MERCURY

Road Asset Management: Pavement Condition, LIDAR and ITS

29 August – 9 September 2027
Istanbul (Turkey)



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Road Asset Management: Pavement Condition, LIDAR and ITS

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Road asset management with pavement condition data, LIDAR and ITS means treating a highway network as an asset: knowing what you own, measuring how it deteriorates and choosing when and how to treat it. This 2-week course is for engineers and planners who look after highway networks, and you leave with a Network Condition and Treatment Pack. This road asset management course is delivered by Mercury Training Center.

About This Course

Many networks are repaired where complaints are loudest, not where the data says treatment pays back most. You should already work on highway operation, inspection or planning. You practice with inventory sheets, condition data, LIDAR point clouds and vehicle count data, then apply each step to a network you know.

Who It Is For

- Highway engineers who inspect carriageways, bridges and drainage and recommend treatments.
- Asset and data staff who keep network inventories and condition records.
- Municipal and public works staff who set annual budgets and work programs for their networks.
- Consultants who survey, design and supervise rehabilitation and resurfacing contracts.
- Operations and ITS staff who run corridor systems and manage works on live lanes.

This course is not for designers of new highways, who need a geometric and structural design course, nor for site supervisors who want only hands-on repair methods, who will be better served by a short field techniques course.

Competencies You Will Build

- Network Inventory Control: you keep a classified, complete register of carriageways, structures and drainage.
- Condition Assessment: you rate surface distress, roughness and rutting and turn them into a condition index.
- Survey Data Use: you plan LIDAR and vehicle count surveys and read the results for decisions.
- Treatment Selection: you match preventive, resurfacing, recycling or reconstruction options to each section.
- Work Program Building: you rank sections by multiple criteria and set a multi-year budgeted program.
- Live-Lane Works Control: you lay out work zones and use ITS data to limit disruption to users.

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What You Will Be Able to Do

By the end of the course you will be able to:

- From a raw asset list, build a classified network inventory with the data fields decisions need.
- Given condition survey results, calculate a condition index for each section and flag those near failure.
- Using a LIDAR point cloud, extract inventory items and check them against the register.
- Given a deteriorating section, choose and cost a treatment and justify its timing with a performance model.
- From a budget ceiling, rank competing sections and draft a multi-year work program.
- Using ITS and vehicle count data, plan a work zone layout and detour that keep delays low.

Course Content

Day 1: The Highway Network as an Asset

- Asset Value and Purpose of Upkeep Activities on a Highway Network
- Network Inventory Register Design and Data Fields
- Functional Classification of Network Sections
- Deterioration Prevention Approaches Across the Asset Life Cycle
- Upkeep Activity Types From Routine Works to Reconstruction

Day 2: Condition Surveys and Deterioration

- Surface Condition Survey Methods and Distress Types
- Roughness, Rutting and Cracking as Condition Variables
- Factors Affecting the Service Life of Carriageways
- Performance Models for Predicting Deterioration
- Condition Index Calculation for Network Sections

Day 3: LIDAR and Network Data Capture

- LIDAR Systems for Corridor Surveys
- Point Cloud Processing for Asset Inventory Capture
- Survey Planning and Preliminary Analysis of Collected Data
- Vehicle Count and Speed Data Collection Methods
- Big Data Analytics for Usage and Deterioration Trends

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Day 4: Treatment Selection and Rehabilitation

- Preventive Treatment Options and Timing
- Resurfacing Options Matched to Surface Condition
- Rehabilitation and Recycling Procedures
- Reconstruction Criteria for Failed Sections
- Emergency Repair Procedures After Storms and Flooding

Day 5: Structures, Roadsides and Materials

- Shoulders, Approaches and Roadside Upkeep
- Bridge and Tunnel Inspection and Upkeep
- Drainage Structure Cleaning and Repair
- Adverse Weather Response for Snow, Ice, Dunes and Drifting Sand
- Eco-Friendly and Recycled Materials and Carbon Footprint Reduction

Day 6: Work Zones and Road Users

- Work Zone Layout to Limit Disruption
- Temporary Signs, Barriers and Protective Devices at Work Sites
- Signage and Marking Systems on Live Corridors
- Flow Control Methods During Works
- Crash Prevention Techniques and Emergency Response Arrangements

Day 7: ITS and Network Audits

- Intelligent Transportation System ITS Components for Network Operators
- ITS Data Feeds in Asset Decisions
- Road Safety Audit Process for High-Volume Corridors
- Design Innovations and Advanced Surface Technologies That Reduce Whole-Life Cost
- Goals and Performance Measures for an Asset Program

Day 8: Budgets, Procurement and Quality

- Upkeep Budgeting and Whole-Life Costing
- Resource Allocation Across Competing Sections
- Procurement and Logistics for Term Contracts
- Expenditure Tracking Against the Work Program
- Inspection Protocols, Audits and Quality Assurance Against Recognized Standards

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Day 9: Multi-Year Work Programs

- Multiple-Criteria Prioritization of Network Sections
- Multi-Year Work Program Structure
- Improvement Proposals and Option Appraisal
- Communication Plan for Agencies, Contractors and Road Users
- Compliance Checks Against Applicable Regulations and Standards

Day 10: Network Decision Practice

- Exercise: Condition Survey Analysis for a Sample Network
- Exercise: Treatment Selection and Costing for Deteriorating Sections
- Exercise: Work Zone and Detour Layout for a Resurfacing Job
- Exercise: ITS and LIDAR Data Review for an Urban Corridor
- Completing the Network Condition and Treatment Pack for Your Own Network

Case Studies and Exercises

These are suggested activities.

- Case study: a municipal network has years of deferred upkeep and a fixed budget; you decide which sections get preventive treatment and which wait.
- Case study: an industrial port access corridor carries heavy trucks and shows fast rutting; you choose a treatment and a works window.
- Exercise: a desert highway suffers sand drift and drainage blockage; you set an inspection routine and emergency response steps.
- Exercise: an urban ring road needs resurfacing at night; you use ITS data to plan lane closures and the detour.

What You Take Back

You return with the Network Condition and Treatment Pack for a network you look after. In your first month back, use it to fill the gaps in your inventory, rate the condition of priority sections and present a draft multi-year work program to your budget holders.

- Classified network inventory and data field list.
- Condition index results and deterioration forecasts.
- Treatment options with costs and timing.
- Prioritized multi-year work program and communication plan.

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Quick Answers FAQ

What should I know before a road asset management course?

You should already work on highway operation, inspection, design or planning. Basic knowledge of surface types and spreadsheets helps; LIDAR and ITS are introduced from the ground up.

How does road asset management differ from a road maintenance management course?

A maintenance management course covers how upkeep is organized, budgeted and contracted. Road asset management adds the data side: inventories, condition indexes, deterioration models, LIDAR and ITS data, and multi-year programs that rank sections by return on spending.

How does LIDAR help road asset management?

LIDAR captures a dense point cloud of the corridor from a moving vehicle, so signs, barriers, edges and surface shape can be measured without closing lanes. It updates inventories faster and gives repeatable data for comparing surveys over time.

What do I take back from road asset management training?

You take back the Network Condition and Treatment Pack: a classified inventory, condition index results, treatment options with costs and a prioritized multi-year work program, built for a network you look after.

For Your Manager

After the course, the engineer can keep a classified network inventory, rate condition with survey and LIDAR data, choose cost-effective treatments and rank sections into a multi-year work program. They return with a Network Condition and Treatment Pack for your network, first used to support the next annual budget submission.