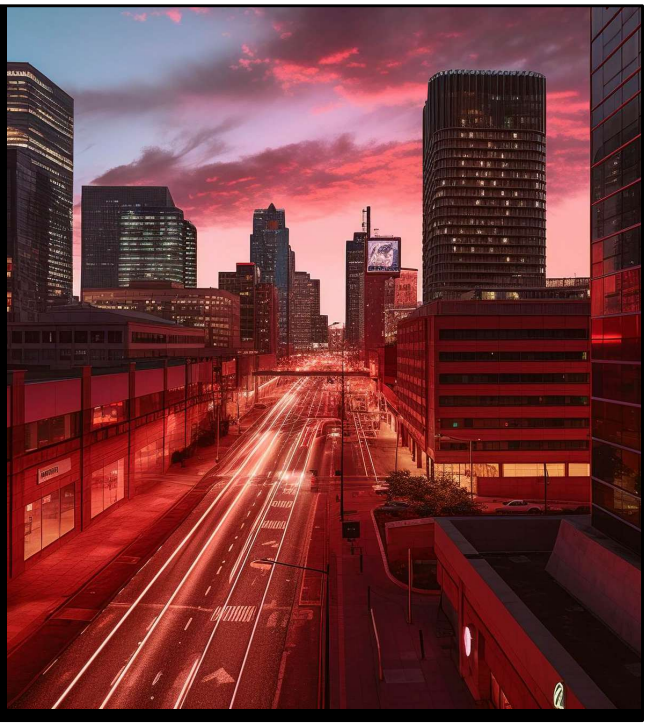
ITS DETECTOR STANDARD UPDATE



SIGNAL NZ USER GROUP 2026
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Scope

Sensors that detect a condition of the roadway network. The scope of this standard includes:

- types of detection applications
- considerations of site selection and placement of sensors
- data standards for sensors
- communication requirements.

The scope of this standard excludes:

- design of detection systems for specific applications such as overweight detection systems, tolling systems, intersection safety zones, ramp metering, traffic signals and automated video incident detection systems
- definition of traffic data measures
- specialised, non-transport detectors such as fire or smoke detection, fibre optic sensors, surveillance, and landslide monitoring.

Standards that apply to any detection system installation and not technology specific.

Examples
- Types of detection application - > table 1
- Site selection -> shall avoid placement at lane drops or gains or Environmental detectors shall not be placed near bus stop
- Data standards -> format, data fields and some guidance on precision and accuracy. i.e. all detectors shall be capable of sending location identification, lane and direction.
- Communications -> Communication to site i.e. communications shall run through a roadside cabinet, and sensor communication i.e. what type of protocol the sensors should use for different applications (TCPIP, MQTT, SNMP, HTTPS)

Table 1. Summary of application specific detector configurations

Application	Reference
Induction loop	ITS specification: *Inductive loops and feeder cables*
Cycle detection	'Cycle Detection' section in *Cycling Network Guidance* 'Cycle loop detection marking' section in *Traffic Control Devices Manual Part 4*
Pedestrian detection	'Crossings' section in *Pedestrian Network Guidance*
Traffic signals	'Inductive loop detectors' and 'Pedestrian and cycle detection' sections in ITS delivery specification: *Traffic signals*
Ramp metering	'Inductive loop types and locations' section in ITS design standard: *Ramp meter systems* 02-R3 *Detail of duct installation – state highway* 08-R3 *Ramp signal system loop details*
Traffic monitoring – mainline state highways	07-R2 *Traffic counting loop details* Appendix E of *Traffic monitoring for state highways* (SM 052).
Active warning signs	'Active Warning Signs and Variable Lane Controls' section in *Traffic Control Devices Manual Part 5*

Table 2. Detection technology strength and weakness considerations

Technology	Strengths[3]	Weaknesses[3]	Data collected	Resolution	Installation
Inductive loop	• insensitive to weather • low maintenance • highly consistent	• non-adjustable detection zone • requires lane closure for maintenance • multiple sensors needed for multilane • impacted by slow conditions	• Vehicle demand • Bike demand • Speed – dual sensors required • Occupancy/Queue • Volume • Classification – length[1]	• by lane[2] • by direction	• Intrusive
Magnetometer	• insensitive to weather • low maintenance • highly consistent	• non-adjustable detection zone • requires lane closure for maintenance • multiple sensors needed for multilane	• Vehicle demand • Speed – dual sensors required • Occupancy/Queue • Volume • Classification – length[1]	• by lane[2] • by direction	• Intrusive
Video-analytics	• covers multiple lanes • temporary/portable	• impacted by weather • placement may impact accuracy • high maintenance	• Vehicle demand • Ped/Bike demand • Speed • Occupancy/Queue • Classification – length • Volume	• by lane • by direction	• Non-intrusive • Side-mounted
Active Infrared Radar	• covers multiple lanes	• impacted by weather • placement may impact accuracy • high maintenance • side-mounted occlusion	• Speed • Occupancy/Queue • Classification – length • Volume	• by lane • by direction	• Non-intrusive • Overhead or side-mounted

Includes 14 different types of detection technology

Considerations for detection system selection…

- **Accuracy:** Data perfectly reflects the real-world objects or true values it represents.
- **Completeness:** All required fields and necessary data elements are present without missing values.
- **Consistency:** Information matches across disparate systems, maintaining uniform formats and business rules.
- **Timeliness:** Data is readily available when needed and accurately reflects the current state of the business.
- **Uniqueness:** There are no duplicate records or overlapping entries for the same data entity.
- **Relevance:** The collected data is strictly applicable and useful to the specific analytical or business goals