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MARYLAND TRANSPORTATION TECHNOLOGY TRANSFER CENTER

Local Technical Assistance Program (LTAP)
University of Maryland at College Park

www.mdt2center.umd.edu

INSIDE:

Developing the Next Generation of Bridges: The Long-Term Bridge Performance Program

The Federal Highway Administration's (FHWA) Long–Term Bridge Performance (LTBP) program is leading the way toward a better future for bridge performance. Launched in 2008 and now in its pilot project phase, the LTBP program will collect, maintain, and study high–quality, quantitative performance data for a representative sample of bridges nationwide. These bridges will feature many structural types and materials, as well as variations in geometry, age, traffic volume, truck loads, and climatic conditions. "This innovative program will lead the way towards identifying high–value, state–of–the–art procedures and practices for assuring bridge performance from cradle to grave," said Firas I. Sheikh Ibrahim, Team Leader for Infrastructure Management in FHWA's Office of Infrastructure Research and Development.

A ground–level view of a bridge in Sandstone, MN, that carries State Road 123 over the Kettle River.

"The data collected by the program will support a better understanding of how and why bridges deteriorate, how to best prevent or mitigate deterioration, and how to most effectively focus development of the next generation of bridge management tools," said Hamid Ghasemi, Manager of the LTBP program at FHWA.

The first phase of the LTBP program included identifying the relevant data types to be collected; establishing a data management and analysis architecture; and developing protocols for data sampling, collection, and quality assurance. Pilot studies are now being conducted at seven bridges across the country to validate the methods and protocols developed during the first phase of the program and to investigate various details about the program management, so that high quality data collection can be ensured while minimizing disruptions to bridge owners and users. These details include the time, effort, and cost of preparation, field work, and collection and analysis of data; the cost of instrumentation and data collection systems; and the cost of traffic maintenance. During the pilot phase, researchers are also looking at the time needed to coordinate with bridge owners and obtain the necessary permits for work.

In the background is a bridge that carries Southbound U.S. Route 15 over Interstate 66 in Prince William County, VA.

Located in California, Florida, Minnesota, New Jersey, New York, Utah, and Virginia, the pilot bridges represent both a broad geographic distribution and a cross section of the bridges that will be the focus of the LTBP program. The program will concentrate on the types of bridges heavily represented in the U.S. bridge population, including highway and interchange overpasses and bridges over minor waterways. Primary selection criteria for the pilot bridges were superstructure type, age, type of deck, composite versus noncomposite design, deck condition, environmental factors, annual average daily traffic (AADT), and the percentage of trucks in the traffic stream.

Check out our Bridge Maintenance Inspection course offered on May 24, 2011. For more information see page 7.

Continued on Page 3

Diagnosing ASR begins with a condition survey to evaluate the presence and severity of distress.

A new report from the Federal Highway Administration (FHWA) is designed to assist engineers in diagnosing and mitigating alkali–silica reaction (ASR), which can lead to expansion and cracking of concrete elements and the premature deterioration of concrete structures. Report on the Diagnosis, Prognosis, and Mitigation of Alkali–Silica Reaction (ASR) in Transportation Structures (Pub. No. FHWA–HIF–09–004) details the necessary steps for detecting and evaluating ASR in a highway structure. The report was developed through FHWA's ASR program, which launched in 2006 with the goals of increasing concrete pavement and structure durability and performance and reducing life–cycle costs through the prevention and mitigation of ASR.

ASR occurs when silica in some aggregates and alkalis in concrete combine with water to form a gel–like substance. As the gel absorbs water and expands, it causes the concrete to crack. Over time, the cracks enable other modes of distress to occur, such as freeze thaw damage or corrosion.

A worker uses a ruler to examine a concrete median barrier affected by alkali–silica reaction (ASR).

As the report describes, diagnosing ASR begins with a condition survey to evaluate the presence and severity of distress. This condition survey is followed by a second level of investigation to document information, measure the cracking index (CI), obtain samples, and conduct a petrographic examination. A third, more detailed level of investigation is then conducted to determine the current rate of concrete expansion and cracking, the potential for future expansion, and the risks posed by the presence of ASR. The third level of evaluation includes both in–situ investigations, such as examining surface cracking and taking expansion and deformation measurements, and laboratory tests.

The report looks at the success of various proposed mitigation measures for ASR. These measures are grouped according to whether they are intended to treat the causes of ASR or the symptoms of the reaction. Measures to treat the causes include using lithium compounds to halt expansion in the concrete and applying sealants to reduce moisture. Measures aimed at treating the symptoms of ASR, meanwhile, include crack filling techniques and the confinement of an ASR–affected member by using nonreactive concrete around it and other strategies.

Engineers and practitioners will also benefit from the resources provided in the report's appendices, which include guidance on identifying the visual signs of ASR, step–by–step instructions for determining the CI, and details on recognizing the petrographic symptoms of ASR. Also included is information on various test procedures, including the procedure to determine the water–soluble alkali content of concrete. Photographs are provided to aid in conducting condition surveys and petrographic analysis.

To download the report, visit http://www.fhwa.dot.gov/pavement/concrete/asrprotocols.cfm. For a printed copy or to obtain additional information on the ASR program, contact Gina Ahlstrom in FHWA's Office of Pavement Technology, at 202.366.4612 or by email at gina.ahlstrom@fhwa.dot.gov. Details on FHWA's ASR program are also available at http://www.fhwa.dot.gov/pavement/concrete/asr.cfm.

Reprinted from the January/February 2011 issue of FOCUS a publication of the U.S. Department of Transportation and the Federal Highway Administration

The underside of a bridge on Eastbound Interstate 95 over Sharon Station Road near Allentown, NJ.

Selected pilot bridges include one that carries Southbound U.S. Route 15 over Interstate 66 in Prince William County, Virginia. Constructed in 1979, this two–span steel haunched girder bridge has a cast–in–place concrete deck and carries an AADT of 16,500 vehicles, with six percent trucks. Both the steel superstructure and the concrete deck are showing a significant degree of deterioration. The Minnesota pilot bridge, meanwhile, carries State Road 123 over the Kettle River in the town of Sandstone. Constructed in 1948, the steel deck truss bridge carries an AADT of 2,050, with eight percent trucks. And in New Jersey, the pilot bridge carries Eastbound Interstate 95 over Sharon Station Road near Allentown, New Jersey. This single span multi–beam steel girder bridge with a cast–in–place concrete deck was constructed in 1969 using stay–in–place forms. The bridge carries an AADT of 25,000 vehicles.

The final pilot bridge to be studied carries Westbound State Road 430 over the Halifax River in Daytona, Florida. Built in 1997, the precast segmental box girder structure has multiple spans.

A ground–level side view of a bridge on Westbound State Road 430 over the Halifax River in Daytona, FL.

Researchers have conducted a detailed visual inspection of each bridge and analyzed the bridges using finite element modeling. Live load testing or dynamic testing were also performed to obtain baseline data on the structural behavior of the bridges. The deck of each bridge was inspected using several nondestructive testing methods, and cores were taken to help characterize the material qualities of the deck and the type and extent of any deterioration.

The data collected from the pilot bridges are now being evaluated to determine if any adjustments in the LTBP program protocols are needed. The pilot phase will be completed by the fall of 2011, with the regular long–term data collection phase of the program beginning this summer.

"The ultimate goal of the pilot study phase is to make certain that all of the components needed to achieve the long–term objectives of the LTBP program are specified before starting the nationwide study on a larger sample of the bridge population," said Ghasemi.

For more information on the LTBP program, visit http://www.fhwa.dot.gov/research/topics/infrastructure/bridges/subindex1.cfm (select "Long Term Bridge Performance"), or contact Hamid Ghasemi at FHWA, 202.493.3024 or by email: ltbp@dot.gov).

Reprinted from the January/February 2011 issue of FOCUS a publication of the U.S. Department of Transportation and Federal Highway Administration

CITE Blended Courses for 2011

The Consortium for ITS Training and Education (CITE) announces its Blended Course schedule for 2011. A "blended" course combines the best features of both instructor-led and web-based instruction. Features include: live discussions through the use of conference calls, convenient, flexible web-based learning, a specific time schedule in which to complete the course, and student interaction through the use of a discussion board.

Scheduled courses include:

- Advanced Telecommunications Technology, April - May
- Improving Highway Safety with ITS, June - July
- Introduction to Systems Engineering, September - October
- Traffic Signal Timing, September - October
- Road Weather Information Systems (RWIS) Equipment and Operations, October - December
- Configuration Management for Traffic Management Systems, October - December

For more information about or to register for CITE's Blended Courses visit:
www.citeconsortium.org

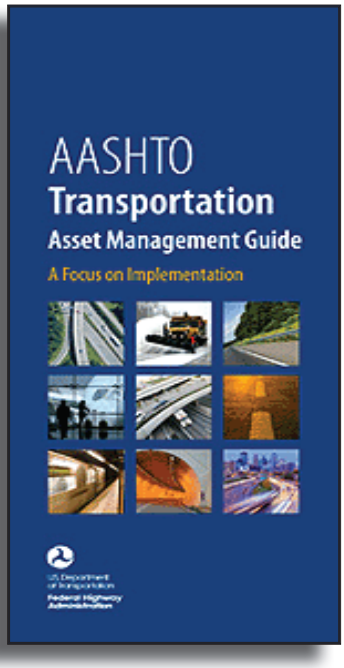
Transportation Asset Management: A Focus on Implementation

Make the most of your transportation assets both today and in the future. From the first steps in implementing transportation asset management (TAM) to support of a comprehensive asset management program, the new AASHTO Transportation Asset Management Guide—A Focus on Implementation can assist transportation agency executives and practitioners in preserving their highway assets, realizing the greatest value from their financial resources, and providing the essential services that their customers depend on every day.

Transportation asset management provides a coordinated approach to managing infrastructure assets over the course of their entire life cycle.

"This guide provides practitioners and decision makers with a hands-on document to implement a transportation asset management approach for their organization that will support a larger performance management program," said Kirk Steudle, Director of the Michigan Department of Transportation.

Developed through the Transportation Research Board's National Cooperative Highway Research Program, the guide complements the 2002 American Association of State Highway and Transportation Officials' (AASHTO) Transportation Asset Management Guide. The new guide provides more detailed hands-on guidance on implementing TAM concepts, principles, performance targets, and strategies. Also addressed are analysis methods, data collection, and the application of information from management systems, including tools that can be used to evaluate return on investment and improve economic efficiency, resource allocation, and budgeting decisions. Management systems featured include Enterprise Resource Planning (ERP) systems, which use software to integrate core functions and share data across an agency. Agencies will also find strategies for enhancing communication and information sharing among decision makers and elected officials.



According to AASHTO's Subcommittee on Asset Management, "Transportation Asset Management is a strategic and systematic process of operating, maintaining, upgrading, and expanding physical assets effectively through their life cycle. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well-defined objectives."

Get a quick introduction to transportation asset management with FHWA's new brochure on the AASHTO Transportation Asset Management Guide—A Focus on Implementation (Pub. No. FHWA-HIF-10-023). The brochure highlights the many resources contained in the guide, including the steps to asset management implementation. To download the brochure, visit www.fhwa.dot.gov/infrastructure/asstmgmt.

TAM provides a coordinated approach to managing infrastructure assets over the course of their entire life cycle, thus improving performance, increasing safety, and providing greater value to the community. With an asset management approach, optimal decisions on what would be the most effective mix of maintaining, repairing, renewing, or replacing infrastructure components are based on accurate data, economic analysis, and sound engineering. Decisions are also supported by performance measures and performance-based goals.

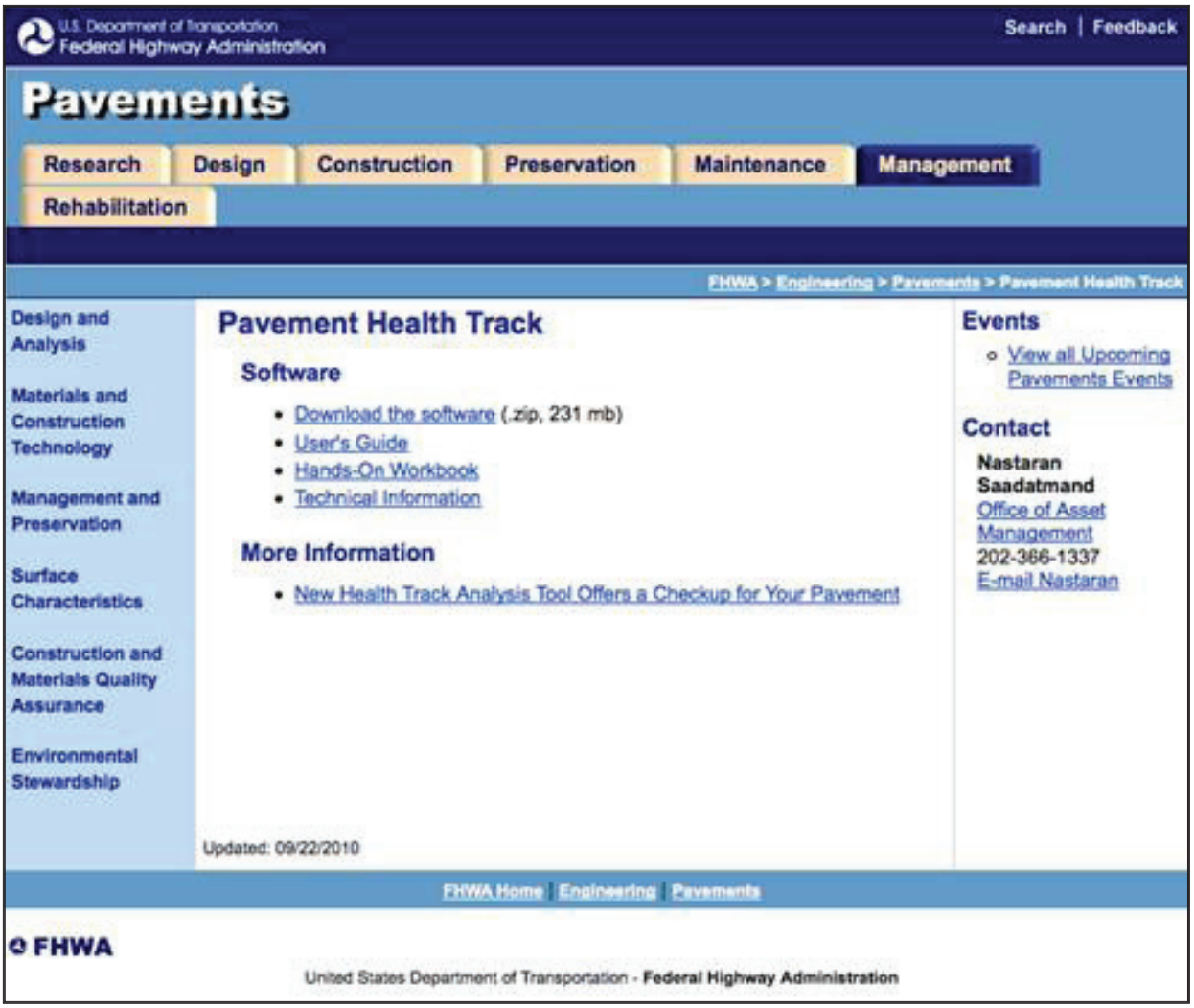
"An asset management approach can reduce long-term costs and improve the credibility of the decision making process by

Continued on Page 6

Download the Pavement Health Track Analysis Tool

Now available online is the Federal Highway Administration's (FHWA) new Pavement Health Track (PHT) Analysis Tool. The PHT Analysis Tool can be used to determine the health of your pavement network in terms of the pavement's remaining service life, based on rideability and pavement distresses (see August 2010 Focus at www.fhwa.dot.gov/publications/focus/10aug/01.cfm). Pavement health can be determined for different pavement types under various conditions such as climate or whether it is in a rural or urban environment. The tool was developed for FHWA by Battelle and Applied Research Associates. It uses pavement performance models that are simplified versions of the models and procedures used in the American Association of State Highway and Transportation Officials' Mechanistic-Empirical Pavement Design Guide.

To download the software tool today, visit www.fhwa.dot.gov/pavement/healthtrack/index.cfm. Also available are a User's Guide, Hands-On Workbook, and technical information about the software. The software, User's Guide, and other supporting documents will periodically be updated as FHWA makes enhancements to the tool. These updated versions will be posted online as they become available. For more information, contact Nastaran Saadatmand at FHWA, 202.366.1337 or by email at nastaran.saadatmand@fhwa.dot.gov.



Visit www.fhwa.dot.gov/pavement/healthtrack/index.cfm to download the Pavement Health Track Analysis Tool.

Reprinted from the October 2010 issue of FOCUS a publication of the U.S. Department of Transportation and Federal Highway Administration

being objective and technically based," said Steve Gaj of FHWA's Office of Asset Management.

As the guide describes, asset management begins with asking five core questions:

1. What is the current state of the agency's physical assets?
2. What are the required levels of service and performance delivery?
3. Which assets are critical to sustained performance?
4. What are the best investment strategies for operations, maintenance, replacements, and improvement?
5. What is the best long-term funding strategy?

The overall goal of a TAM program is to minimize the life-cycle costs for managing and maintaining transportation assets, including roads, bridges, tunnels, rails, and roadside features.

The guide takes readers through a sequence of management steps that are key to TAM implementation, from setting the direction and creating alignment within the organization to developing the asset management plan and strengthening the necessary processes, systems, and data. Included are both national and international case studies. The Colorado Department of Transportation (CDOT), for example, has been emphasizing asset management since the early 1990s, with a system that comprises 1,868 center line km (1,161 center line mi) of roadway, more than 3,700 bridges, and 20 tunnels. The agency has one of the Nation's most mature pavement management systems and was an early user of the Pontis® bridge management system. More recently, CDOT has implemented an ERP system to support its asset management program. The ERP uses software to integrate data from different management systems to help maximize the value of the agency's investment choices.

Interested in Asset Management?
Check out these courses that can help!

Traffic Signs, April 5, 2011 - learn how to make your traffic signs last longer.

Preventive Pavement Maintenance, April 14, 2011 - This course is the first step in making your asphalt pavements last longer at lower costs.

For more information, see page 7.

To download the AASHTO Transportation Asset Management Guide—A Focus on Implementation, visit assetmanagement.transportation.org (click on Topic Area "AASHTO"). For more information on TAM, contact Steve Gaj in FHWA's Office of Asset Management at 202.366.1336 or by email at stephen.gaj@fhwa.dot.gov, or visit www.fhwa.dot.gov/infrastructure/asstmgmt.

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Upcoming Conferences

Come see us at the following upcoming conferences:

CEAM Spring 2011 Conference - The County Engineers' Association of Maryland (CEAM) is holding its Spring Conference on Tuesday, May 10th from 8am - 4pm at Oregon Ridge Park, 13401 Beaver Dam Road, Cockeysville, Maryland. For more information, visit: www.countyengineers-md.org

Annual MACo Summer Conference - The Maryland Association of Counties, Inc. is holding its annual Summer Conference on August 17-20, at the Roland Powell Convention Center in Ocean City, Maryland. For more information, visit: http://www.mdcounties.org.

We hope to see you there!

The following courses are currently scheduled and we are still adding to the list! For more information or to schedule a class, contact Janette Prince at 301.403.4623 or register online by visiting us at www.mdt2center.umd.edu.

ROAD SURFACE MANAGEMENT

Ed Stellfox
March 31, 2011, 8:30am – 3:00pm
College Park, Maryland
$89 All Participants

This course provides participants with the basic concepts of road surface management including inventory, distress identification, condition survey, strategies, programs, budgets, and field surveys. A Road Surface Management Systems software demonstration will also be conducted during this course.

TRAFFIC SIGNS

Ed Stellfox
April 5, 2011, 8:30am – 12:30pm
College Park, Maryland
$59 All Participants

This half-day course will cover the regulations and guidelines for traffic signs including; regulatory signs, warning signs, and guide signs. A review of the Manual on Uniform Traffic Control Devices (MUTCD) will also be covered. An in depth discussion of sign examples, installation and maintenance, as well as sign management will be covered.

FLAGGER CERTIFICATION

Juan Morales
April 11, 2011, 8:30am – 12:30pm
College Park, Maryland
$100 All Participants

The safety of workers, motorists and pedestrians is dependent upon the flaggers' performance. Since the flagger position involves safety, proper training is vital; flaggers are expected to pass a test to prove their proficiency and competence level. A MD SHA-approved ATSSA (American Traffic Safety Services Association) flagger card will be issued upon satisfactory completion of this course. This will be valid for 4 years and is acceptable in several states, including MD, VA and DC. The class is presented in PowerPoint© and will include a 25-question multiple choice exam and a flagger demonstration (dexterity test). Students will receive their ATSSA Flagger Certification card the day of the course (upon passing the exam).

ASPHALT RESURFACING

Ed Stellfox
April 12, 2011, 8:30am – 12:30pm
College Park, Maryland
$59 All Participants

This course reviews the various asphalt mixes, their components and their uses. Asphalt resurfacing procedures are covered, including preparation, material, equipment, operation and safety. Special emphasis is placed on proper rolling and compaction of the asphalt overlay. Superpave mix design is discussed as well. Municipal officials, road commissioners, supervisors, and superintendents; public works and maintenance personnel; equipment operators; and city or town managers are encouraged to attend.

PREVENTIVE PAVEMENT MAINTENANCE

Ed Stellfox
April 14, 2011, 8:15am – 3:00pm
College Park, Maryland
$89 All Participants

The course covers preventive maintenance treatments such as chip seals, slurry seals, and micro-surfacing and discusses when and where each technique could be effective. It presents application methods, including preparation, materials, equipment, operations and safety, along with practical tips on how to avoid trouble.

UNDERSTANDING ROAD DESIGN AND MAINTENANCE

Ed Stellfox
April 19, 2011, 8:30am – 3:00pm
College Park, Maryland
$89 All Participants

This course is the first step in understanding the problems that a Municipal Road department faces on a daily basis. This course designed for elected officials conveys an understanding of design and maintenance of municipal roads that will make your life easier when dealing with Road Superintendents, Public Works Directors, Foremen, etc. It also gives elected officials a better understanding of what is involved in a road and street budget.

UNPAVED AND GRAVEL ROAD MAINTENANCE

Ed Stellfox
April 28, 2011, 8:30am – 12:30pm
College Park, Maryland
$59 All Participants

This course addresses basic maintenance techniques for unpaved and gravel roads. Topics include road materials, blading or dragging, reshaping or regrading for proper crown, regraveling, stabilization or full-depth reclamation, and dust control, with an introduction to road management techniques.

INTRODUCTION TO GEOSYNTHETICS

Ed Stellfox
May 3, 2011, 8:30am – 3:00pm
College Park, Maryland
$89 All Participants

This course is an introduction to geosynthetics, beginning with a discussion of geosynthetics, what they are, how they are made and how they can be used in a road maintenance program. The course then looks at other geosynthetics and their road system uses, including geogrids, geocells and geowebs, presenting new materials with new applications.

BRIDGE MAINTENANCE INSPECTION

John Hopkins
May 24, 2011, 8:30am – 3:00pm
College Park, Maryland
$110 Maryland Local Government Participants
$125 All Other Participants

This one day course will cover inspection of bridge maintenance. A brief summary of the topics to be covered are as follows: approach, deck maintenance, deck joints, deck drains, bearing maintenance, concrete beams, steel beams, timber beams, bridge seats and caps, piles and bents, truss maintenance, painting, and winter maintenance. The class is for the actual field maintenance worker who has to do the repairs. It is mostly concerned with what to look for from a maintenance standpoint not a structural rating perspective.

CONSTRUCTION INSPECTION FOR LOCAL AGENCY EMPLOYEES

John Hopkins
May 25, 2011, 8:30am – 3:00pm
College Park, Maryland
$110 Maryland Local Government Participants
$125 All Other Participants

This one day session will cover some of the major duties and responsibilities of an individual responsible for the quality of a project. It will address the importance of understanding the plans, the contract, the order of operations, the materials to be used and the various quality control tests used in project inspection. This course is presented in a straight forward manner and deals with the reality of everyday factors involving contractors and agencies. Qualified field inspection personnel with one to three years of field experience are encouraged to attend; participants must possess basic math skills in geometry and algebra. *Participants should bring a calculator, scale and straight edge; notebooks will be provided.

INTRODUCTION TO TEMPORARY TRAFFIC CONTROL

Juan Morales
June 6, 2011, 8:30am-3:00pm
College Park, Maryland
$110 Maryland Local Government Employees
$125 All Other Participants

An introductory course to temporary traffic control (TTC) in work zones, TCC is a one-day course designed to give participants a complete overview of traffic control in work zones, including applicable standards, devices used, component parts and their requirements, and installation/ removal considerations. This is intended for anyone whose actions affects safety on temporary traffic control work zones, including traffic managers, traffic technicians, inspectors and designers; and will prepare participants to take the Maryland SHA Traffic Manager's course. The following topics will be covered: definition of TTC, quantification of the safety problem, manuals and standards applicable in the State of Maryland, fundamental principles of TTC, and component parts of the TTC, introduction to traffic control devices, tapers and other transitions, and installation and removal considerations.

WORK ZONE DESIGN

Juan Morales
June 7-8, 2011, 8:30am-3:00pm
College Park, Maryland
$220 Maryland Local Government Employees
$250 All Other Participants
CEU's: 1.2

The course will give participants knowledge of the entire temporary traffic control (TTC) process: planning, design, review, installation, maintenance, and evaluation of proper maintenance of traffic (MOT) controls for work zones. While the functions of planning, design, review, and operation of temporary traffic control are covered in detail, issues concerning safety of pedestrians and highway workers, human factors, and legal responsibility are also addressed. The procedures and devices covered are generally taken from Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD) and are modified to meet practices and standards in Maryland.

CONSTRUCTION INSPECTION INTERMEDIATE LEVEL

John Hopkins
July 13-14, 2011, 8:30am – 3:00pm
College Park, Maryland
$215 Maryland Local Government Participants
$245 All Other Participants
CEU's: 1.2

An intermediate class focuses on the construction, inspection, measurement and testing of materials associated with road way construction. Includes real-life scenarios and problems faced on the job, and covers general practices and MD standards. Qualified field inspection personnel with one to three years of field experience are encouraged to attend; participants must possess basic math skills in geometry and algebra. A test will be administered to acquire class credit. Participants should bring a calculator, scale and straight edge; notebooks will be provided.

TRAFFIC SIGN INSTALLATION AND INSPECTION

Mark Hood
July 20, 2011, 8:30am-3:00pm
College Park, Maryland
$110 Maryland Local Government Employees
$125 All Other Participants

This one-day course will cover the basics of traffic signs: using the appropriate rules and regulations to select and apply appropriate traffic signs, as well as proper installation and maintenance techniques. Participants will learn the importance of and the basic rules for signing, inspection techniques for sign installations, and maintenance procedures for sign faces and supports. This course was designed for technicians, supervisors, & crew involved in sign assembly, installation, maintenance, inspection, or management.

LOW COST SAFETY IMPROVEMENTS

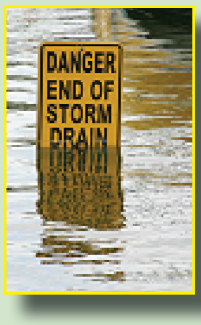
Mark Hood
September 14, 2011, 8:30am-3:00pm
College Park, Maryland
$110 Maryland Local Government Employees
$125 All Other Participants

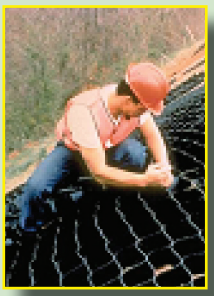
This course provides participants with methods for implementing effective, low cost safety improvements targeted at high crash areas. It emphasizes the basic and enhanced application of traffic control devices, low cost safety improvements, and their specific safety benefit (crash reduction factors). Traffic crash data collection, identification of hazardous locations, and engineering study procedures are also discussed. Emphasis is placed on low cost solutions that may be made at the local level.

WINTER MAINTENANCE

Ed Stellfox
October 4, 2011, 8:30am – 3:00pm
College Park, Maryland.
$89 All Participants

This course covers all aspects of winter operations- planning and organizing, methods of snow and ice control, salt usage, and winter equipment maintenance. This lesson will include usage of snow maps, formal snow plans, snow plow and salt spreader operation. This course in intended for municipal officials, road commissioners, supervisors, superintendents, publics works and maintenance personnel, equipment operators, and city or town managers.



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Requesting a course is simple, visit www.mdt2center.umd.edu and fill out our request training form or call Janette Prince at 301.403.4623 and she'll be glad to assist you.

MD T² Advisory Board Committee