



BHARATMALA
ROAD TO PROSPERITY



भारतीय राजमार्ग अभियन्ता अकादमी
(सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार)
Indian Academy of Highway Engineers
(Ministry of Road Transport and Highways, Govt. of India)



Design, Construction, Maintenance and Operation of Expressway

Time Period	Description of Topic
Day 1	
09:45 - 11:15	International Scenario of Expressways <ul style="list-style-type: none"> ➤ History ➤ Access Management ➤ User Charge Principles including Ramp Metering
11:30-13:00	Indian Scenario of Expressways <ul style="list-style-type: none"> ➤ Overview of Road Development Programme including NHDP, Bharatmala Pariyojana ➤ Existing Expressways in India ➤ Rationale for building expressways in India.
14:00-17:15	Features of Modern Expressways <ul style="list-style-type: none"> ➤ High Speed <ul style="list-style-type: none"> • Smooth Alignment • Smooth Traffic Flow • Safety Measures • Interchanges ➤ Comfortable Travel <ul style="list-style-type: none"> • Road Aesthetics • Wayside Amenities • Driving Information ➤ Reliability <ul style="list-style-type: none"> • Advance Traffic Control • Advance Maintenance • Emergency Preparedness
Day 2	
09:45 - 13:00	Features of Modern Expressways contd.. <ul style="list-style-type: none"> ➤ Intelligent Expressways <ul style="list-style-type: none"> • ITS Development • ETC Development ➤ Cost Recovery <ul style="list-style-type: none"> • Mode of Contract • Lessons from the World • Toll Collection Methodology
14:00-17:15	General Features, Geometrics, Cross Sectional Characteristics of Expressways <ul style="list-style-type: none"> • Design Speed • RoW • Lane Width of Carriageway , Median, Shoulder , Roadway Width • Crossfall • Horizontal and vertical Alignment

Please note: All correspondence should be addressed to the Director by designation only

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	<ul style="list-style-type: none"> • Super Elevation • Horizontal Curve, Transition Curve, Vertical Curve • Sight Distance • Gradients • Lateral and Vertical Clearances at Underpasses and Over Passes • Access Control • Grade Separated Structures • Median Opening, Fencing and Boundary Stones, Clear Zone • Capacity of Expressway • Embankment and Cut Section
Day 3	
09:45 - 13:00	Grade Separators and Interchanges for Expressways <ul style="list-style-type: none"> ➤ Types of Grade Separators and Interchanges ➤ Geometrics standards for Design of Grade Separators and Interchanges
14:00- 17:15	Safety Measures in Expressways <ul style="list-style-type: none"> ➤ Approaches to Improve Road Safety ➤ Traffic Safety Measures for Night Driving- High Visibility Road Marking, Lighting Installation, Self-luminous delineators, Anti-glare devices, Curve indicators ➤ Safety Measures for Bad Weather Driving ➤ Safety Measures for Accident prone points- Rumble Strips on curves, Driving Speed Rectifiers, Reinforcement type median guard rails, ETC lane safety measures, Diverge gore indicators, Vertical sign, Safety barrier protection, Animal Crossing and fencing, Lane regulator, boundary fencing, Fencing in for crossing road and railways ➤ ITS Application for Expressway Safety ➤ Road Safety Audit/Inspection
Day 4	
09:45 - 13:00	Traffic Information Control for Expressways <ul style="list-style-type: none"> ➤ System Composition <ul style="list-style-type: none"> • Incident • Information Collection • Traffic Control Center • Information Dissemination ➤ Events and Information <ul style="list-style-type: none"> • Events (Earthquake, flood, rain fog, snow etc.) • Traffic Flow • Location of Events • Instruction Message • Dissemination Timing • Information Renewal Cycle ➤ Information Collection- ATCC, CCTV, ECB, MET, Patrol Car ➤ Traffic Control System ➤ Information Dissemination ➤ Field Response

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14:00-17:15	➤ Field Visit to Expressway
Day 5	
09:45 - 13:00	Expressway Operations & Maintenance <ul style="list-style-type: none"> ➤ Toll Plaza Operation <ul style="list-style-type: none"> • Toll Collection System • Toll Payment Options • Toll Rates • Traffic Safety at Toll Plaza • Security at Toll Plaza • Audit • Toll Evasion Countermeasures ➤ Traffic Management <ul style="list-style-type: none"> • Traffic Control • Information Collection • Control Center • Information Dissemination • Incident Management • Inclement Weather ➤ Service Area Management <ul style="list-style-type: none"> • Administration for Service Area • Customer Service • Environmental Consideration • Planning for Profitable Service Area • Parking Management • Safety and Maintenance of Service Area ➤ Maintenance <ul style="list-style-type: none"> • Types of Maintenance Activities • Inspection • Maintenance Work • Maintenance Operation • New Maintenance Practices • Disaster Prevention
14:00-17:15	Expressway wayside amenities <ul style="list-style-type: none"> ➤ Purpose and Kind of Wayside Amenities ➤ Spacing and Locations ➤ Layout and Facilities ➤ Design Criteria ➤ Operation and Management ➤ Suggestion to improve Indian Way Side Amenities
17:15- 17:30	Closing Ceremony- Distribution of Certificate

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