Training Course on GIS for Transportation Planning and Logistics

Professional Development Training Course Outline

Category	GIS	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Geographic Information Systems (GIS) have emerged as an indispensable **transformative technology** for modern **transportation planning** and **logistics optimization**. In an increasingly interconnected and complex global landscape, effective **spatial analysis**, **data-driven decision-making**, and **real-time visibility** are paramount for efficient movement of people and goods. This course delves into the advanced applications of GIS, empowering professionals to leverage geospatial intelligence for **route optimization**, **fleet management**, **infrastructure development**, and building **resilient supply chains** that can withstand today's dynamic challenges, from **urban congestion** to **climate change impacts**.

Training Course on GIS for Transportation Planning and Logistics will equip participants with the skills to harness cutting-edge GIS tools and techniques. From **predictive analytics** for demand forecasting to implementing **smart city solutions** and **sustainable transport initiatives**, attendees will gain practical expertise in managing, analyzing, and visualizing complex spatial data. The focus is on translating theoretical knowledge into actionable strategies, ensuring that participants can immediately apply their newfound skills to enhance operational efficiency, reduce costs, and foster **sustainable mobility** within their organizations.

Programme Curriculum

Training Course on GIS for Transportation Planning and Logistics

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Course Duration

10 days

Course Objectives

Upon completion of this course, participants will be able to:

1. Master fundamental GIS concepts and their advanced applications in transportation network analysis.
2. Utilize GIS for intelligent route planning and dynamic optimization across various modes of transport.
3. Implement GIS solutions for real-time fleet tracking and efficient resource allocation in logistics operations.
4. Conduct comprehensive spatial data analysis for traffic flow modeling and congestion management.
5. Apply GIS in urban planning to develop sustainable transportation infrastructure and smart city initiatives.
6. Leverage GIS for supply chain resilience and risk assessment, including natural disaster preparedness.
7. Integrate IoT data and geospatial intelligence for enhanced visibility and predictive analytics.
8. Perform site selection optimization for distribution centers, warehouses, and transport hubs using GIS.
9. Develop interactive web maps and dashboards for effective communication of transportation insights.
10. Understand the role of AI-driven geospatial analysis in future transportation and logistics systems.
11. Apply GIS for environmental impact assessment and promotion of green logistics.
12. Utilize open data initiatives and interoperability standards in transportation GIS projects.
13. Design and implement geo-fencing solutions for improved operational control and security.

Organizational Benefits

- Streamlined transportation processes, reduced travel times, and optimized resource utilization.
- Lower fuel consumption, decreased vehicle maintenance costs, and optimized inventory management.
- Data-driven insights leading to more effective strategic planning and problem-solving.
- Proactive risk identification and mitigation strategies against disruptions.
- Support for green logistics initiatives and reduced carbon footprint through optimized routes and infrastructure.

- Adoption of cutting-edge technologies to outperform competitors in logistics and transport services.
- Faster and more reliable deliveries, leading to improved service quality.
- Foster a culture of technological adoption and continuous improvement.

Target Audience

1. Transportation Planners and Engineers
2. Logistics and Supply Chain Managers
3. Urban and Regional Planners
4. GIS Analysts and Specialists
5. Fleet Managers and Operations Coordinators
6. Emergency Management and Disaster Response Personnel
7. Data Scientists with an interest in geospatial applications
8. Consultants in transportation, logistics, and urban development

Course Outline

Module 1: Foundations of GIS for Transportation & Logistics

- Introduction to GIS concepts, data models, and coordinate systems.
- Overview of GIS software and their relevance in transport.
- Understanding spatial data infrastructure (SDI) for transport agencies.
- Data sources for transportation and logistics: open data, proprietary data, sensor data.
- **Case Study:** Analyzing road network data from OpenStreetMap for a city's public transport system.

Module 2: Geospatial Data Acquisition & Management

- Methods of collecting transportation data: GPS, mobile mapping, remote sensing, IoT sensors.
- Geocoding and address matching for logistical addresses.
- Database design for transportation and logistics spatial data.
- Data quality control, validation, and integration from diverse sources.
- **Case Study:** Integrating real-time traffic sensor data with static road network data for a city's traffic management center.

Module 3: Core Spatial Analysis for Transportation

- Proximity analysis: buffers, nearest facility, service area analysis.
- Overlay analysis: intersection, union, erase for land use and infrastructure planning.
- Spatial queries and selections for identifying critical transport assets.
- **Case Study:** Identifying optimal locations for new bus stops based on population density and existing routes using buffer analysis.

Module 4: Network Analysis for Route Optimization

- Fundamentals of network datasets: nodes, edges, turns, and impedance.
- Shortest path and fastest route analysis for vehicle routing.
- Vehicle Routing Problem (VRP) and its application in logistics.
- Building and managing realistic road networks for analysis.
- **Case Study:** Optimizing delivery routes for a last-mile logistics company to minimize fuel consumption and delivery time.

Module 5: Fleet Management & Real-time Tracking

- Integrating GIS with GPS and telematics for real-time fleet visibility.
- Monitoring vehicle performance, location, and status.
- Geo-fencing and alerts for route deviations and unauthorized movements.
- Dashboard creation for real-time operational oversight.
- **Case Study:** A freight company using GIS to track its truck fleet, monitor delivery progress, and respond to delays in real-time.

Module 6: Traffic Analysis & Congestion Management

- Mapping traffic flow patterns and congestion hotspots.
- Analyzing accident data and identifying high-risk areas.
- GIS for intelligent traffic signal optimization.
- Predictive modeling for traffic forecasting.
- **Case Study:** A city transport department using GIS to analyze traffic accident blackspots and implement targeted road safety improvements.

Module 7: Public Transportation Planning with GIS

- Optimizing public transit routes and schedules.
- Analyzing transit accessibility and ridership patterns.
- Site selection for bus stops, train stations, and multimodal hubs.
- Integration of GIS with public transport data standards (GTFS).
- **Case Study:** Redesigning a city's bus network using GIS to improve coverage and reduce travel times for commuters.

Module 8: GIS for Infrastructure Planning & Development

- Site suitability analysis for new roads, railways, and airports.
- Environmental impact assessment (EIA) for transport projects.
- Asset management: mapping and monitoring transportation infrastructure.
- Visualizing proposed developments in 2D and 3D.
- **Case Study:** Using GIS to plan the optimal alignment for a new highway, considering environmental sensitivity and land acquisition.

Module 9: Supply Chain Optimization & Location Intelligence

- Strategic location analysis for warehouses and distribution centers.
- Demand forecasting and market analysis using demographic data.
- Supply chain network design and optimization.
- Risk assessment for supply chain disruptions (e.g., natural disasters, geopolitical events).
- **Case Study:** A retail chain using GIS to identify the best locations for new regional distribution centers to serve its expanding customer base.

Module 10: Advanced Geospatial Analytics & Data Science

- Spatial statistics for pattern detection and anomaly identification.
- Integration of GIS with Python for advanced scripting and automation (ArcPy/GeoPandas).
- Machine learning applications in geospatial data (e.g., predicting demand, identifying traffic anomalies).
- Big data analytics for large-scale transportation datasets.
- **Case Study:** Developing a predictive model using GIS and machine learning to forecast demand for logistics services in different urban areas.

Module 11: GIS for Smart Cities & Future Mobility

- Concepts of smart city infrastructure and their reliance on GIS.
- Integration of GIS with autonomous vehicles and connected car data.
- Planning for electric vehicle charging infrastructure.
- Micromobility planning and analysis (e.g., bike-sharing, e-scooters).
- **Case Study:** A smart city initiative using GIS to plan and manage an integrated network of autonomous shuttles and charging stations.

Module 12: Environmental Sustainability & Green Logistics

- Calculating carbon footprints of transportation routes.
- Identifying areas for promoting active transport
- GIS for evaluating the environmental impact of logistics operations.
- Route optimization for reduced emissions and fuel consumption.
- **Case Study:** A logistics company implementing GIS-driven route optimization to reduce its fleet's carbon emissions and achieve sustainability targets.

Module 13: Risk Management & Disaster Response

- Mapping vulnerability and exposure to natural hazards affecting transport.
- Developing emergency evacuation routes and logistics plans.
- Real-time monitoring of disaster events and their impact on infrastructure.
- GIS for post-disaster recovery and reconstruction planning.
- **Case Study:** A government agency using GIS to plan emergency response routes and preposition aid supplies in flood-prone regions.

Module 14: Data Visualization & Communication

- Principles of effective cartography for transportation maps.
- Creating interactive web maps and story maps.
- Designing compelling dashboards for operational insights.
- Communicating complex spatial analysis results to non-technical stakeholders.
- **Case Study:** Presenting a city's traffic master plan using an interactive GIS dashboard to engage citizens and stakeholders.

Module 15: Future Trends & Emerging Technologies

- The rise of **digital twins** in transportation infrastructure.
- **Geospatial AI** and its impact on autonomous systems and intelligent transport.
- **Blockchain for transparent supply chains** and freight tracking.
- Ethical considerations and data privacy in geospatial applications.
- **Case Study:** Exploring the concept of a "digital twin" for a major port, simulating cargo movements and logistics in a virtual environment to optimize real-world operations.

Training Methodology

This training course employs a highly interactive and practical methodology to ensure maximum learning and skill acquisition. The approach combines:

- **Instructor-Led Presentations:** Clear and concise delivery of theoretical concepts.
- **Hands-on Software Exercises:** Extensive practical sessions using industry-standard GIS software (e.g., ArcGIS Pro, QGIS), ensuring direct application of learned techniques.
- **Real-world Case Studies:** In-depth analysis and discussion of actual transportation and logistics scenarios to illustrate practical applications.

- **Group Activities and Discussions:** Collaborative problem-solving and sharing of experiences among participants.
- **Demonstrations:** Live demonstrations of advanced GIS tools and workflows.
- **Q&A Sessions:** Opportunities for participants to clarify doubts and explore specific challenges.
- **Practical Project Work:** Participants will work on a mini-project applying GIS skills to a relevant transportation/logistics problem.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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