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**The International Pavement Management Association  
(IPMA™) Presents YOUR IPMA™ Academy Curriculum:**

**THE THREE LEGGED STOOL SYSTEM™**

**APM™ Certification Program Syllabus**

# Asphalt Pavement Management, In-Place Asphalt Recycling & Preservation Online APM™ (Accredited Pavement Manager) Certification Course

How to Combine a Solid Pavement Management Plan with a Proactive Asphalt Recycling and Preservation Plan to Stretch Your Agency’s Infrastructure Budget

## Syllabus

By: Blair Barnhardt, APM

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**“IPMA™ Academy: Teaching agencies engineers how to do more with less while increasing authority, expertise and income”**

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# Asphalt Pavement Management, In-Place Asphalt Recycling & Preservation Online APM™ Certification Course

## IPMA™ Academy

### Syllabus

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#### I. Course Information

##### Instructor Information

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(Please allow 48 hours for response to non-urgent requests)

**Websites:** <http://www.ipmaacademy.com>

<http://ipma.co>

<http://drivingamericaforbetterroads.com/>

<http://thebarnhardtgroup.com/>

**Facebook:** <http://www.facebook.com/groups/IPMAAcademy/>

(NOTE: this is a private group for IPMA Academy learners only!)

<http://www.facebook.com/DrivingAmericaForBetterRoads>

**YouTube:** <http://www.youtube.com/user/ipmaTV>

<http://www.youtube.com/user/barnhardtgroup>

## Introduction:

Thank you to all that signed up for this program. I look forward to sharing my 30 years of construction experience and 17 years of university level course design and delivery with you. Over the last seven weeks alone I have driven over 25,000 miles across America to finalize the field video portions of this curriculum. It has taken me over two years to amass and over \$100,000 in time and equipment to put together the most comprehensive PDH training program for all things Pavement Management, Pavement Distress Evaluation, In-Place Asphalt Recycling and Pavement Preservation.

In addition to my instruction we will have special guest lecturers that will include experts from all areas of our pavement management circle. You will also be provided bonus material above and beyond the 70+ hours of online training in your personal portal in the form of additional online learning material and periodic eBooks, CDs, MP3s, and DVDs if available at the time.

Note that this class will be made up of three main ingredients; one you will read the material that is suggested, visit the web links provided and watch the recorded homework sessions. Second, you will continue to read The Book on Better Roads and immerse yourself in our free pavement management content.

Third, you will do periodic short multiple-choice quizzes that we will be grading. Upon completion of the 20 weeks of your APM™ Curriculum, you will apply to the IMPA™ Advisory Board to receive your certificate and credentials.

## Lead Instructor BIO



### Blair Barnhardt, APM



**Blair Barnhardt** is an Amazon #1 Best Selling Author of *The Book on Better Roads* and an award winning National Highway Institute (NHI) Certified Instructor for the Federal Highway Administration (FHWA). He has spent over 30 years building roads, with 17 of those years spent designing and delivering college and university classes to students, state DOTs and agency engineers across North America. He has taught every single NHI In Place Asphalt Recycling Workshop to date from AK to FL to ME to CA and everywhere in between. He has taught agency personnel how to manage their pavement and implement a cost-saving pavement management, in-place asphalt recycling and preservation program, otherwise known as The Three Legged Stool System™.

Most agencies save 30% to 40% of their annual road budget by implementing a solid pavement management plan, which uses eco efficient in-place asphalt recycling (i.e. hot in place, cold in place, full depth reclamation) and pavement preservation techniques (i.e. crack sealing, chip seals, slurry & microsurfacing, thin asphalt overlays etc.). If you want to stretch your agency's SPLOST, LMIG, LARP, FHWA Grants, etc. funds as far as possible each year, this APM™ Certificate program can provide the necessary expert education, deliverables and guidance for your journey to become a Pavement Management RockSTAR!

An engineering graduate of Mohawk College in Canada, he also served as a professor in their Continuing Education Department. He has designed and delivered online education programs on Pavement Management, In-Place Asphalt Recycling and Preservation for the University of Kansas, Auburn University and the UC Berkley ITS Department. In addition, Blair has provided design and delivery of specialized workshops on the Three Legged Stool for the Northwest Environmental Training Center. In 2013 Blair will also be teaching for the Road School Program at Purdue University and UTAH LTAP.

Blair was involved with the most recent revision for one of the industry standards, the BARM (ARRA/FHWA Basic Asphalt Recycling Manual). In addition, he is a published author in every major related trade journal including *FHWA Public Roads*, *Public Works*, *Roads & Bridges*, *Asphalt Contractor*, *Army Engineer*, *Better Roads*, and *World Highways Magazine*.

He also worked with AP Tech as a subject matter expert for revisions to the FHWA NHI #131050 Asphalt Recycling Curriculum while serving on two subcommittees for the FHWA Expert Task Group on Pavement Preservation. Blair has taught several APWA Carl Vinson School of Public Works Management Sessions, and specialized workshops and is on the National Data Base of LTAP Instructors. He currently accepted a position as Vice Chair of the Training Task Force Committee and a Board of Directors nomination for the Southeast Pavement Preservation Partnership at the National Center for Pavement Preservation (NCPPI).

An active member of Asphalt Recycling & Reclamation Association (ARRA), Blair also served as chair of the Committee on Asphalt Recycling Education (CORE) for the Board of Directors for several years. He is also a member of the International Slurry Surfacing Association (ISSA), American Public Works Association (APWA), American Society of Civil Engineers (ASCE) and Association of Asphalt Pavement Technologists (AAPT).

In addition to NHI Certification, Blair holds two Certificates for MicroPAVER™ Specialized & Advanced Training from the University of Illinois at Urbana - Champaign. Further, he is also a registered StreetSaver® Pavement Management Consultant, Technical Trainer and Software Development Team Member. The aforementioned software programs will be discussed thoroughly in class along with their GIS integration implementation.

In addition to teaching, Blair is the Host of Driving America for Better Roads, a weekly YouTube Series, CEO of The Barnhardt Group, LLC, an engineering firm specializing in on-the-ground pavement distress evaluation and pavement management services at the network and project level. He also provides asphalt recycling and pavement preservation outreach to agencies.

Blair has brought PMS, asphalt pavement recycling and preservation procedures to thousands of agency engineers; consequently, they have saved millions of dollars by implementing these very technologies. He is one of only a few industry experts with a lifetime of expert knowledge orchestrating the work for hot in place, cold in place, full depth reclamation, pavement preservation, pavement management and pavement distress evaluation experience. Blair Barnhardt and The Barnhardt Group is a  Founders Circle Lifetime Member of the Pavement Recycling & Reclaiming Center at CalPoly Pomona.

### **Course Description (21 Week APM™ Certification On-Line Series)**

Asphalt is the number one recycled product in America by weight and yet we only recycling approximately 3% of our roads in place. Furthermore, in a recent poll by the National Center for Pavement Preservation, only 10% of our citizens in this Country understand what pavement preservation is. Yet, these methods are tried and proven, repeatedly to save 30% to 50% of an agency's annual road budget. The goal of this series is to educate the learner, whether an agency person, consultant or academia, or otherwise, cost effective ways to implement a successful program which combines pavement management, recycling and preservation.

Delivery of the course is a comprehensive instructor-led online video training course focusing on project and technique selection and justification, material considerations and mix design, construction specifications, and project control considerations during construction. Case studies and videos of actual projects are presented. Each of the 18 weekly lessons takes approximately 3-5 hours each to complete. Seventy total Professional Development Hour **(PDH) credits** are awarded to the learner upon completion of the 20-week series. The learners will also be required to complete periodic quizzes and apply to the IPMA™ Advisory Board. We can award CEUs as well via our academic partner, Auburn University.

## **II. Goals, Learning Outcomes, and Target Audience**

### Course Goal

This 21 week online APM™ Certification Course is designed to increase participants' knowledge of a) pavement management and distress evaluation system, b) the three major asphalt pavement in-place recycling techniques (i.e. Hot in Place Recycling, HIR, Cold in Place Recycling, CIR, Full Depth Reclamation, FDR and their respective sub disciplines), and all of the major pavement preservation techniques available to local agencies.

Having studied all 21 weeks of the online curriculum, the learner should have a thorough understanding of how to implement a cost saving pavement management, in-place asphalt recycling and long-term pavement preservation program at their respective agency that models successful agencies currently using The Three Legged Stool System™. Moreover, this training program will help the learner seeking to advance their career by providing them with innovative concepts that are saving agencies millions across America. The Accredited Pavement Manager (APM™) Designation was conceived to allow our circle of pavement management experts to form as proof of their hours of dedication to better learn how to manage their millions of dollars worth of pavement infrastructure for less money and even less carbon footprint.

### Course Learning Outcomes

At the end of the 21 week online APM™ Certification Course, participants will have the knowledge to be able to perform a comprehensive pavement distress evaluation by identifying and classifying 20 pavement defects in the PAVER manual (20 and/or 7 for StreetSaver®). The same list of pavement defects can also be assessed with StreetSaver® software that is covered in detail during the curriculum. Actual screen capture of the MicroPAVER™ and StreetSaver® software will be used in the recorded homework video sessions. The learner does not have to purchase the software in order to take this program, but is encouraged to download the free 30 day trial for StreetSaver® if they would like to practice.

DISCLAIMER: IPMA™ DOES NOT RECEIVE FUNDS FOR PROMOTION OF ANY OF THE PRODUCTS MENTIONED IN THE CURRICULUM, WE ARE NOT AFFILIATES, AND WE DO NOT ENDORSE PRODUCTS, SERVICES, OR EQUIPMENT. ALL SUCH NAMES AND USE OF ABOVE ARE MERELY BASED ON THEIR POPULARITY IN THE CIRCLE OF PAVEMENT MANAGERS IN NORTH AMERICA

The learner will also be able to identify suitable candidates for in-place recycling, to select the appropriate recycling technique under varying conditions, to select the appropriate materials, and to identify the major types of pavement preservation that are used to make our good pavements last longer across USA and the world. All of the dimensions referred to in the curriculum are SAE units, however, we will strive to translate to Metric if there is a need or request by the learners.



The learner will also be able to correlate what Pavement Condition Indexes (PCIs) are best suited for the rehabilitation techniques above and how to construct a decision tree with the appropriate unit prices for their respective region.

- Understand the different means and methods to collect pavement distress data
- Discover the benefit to using portable devices such as the iPad to collect field data and connect with remote PMS servers
- Recognize the benefit of linking the collected field data to a GIS system
- Correlate the PCI ratings from the Pavement Management System (PMS) with the respective corrective rehabilitation method or pavement preservation technique by using the decision tree within the PMS
- Understand basic estimating principles in order to justify long range planning decisions with regards to the selected treatments
- Describe the economic, environmental, and performance benefits associated with using in-place recycling.
- Identify the key factors that contribute to the selection of appropriate in-place asphalt recycling techniques under different traffic levels, pavement conditions, and environments.
- Understand how to select the appropriate binders and additives needed for each of the three asphalt in-place recycling techniques.
- Describe the main types of pavement preservation techniques that are available for asphalt pavements.

### Target Audience

This course is designed for state and local transportation agency engineers and other agency personnel who are responsible for pavement management, evaluation, selecting, designing, and/or constructing the agency's asphalt pavement resurfacing, rehabilitation, reconstruction and preservation alternatives. The course will particularly benefit those individuals responsible for selecting and designing asphalt in-place recycling and preservation projects, for writing effective specifications, or for inspecting asphalt in-place recycling and preservation projects during their construction. Contractors, consulting engineers, and industry representatives involved in pavement management, evaluation, asphalt pavement in-place recycling and pavement preservation will benefit from the course.

### III. Help

If you are experiencing problems with the Optimize Press Online Learning Platform for your homework videos, please note that technical assistance is available by contacting the following personnel:

Ben Cope, Internet Genius

[ben@ipma.co](mailto:ben@ipma.co)

If you require immediate assistance with any other details regarding the curriculum or otherwise, please contact me with a request with that information in the subject line [blair@ipma.co](mailto:blair@ipma.co) or 404-323-5974. If you are leaving a voice mail message, be sure to spell out your email address clearly, so I can get the correct information to you quickly. You may also copy [lori@ipmaacademy.com](mailto:lori@ipmaacademy.com) so that she can help expedite the situation.

### IV. Course Prerequisites – Optional Study

While there are no formal prerequisites prior to taking the 21 week online APM™ Certification Course, it is in the best interests of the learners to take these weekly content videos in their sequential order. The bonus videos and interviews may be taken at any time. It is understood that the learner has some basic background with the equipment, materials and labor required to evaluate, survey, build and maintain roadway infrastructure. There will be plenty of actual field videos of actual projects being constructed in real time, so even if you have never been on a project, you will feel as if you are there by watching the content on your tablet or notebook computer.

In addition to the 21 weeks of online APM™ Certificate Program curriculum, the learner is encouraged to read a list of books and view additional reference material that would include but not be limited to the following. For more information on these books and/or media, please contact the instructor at [blair@ipma.co](mailto:blair@ipma.co)

- The Book on Better Roads, Saving Your Crumbling Roads with Practical Pavement Management – Blair Barnhardt, APM
- PAVER™ Distress Identification Manual – Asphalt Surfaced Roads & Parking Lots – US Army Corp
- StreetSaver® Distress Evaluation Manuals
- Pavement Management for Airports, Roads and Parking Lots Second Edition – M.Y. Shahin

- Basic Asphalt Emulsions Manual – MS 19 – Fourth Edition – Asphalt Institute
- Basic Asphalt Recycling Manual (BARM) – FHWA – Asphalt Recycling and Reclaiming Association (IPMA™ can order for you if you supply us with your home mailing address – \*The cost of the 2<sup>nd</sup> edition has increased to \$80.00. Please submit \$99.95 to cover shipping and book. Contact [lori@ipmaacademy.com](mailto:lori@ipmaacademy.com) for more information.
- High Performance Slurry Systems Inspector’s Manual – International Slurry Surfacing Association
- At The Crossroads – Preserving our Highway Investment – NCPP National Center for Pavement Preservation
- Introduction to Asphalt MS-5 Eighth Edition – Asphalt Institute
- Asphalt in Pavement Preservation and Maintenance – MS 16 – Fourth Edition – Asphalt Institute
- Distress Identification Manual for the Long Term Pavement Performance Program – FHWA
- Distress Identification Guide – Asphalt Concrete Pavements – FHWA
- Cement The Road Recycled – DVD – Portland Cement Association
- Pavement Preservation Strategy – DVD - ISSA
- Preventive Maintenance – The Right Approach – DVD – ISSA
- YouTube various videos and specific ones on instructor channel “barnhardtgroup” visit [www.youtube.com/user/barnhardtgroup](http://www.youtube.com/user/barnhardtgroup)
- YouTube videos at <http://www.youtube.com/user/ipmaTV> especially all Driving America for Better Roads Episodes 1 - 40

## V. Class Size

Due to the nature of this online learning curriculum, there is no maximum class size.

## VI. Textbook & Course Info: Note that despite what some videos will say, the most recent revisions to the curriculum require a copy of The Book on Better Roads which we will provide at no charge (\$50.00 plus shipping value). Optional Reference Media BARM will be available at our cost of \$35.00 plus add \$14.99 for shipping in US and \$29.99 for non US Residents

Title: Basic Asphalt Recycling Manual (BARM) (IPMA™ Supplied to your home address if provided to our office \*see shipping fees above)

Author: U.S. Department of Transportation (FHWA) and ARRA

Publisher: U.S. Department of Transportation (FHWA) and ARRA

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Web: [www.arra.org](http://www.arra.org)  
PUB: NHI01-022

Title: The Book on Better Roads, Saving Your Crumbling Roads with Practical Pavement Management  
Author: Blair Barnhardt, APM  
Publisher: The Barnhardt Group  
Web: [www.thebookonbetterroads.com](http://www.thebookonbetterroads.com)  
ISBN: 1-887918-55-8  
(We will ship this book at no charge to you)

### **Optional Learning References**

Title: Asphalt in Pavement Preservation & Maintenance MS-16 4<sup>th</sup> Edition  
Author: Asphalt Institute  
Publisher: Asphalt Institute  
Web: [www.asphaltinstitute.org](http://www.asphaltinstitute.org)  
ISBN: 978-1934154-58-8

Title: Basic Asphalt Emulsion Manual MS-19 4<sup>th</sup> Edition  
Author: Asphalt Institute  
Publisher: Asphalt Institute  
Web: [www.asphaltinstitute.org](http://www.asphaltinstitute.org)  
ISBN: 978-1934154-56-4

Title: Inspector's Manual for Slurry Systems  
Author: ISSA  
Publisher: ISSA  
Web: [www.slurry.org](http://www.slurry.org)

Title: At the Crossroads Preserving our Highway Investment  
Author: NCPP National Center for Pavement Preservation  
Publisher: NCPP/TRIP  
Web: [www.pavementpreservation.org](http://www.pavementpreservation.org)

Title: PAVER™ Distress Identification Manual Asphalt Surfaced Roads & Parking Lots  
Author: US Army Corps of Engineers ERDC-CERL  
Publisher: US Army Corps of Engineers ERDC-CERL  
Web: <http://www.cecer.army.mil/paver/Paver.htm>

**NOTE:** *Various Technical Specifications, ARRA, ISSA brochures, DVDs and Technical Specifications, StreetSaver® information as well as the FHWA Distress Evaluation Manual will be mentioned during the course periodically, however the only text required for the APM™ Certificate Course is the BARM, and IPMA™ is providing this to you at no cost if you provide your home mailing address to us.*

## **VII. APM™ Online Certificate Course Requirements**

- Internet connection (DSL, LAN, or cable connection desirable)
- Access to Optimize Press Learning Platform for Online Class, Tracey will supply links to the portal in a timely fashion so you can set up your password and access the content. Note that the content will be delivered each week to the portal, and will stay there for the duration of the 21-week program.
- An open-minded attitude to learn different techniques that can actually cost less in the long run versus conventional rehabilitation types.
- The learners are encouraged to interact on the private FACEBOOK group.

**Important Note:** This syllabus, along with course quizzes and/or assignments and due dates, are subject to change. It is the student's responsibility to check with IPMA™ Academy for corrections or updates to the syllabus. I will note any changes to this syllabus if they are substantial (Blair)

## Outline/Schedule

**Important Note:** Refer to the course calendar for specific meeting dates and times. Activity and assignment details will be explained in detail within each week's corresponding learning module. If you have any questions, please contact your instructor.

### IPMA™ Academy APM™ Certification Course The Three Legged Stool System™ Asphalt Pavement Management, Recycling & Preservation Online Certificate Course

#### Course Dates

This is an open enrollment course with no specific time frame for completion. Some learners have done it in less than 5 weeks, others have taken over a year to complete. Ideally you would finish over a 21-week period.

#### **Module One – Pavement Evaluation, Management, Recycling & Preservation Overview**

Weeks One through Seven – One Final Multiple Choice Quiz

#### **Module Two – Pavement Preservation Techniques**

Weeks Eight through Twelve – One Final Multiple Choice Quiz

#### **Module Three – Eco Efficient Asphalt Pavement Recycling Technology**

Weeks Thirteen through Nineteen – One Final Multiple Choice Quiz

## VIII. Grading Policy

### A. Graded Course Activities

Points	Description
70	Periodic Quizzes
30	Attendance and Level of Input and Interaction into IPMA™ Academy by Learner
100	Total Points Possible

## 1. Late Work Policy

Be sure to pay close attention to deadlines—there will be no makeup assignments or quizzes, or late work accepted without a serious and compelling reason and instructor approval.

## 2. Viewing Grades Received from IPMA™ Academy

Points you receive for graded activities will be posted to the IPMA™ Academy Grade Confidential Grade Book at Headquarters, you will receive an email from our office with your grade point for each quiz and the overall final grade leading up to APM™ Application to the IPMA™ Advisory Board. Please be sure to provide us with the email address that you would like these updates sent to. Grade Point Correlation with Letter Grades

Letter Grade	Percentage	Performance
A	93-100%	Excellent Work
A-	90-92%	Nearly Excellent Work
B+	87-89%	Very Good Work
B	83-86%	Good Work
B-	80-82%	Mostly Good Work
C+	77-79%	Above Average Work
C	73-76%	Average Work
C-	70-72%	Mostly Average Work
D+	67-69%	Below Average Work
D	60-66%	Poor Work
F	0-59%	Failing Work

**Important note:** For more information about grading at IPMA™ Academy, please send an email to [blair@ipma.co](mailto:blair@ipma.co) and request more details of the academic policies and grading section of the program in the subject line.

## IX. Course Policies

### A. Participation

Students are expected to participate in all online activities as listed in this syllabus.

#### Build Rapport

If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let your instructor know as early as possible. As you will find, building rapport and effective relationships are key to becoming an effective professional. Make sure that you are proactive in informing your instructor when difficulties arise during the semester so that we can help you find a solution.

### B. Complete Assignments

**All additional assignments if any for this course will be submitted electronically through email unless otherwise instructed.** Assignments must be submitted by the given deadline or special permission must be requested from instructor *before the due date*. Extensions will not be given beyond the next assignment except under extreme circumstances. All discussion assignments if applicable must be completed by the assignment due date and time. Late or missing discussion assignments will affect the student's grade.

### C. Understand When You May Drop This Course

It is the student's responsibility to understand when they need to consider disenrolling from a course. You have 30 days only to ask for your 100% no hassle refund, after that there will be no refunds. You are responsible to comply with all dates and deadlines for registration. After this 30-day period, a serious and compelling reason is required to drop from the course. Serious and compelling reasons includes: (1) documented and significant change in work hours, leaving student unable to attend class, or (2) documented and severe physical/mental illness/injury to the student or student's family.

#### 1. Incomplete Policy

Under emergency/special circumstances, students may petition for an incomplete grade. An incomplete will only be assigned with the approval of the IPMA™ Advisory Board.

#### Commit to Integrity

As a learner in this course (and at this IPMA™ Academy), you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this class and integrity in your behavior in and out of the classroom.

#### 2. IPMA™ Academy Academic Honesty Policy & Procedures

"The principles of truth and honesty are recognized as fundamental to a community of scholars and teachers. IPMA™ Academy expects that both faculty and students will honor these principles, and in so doing, will protect the integrity of academic work and student grades."



### 3. Definitions

“**Cheating** is the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means.”

“**Plagiarism** is a form of cheating. Plagiarism is the use of distinctive ideas or works belonging to another person without providing adequate acknowledgement of that person’s contribution.”

**Important Note:** Any form of academic dishonesty, including cheating and plagiarism, may be reported to the office of IPMA™ Academy.

**Course policies are subject to change.** It is the student’s responsibility to check with the IPMA™ Academy Office for corrections or updates to the syllabus.

### XI. Agendas

A typical agenda for the learner would be to view and/or download the video homework assignments (usually an instructor-led video portion of the course is 2 to 3 hour total clips in each weekly session) to their computer or iPad, study their reading assignment for that week, and prepare for the upcoming monthly online session with a list of questions. The agenda outlined would entail upwards of 3 or more hours of week of total study, plus quizzes and final exams. Naturally, the learner may wish to space their workload out over the week, albeit they could do this in one day. No learner will be able to fast-forward through the program, as the content will be delivered in a staged weekly method to keep everyone on the same path to learning outcomes.

### XII. Lesson Plans

This section provides preliminary lesson plans for each the three main content topics that are covered during the instructor-led online APM™ Certification Course video homework and the live monthly Q and A sessions. Each of the preliminary lesson plans includes the following:

- The learning outcomes and objectives for the lesson.
- The topics that will be covered.
- The instructional method used to present the materials.
- The amount of time allocated to the lesson.
- The plan for evaluating participants’ success at meeting the learning objectives.
- References that will be used in preparing the course materials.

## MODULE ONE

This module consists of one module of three for the complete certificate program.

<b>Module Number:</b>	One
<b>Lesson Number</b>	ACA11212
<b>Module Title:</b>	<b>Pavement Evaluation, Management, Recycling &amp; Preservation Overview</b>
<b>Performance-Based Learning Outcome(s):</b>	<ul style="list-style-type: none"> <li>• Identify common means and methods for evaluating pavement condition.</li> <li>• Describe situations in which common methods of assessing pavement condition might be used.</li> <li>• Identify common asphalt pavement distress types and severities. Distinguish between types of pavement management software (PMS) that is available and widely used by agencies in USA.</li> <li>• Describe specific types of asphalt distress and how they are measured in the field.</li> <li>• Summarize the importance of proactively managing pavements.</li> <li>• Select appropriate PMS software for their agency.</li> <li>• Recognize how to perform some of the individual pavement distress evaluations in the field.</li> <li>• Explain the interaction of the Geographical Information System (GIS) and the PMS</li> </ul>
<b>Instructional Method(s):</b>	<p>This lesson introduces methods of assessing the type and amount of pavement deterioration present, including pavement condition surveys, nondestructive testing, and coring. Common asphalt pavement distress types are also introduced.</p> <p>The lesson begins with an overview of the most common methods of assessing pavement condition, including pavement condition surveys, nondestructive deflection testing, and coring. The primary uses of each testing method will be presented and pictures of equipment will be provided, as appropriate.</p> <p>The overview will be followed by more information that is specific on pavement condition surveys and the types of distress most commonly noted in asphalt pavements. Typical pavement deterioration mechanisms will be introduced (e.g., load, climate, material properties) along with the resulting distress (e.g., fatigue cracking, rutting). Methods of assessing distress severity will also be introduced, using the Long-Term Pavement Performance <i>Distress Identification Manual</i> as an optional study guide.</p> <p>The relationship between pavement condition information obtained through surveys</p>

	<p>and test results, and the selection of an appropriate rehabilitation and preservation action, will be introduced.</p> <p>The instructor will use case studies, streaming video field demonstrations, interviews, and actual job information where possible to aid in the delivery of this module.</p>
<p><b>Instruction Led Instruction Time:</b></p>	<p>2-3 hours weekly, six weeks total online video learning includes video homework assignment and monthly teleseminar class</p>
<p><b>Evaluation Plan:</b></p>	<p>Several opportunities for evaluating comprehension will be built into the online delivery. For instance, participants will be provided an opportunity to match distress photos to the appropriate distress type. Participants will also be given an opportunity to demonstrate that they can select the conditions under which each type of pavement evaluation may be used. A 10 to 15 question multiple choice quiz will be given at the end of this each module to access the learner’s comprehension of the learned material as well as a final exam.</p>
<p><b>Objectives:</b></p>	<p>At the end of Module One, the learner will be able to:</p> <ul style="list-style-type: none"> <li>- Describe what current techniques are being used to replace conventional rehabilitation techniques</li> <li>- Differentiate between the costs of conventional rehabilitation techniques to asphalt recycling and pavement preservation and calculate savings</li> <li>- Cite what techniques are being implemented by other agency personnel in terms of asphalt recycling, pavement preservation and pavement management</li> <li>- Calculate their own agency pavements using similar PMS software and methodology</li> </ul>
<p><b>Reference(s):</b></p>	<p>Instructor Supplied Videos, Photographs, Actual Field Survey Data  MicroPAVER™ and PAVER™/StreetSaver® Distress Identification Manuals</p> <p>NCHRP Synthesis 401 Quality Management of Pavement Condition Collection Data</p> <p>NHI Course 131063, <i>HMA Pavement Evaluation and Rehabilitation</i> (current course slides and reference materials)</p> <p>FHWA’s Long-Term Pavement Performance <i>Distress Identification Manual</i>  FHWA’s Long-Term Pavement Performance <i>Distress Identification Guide</i></p> <p>Various Industry References</p>

## MODULE TWO

This module consists of one module of three for the complete certificate.

<b>Module Number:</b>	Two
<b>Lesson Number</b>	ACA21212
<b>Module Title:</b>	<b>Eco Efficient Pavement Preservation Techniques</b>
<b>Performance-Based Learning Outcome(s):</b>	<ul style="list-style-type: none"> <li>• Distinguish between distinctive types of pavement preservation techniques for flexible (hot mixed asphalt pavement) and rigid (Portland cement concrete) pavements that are widely used by agencies in USA. Note that the emphasis will be placed on flexible pavements and their respective preventive treatments.</li> <li>• Describe how specific types of pavement preservation treatments correlate with their respective pavement distresses and how they are applied in the field.</li> <li>• Summarize the importance of a successful pavement preservation program as it is tied to the Pavement Management System employed by that agency.</li> <li>• Select the appropriate pavement preservation techniques and be able to put the work out for bid, know where to get help for additional information, and have a strong idea of where to learn more about QC and QA.</li> <li>• Define what pavement preservation techniques work best on their agency roads.</li> <li>• Explain the interaction of the PMS and the pavement preservation program.</li> </ul>
<b>Instructional Method(s):</b>	<p>This lesson introduces the learner to the concept of pavement preservation. The National Center for Pavement Preservation states that only ten percent of the US population understands the concept of preserving our infrastructure. Yet we all change the oil in our vehicles.</p> <p>The curriculum begins with an overview of the concept along with an emphasis on proper treatment timing. Various methods that are employed on flexible pavements are presented to the learner, and pictures of various labor and equipment will be provided to demonstrate to the learner what an actual jobsite and subsequent treatment applied looks like. Numerous case studies highlight the potential savings that may be had if the learner were to adopt similar programs with their agency. A brief look at social media as it relates to the industry will ensue.</p> <p>The overview will be followed by specific information on pavement preservation techniques utilized by agencies and how they have gone about implementing such programs, often at the resistance of their elected officials. The pavement preservation principals are generally diabolically opposite to the “worst first” mantra that most agencies follow.</p>

	<p>The instructor will use case studies, streaming video field demonstrations, interviews, and actual job information where possible to aid in the delivery of this module. In addition to the above, the instructor will introduce the overall concept of asset management and how the GASB 34 rules fit in to the “big picture” in the industry.</p> <p>Most major types of pavement preservation treatments for the flexible pavement infrastructure will be covered as well as an overview of similar treatments for rigid pavement structures.</p>
<p><b>Instruction Led Instruction Time:</b></p>	<p>2-3 hours weekly, five weeks total online learning includes video homework assignment and monthly teleseminar Q and A class</p>
<p><b>Evaluation Plan:</b></p>	<p>Several opportunities for evaluating comprehension are built into the online delivery. A 10 to 15 question multiple choice quiz will be given at the end of this module to access the learner’s comprehension of the learned material.</p>
<p><b>Objectives:</b></p>	<p>At the end of Module Three, the learner will be able to:</p> <ul style="list-style-type: none"> <li>- Describe a few of most popular types of pavement preservation treatments that are being used across America</li> <li>- Distinguish between pavement preservation; conventional rehabilitation and the worst first fix philosophy.</li> <li>- Differentiate between the different types of pavement preservation techniques for rigid and flexible pavements and summarize some of their inherent advantages and disadvantages in terms of service life extension.</li> <li>- Cite what techniques are being implemented by other agency personnel in terms of in place asphalt recycling (HIR &amp; CIR), pavement preservation and pavement management systems.</li> <li>- Calculate their own agency pavement preservation budget costs using similar treatments that have been presented in this module’s case studies.</li> </ul>
<p><b>Reference(s):</b></p>	<p>Instructor Supplied Videos, Photographs, Actual Field Survey Data</p> <p>NHI Course 131103, <i>Design and Construction of Quality Pavement Preservation Treatments*</i> (*current course slides and reference materials)</p> <p>Asphalt Institute MS-16 and MS-19</p> <p>NHI Course 131063, <i>HMA Pavement Evaluation and Rehabilitation *</i></p> <p>FHWA’s Long-Term Pavement Performance <i>Distress Identification Manual</i></p> <p>FHWA’s Long-Term Pavement Performance <i>Distress Identification Guide</i></p> <p>Various Industry Resources</p>

## MODULE THREE

This module consists of one module of three for the complete certificate.

<b>Module Number:</b>	Three
<b>Lesson Number</b>	ACA31212
<b>Module Title:</b>	<b>Asphalt Pavement Recycling Technology</b>
<b>Performance-Based Learning Outcome(s):</b>	<ul style="list-style-type: none"> <li>• Distinguish between the two uniquely distinctive types (HIR and CIR) of partial depth in place asphalt recycling techniques for flexible pavements that are widely used by agencies in USA.</li> <li>• Identify the differences in field procedures for the in-place versus conventional mill and inlay efforts.</li> <li>• Describe what types of pavement distresses are treated effectively using in place recycling in the form of hot in place and/or cold in place recycling.</li> <li>• Summarize the importance of proper roadway candidate selection and how an agency may go about obtaining the required data to ensure that they have selected the right treatment for the right road.</li> <li>• Select the appropriate in place partial depth technique and most appropriate sub discipline of that selected technique.</li> <li>• Demonstrate the knowledge to confidently put the work out for bid, know where to get help for additional information, and have a strong idea of where to learn more about QC and QA.</li> <li>• Define what partial depth in place asphalt recycling techniques work best on their agency roads.</li> <li>• Explain the interaction of a PMS, pavement preservation plan and an in-place asphalt reclamation program in the Module 3 curriculum. Distinguish between the two uniquely distinctive types (FDR and Soil Stabilization) techniques used for flexible pavements by agencies in USA.</li> <li>• Identify the differences in field procedures for the in-place asphalt and recycling and soil stabilization procedures versus conventional total remove and replace methods.</li> <li>• Describe what types of pavement distresses using FDR and Soil Stabilization eliminates.</li> <li>• Select the appropriate stabilizing agent for the FDR technique and most appropriate set up equipment and compactive effort.</li> <li>• Demonstrate the knowledge to confidently put the work out for bid, know where to get help for additional information, and have a strong idea of where to learn more about QC and QA.</li> <li>• Define what FDR and Soil Stabilization techniques work best on their agency roads.</li> <li>• Explain the interaction of a PMS, pavement preservation plan and an in-place asphalt reclamation program in the Module 3 curriculum.</li> </ul>

<p><b>Instructional Method(s):</b></p>	<p>This lesson introduces the learner to the concept of partial depth in-place asphalt pavement recycling. While asphalt concrete is the number one recycled product in the United States, we only recycle 3 three percent of our roads in place. Yet, the savings by implementing such techniques are in the billions.</p> <p>The curriculum begins with an overview of the asphalt-recycling concept along with an emphasis on proper selection of roadway candidates. Two distinct partial-depth in place asphalt recycling methods will be presented along with their respective sub disciplines. Photos and videos of various labor and equipment will be provided to demonstrate to the learner what an actual jobsite and subsequent overlay treatment applied to the HIR and/or CIR looks like. Four sub-disciplines of HIR and three sub-disciplines of CIR will be discussed in detail.</p> <p>Following the overview is specific information on how to bid and contract HIR CIR, FDR and Soil Stabilization work with agency examples showing implementation of such programs, often at the resistance of their elected officials. The savings offered by these processes are not only monetary, but also in user delay as well. More often than not, these asphalt-recycling trains can perform the asphalt rehabilitation work much faster than conventional reconstruction methods such as mill and inlay total removal and replacement.</p> <p>Three distinct FDR groups of stabilization are discussed (mechanical, chemical and bituminous). Photos and videos of various labor and equipment are provided to demonstrate to the learner what an actual jobsite and subsequent overlay treatment applied to an FDR project looks like.</p> <p>The instructor will use case studies, streaming video field demonstrations, interviews, and actual job information where possible to aid in the delivery of this module.</p>
<p><b>Instruction Led Instruction Time:</b></p>	<p>2-3 hours weekly, seven weeks total online learning includes video homework assignment and monthly Q and A class</p>
<p><b>Evaluation Plan:</b></p>	<p>Several opportunities for evaluating comprehension are included in the online delivery. A 10 to 15 question multiple choice quiz follows at the end of this module to access the learner’s comprehension of the learned material.</p>
<p><b>Objectives:</b></p>	<p>At the end of Module Three, the learner will be able to:</p> <ul style="list-style-type: none"> <li>- Describe the two types of partial depth in-place asphalt recycling treatments and their respective sub disciplines.</li> <li>- Distinguish between the hot and cold processes and identify the equipment and materials utilized for all seven HIR and CIR sub disciplines.</li> <li>- Differentiate between the different types of additives are used to glue the insitu aggregate together on site along with the different supplementary materials that are used.</li> <li>- Cite what techniques in terms of in place asphalt recycling (HIR &amp; CIR), pavement preservation and pavement management systems the case study</li> </ul>

	<p>agencies are implementing.</p> <ul style="list-style-type: none"> <li>- Calculate their own agency pavement preservation budget costs using similar treatments presented in this module’s case studies. Describe the three distinctive types of FDR work that are common to the industry (mechanical, chemical and bituminous stabilization).</li> <li>- Identify the difference between soil stabilization and FDR.</li> <li>- Recognize how to combine the two elements above to create a complete pavement structure when topped with an overlay.</li> <li>- Distinguish between the different types of stabilization agents and identify the equipment and materials utilized for all types of additive injection into the FDR process.</li> <li>- Cite what techniques in terms of in FDR, partial depth in-place asphalt recycling, pavement preservation and pavement management systems the case study agencies are implementing.</li> <li>- Calculate their own agency pavement preservation budget costs using similar FDR and Soil Stabilization treatments that are presented in this module’s case studies.</li> </ul>
<p><b>Reference(s):</b></p>	<p>Instructor Supplied Videos, Photographs, Actual Field Survey Data</p> <p>NHI Course 131050, Asphalt Pavement Recycling Technologies* (*current course slides and reference materials)</p> <p>Asphalt Institute MS-16 and MS-19 Manuals</p> <p>ARRA Basic Asphalt Recycling Manual (BARM)</p> <p>FHWA’s Long-Term Pavement Performance Distress Identification Manual</p> <p>FHWA’s Long-Term Pavement Performance Distress Identification Guide</p> <p>Various Industry Resources</p>