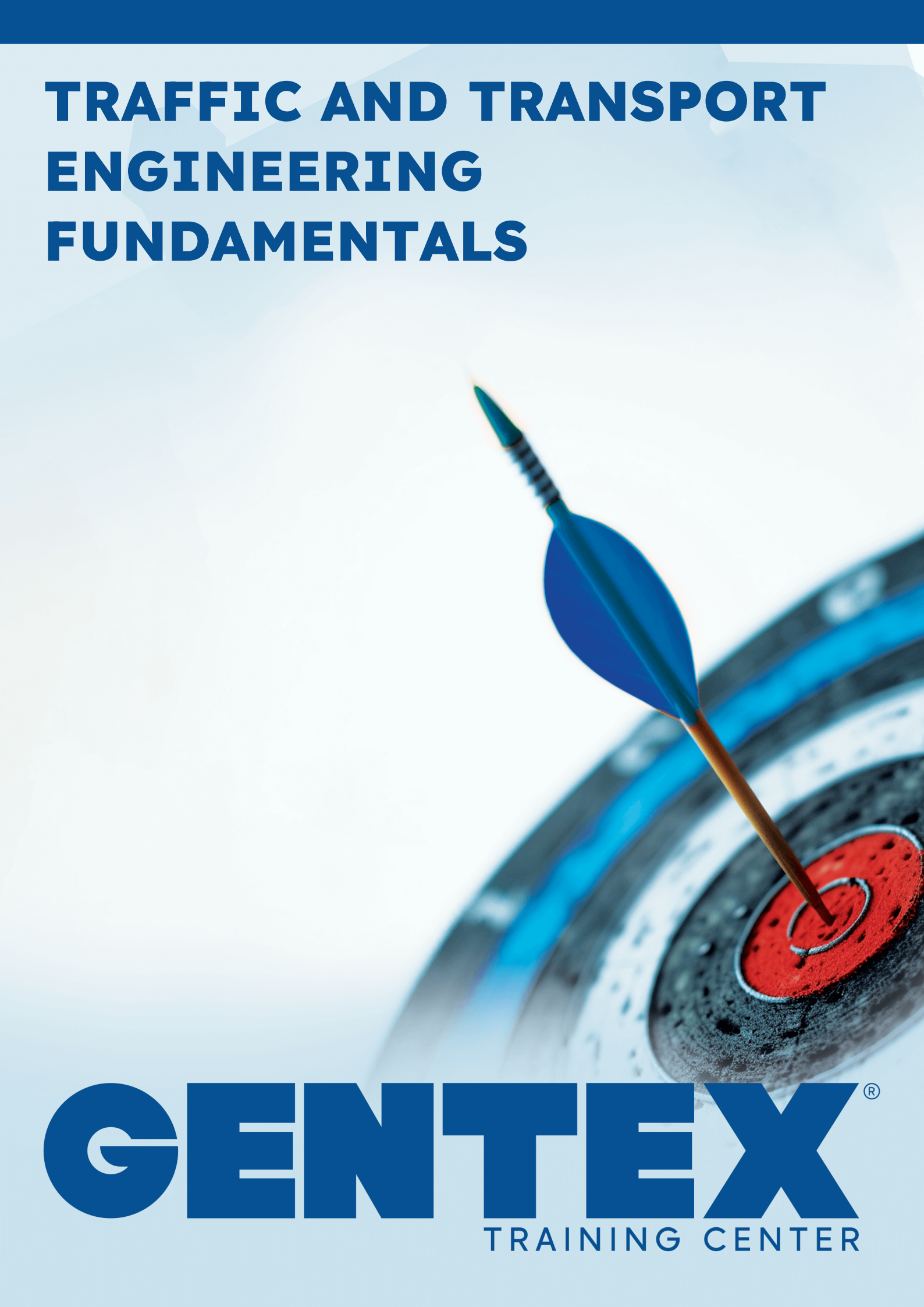
TRAFFIC AND TRANSPORT ENGINEERING FUNDAMENTALS



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Introduction

Road space is finite and demand for it is not. Every lane closure, new development, or signal change has a traffic consequence, and engineers who can predict and measure those consequences make better decisions than those who react afterwards. This Traffic and Transport Engineering Fundamentals Training Course gives traffic engineers, transport planners, and municipal staff a complete working method for the basics of the discipline. Participants learn traffic flow theory, capacity and level of service, junction design and control, road safety analysis, parking and demand management, and transport modelling practice.

Traffic and Transport Engineering Fundamentals Course Objectives

- Apply traffic flow theory: flow, density, speed, and headway relationships.
- Calculate capacity and level of service for roads and junctions.
- Apply Highway Capacity Manual methods to real intersections.
- Design and analyse signalised and unsignalised junctions.
- Apply road geometry, sight distance, and design standards.
- Conduct road safety audits and identify accident blackspots.
- Apply pedestrian, cyclist, and accessibility requirements.
- Apply parking policy and travel demand management measures.
- Apply transport modelling and traffic impact assessment basics.
- Measure performance with journey time, delay, and accident rate.

Course Methodology

- Facilitated sessions built on real traffic counts, junction designs, and accident records.

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- Case workshops on junction failures, safety blackspots, and development impacts.
- Capacity, delay, and level of service calculation exercises with live data.
- Junction design and signal timing practice labs.
- Group exercise on a traffic study with recommendations and priorities.

Who Should Take This Course

- Traffic and highway engineers.
- Transport planners and municipal engineers.
- Road safety and audit officers.
- Traffic management and enforcement staff.
- Developers' transport consultants.
- Police and emergency service traffic liaison officers.

Traffic and Transport Engineering Fundamentals Course Outlines

Day 1: Traffic Flow Theory and Characteristics

- Traffic flow variables: flow, speed, density, and headway.
- Fundamental diagrams and their practical use.
- Vehicle and driver characteristics.
- Volume, demand, and capacity definitions.
- Peak hour, peak hour factor, and design flow.
- Traffic count methods and survey design.
- Data quality and analysis of counted data.

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Day 2: Capacity and Level of Service

- Concepts of capacity, saturation flow, and degree of saturation.
- Highway Capacity Manual methods overview.
- Level of service for urban streets and rural roads.
- Gap acceptance and conflicting flow analysis.
- Queuing theory basics and delay estimation.
- Roundabout capacity assessment methods.
- Interpreting and reporting level of service results.

Day 3: Junction Design and Traffic Control

- Junction types: priority, roundabout, and signalised.
- Geometric design: turning radii, islands, and channelisation.
- Sight distance, visibility splays, and safe stopping.
- Signal phasing, staging, and cycle time design.
- Signal timing calculation and green time allocation.
- Pedestrian crossings, phases, and accessibility.
- Junction safety and conflict point reduction.

Day 4: Road Safety and Vulnerable Users

- Road safety audit process and stages.
- Accident data analysis and blackspot identification.
- Collision diagram preparation and interpretation.
- Design and operational factors in crash causation.
- Vulnerable road users: pedestrians, cyclists, and motorcyclists.

- Speed management and traffic calming measures.
- Safe system approach and treatment selection.

Day 5: Demand, Parking, and Evaluation

- Travel demand management measures and pricing.
- Parking policy, supply, and control strategies.
- Access management and development impact.
- Traffic impact assessment basics and mitigation.
- Transport modelling steps and their limitations.
- KPIs: journey time, delay, and accident rate.
- Building a traffic engineering improvement plan.

Conclusion

By successfully completing the Traffic and Transport Engineering Fundamentals Training Course, participants will have acquired a solid working knowledge of traffic flow theory, capacity and level of service analysis, junction design and signal control, road safety auditing and blackspot analysis, parking and demand management, and traffic evaluation. They will leave able to calculate capacity and delay with recognised methods, design junctions that operate safely, and justify traffic decisions with measured evidence. Gentex Training Center delivers this programme with traffic engineering and transport planning practitioners working on live networks.

FAQs for the Traffic and Transport Engineering Fundamentals course

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Q1 What is the "Traffic and Transport Engineering Fundamentals" course about?

It is a five-day programme on the core methods used to design and manage road traffic. It covers traffic flow theory, capacity and level of service, junction design and signal control, road safety auditing, parking and demand management, and traffic evaluation.

Q2 What are the key benefits of the "Traffic and Transport Engineering Fundamentals" course?

Participants calculate capacity and delay using recognised methods instead of estimation, design junctions that operate safely and predictably, and justify traffic decisions with counted data. They also identify safety blackspots and treatments before accidents accumulate.

Q3 What skills will I gain from the "Traffic and Transport Engineering Fundamentals" course?

You will gain traffic flow and capacity analysis, junction design and signal control application, road safety audit and accident analysis, and transport demand, parking, and evaluation management.

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Q4 What tools, methods, or standards are covered in the "Traffic and Transport Engineering Fundamentals" course?

The course works with traffic flow variables covering flow, speed, density and headway, fundamental diagrams, volume, demand and capacity definitions, peak hour factor and design flow, traffic count methods and survey design, capacity and saturation flow concepts, degree of saturation, Highway Capacity Manual methods for urban streets and rural roads, gap acceptance and conflicting flow analysis, queuing theory and delay estimation, roundabout capacity assessment, junction types covering priority, roundabout and signalised, geometric design with turning radii, islands and channelisation, sight distance and visibility splay analysis, signal phasing, staging and cycle time design, green time allocation and signal timing calculation, pedestrian crossing design and accessibility, road safety audit process and stages, accident data analysis and blackspot identification, collision diagram preparation, speed management and traffic calming measures, safe system approach and treatment selection, travel demand management measures and pricing, parking policy, supply and control strategies, access management, traffic impact assessment, and transport modelling steps with their limitations.

Q5 How is the "Traffic and Transport Engineering Fundamentals" course applied in real-world practice?

Teams apply it when calculating capacity for a new junction, retiming signals after a queue complaint, auditing a road scheme before construction, investigating a blackspot with collision diagrams, assessing the traffic impact of a development, and reviewing journey time and accident rate at an annual network review.