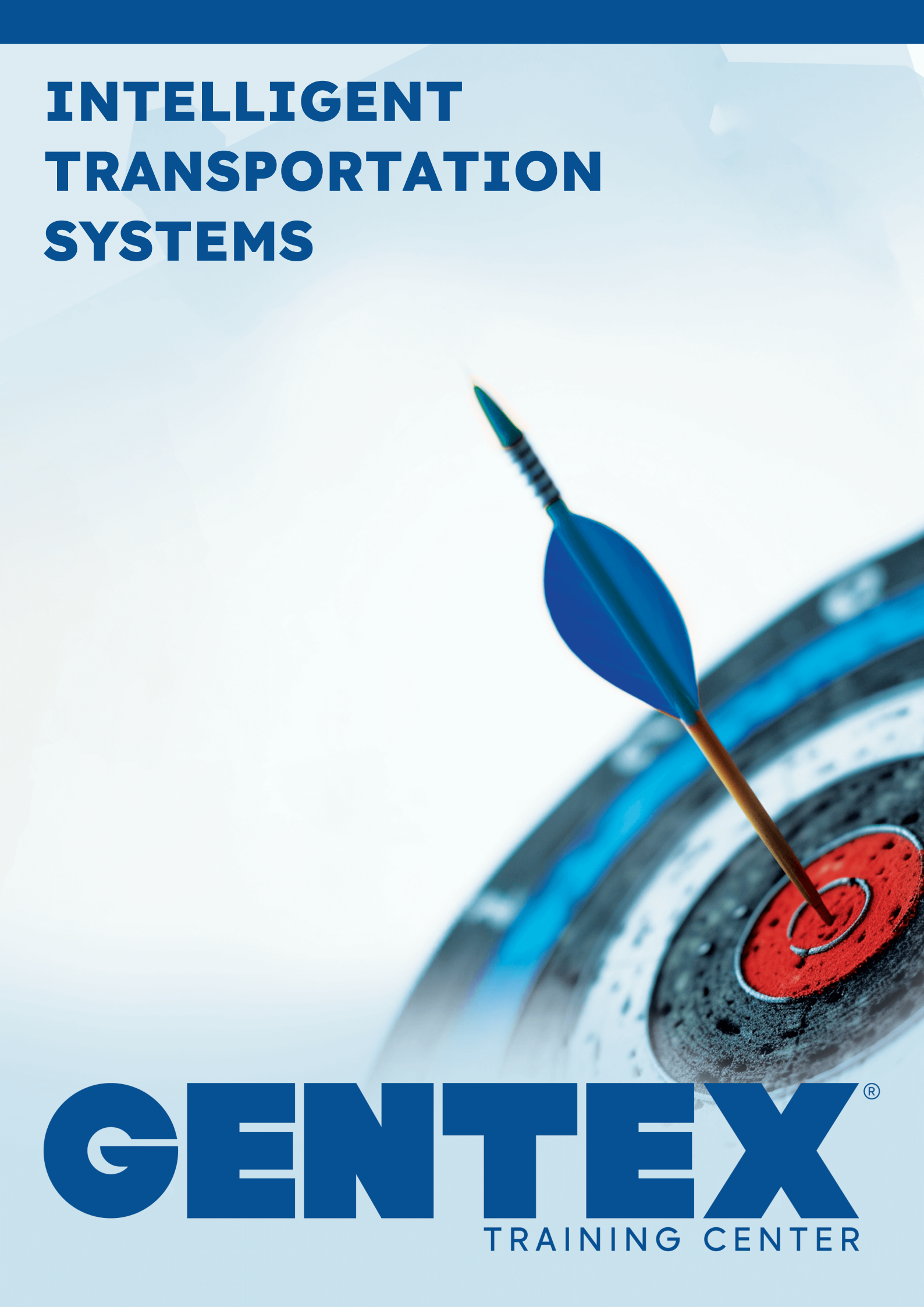
INTELLIGENT TRANSPORTATION SYSTEMS



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Introduction

Road networks generate more data than any transport authority can read manually. Loop detectors, cameras, GPS traces, and connected vehicles produce a continuous stream that shows congestion forming, incidents starting, and signal timing failing before anyone reports them. This Intelligent Transportation Systems Training Course gives transport engineers, planners, and technology specialists a complete working method for turning that stream into decisions. Participants learn ITS architecture, detection and communication layers, traffic management and signal control, incident and emergency management, traveller information services, and data governance. Furthermore, the course connects system design to real outcomes such as travel time, safety, and network capacity.

Intelligent Transportation Systems Course Objectives

- Apply ITS architecture frameworks and reference models to system design.
- Select detection technologies: loops, radar, video, and connected vehicle data.
- Design communication layers using fibre, cellular, DSRC, and C-V2X options.
- Operate traffic management centres and manage signal control systems.
- Apply adaptive signal control and corridor coordination logic.
- Manage incidents, events, and emergency response using ITS tools.
- Deliver traveller information through VMS, apps, and open data feeds.
- Apply standards: NTCIP, DATEX II, GTFS, and TMC location referencing.
- Handle ITS data governance, privacy, and cybersecurity requirements.
- Measure ITS performance with travel time, delay, and safety indicators.

Course Methodology

- Facilitated sessions built on real network plans, traffic data, and ITS deployments.
- Case workshops on congestion management, incident response, and system failures.

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- Traffic data analysis and signal timing exercises using live detector data.
- Architecture and standards review labs with real ITS specifications.
- Group exercise on an ITS roadmap with measurable performance targets.

Who Should Take This Course

- Transport and traffic engineers.
- Traffic management centre operators and supervisors.
- Transport planners and network managers.
- ITS project and systems engineers.
- Smart city and mobility technology specialists.
- Data and performance analysts in transport authorities.

Intelligent Transportation Systems Course Outlines

Day 1: ITS Concepts, Architecture, and Strategy

- Definition, scope, and user services of intelligent transportation systems.
- ITS architecture frameworks and reference models.
- Regional architecture development and stakeholder roles.
- System integration between authorities and operators.
- Business case, funding, and procurement routes for ITS projects.
- Interoperability, standards alignment, and scalability.
- ITS strategy alignment with national transport policy.

Day 2: Detection, Communication, and Data Collection

- Detection technologies: inductive loops, radar, video analytics, and Bluetooth.

- Probe and connected vehicle data sources and their limits.
- Communication options: fibre, cellular, DSRC, and C-V2X.
- Roadside unit placement and coverage planning.
- Data quality: accuracy, latency, completeness, and gap filling.
- Data fusion across multiple sources.
- Field device maintenance and fault management.

Day 3: Traffic Management and Signal Control

- Traffic management centre functions, systems, and operator workflows.
- Signal control types: fixed time, actuated, and adaptive.
- Adaptive control logic and corridor coordination.
- Ramp metering, variable speed limits, and lane control.
- Congestion monitoring, prediction, and response actions.
- Incident detection algorithms and verification practice.
- Evaluating control strategies with before-and-after studies.

Day 4: Incident, Emergency, and Traveller Information

- Incident management process from detection to clearance.
- Coordination with police, ambulance, and civil defence.
- Emergency vehicle priority and route pre-emption.
- Variable message signs, content rules, and message libraries.
- Traveller information apps, websites, and open data feeds.
- GTFS and real-time transit information standards.
- Event and planned works management.

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Day 5: Standards, Governance, and Performance

- Standards overview: NTCIP, DATEX II, GTFS, and TMC location referencing.
- Data governance, retention, and privacy in ITS.
- Cybersecurity for connected and roadside systems.
- KPIs: travel time, delay, throughput, and incident clearance time.
- Safety analysis and ITS contribution to crash reduction.
- Asset management and lifecycle for ITS equipment.
- Building an ITS roadmap with phased investment and targets.

Conclusion

By successfully completing the Intelligent Transportation Systems Training Course, participants will have acquired a solid working knowledge of ITS architecture and standards, detection and communication layer design, traffic management and signal control, incident and emergency management, traveller information services, and data governance and performance measurement. They will leave able to specify ITS systems that interoperate, operate a traffic management centre with confidence, and show the network benefit of ITS investment with credible indicators. Gentex Training Center delivers this programme with transport technology practitioners working on live networks.

FAQs for the Intelligent Transportation Systems course

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Q1 What is the "Intelligent Transportation Systems" course about?

It is a five-day programme on using technology to manage traffic, incidents, and traveller information. It covers ITS architecture, detection and communication layers, traffic management and signal control, incident and emergency management, traveller information services, data governance, and performance measurement.

Q2 What are the key benefits of the "Intelligent Transportation Systems" course?

Participants design ITS systems that interoperate instead of locking the authority into one vendor, cut travel time and delay through better signal and incident response, and produce evidence that shows which systems actually earned their cost. They also protect traveller data and roadside infrastructure from cybersecurity and privacy failure.

Q3 What skills will I gain from the "Intelligent Transportation Systems" course?

You will gain ITS architecture and standards application, detection and communication layer design, traffic management and signal control operation, and incident management, traveller information, data governance, and performance measurement.

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Q4 What tools, methods, or standards are covered in the "Intelligent Transportation Systems" course?

The course works with ITS architecture frameworks and reference models, regional architecture development, detection technologies including inductive loops, radar, video analytics and Bluetooth, probe and connected vehicle data sources, communication options covering fibre, cellular, DSRC and C-V2X, roadside unit placement and coverage planning, data quality assessment and fusion, traffic management centre systems, fixed time, actuated and adaptive signal control, corridor coordination, ramp metering, variable speed limits and lane control, incident detection algorithms and verification, variable message sign content rules and message libraries, GTFS and real-time transit information standards, and the standards NTCIP, DATEX II, GTFS and TMC location referencing, plus KPIs covering travel time, delay, throughput and incident clearance time.

Q5 How is the "Intelligent Transportation Systems" course applied in real-world practice?

Teams apply it when specifying a new signal control system, planning roadside unit coverage on a corridor, tuning adaptive control after a congestion study, designing a traveller information feed, running a before-and-after evaluation of an ITS investment, and reviewing incident clearance performance at a traffic management centre.