



## Maintenance Activity Training

### **INTRODUCTION:**

The Maintenance Activity Training (MAT) project was developed to provide an electronic training platform for specific highway maintenance activities for use in the field. The training was developed specifically for PennDOT personnel responsible for planning, scheduling, conducting, and assessing maintenance activities, but can be adapted for use by any agency responsible for the maintenance of roadways. This training focuses on the full-range of tasks associated with each identified roadway maintenance activity and is suitable for self-paced individual instruction or instructor-led training. The MAT developed for PennDOT's Pipe Replacement activities can be downloaded [here](#) for your review.

Please note that the functionality of the MAT requires it to be viewed using PowerPoint's Slide Show mode.

### **DEVELOPMENT TEAM:**

The training development team includes IUP staff and consultants, who work closely with agency personnel throughout the development of each activity-specific MAT. Together, the team develops a scope for the MAT and begins the process of developing the training. To ensure that details of the activities are captured accurately, IUP will assemble work teams and conduct workshops where a facilitator elicits information and details from field employees and stakeholders. The IUP team then integrates the feedback from the field employees/stakeholders; gathers source documents; reviews specifications, policies, and regulations; develops scripts; gathers appropriate photographs and creates graphics, and develops the initial prototype. Each module is reviewed by the agency field personnel/stakeholders. The completed product is not delivered until the electronic MAT has undergone stringent quality assurance reviews to ensure accuracy of information and functionality.

### **FORMAT:**

The electronic training on which the MATs are based provides for highly flexible, widely accessible, versatile training in a non-linear format. Each MAT uses a stand-alone set of training "modules" that can be reviewed consecutively or out of sequence as needed to address the relevant training needs for the situation. They can be completed in one training session, a few at a time, or one specifically to reinforce a topic like safety. MATs can be used to orient new employees, refresh current employees, cross train employees in other departments, prepare employees for promotion, and familiarize new managers on the activities under their responsibility. Their digital format ensures MATs can provide training in the office, at the stockpile, on the job site, and at home for ultimate accessibility.

## **TRAINING TOPICS & MODULES:**

Each activity-specific MAT consists of a series of independent training “modules” designed to focus on a specific training topic related to the activity. Topics may be tailored to the needs of your agency. Currently, each MAT consists of the following 13 independent training modules:

- Planning
- Project Preparation
- Concurrent Projects
- Scheduling
- Safety
- Work Zone Traffic Control
- Quality Assurance
- Environmental Concerns
- Risk Management
- Project Wrap-Up
- Follow-Up Activities
- Preventative Maintenance
- Operational Sequence

The training modules are displayed in a hub and spoke fashion on a “Module Selector Slide” that allows the user to begin and end at any module and at any time. Each MAT identifies the specific modules that are intended for various classification levels. Specific Learning Objectives and associated Key Topics are identified at the beginning of each module and then summarized at the end of each module.



The activity-specific MATs that have been developed to date include:

- **Mechanized Base Repair**...also includes the following activities:
  - Widening with Bituminous Concrete Base Course (BCBC)
  - Widening with Recycled Materials
- **Crack Sealing** (Manual Treatment on Paved Surface with Liquid Bituminous)
- **Seal Coating** (Mechanized Treatment on Paved Surface with Liquid Bituminous)
- **Manual Patching**...includes the following methods:
  - Standard Patching
  - Spray Patching
  - Liquid Bituminous Patching (Skin Patching)
- **Paving (Bituminous Concrete)**...includes the following activities:
  - Patching with Mechanized Paver Finisher
  - 1" Depth with Mechanized Paver Finisher
  - 1 ½" Depth With Mechanized Paver Finisher
  - Leveling Course
- **Mechanized Shoulder Cutting**...includes the following methods:
  - Belt Loader
  - Front End Loader
- **Pipe Replacement/Installation**
- **Vegetation Management**...includes the following methods:
  - Selective Tree Thinning and Tree Removal
  - Mechanized Tree Trimming and Tree Removal

Additional modules that were developed and incorporated into these trainings include:

- Hot Liquid Asphalt Safety
- Equipment Calibration, and
- Trench Restoration (Manual Patching of Pipe Trenches)

Development of future MATs may include the following topics:

- Traffic Engineering
- Permitting
- Sign Management and Pavement Marking
- Guiderail, Barrier, and Roadside Safety Appurtenances
- Pavement Preservation
- Inlet Maintenance
- Full Depth Reclamation
- Bridge Maintenance
- Incorporating additional information on Storm water Management in the Pipe Replacement and
- Incident Management
- Emergency Management

## **INTENDED USE:**

Deployment of the product is intended for use in a variety of ways from individual self-paced instruction, to Supervisor-led training (e.g. dark-hours or Safety Talks), to instructor-led classroom instruction. The Pipe Replacement MAT has the enhanced capability for the use as a tool for instruction for a large group when instructors intend to move through the entire presentation in one sitting. It includes a completely different set of training slides that utilize the same material in a sequence more conducive for this type of group training use.

## **EASE OF USE & MAT MAINTENANCE:**

All MATs utilize Microsoft PowerPoint that allows the users to:

- Read the individual slides at self-paced speed
- Navigate from slide to slide using the navigation arrows in the lower right hand corner of each slide
- Return to the module selector slide at any time by clicking on a “hub and spoke” training logo in the lower left-hand corner of each slide

The learning capabilities are enhanced through the use of the following:

- Appropriate photos and audio/visual aids that supplement the objective
- Highlighted fields that provide the user with an opportunity to view additional corresponding text and/or graphics

The size of the digital files ranges from 20MB to 200MB, dependent on the content, the number of slides required to convey the message and audio and visual aids incorporated. Users should consider the size of the MAT in its utilization. Time and technology capability needs will vary depending on the size.

To extend the shelf-life of the MATs and ensure the most current information is provided in the training, IUP ALS-RTC recommends that each MAT be reviewed at least once annually for the following:

- Material that is no longer accurate and requires modification
- Material that is obsolete and must be updated
- Conflicting information from updated Regulations and Publications (both State & National) that must be changed
- Opportunities to provide better photos or audio/visual aids

## **CONCLUSION:**

MATs can provide roadway maintenance agencies with electronic training for a wide variety of maintenance activities that are easy to use in a self-paced or instructor-led fashion and can be progressed through in a variety of ways to accommodate the trainees' needs and available time. Specific Learning Objectives and Key Topics are provided for associated tasks and learning capabilities are enhanced through audio/visual aids that supplement the learning objective. The Microsoft PowerPoint format allows MATs to be updated as needed so their service life can be maximized.

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