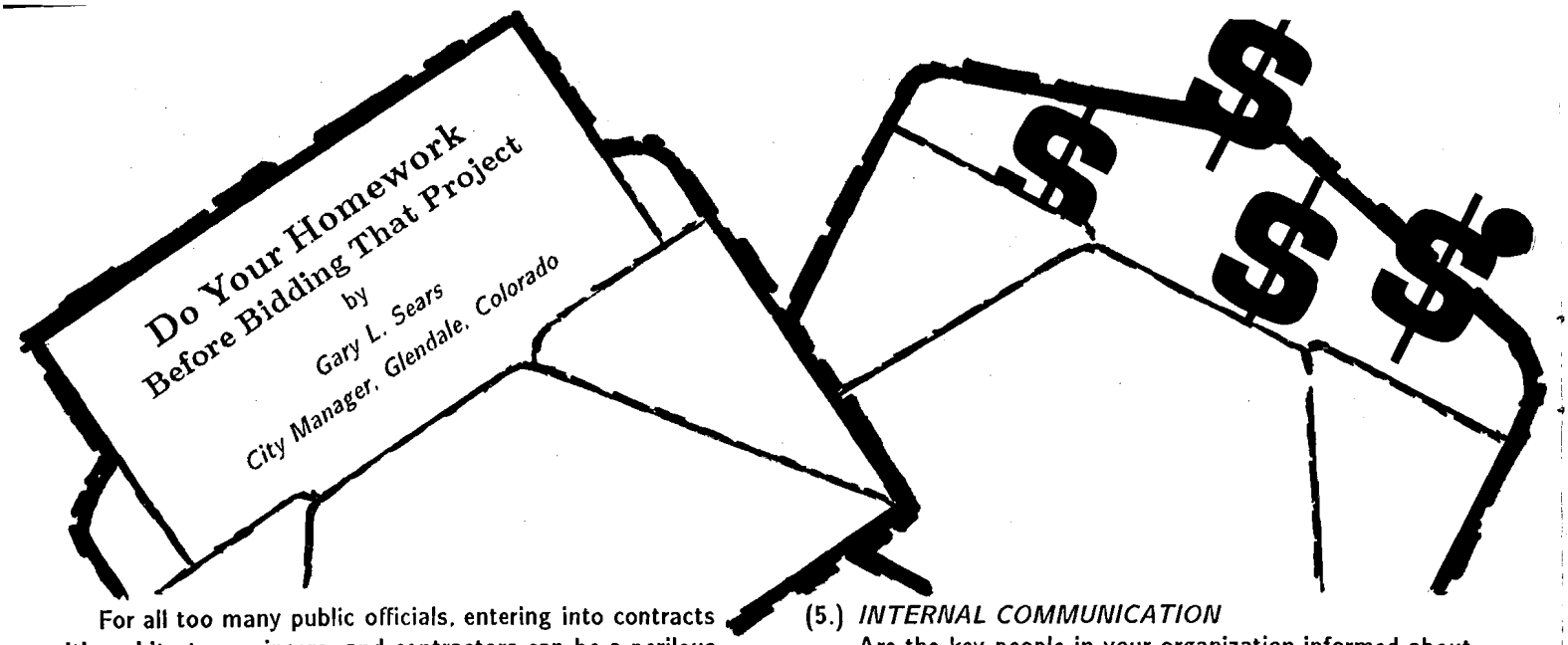
The workshop provided "guidelines" rather than a state-of-the-art report to help those responsible for designing pavement management systems, especially a system adapted to the particular conditions of a locality. Participants found the workshop very useful and requested a follow-up workshop on project level pavement management. The Baystate Roads Program made a videotape of the workshop, which is available upon request. Workshop handouts can also be provided while supplies last. Call (413) 545-2604 or write to the Program for a copy of either.

Gil Alegi (MDPW) reviews various local aid programs

Workshop attendees at the Northampton location



Bill Silvernail (MDPW) discusses availability of state funding



For all too many public officials, entering into contracts with architects, engineers, and contractors can be a perilous undertaking. Public officials should strive to make certain that everything is in place before a construction project is bid or awarded, and that the city follows through sufficiently to ensure that a project is performed according to the contract. To simplify the process, this checklist is divided into three categories:

1. items to consider before the project,
2. items to consider in bidding and awarding the contract, and
3. items to consider in following up with the contractor once the project has begun.

BEFORE THE CONTRACT IS LET

(1.) *SCOPE OF WORK*
Has the scope of the work been established? Have the elements of the job been defined? Are the directions to the architect, engineer, or contractor clear? Have all departments reviewed the plans and given input into the final set of plans?

(2.) *VIEWING SIMILAR PROJECTS*
Have tours been scheduled of similar projects or plans discussed with other municipalities or counties that have attempted similar types of projects? Has the state Department of Local Affiars or municipal league been contacted to discuss the project with them?

(3.) *SPECIFICATION PREPARATION*
Are the specifications well detailed? Have the plans been reviewed with the local building inspector and attorney? Do you have or will you be sure to have a final set of plans completed and available to you before advertising for bids? Is there a complete bidders list so that if amendments are added you can send them out?

(4.) *PRE-BID CONFERENCE*
Have you considered scheduling a conference to review the plans or inspect the site with prospective bidders? Such a conference may eliminate marginal bidders and allow an opportunity to provide bidders with amendments to the specifications.

(5.) *INTERNAL COMMUNICATION*
Are the key people in your organization informed about the schedule and have they been given ample opportunity for input? For example, the building inspectors need inspection schedules; the city clerk, administrator, or treasurer needs cash flow information; and the attorney needs to ensure that documents are complete and proper certifications are included.

(6.) *FINANCIAL REVIEW*
Have finances been reviewed to provide for contingencies and cash flow considerations during the term of the contract? Have the bonds been sold or is a date set for closing the bond issue?

(7.) *EXTERNAL COMMUNICATION*
Have other governmental entities been informed about the project, and have the proper permits been received? These could include highway permits and review by the EPA, Army Corps of Engineers, Bureau of Reclamation (for power lines), local power company , telephone company, Division of Wildlife, Forestry Service, state Engineer's Office, or other federal, state, or local agency.

(8.) *PROPERTY OR EASEMENTS*
Does your municipality own the property or control the easements where the project is planned?

(9.) *BONUS OR DAMAGES*
Have you considered paying the contractor a bonus for work completed ahead of schedule, or assessing liquidated damages for work performed beyond the schedule completion date?

(10.) *DISRUPTIONS*
Have residents and local businesses been informed about the project and any disruptions that may occur, such as temporary street closures, low or no water pressure, power outages, blocked sewer lines, increased noise levels, or other anticipated or unanticipated occurences?

(11.) *UPGRADING SERVICES*
Has the municipality tried to maximize the benefit of the construction project by upgrading associated water and sewer lines, adding hydrants, upgrading utilities, expanding or improving pavement, or meeting other community objectives?

(12.) *TAX EXEMPT STATUS*
Have bidders been informed that they may reduce their costs by using the tax exempt status of the municipality to avoid the imposition of state sales tax on building materials if they apply for a sales tax number from the state?

BEFORE THE CONTRACT AWARD IS MADE

(1.) *REFERENCE REVIEW*
Have the credentials of the low bidder been checked? Have the references of the contractor been checked, preferably with other communities or governmental jurisdictions?

(2.) *BIDDER QUALIFICATION*
In checking references, did you ask if the contractor finished work on time, met the projected budget, or was a "change order" artist? Did the contractor do a quality job? Was there a great deal of excess time spent monitoring the project? Did the jurisdiction need to contact the bonding company regarding the performance of the contractor? Were the contractor's subcontractors paid on time?

(3.) *BID DISCREPANCIES*
Did the municipality give the contractor an opportunity to drop out before awarding the contract? Have you made certain that all elements were bid, including amendments and bond requirements? Are there major discrepancies in the low bid from other bids?

(4.) *BIDDER INSURANCE LIABILITY*
Is the contractor insured? Did the contractor supply payment and performance bonds and an insurance certificate? Does the insurance amount cover the cost of the work? Is the municipality held harmless for faults of the contractor and for city inspectors during the job? Are the coverages adequate according to state law? (This insurance is required by MA State law.)

(5.) *LOW BID REVIEW*
Has the municipality considered awarding the contract to a contractor other than the low bidder? Is the low bidder a qualified bidder? Did you consider giving all bidding contractors an option to add items not included in the specifications that, if included, may change the overall low bid?

(6.) *BID AMENDMENTS*
Have you checked that all amendments are signed and included before the contract is awarded?

(7.) *GRANT AGENCY REQUIREMENTS*
Has the bidder met the requirements of any agency that is providing a grant? Does the contractor meet affirmative action criteria, if required, Davis-Bacon responsibilities; and does the contractor provide for record keeping requirements or meet other items required by a grant agency?

(8.) *OWNER REPRESENTATION*
Who represents the owner? Has the governing body assigned the responsible party to the project? Who will sign and make decisions regarding change orders? Who will coordinate the payment schedule? Who will coordinate the inspection schedule of the architects, engineers, and city staff?

AFTER THE CONTRACT IS AWARDED

(1.) *PRE-CONSTRUCTION CONFERENCE*
Has the municipality made plans to set up weekly meetings with the contractors to ensure that work is on schedule, change orders are properly reviewed, and all parties are informed of progress? The contractor and municipality should establish a mutual time at the onset of the project. Have all documents been submitted to the municipality prior to construction?

(2.) *PROJECT SUPERINTENDENT*
Has the municipality identified the project superintendent and who might replace him if problems arise?

(3.) *GRANT FOLLOW UP*
Has the state or other grant agency been notified regarding required permits, payment schedules, or documentation needed during the construction project?

(4.) *SCHEDULE OF PAYMENTS*
Have payments been scheduled to meet the cash flow requirements without losing interest on investments or incurring penalties?

(5.) *JOB SECURITY*
Has the contractor made provisions for protecting materials and supplies on the job to avoid theft or damage?

(6.) *COMMUNICATION*
Has the staff provided periodic updates to the town board or city council and news media regarding the status?

(7.) *PENALTY ASSESSMENTS*
Has the contractor been informed that he may be assessed liquidated damages for completing the project late due to increased engineering, legal or staff time?

(8.) *USE OF ARBITRAGE*
Have you calculated any arbitrage or bond payments and earmarked the money? Will work be accomplished within the required time period?

(9.) *WARRANTY*
Has the contractor been informed that he is responsible for the work for a specified time period after final completion as determined by the muncipality?

(10.) *FINAL PAYMENT*
Before final payment, have you advertised? If there are claims from subcontractors, have you informed the general contractor? Is the work on a final punch-list completed before final payment is made?

FINAL COMMENTS

It is extremely important to give a great deal of thought to the scope of work, finances, parties involved, and management before the plans begin and to insure that there will be adequate inspection and supervision during the project. Public projects should be viewed as long-term commitments by public officials. With the development of a comprehensive strategy, it is more likely that a community will have the full benefit of a successful and well-built public project that will please everyone concerned.

(Adapted from Public Works, September 1987, and reviewed by Atty. Peter Waltonen, MA Dept. of Labor and Industries)

Health and Heart Attacks

Are You At Risk?

.....a few beers with lunch isn't going to hurt me...yeah, at the last meeting they served such a large piece of steak that it was hanging over the edge of the plate...I don't need to exercise regularly because I lift things and move around all day long...the selectman keeps asking when his street is getting a new overlay, but it's only scheduled for pothole patching in our three year plan...my belt still hooks just fine; so what if it rides lower to hold up my belly...I quit cigarette smoking, now I smoke cigars; they aren't as bad for you...I really love salt on my french fries, sweet corn, and basically any other dish...my wife complains because I never tell her when something is bothering me, but that's just not my style...

If any of the above statements sounds like something you might say, you may be a candidate for a heart attack. The American Heart Association has summarized dozens of studies conducted over the past 40 years, and compiled the following list of risk factors for increasing your heart attack chance:

* **Cigarette Smoking:** Smokers have nearly three times the risk of a heart attack and two to four times the risk of sudden cardiac death than nonsmokers.
* **Hypertension:**. People with high blood pressure have an increased risk of heart attacks, strokes and kidney failure. The chances of heart attack are even greater when combined with cigarette smoking and other cardiovascular risk factors.
* **High blood colesterol:** A blood cholesterol level over 200 milligrams per deciliter of blood greatly increases the risk of a heart attack and stroke. High cholesterol is a major cause of atherosclerosis, the clogging of blood vessels with fatty plaque, which is a direct cause of most heart attacks.
* **Diabetes:** Most diabetes appears during middle age and is most common among people who are overweight. Diabetics have an increased risk of heart attacks, strokes, kidney failure and circulatory problems, all of which can be minimized by weight control, exercise, and diet.
* **Obesity:** People who are 20 percent or more above ideal weight have a higher incidence of heart attacks, strokes, diabetes, certain types of cancer and other diseases.
* **Stress:** The mechanisms whereby stress may increase the risk of heart attack are unknown, but studies have found that people with Type A personality – characterized by overly aggressive behavior, quick tempers, excessive awareness of time, an extraordinary drive to compete and succeed – react poorly to stress and have a high incidence of heart attacks.
* **Lack of exercise:** Exercise is thought to help lower the risk of a heart attack by reducing other risk factors such as overweight, stress, and cholesterol.

Now is the time to recognize the above risks as they apply to you, and try and minimize them. Heredity, a factor in some of the risk areas such as diabetes, may increase your individual risk. However, since heredity plays an uncertain role, the overall goal should be to minimize all the risk factors. You can foster good health by choosing activities and a lifestyle that downplay destructive behaviors. Quit smoking once and for all. Eat a well-balanced diet, low in saturated fats. Don't let yourself become overweight, or go on a sensible diet it you need to lose a few pounds. Exercise regularly for your aerobic fitness, stress reduction, and increased productivity. Make the time to relax. Get plenty of sleep. If you do drink alcohol, do so only in moderation. Make sure you get regular medical checkups, then follow your doctor's advice.

...so pass up that second beer at lunch...get out to the tennis court three times a week...tell the selectman his street doesn't come up on your pavement management plan until next year...say no to that good looking ice cream sunday...get the picture?

GEOTEXTILES

by Major Hiram Gonzalez
Waterways Experiment Station, Puerto Rico

Introduction

A new concept in materials has emerged for the civil engineering community. The most strongly influenced groups are geotechnical engineering and heavy construction, although all soil and rock-related activities fall within the general scope of the various applications. These materials are known as "geosynthetics", since they are used in soil and are synthetic. Geotextiles form the largest group within the geosynthetics family – the others being geogrids, geomembranes and geocomposites. (See Figure 1)

The term "geotextile" refers to a textile (fabric) material used in geotechnical engineering to improve the performance or cost of a human-made product, structure or system. Although these materials were introduced in the 1950's, their use has grown very rapidly in the last decade. The rate at which these products are being developed and used forces design methods to continuously evolve. As a consequence, many engineers are not aware of existing methods of design. Therefore, the user of geotextiles should be aware that in most cases, design criteria are not well refined due to a lack of long-term field experience with the variety of materials available and to the wide range of field conditions which can occur.

Geotextiles are also synonymous with filter fabric, filter cloth, geotechnical fabric, engineering fabric and geofabric.

Basic Description

Geotextiles are indeed textiles in the traditional sense, but consist of synthetic fibers rather than natural ones such as cotton, wool, or silk. Therefore, biodegradation is not a problem. The fibers are made into a flexible, porous fabric by standard weaving machinery, or are matted together in a random, or nonwoven manner. Some fibers are also knit. Their porosity to water across their manufactured plane and also within their plane varies widely.

Materials

Geotextile fibers are currently being made from the following materials: polypropylene, polyester, polyethylene, nylon, polyvinylidene chloride and fiberglass. Some experimental fabrics have been made from Kevlar (a registered trademark of Du Pont for their aramid fiber). Polypropylene and polyester are by far the most used. The physical properties of these materials can be varied considerably depending on the additives used in their composition and on the

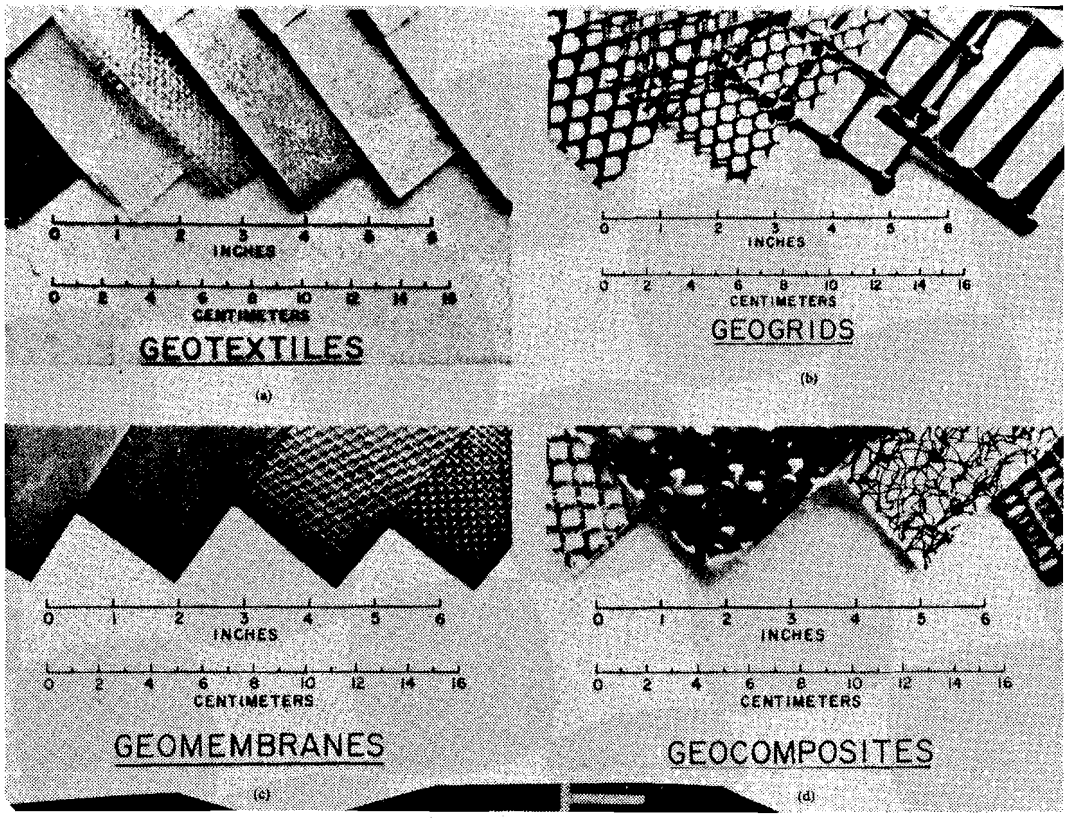


Figure 1. Typical Geosynthetic Materials

methods of processing the molten material into filaments. Table 1 shows some physical properties of these synthetic fibers.

Table 1. Some Physical Properties of Synthetic Fibers

Fiber Composition	Density g/cm3	Melting Point, °C
Polypropylene (olefin)	0.89-0.91	170
Polyester	1.31-1.39	225-283
Nylon (polyamide)	1.02-1.14	185-275
Polyethylene (olefin)		135
Low Density (LDPE)	0.91-0.93	
Medium Density (MDPE)	0.93-0.94	
High Density (HDPE)	0.94 and above	
Polyvinylidene Chloride (saran)	1.65-1.72	170
Fiberglass	2.55	570
Kevlar (aramid)	1.44	425

Fabric Types

Fibers are made into fabrics. The basic manufacturing choices are: woven, nonwoven and knit. Woven fabrics are made on conventional weaving machinery into a wide variety of fabric weaves. Woven construction is the most expensive, but tends to produce fabrics with relatively high strengths and moduli. It also produces fabrics with a relatively simple pore structure and narrow ranges of pore sizes or openings between fibers. Wovens can be monofilament or multifilament. Monofilament wovens are generally used for filtration and for some reinforcement applications because of their high cost. Nonwoven fabrics comprise those fabrics which are formed by some process other than weaving or knitting. Their structure is produced by bonding or interlocking fibers, or both, accomplished by mechanical, chemical, or solvent means. Knit fabrics are seldom used as geotextiles. Although the knitting process is less expensive than weaving, only two fabrics are currently made by this process–one is designed for unidirectional soil reinforcement, and the other for temproary surface erosion protection.

Functions and Applications

There are at least 100 specific engineering applications for geotextiles; however, in any one application, the fabric may be performing one or more of six basic functions: filtration, drainage, screening, erosion control, reinforcement and separation.

Filtration: This function involves the movement of water through the fabric itself (across its manufactured plane). The geotextile substitutes for and serves the same function as the traditional graded granular sand and gravel filter. This filter must allow the water to pass without significant build-up of hydrostatic pressure. A geotextile-lined drainage trench along the edge of a road pavement is an example of an application using a geotextile as a filter.

Drainage: When functioning as drains, geotextiles act as conduits, whereby water is transmitted in the plane of their structure. Basically, all fabrics can provide such a function, but to widely varying degrees. Geotextiles can be used in trench drains, blanket drains and drainage columns next to structures, as a substitute for granular material. Strip drains substitute for sand drains to accelerate the consolidation of fine-grained soils.

Screening: A geotextile functions as a screen when it stops particles suspended in surface fluid flow while allowing the fluid to pass through. Silt fences placed across ditches and small streams to reduce the amount of sediment carried off construction sites and into nearby water courses are an example of this application.

Erosion Control: The geotextile protects the soil from the tractive forces of moving water or wind and rainfall erosion. Geotextiles are often used in ditch linings to protect erodible fine sands and cohesionless silts. The fabric lines the ditch and is secured by staking, or is covered with rock or gravel to secure it in place, shield the fabric from ultraviolet light and dissipate the energy of the flowing water.

Reinforcement: When the tensile capabilities of a geotextile are used to complement and strengthen the performance of those materials that are weak in tension, such as earth structures or geotechnical systems, primarily by increasing the mechanical strength of the system, the geotextile is acting as reinforcement. In the most common applicaton, the geotextile interacts with the soil through interface shear forces to resist tensile or shear forces in the soil mass. Geotextile reinforced embankments and earth retaining walls are examples of this use of fabrics. There are many other uses.

Separation: Separation is the concept of preventing two dissimilar materials from mixing under the action of applied loads so that the integrity and functioning of both materials can remain intact or be improved. In this function, the geotextile is most often required to prevent the mixing of fine soils and gravel. In construction of expedient haul roads over soft soil, fabric is placed over the soft subgrade, and then the gravel or crushed stone is placed on the fabric. In addition to providing some reinforcement, the fabric acts as a separator, preventing the subgrade from intruding into the overlying coarser material.

Properties and Test Methods

Many different properties must be considered when selecting geotextiles for any particular application. A "data base" from which one can select a fabric together with its relevant properties is desirable. Table 2 presents a summary of properties, range values of commercially available geotextiles and current ASTM test methods.

Table 2. ASTM Tests and Typical Property Ranges of Currently Available Geotextiles

Properties	Available Ranges	ASTM Test Methods
Physical Properties		
Specific gravity	0.90-1.4	
Mass per unit area	4-20 oz/ yd2	D 3776
Thickness	10-300 mils	D 1777
Mechanical Properties		
Compressibility	Neg to high	
Tensile strength		D 1682
Grab strength	50-1000 lb/in	D 4632
Strain at failure	20-100%	
Modulus	10-10,000 lb/in	D 4595
Fatigue strength	50-100% tens. strgth.	
Burst strenght	50-750 lb/in2	D 3786
Tear strength	20-300 lb	D 4533
Impact strength	10-150 ft-lb	D 256
Puncture strength	10-75 lb	D 3787
Friction	50-100% soil frict.	In Draft
Pullout	50-100% fabr. strgth.	
Hydraulic Properties		
Porosity (nonwovens)	50-95%	
Percent Open Area (POA)	1-36%	In Draft
Apparent Opening Size (AOS)	No. 10-No. 200 sieve	In Draft
Permeability (cross-plane)	0.02-10 ft/min	D 4491
Transmissivity (in-plane)	Neg-4 ft/min	In Draft
Endurance Properties		
Creep resistance	GNP if< 50% strgth. used	D 2990
Abrasion resistance	GNP unless vibration	D 3884
Long-term flow (clogging)	GNP	In Draft
Gradient ratio values	1.0-2.1	In Draft
Environmental Properties		
Resistance to chemicals	GNP unless hydrocarbons	D 543
Resistance to temperature	GNP	D 4594
Resistance to light/ weather	Major prob unless stab.	D 1435
Resistance to bacteria	GNP	G 21,22
Resistance to burial deterioration	GNP	D 308
Ultraviolet Stability	Major prob unless cov'd.	D 4355

Neg= negligible
GNP= generally no problem

Design

The selection of the particular design method, or design philosophy, is a critical decision that must be made before the actual mechanics of the design process are initiated. The design of a specific geotextile for a particular application can take one of three directions: design by cost, design by specification and design by function.

Design by cost: This is quite simple. One takes the funds available divided by the area to be covered, and calculates a maximum allowable geotextile unit price. The fabric is then selected within this price limit. This method is very weak technically, but one that is, unfortunately, practiced often.

Design by specification: Several categories of use are listed, together with critical fabric properties. Those geotextiles available are then checked for their properties versus the recommended values in the specification. If several geotextiles are adequate, the selection is made on the basis of availability and least cost.

Design by function: Consists of assessing the primary function that the geotextile will serve and then calculating the required numerical value of that particular property. By dividing this value into the candidate geotextile's actual property value, a factor of safety will result. If the factor of safety is adequate, this is an acceptable geotextile. This is done for a number of geotextiles and then the choice is made on the basis of availability and least cost. This method is recommended over the previous two.

Sources of Information

A very good reference is "Designing with Geosynthetics", by Robert M. Koerner, Prentice-Hall, 1985. Also, a new technical manual, TM 5-800-08, "Engineering Use of Geotextiles", is about to be published by the U.S. Corps of Engineers.

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

In addition to publishing *Mass Interchange*, the Baystate Roads Program facilitates information exchange by conducting workshops, providing reports, 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 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.

THE WORD ON THE STREET

New Massachusetts Scenic Vista Preservation Program

by Susan Quateman, Director

MDPW OPEN SPACE PROGRAM

The classic Massachusetts pastime and necessity, driving along the highway, is an experience daily enhanced by the sight of the beautiful scenery. Travelers enjoy the visual transition from an urban streetscape to a sweeping rural landscape; the sudden splash of color of wildflowers along the roadside; white church steeples peeping out of a cluster of buildings or glimpsed above the tree tops. Such enjoyment, however, is not always long-lasting. As developers move into cities, towns, suburbia, meadows and mountains, those special New England scenic vistas of historic farmsteads, lakes surrounded by unspoiled forests, or sweeping green hillsides, begin to disappear. Billboards, sprawling condos, and industrial developments are becoming more commonplace sights from the road.

A new Massachusetts Department of Public Works program is trying to change this visual affront to both drivers and passengers. The MDPW Open Space Program was set up as a result of the 1985 Transportation Bond Issue to preserve, enhance, and restore areas of special scenic and environmental significance adjacent to public ways in Massachusetts. The 1985 Bond Issue provided $10 million to acquire distinctive scenic vistas beside the highways by fee simple or conservation restriction.

Potential sites for acquisition are nominated by towns, local environmental groups, or conservation commissions. Program staff members then assess the site and make project recommendations on the basis of a parcel's distinctive attributes; development threats; how well travelled the road is; and the feasibility of making a joint acquisition and maintenance agreement with the town, another State agency, or a non-profit environmental group. The site is then evaluated by a DPW Advisory Committee. If selected for acquisition by the Open Space Program, it is appraised by the DPW to determine its fair market or scenic easement value. The Real Estate Review Board and the House and Senate Ways and Means Committees review the site. The final step in the approval process is by the DPW Board of Commissioners, before it is acquired for conservation. Long-term maintenance is typically a local responsibility.

Roadside landscape protection and restoration is a new departure for the DPW. Without it, however, Massachusetts' transportation corridors will tend to become avenues of billboards and strip development rather than luscious forests, unspoiled agricultural land, and memorable vistas.

For more information on the Open Space Program, call Ms Quateman at the MDPW at (617) 973-7323.

(From the WTS National Newsletter) (March/April 1988)

CALENDAR

S	M	T	W	T	F	S
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				

September 8
Annual Equipment Show & Clambake
Massachusetts Highway Association
Topsfield Fair Grounds
Contact: Harry Loftus
MHA Secretary
(617) 485-1973

mid-September (date pending)
ITE New England Section Meeting
Boston area
Contact: John Kennedy
Meeting Coordinator
(617) 783-7000

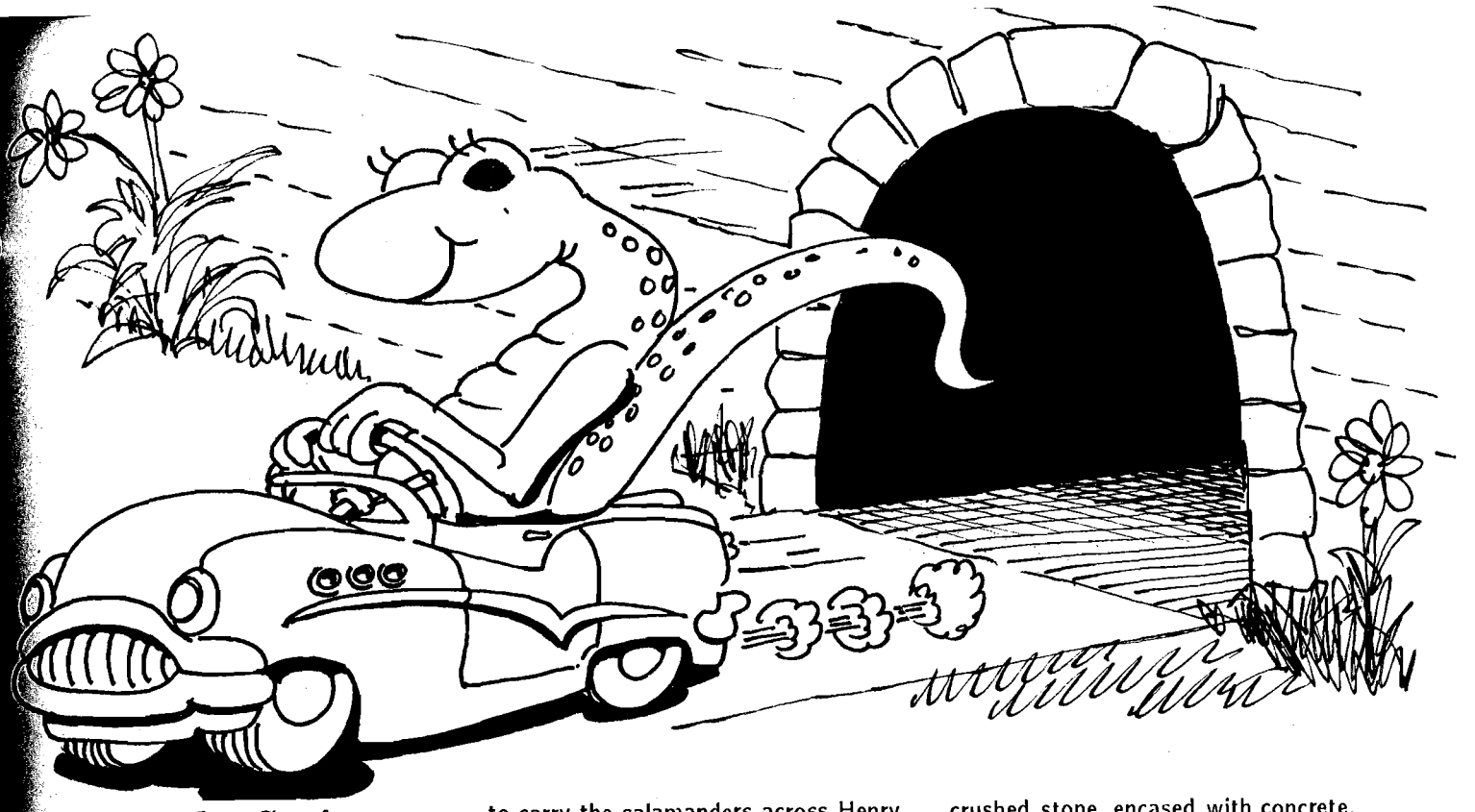
September 24-29
APWA Congress & Equipment Show
Toronto, Canada
Contact: S. Robert Pryzby
Secretary/Treasurer, NE Chapter APWA
(203) 659-2711 Ext. 344

October 4,5
Drainage Workshop
Baystate Roads Program
Contact: Meryl Ann Mandell
Note: Watch for a brochure

October 26
Microcomputer Workshop
NE Chapter APWA
Topics: morn. - CAD Systems
afternoon - Equip. Maint. Systems
Colonial Hilton, Wakefield, MA
Contact: Lon Hultgren
(203) 429-3332

October 27
Regional Recycling Seminar
Asphalt Recycling & Reclaim. Assoc.
Sheraton Hotel, Worcester, MA
Contact: Michael R. Krissoff
(301) 267-0023

October 31-November 1
ITE Conference on Urban Congestion
Boston
Contact: Sandra O'Connell
(617) 973-7383



Salamander Saviors Successful

by
Meryl Ann Mandell

Nation-wide, spotted salamanders and other amphibians face the threat of human encroachment into their wilderness habitats. Robert Winston, an amateur naturalist from Amherst, MA, has been observing the annual spotted salamander migration for over ten years. Commencing on the first warm rainy night in Spring, the march to nearby breeding grounds lasts a few days. In Amherst, the salamanders face crossing motorists on Henry St., a local collector, before they reach their mating grounds on the opposite side of the road. Given their high mortality rate – only 2 of every 50,000 eggs will survive their hatch - the loss of the adults before breeding threatens to severely diminish total numbers and unbalance local ecological systems. Armed with these facts, Mr. Winston enlisted the support of sundry environmental groups, aroused the curiosity of nearby residents, and successfully convinced the Amherst Board of Selectmen to take direct measures to protect the salamanders.

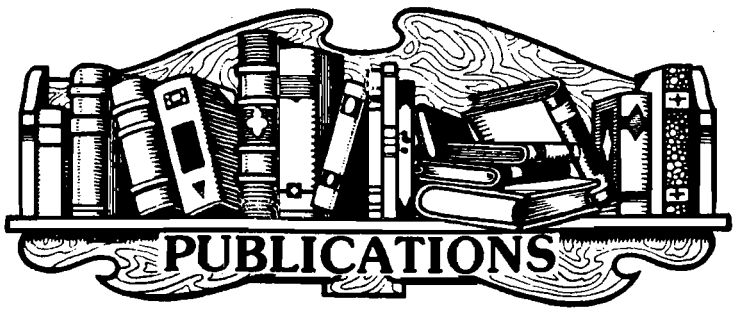
The first approved measure was to redirect traffic on Henry St. using Whorses. Volunteers were organized to carry the salamanders across Henry St. When it became apparent that more effective action was needed, town approval was sought to close Henry St. during peak crossing periods. The number of crossing creatures averaged about 60 per day. The enthusiastic volunteer efforts did not go unnoticed. The protected crossing was covered by a news crew from the "Today" show, generating calls to the station from over 12,000 people interested in organizing similar programs in their communities. The spot on "Today," and other media attention also sensitized more local residents and town officials to the plight of the salamanders.

In late 1987, a proposal was put forth by the Fauna and Flora Preservation Society in Boston to construct tunnels under Henry St. to promote safer passage. Cost was an important factor, since it was estimated at approximately $2000 for materials alone. Installation, a public works activity, was labeled a minor project by Stanley Ziomek, Superintendent of Public Works for Amherst. The local highway crew completed the installation in one day. Again, publicity played a role when an Ohio company heard about the proposed tunnels and offered to donate the materials. The town accepted, and installed two 1-1/2 foot high by 8 inch wide tunnels 200 feet apart on Henry St. The tunnels were laid on crushed stone, encased with concrete, and grated on top to provide ambient light.

Radio stations from San Francisco, to Lexington, KY, to Columbus, Ohio reported the progress of the salamander project. Local elementary schools ran contests to develop a warning sign for motorists (MUTCD standards??) Volunteers erected $550 worth of mesh drift fencing along 350 feet of roadway to guide the salamanders into the tunnels. So, did the tunnels work? After a slow start, crews monitoring use of the tunnels claimed an 85% use rate for salamanders near the tunnels. The fencing helped guide the critters, although a few industrious fellows crawled over. Overall, the tunnels were judged successful at protecting the crossing amphibians.

These events in Amherst may be an indication of future more widespread conservation efforts. This was the first installation of its kind in this country; however, tunnels have been used to protect breeding frogs in England and Germany. The use of similar protective measures is sure to become more common in communities and conservations areas where traffic threatens local wildlife populations.

This article is based on a series of stories which appeared in the Daily Hampshire Gazette from March 1987 to March 1988.



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, or call Meryl Ann Mandell at (413) 545-2604.

Workshop Related

* *"Public Roads: Understanding Massachusetts Highway Legislation,"* Berkshire County Regional Planning Commission (62 pages - 1986) This report supplements handouts from the recent Baystate Roads Program (BRP) Local Roads Acceptance and Discontinuance portion of the State Regulations Workshop. It is available directly from Charles W. Cook of the BCRPC, one of the authors, for $10.00. To obtain a copy call Mr. Cook at (413) 442-1521.
* *"Rating Unsurfaced Roads - A Field Manual for Measuring Maintenance Problems,"* U.S. Army Corps of Engineers, Cold Regions Research Lab, (34 pages - 1987) Discussed at the last BRP Local pavement Management Workshop, it describes a simple methodology for assisting local agencies in the evaluation and rating of unsurfaced roads as part of a road management system.
* *"National Association of County Engineers Action and Training Guides,"* NACE - Federal Highway Administration, U.S. DOT, (three large notebooks and seven booklets - 1986) A BRP/NACE workshop reviewed this excellent set of reports on a range of technical and management procedures useful for agencies with local road responsibilities. Very few complete sets are still available.
* *"Local Highway Safety Improvement Program,"* Federal Highway Administration, U.S. DOT (94 pages - 1986) From our Local Highway Safety Improvements Workshop, this guidebook is aimed at assisting responsible personnel in addressing highway safety problems in rural and small urban areas.

New Listings

* *"How to Limit Traffic Congestion in Your Community,"* Housatonic Valley Council of Elected Officials, Brookfield, CT (46 pages - 1984). Much of this report is specific to Connecticut statutes, however the approach to traffic problem solving should be of interest. General approaches to traffic impact studies, off-site roadway modifications, and procedures to limit congestion are presented.
* *"Weyerhaeuser Glulam Wood Bridge Systems - Technical Manual About New and Rehabilitated Bridges,"* Weyerhaeuser Company (114 pages - 1980). This publication presents features of modern preservative-treated glulam wood bridge components and their applications for rehabilitation and construction of many bridge types.
* *"Low-Cost Methods for Improving Traffic Operations on Two-Lane Roads,"* Federal Highway Administration, U.S. DOT (104 pages - 1987). Aimed at highway agencies, this report offers relatively inexpensive solutions for dealing with inadequate road geometries, lack of passing opportunities, and traffic conflicts at intersections and driveways for rural two-lane highways.
* *"Inspector's Job Guide for Highway and Street Construction/Road and Highway Maintenance Tables,"* Baystate Roads Program (34 pages - 1988) Suggested use of this laminated, pocket-size booklet is as a field reference checklist for public works construction projects. The flip side of the booklet contains convenient tables for estimating materials quantities.

Videotape Lending Library New Acquisitions

The videotapes listed below have been added to the Videotape Lending Library Holdings. To borrow a copy, send a note to the Baystate Roads Program listing the tape code number and title. A Borrower's Registration Card must be on file before a tape can be borrowed.

Maintenance/Operations

MO-138 Operator Daily Maintenance of Rollers (22 min)*

MO-139 Driver Daily Maintenance of Light Vehicles (17 min)*

MO-140 Common Maintenance Problems and Causes (20 min)*

MO-141 Operator Daily Maintenance of Motorgraders (21 min)*

MO-142 Concrete Bridge Deck Repair (17 min)*

MO-143 Patching Unpaved Roads (11 min)*

MO-144 Pothole Repair in Asphalt Concrete Pavement (13 min)*

MO-145 Mechanical Cleaning of Unlined Ditches (20 min)*

MO-146 Repair of Depressions, Rutting, and Corrugations (14 min)*

MO-147 Cleaning of Lined Ditches, Culverts and Catch Basins (16 min)*

MO-148 Operator Daily Maintenance of Front and End Loaders (19 min)*

MO-149 Operator Daily Maintenance of Asphalt Distributors (17 min)*

MO-150 Cleaning and Clearing of Bridges (14 min)*

MO-151 Smoothing and Reshaping of Earth and Gravel Roads (21 min)*

MO-152 Crack Repair in Asphalt pavement (12 min)*

MO-153 Operator Daily Maintenance of Dump Trucks (20 min)*

MO-154 Operator Daily Maintenance of Crawler Tractors (21 min)*

MO-155 Replenishing Earth and Gravel Shoulders (19 min)*

MO-156 Regraveling (18 min)*

MO-157 Reshaping Earth and Gravel Shoulders (16 min)*

MO-158 Pothole Repair in Surface Treatment Pavement (14 min)*

Design/Construction

DC-116 Road Reclamation (10 min)

DC-117 Base and Sub-Base Repair (17 min)*

DC-118 Single and Multiple Surface Treatments (15 min)*

DC-119 Build Better and Save with modern Timber Bridges (22 min)

DC-120 Ultrapave (14 min)

DC-121 Lime - The Versatile Stabilizer in Construction (26 min)

Safety/Traffic

ST-119 Brake Cleaning Equipment Treatment - Don't Blow It (17 min)

Planning/Administration

PA-108 Down in the Dumps (27 min)

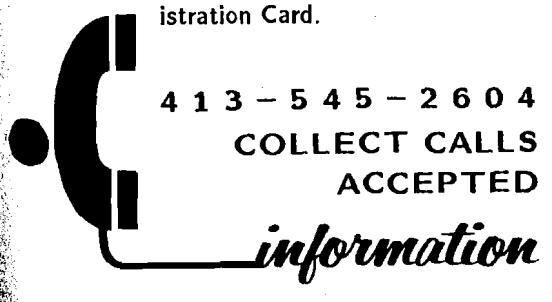
PA-109 Recycling: Don't Take NO for an Answer (59 min)

PA-110 Construction Ahead (20 min)

PA-111 Caution, Litigation Ahead: The Road to Effective Risk Management (25 min)

*** These tapes, produced by the International Road Federation, provide very basic, applied information. They are COPYRIGHT PROTECTED AND MAY NOT BE REPRODUCED.**

Phone or write the Baystate Roads Program - (413) 545-2604 - to obtain a listing of other Videotape Lending Library Holdings and a Borrower's Registration Card.



Report Of The Transportation 2020 Consensus Hearings

On March 1, 1988, a day long public forum on the "Future of Transportation into the 21st Century" was held at the Transportation Buidling in Boston. The 46th in a series held nationwide, the forum elicited testimony from a broad cross-section of individuals concerned with tomorrow's transportation issues. Panelists receiving the testimony included: State Transportation Secretary Frederick Salvucci, MDPW Commissioner Jane Garvey, Mass. Turnpike Authority Chairman Allen McKinnon, Construction Industries of Massachusetts President J. Philip Mitchell, and Highway Users Federation President Lester Lamm.

Advocates from groups as diverse as the Massachusetts Petroleum Council, the MA Audubon Society, the Berkshire County Bicycle Association, the Coalition of Northeastern Governors, and the Baystate Roads Program contributed their views. Some insights and themes offered by the speakers suggested that: the anticipated growth in travel demand can only be met by a multi-modal, coordinated effort from many transportation providers; investment in public works infrastructure must be greatly increased to maintain economic viability; there will be a severe shortage of professionally trained civil engineers unless more young people can be attracted to the field; cooperative efforts between large private companies and State transportation agencies are necessary to avoid severe congestion on major traffic corridors; more and more local roads are slipping into poor condition; the productivity of all transportation modes must increase, with consideration given to new technologies; attention to new transportation patterns should be considered in the planning process; good roads and good business are intimately linked; too many bridges are either functionally obsolete or structurally deficient; and more flexible State and federal funding programs are needed.

Local roads issues were primarily discussed by: Paul Shuldiner, Director of the Baystate Roads Program; Richard Boutiette representing Mass. Highway Association; Michael Burke, Transportation Director for Waltham; Lee Peck representing the Plymouth County Highway Association; Richard Tracy, Highway Superintendent of Westhampton; and Stephen Delaney of the Danvers Department of Public Works. They expressed concern over increasing suburban traffic congestion, insufficient funding, traffic safety on local roads, the need to maintain local roads to accommodate increasingly higher volumes and heavier loads, and other important issues facing municipal highway departments statewide.

Following the completion of the forums nationwide, a summary will be written to describe the quality of existing transportation services and trends for the future. In early 1989, these findings will be presented to Congress for consideration in the 1991 surface transportation act. Transcribed testimony of the MA forum speakers is available.

For more information, call the Baystate Roads Program (413) 545-2604.

TRANSPORTATION
America's Future Depends on it **2020**

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
Marston Hall 214F
Amherst, MA 01003

Non-Profit Organization
U.S. POSTAGE PAID
Permit No. 2
Amherst, MA
01002

IN THIS ISSUE

1 Local Pavement Mangt.

2 Bidding Projects

3 Health

4 Geotextiles

5 The Word On The Street

6 Calendar

7 Salamanders

8 Publications

9 Transp. 2020