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COURSE BROCHURE

Advanced GIS Applications for Transport Planning Course

25 July – 5 August 2027
Muscat

Advanced GIS Applications for Transport Planning Course

Ref: 135_3579 **Date:** 25 July – 5 August 2027 **Location:** Muscat **Fees:** 11700 GBP

Advanced GIS Applications for Transport Planning is a 2-week training course for transport planners, urban planners, GIS analysts and strategy officers who must justify where roads, transit lines and facilities go, and it ends with a spatial decision study for a transport or land-use proposal. Cities and transport operators face growing travel demand while funding bodies ask for evidence behind every corridor choice. Jupiter Prime Training approaches Advanced GIS Applications for Transport Planning as decision evidence rather than map production.

Why GIS Applications for Transport Planning Matters Now

Three pressures shape transport geography today. Rapid urban growth shifts where people live and work faster than travel surveys can track; investors and finance committees want options compared on accessibility and cost before money is committed; and residents expect fair access to jobs, schools and clinics. A planning authority that models these questions spatially can show who gains from a new link, where demand will cluster and which site serves most people. One that relies on intuition risks stranded stations, congested junctions and facilities placed beyond walking reach of the communities they were meant to serve.

Who Gains Most from GIS Applications for Transport Planning

- Planners who appraise road, rail and bus corridor options against travel demand
- Land-use planners who test zoning and density choices against access to services
- Analysts who build network datasets, travel time surfaces and catchment models
- Strategy officers who compare investment scenarios for executive committees
- Facility planners who locate depots, schools, clinics or logistics hubs

A planning department gains most when its transport modellers, land-use planners and strategy officers attend together and agree one evidence base for corridor and site decisions.

GIS Applications for Transport Planning Capabilities

Participants learn to convert travel networks, population layers and demand signals into options that a committee can compare and defend.

- Build a routable network dataset with impedances, turns and restrictions — corridor appraisal teams
- Calculate accessibility indicators and travel time catchments — equity and service coverage decisions
- Design site suitability models with weighted criteria — facility and station location
- Apply demand mapping from origin destination and trip generation layers — capacity planning
- Weigh scenarios with spatial indicators and trade-off matrices — investment committees
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Communicate findings through decision maps and story-led dashboards — elected officials and the public

Key GIS Applications for Transport Planning Terms

- Network Dataset — a connected model of links and nodes with travel costs, used to calculate routes and travel times.
- Accessibility Index — a score showing how many opportunities, such as jobs or schools, can be reached within a travel time.
- Service Area — the zone reachable from a facility within a chosen time or distance along the network.
- Origin Destination Matrix — a table of trips or travel costs between every pair of zones in a study area.
- Location Allocation — a method that chooses facility sites to serve demand points at least total travel cost.
- Scenario Comparison — testing alternative networks or land-use patterns side by side with the same spatial indicators.

GIS Applications for Transport Planning Day by Day

Day 1: Transport Geography and Planning Questions

- Mobility and Land-Use Interaction — Framing How Growth Shapes Travel
- Planning Question Scoping — Defining Study Areas and Decision Criteria
- Spatial Data Sources for Transport — Choosing Census, Survey and Sensor Layers
- Traffic Analysis Zones — Setting the Geography for Demand Work
- Stakeholder Map of the Decision — Identifying Who Uses the Evidence

Day 2: Building Transport Networks

- Road and Transit Network Topology — Connecting Links, Nodes and Stops
- Impedance Attributes — Setting Speeds, Turn Penalties and Restrictions
- Multimodal Network Design — Linking Walking, Bus and Rail Legs
- Timetable Integration — Representing Service Frequency in Travel Times
- Network Validation Checks — Testing Routes Against Observed Journeys

Day 3: Accessibility Modelling

- Service Area Analysis — Mapping Catchments Around Stations and Facilities
- Cumulative Opportunity Measures — Counting Jobs Reachable Within Time Bands
- Gravity-Based Accessibility — Weighting Destinations by Distance Decay
- Equity Overlays — Comparing Access Across Income and Age Groups
- Walkability Surfaces — Assessing First and Last Mile Connections

Day 4: Demand Mapping

- Trip Generation Layers — Estimating Trips From Population and Employment
- Origin Destination Matrices — Mapping Flows Between Zones
- Desire Line Visualisation — Revealing Corridors of Unmet Demand
- Mobile and Smart Card Data — Detecting Travel Patterns at Scale
- Hot Spot Statistics — Locating Clusters of Congestion or Collisions

Day 5: Routing and Location Allocation

- Closest Facility Analysis — Assigning Emergency and Service Coverage
- Location Allocation Models — Choosing Sites That Minimise Travel Cost
- Vehicle Routing Problems — Planning Fleet Rounds and Logistics Hubs
- Coverage Gap Mapping — Showing Underserved Neighbourhoods
- Capacity Constraints — Balancing Demand Against Facility Limits

Day 6: Site Suitability for Transport Projects

- Criteria Selection — Translating Policy Goals Into Spatial Layers
- Analytic Weighting Methods — Agreeing Criteria Importance With Stakeholders
- Constraint Masking — Excluding Protected Land and Hazard Zones
- Station and Depot Siting — Ranking Candidate Locations
- Robustness Checks — Testing Rankings Under Different Weights

Day 7: Scenario Building and Comparison

- Baseline and Future Year Networks — Representing Committed Schemes
- Land-Use Growth Scenarios — Allocating Population and Jobs Spatially
- Indicator Frameworks — Comparing Access, Coverage and Cost per Option
- Trade-Off Matrices — Showing Winners and Losers by Area
- Sensitivity to Assumptions — Stating How Results Shift With Inputs

Day 8: Appraisal Evidence and Corridor Choices

- Corridor Alignment Screening — Comparing Routes Against Terrain and Land Take
- Land Value and Development Potential Layers — Linking Transit to Growth
- Environmental Constraint Overlays — Flagging Noise and Habitat Effects
- Cost Surface Modelling — Estimating Relative Construction Difficulty
- Option Shortlisting — Recording Reasons for Rejecting Alternatives

Day 9: Communicating Spatial Decisions

- Decision Map Design — Presenting Options for Committee Papers
- Story Maps — Explaining Proposals to Residents and Businesses
- Indicator Dashboards — Tracking Access Outcomes After Opening
- Uncertainty Statements — Showing Confidence Ranges on Maps
- Consultation Feedback Mapping — Locating Public Comments Spatially

Day 10: Practising the Spatial Decision Study

- Proposal Network Build — Applying Multimodal Network Design to a Live Case
- Accessibility and Demand Run — Applying Catchment and Flow Methods
- Scenario Indicator Table — Applying Trade-Off Matrices to Options
- Recommendation Map Set — Applying Decision Map Design for Approval
- Spatial Decision Study — Completing the Work Product for Submission

Applying GIS Applications for Transport Planning After the Course

- Produce a travel time catchment and accessibility index for one existing station or facility and share the coverage gaps with service planners
- Run a two-option scenario comparison for a live corridor or site proposal using the indicator framework and a trade-off matrix

GIS Applications for Transport Planning Questions FAQ

What are Advanced GIS Applications for Transport Planning and why do they matter now?

Advanced GIS Applications for Transport Planning use network, accessibility, demand and suitability models to compare corridor and site options. They matter now because growing cities and funding bodies need clear spatial evidence before committing to transport investment.

Which roles gain most from Advanced GIS Applications for Transport Planning?

Transport planners, urban planners, GIS analysts and strategy officers gain most. They frame planning questions, build network and demand models and present options to committees that approve corridor, station and facility investments.

How do Advanced GIS Applications for Transport Planning differ from a general GIS analysis course?

They apply spatial methods to transport and land-use decisions rather than teaching general geoprocessing. A general analysis course covers data handling and automation; this course centres on accessibility, demand, location allocation and scenario appraisal.

What do you bring back from Advanced GIS Applications for Transport Planning?

You bring back a spatial decision study for a transport or land-use proposal, with a network model, accessibility and demand results, scenario indicators and a set of recommendation maps.

GIS Applications for Transport Planning: The Way Forward

The spatial decision study first informs which corridor or site option goes forward for detailed design. Planners, strategy officers and approval committees use it to see who gains access and at what cost. After its first use, revisit the demand assumptions and equity overlays, because opening-day travel patterns often differ from the zones and growth rates first modelled.