Transportation Systems Engineering and Planning Applications of Geographic Information Systems (GIS)

Traffic and Transport Infrastructure Solutions Using GIS

Introduction

The goal of this Course N Carry Transportation Systems Engineering and Planning Applications of Geographic Information Systems (GIS) training course is to provide participants with a thorough understanding of the principles of GIS, as well as an introduction to data collection related to road safety and transportation infrastructure, as well as analytical methodologies and techniques using GIS.

Geographic Information System (GIS) is being actively used by authorities for highways and transport management in many developed countries. This is primarily because of the advantages of declining costs and increased ease of planning, monitoring, and managing complex systems involved in transportation planning and management, accident analysis, and route planning.

The utilisation of Geographic Information System (GIS) technologies and techniques greatly facilitates the process of identifying the most strategic investments to maintain the optimal operation of any country's transport system, as well as capacity increases and operational improvements. The goal of this training programme is to foster critical spatial thinking and spatial decision-making abilities in addition to teaching the technical components of using Geographic Information Systems (GIS).

The following will be covered in this training course on Transportation Systems Engineering and Planning Applications of Geographic Information Systems (GIS):

- The Basics and Principal Purposes of Geographic Information Systems (GIS)
- Databases, Geospatial Information, and Geo-Referencing Methods
- Geographic Information System (GIS) and Visualisation Information Request
- Modelling and Analysis of Space
- Overlay Analysis and Multilayer Mapping
- Heat Maps and Analysis of Hotspots

Objectives

Participants in this training course on Transportation Systems Engineering and Planning Applications of Geographic Information Systems (GIS) will be able to:

- Recognise the full range of applications that Geographic Information System (GIS) may provide for transportation research.
- Determine patterns in traffic operations and safety metrics that will enhance the level of transportation safety.
- Find the underlying causes of road accidents and implement workable solutions
- Analyse the effectiveness of individual segments, routes, networks, or areas.
- Use density estimate heat mapping to identify hot and cold locations.
- Perform the intricate spatial analysis needed to design the future transport networks.
- Create rich and dynamic mapping applications.
- Develop crucial spatial reasoning abilities and build your self-assurance in making spatial decisions.

Training Methodology

The instructor of this Course N Carry training course will use a range of tried-and-true adult learning strategies to present the material, with an emphasis on case studies and best practices. Active engagement, in-class practice cases, vigorous group discussions, multimedia resources, and tabletop exercises are all part of this.

Organizational impacts

Using a robust geospatial data analysis platform would help the company advance its efficiency in transportation infrastructure solutions, manage cost reduction, and enhance organisational workflow.

The following people will take this training course on Transportation Systems Engineering and Planning Applications of Geographic Information Systems (GIS):

- Use cutting-edge spatial data analytics in the design, planning, and management of transportation and traffic.
- Enhance the workflows, policies, and operational procedures.
- Bolster the resilience of their offerings for infrastructure solutions
- Showcase sophisticated presenting techniques with all-inclusive mapping programmes.
- Cut the price of the methods used for performance evaluation and assessment.
- Boost their understanding of their ability to make decisions

Personal Imapct

After completing this Course N Carry training course, each participant gains practical experience and a strong foundation in GIS applications connected to transportation by doing the following:

- Find out how geographic information systems (GIS) may help with urban planning and transportation engineering procedures.

- Gain a thorough understanding of the preparation, processing, and analysis of geographic data.
- Use the right kind of data and analysis techniques for complicated issues with road infrastructure, safety, administration, and planning.
- Expand your theoretical knowledge of spatial issues.
- Analyse and evaluate how road infrastructure is affected by the environment and sociodemographic factors.

Who should attend?

A wide range of professionals can benefit from Transportation Systems Engineering and Planning Applications of Geographic Information Systems (GIS) training course, but those with an interest in traffic and transportation engineering concepts, road infrastructure and safety, urban planning, and traffic management centres will find it especially helpful.

A wide range of professionals can benefit greatly from this Transportation Systems Engineering and Planning Applications of Geographic Information Systems (GIS) training course, however the following are the main ones:

- Professionals and Engineers in Traffic and Transportation
- Experts in Urban Development and Planning
- Managers of projects in infrastructure solutions consulting, data analysts, and traffic management centre technicians
- Scholars and Advisors
- Traffic and transport engineering practitioners
- Professionals in Traffic Safety
- Designers of roads and highways

Course Outline

Day 1

Basics of Geographic Information Systems (GIS)

- Applications of Geographic Information Systems (GIS) in the Broad Field and in Transportation Studies
- Principal Purposes of a Geographic Information System (GIS): Linking Data from Various Sources
- Geographic Information and the Database
- Obtaining Data
- Data Structure and Integration
- Practice of Data Modelling for ArcMap

Day 2

Comprehending Data Information Maps in Geographic Information Systems (GIS)

- Spatial information
- Database for Geographic Information Systems (GIS): Vector versus Raster
- Shapefiles for GIS
- The ESRI Shapefile format
- Presenting and Getting Around Features of Geographic Information System (GIS) Maps
- Units of Census
- Point, Line, and Polygon Information

Day 3

Gathering Data: Global Positioning System (GPS)

- Geographic Information Library
- Census Information; Geographic Information System (GIS) Transportation Data
- Analytics; Geographic Crash Analysis

Day 4

Processing Data and Visualisation

- Geographic Information System (GIS) Symbolization and Labelling Information
- Both Categorical and Continuous Data
- Methods of Classification
- Normalisation
- System of Geographic Information (GIS) Information Query Categorization
- Determine, Pick, Locate, Choose Features based on Attributes
- Table Joining and Relationships
- Layers for spatial joining, dissolving, and clipping

Day 5

Hotspot and Geographical Analysis

- Introduction to Buffering Features in Spatial Analysis
- Data Overlay for Spatial Analysis Techniques for Locating Hotspots
- Analysis using Fishnets
- Core Density Approximation