MERCURY

GIS in Traffic and Transport Infrastructure Solutions

27 June – 1 July 2027
Cairo (Egypt)



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GIS in Traffic and Transport Infrastructure Solutions

Ref: 15434_307791 **Date:** 27 June – 1 July 2027 **Location:** Cairo (Egypt) **Fees:** 4000 Euro

Introduction:

In this GIS in traffic management and transport solutions training course, participants will gain an in-depth understanding of Geographic Information System GIS applications within transportation systems engineering and planning. It explains the vital role that GIS technology plays in facilitating the collection, analysis, and interpretation of transportation infrastructure and road safety-related data.

Authorities worldwide are increasingly adopting Geographic Information Systems GIS for highway and transport management, driven by reduced costs and enhanced capabilities in planning, monitoring, and managing complex systems. GIS is an invaluable resource for contemporary transportation professionals.

Geographic information systems GIS tools and techniques are instrumental in determining necessary capacity enhancements, improving operations, and identifying the most strategic investments to maintain the transportation systems' optimal functioning.

In this GIS in traffic management and transport solutions course, participants will not only comprehend the technical user aspects of GIS but also develop critical spatial thinking and decision-making skills that are fundamental for effective transportation system planning and management.

Enhancing traffic and transport infrastructure efficiency is a major challenge for urban planners and engineers. By integrating Geographic Information System GIS technology, professionals in this field can leverage spatial data to optimize traffic flow, manage transportation networks, and develop sustainable infrastructure solutions.

This GIS in traffic management and transport solutions course will explore how GIS is a linchpin in traffic and transportation management. It will highlight its importance in transportation, its use for transportation planning, and the various GIS solutions supporting transport infrastructure.

Targeted Groups:

- Traffic and Transportation Engineers and Professionals.
- Professionals in Urban Planning and Development.
- Project Managers in Infrastructure Solutions Consulting.
- Data Analysts and Technicians in Traffic Management Centers.
- Researchers and Consultants.
- Practitioners in Traffic and Transport Engineering.
- Traffic Safety Professionals.
- Highway and Roadway Design Engineers.

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Course Objectives:

By the end of this GIS in traffic management and transport solutions course, participants will be able to:

- Grasp how Geographic Information System GIS enhances transportation studies.
- Identify trends in traffic operations and safety performance measures for transportation improvement.
- Uncover the root causes of traffic incidents and propose effective countermeasures.
- Evaluate the performance of transportation segments, corridors, networks, or regions.
- Analyze transportation data using heat mapping to pinpoint high-risk and low-risk areas.
- Undertake complex spatial analysis to plan future transportation systems.
- Develop dynamic and insightful mapping applications.
- Hone critical spatial thinking skills and confidently make spatial decisions.

Targeted Competencies:

At the end of this GIS in traffic management and transport solutions training, participants competencies will:

- Understanding the fundamentals and major functions of Geographic Information System GIS.
- Mastery of geospatial data, database management, and geo-referencing techniques.
- Proficiency in Geographic Information System GIS data visualization and querying.
- Conducting advanced spatial analysis and modeling.
- Creating multilayer maps and performing overlay analysis.
- Executing heat maps and hotspot analysis for transportation data.

Course Content:

Unit 1: Geographical Information Systems GIS Fundamentals:

- Introduction to Geographic Information System GIS Applications in various sectors.
- Exploring Geographic Information System GIS Applications in Transportation Studies.
- Understanding the Major Functions of Geographic Information Systems GIS.
- Relating Information from Multiple Geographic and Data Sources.
- Overview of Geographic Data and the Database.
- Techniques for Data Acquisition and Integration.
- Data Structures and Modeling within GIS Contexts.
- Practical exercises with ArcMap.

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Unit 2: Understanding Geographic Information System GIS Maps:

- In-depth discussion of Data Information and Spatial data.
- Insights into Geographic Information System GIS Database structures.
- Difference between Raster vs. Vector Data.
- Understanding GIS Shapefiles and ESRI Shapefile format.
- Techniques for Displaying and Navigating Geographic Information System GIS Maps.
- Investigating Feature Attributes and Census Units.
- The Point, Line, and Polygon Data.

Unit 3: Data Collection:

- Utilizing a Global Positioning System GPS for data collection.
- Exploring Geographic Data Libraries.
- Integrating Census Data into Transportation Analysis.
- Transportation Data and Analytics harnessing Geographic Information System GIS solutions.
- Geospatial Crash Analysis methods and tools.

Unit 4: Visualization and Data Processing:

- Symbolizing and Labeling Geographic Information System GIS Data.
- Managing Continuous and Categorical Data.
- Methods of Classification and Normalization.
- Querying Geographic Information System GIS Data.
- Classification.
- Identify, Select, and Find.
- Advanced Techniques for Selecting Features by Attributes.
- Data integration through Joining and Relating Tables.
- Spatial Joining: Techniques and Applications.
- Layer Manipulations with Dissolving and Clipping.

Unit 5: Geospatial Analysis and Hotspot Analysis:

- Fundamentals of Spatial Analysis.
- Buffering Techniques for Geographical Features.
- Data Overlay Strategy and Applications in GIS.
- Spatial Analysis Methods to Identify Hotspots.
- Fishnet-based analysis for transportation planning.
- Kernel Density Estimation and its applications in GIS transportation studies.