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NZ TRANSPORT AGENCY

Intersection speed zones

Intelligent transport systems (ITS) design standard

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More information
If you have further queries, contact the Intelligent Transport Systems Standards and Specifications (ITS S&S) team via email: itsspec@nzta.govt.nz

More information about ITS is available on the NZTA website at https://www.nzta.govt.nz/its

This document is available on the NZTA website at https://www.nzta.govt.nz/itsspecs

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1 Overview

This section defines the operational requirements for intelligent transport systems (ITS) with respect to the transport network.

1.1 Purpose

The purpose of this design standard is to define the system requirements for intersection speed zones (ISZ) (formerly known as rural intersection activated warning signs (RIAWS)) used for operational purposes by the Client. This design standard shall comply with the Client's operational and asset management systems.

1.2 Overview

This design standard provides requirements for ISZ systems.

1.2.1 Definition

An ISZ is a system and series of devices which provide a regulatory speed reduction for motorists approaching an intersection at the major road. An ISZ system is typically installed at intersections in a rural environment with stop-controlled and/or give-way priority.

1.2.2 NZTA ITS class

001 Signs – Equipment which provides a visual message or warning to the users of the transport network. Class definitions

1.3 Scope

This design standard provides requirements for the use of ISZ systems in terms of:

i. ISZ system design,
ii. sign location,
iii. equipment selection criteria,
iv. vehicle detection,
v. power and communications,
vi. roadside cabinets,
vii. LED signage,
viii. maintenance,
ix. security features.

1.4 Operational

All ISZ systems must:

i. activate signs when motorists are approaching the intersection from the side roads,
ii. if applicable, activate signs when motorists are turning right into the side roads (refer to section 2.1 for guidance),

iii. on sign activation, be able to display and maintain visible and legible regulatory speeds via an active warning and regulatory sign (AWRS) to road users, under all conditions,
iv. be configured in a manner which allows road users to react and reduce speed on approach to the intersection, both optically (optimising height and viewing angles) and logically (preceding intersections) (this is covered in the latest version of ITS design standard: *Active warning and regulatory signs* and New Zealand Gazette *(Land Transport Rule: Traffic Control Devices 2004 (April 2021)-Speed Limit Signs for New Setting of Speed Limits Rule 2022),*
v. be in a known state at all times and report operational status and health through an appropriate non-proprietary monitoring product capable of interfacing with the Client's monitoring system,
vi. meet all of the Client's operational requirements.

2 Designing for operation

This section defines the functionality required to achieve successful operation of the ITS equipment.

A concept of operations (CoO) shall be created by the Consultant to support the ISZ system design, including intended devices. Refer to Appendix A for guidance. This shall be reviewed and approved by a road safety and ITS subject matter expert before commencing a design.

The ISZ design shall be carried out in the context of the operational requirements which are specific to the project. Careful consideration shall be given to each individual site and the suitability for an ISZ system, including any environmental or geometric factors which affect operation.

Refer to Appendix B – Theoretical basis of an ISZ design.

2.1 ISZ system design

The ISZ system is designed to reduce the speed of motorists approaching an intersection at the major road. This is achieved by using ITS vehicle detection devices and techniques at the side road when vehicles are approaching or waiting to turn out of and/or into the side roads. This in turn activates the electronic ISZ on the main approach to the intersection.

Appearance of right-turn bay (RTB) infrastructure and associated pavement markings can vary at rural intersections. ISZ systems shall only be used for RTBs if the infrastructure supports it and it is agreed with the Client.

The consultant shall discuss with the Client regarding an RTB ISZ design. This is to ensure that the design allows for the most suitable and up-to-date practices and techniques for accurately detecting right-turning vehicles from the major road into the side road.

2.1.1 Elements of an ISZ

An ISZ site shall consist of:

i. electronic variable speed limit signs,
ii. high-definition radar detectors, in-ground detector loops and/or other Client-approved detection device(s),
iii. roadside control cabinet with a programmable logic controller (PLC),
iv. if applicable, intersection closed-circuit television (CCTV) monitoring camera (not to be used for detection),
v. communications,
vi. power.

The requirements listed above will vary from project to project, and a wider understanding of the context of the project had before selecting each design element.

An ISZ concept layout example is presented below in **Figure 1** and **Figure 2** to provide typical design guidance on the layout of elements, including ISZ devices.

ISZ systems comprise of the following:

i. side-road radar sensors (e.g. high-definition radars) to detect approaching side road traffic approximately 55m from the intersection (refer to **Figure 4** in Appendix B – Theoretical basis of an ISZ design) – these activate the main road electronic signs,
ii. side-road limit line sensor (e.g. in-ground detector loops) to detect waiting/queuing traffic and terminate the sign activation following a delay once a motorist has left the sensor detection zone,
iii. RTB advance detectors (refer to section 2.3.3 if applicable) prior to and at the limit line, to activate the main road electronic signs,
iv. RTB limit line detectors (refer to section 2.3.3 if applicable) to detect waiting/queuing traffic and terminate the sign activation following a delay once a motorist has left the sensor detection zone,
v. variable speed limit signs approximately 200m from the intersection (refer to section 7.6), in each direction (road traffic signs need to be located at the edge of the road or above the road to be visible and legible for approaching drivers),
vi. a control system to manage the ISZ, and if required, data collection equipment.

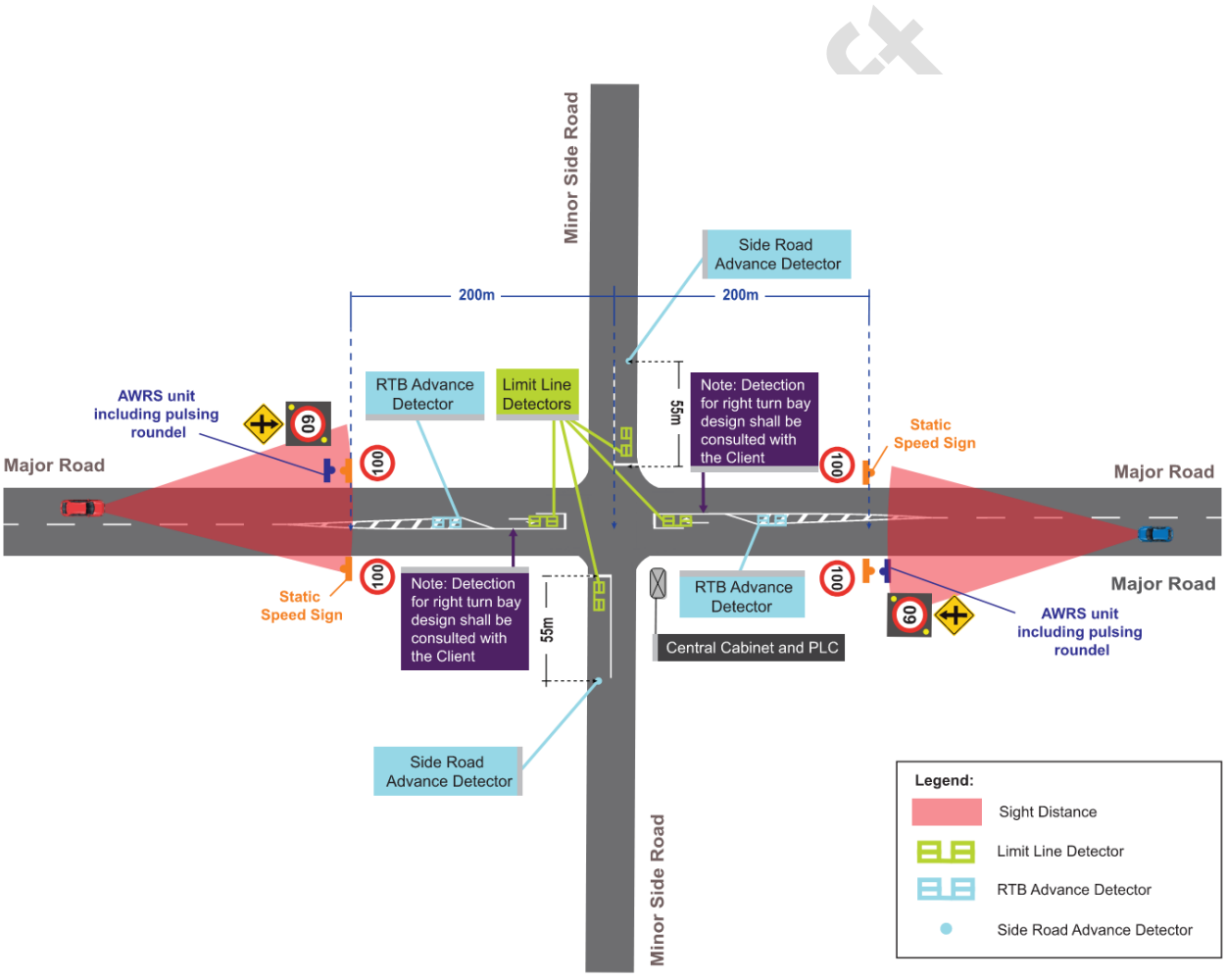

Figure 1: Concept layout for a crossroad intersection

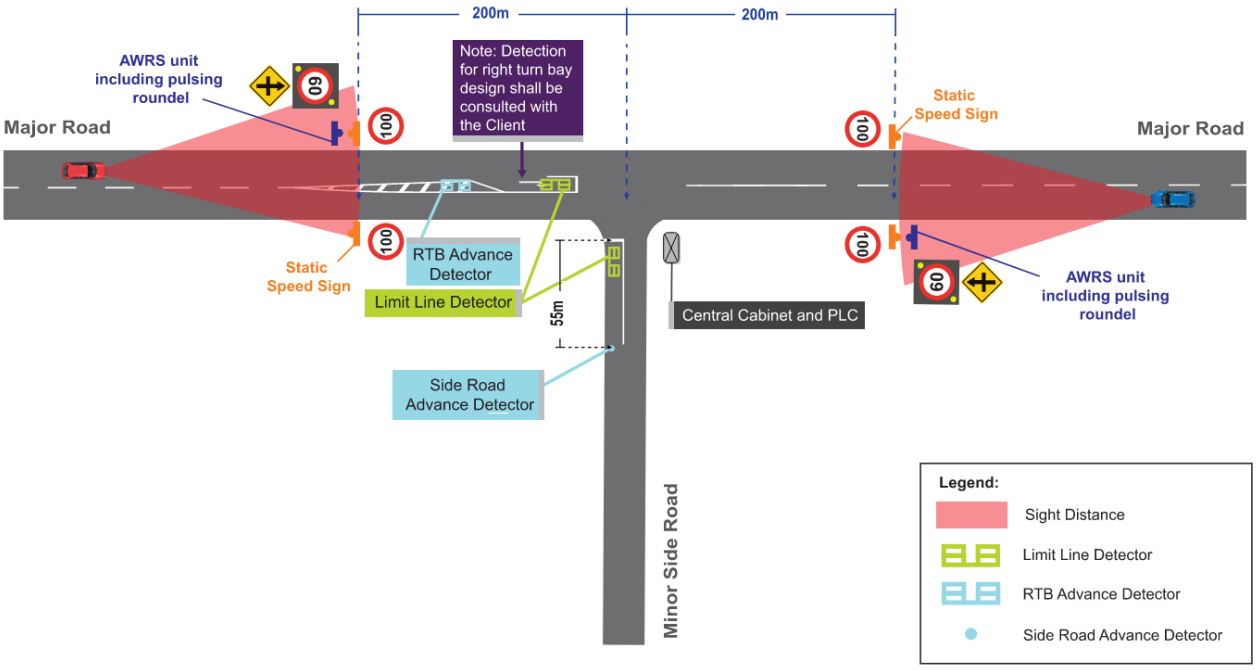

Figure 2: Concept layout for a 'T' intersection

2.1.1.1 Clear sight distance

ISZ signs shall be visible by the road user for a minimum of 200m. This distance is determined at a 100km/h speed limit. For calculation, refer to the section titled 'Clear sight distance' in the latest version of ITS design standard: *Active warning and regulatory signs*. This ratio provides motorists driving at the legal speed limit with at least seven seconds to read the ISZ sign display, and those approaching at 50% above the legal speed limit with at least four seconds to read the ISZ sign display.

ISZ signs shall be gated where clear sight distance cannot be achieved. Dual or gated signs (i.e. an additional sign on the right-hand side of the road or mounted above the roadway (taking over-dimensional loads and routes into account)) as per the section titled 'Active signs' in Traffic control devices Manual (*TCD manual*) part 1: *General requirements for traffic signs*.

If the site cannot provide adequate space for gated signs, a location further back at the major road and intersection is required. The Consultant shall undertake further investigations and reconfiguration for predefined sign activation timings based on the new ISZ sign placement and side road detector locations. Please refer to section 2.3.1 for location of side road detectors.

2.1.2 Presence of road signage

ISZ signage must not compete with the presence of other existing road signage. A reorganisation of signage shall be required to ensure any new assets can fit.

An assessment of existing signage shall be undertaken to understand if modifications or removal of existing signage is required.

In general, the minimum spacing distance between signs will be based on the 85th percentile speed of traffic, in km/h, at the sign location. Refer to the TCD manual.

2.2 ISZ sign requirements

ISZ signs must be AWRS with pulsing roundels as well as a PW-9 supplementary warning sign (refer to **Figure 3**). It is important to refer to the New Zealand Gazette *(Land Transport Rule: Traffic Control Devices 2004 (April 2021)-Speed Limit Signs for New Setting of Speed Limits Rule 2022)* for requirements.

Figure 3. Example of an AWRS (with pulsing roundel) and supplementary warning sign (PW-9 intersection layout static panel) (Source: 'ISZ signs' section of ITS design standard: Active warning and regulatory signs).

ISZ signs must be connected to a control and monitoring system.

2.2.1 Speed limit changes

ISZ signs must comply with the New Zealand Gazette *(Land Transport Rule: Traffic Control Devices 2004 (April 2021)-Speed Limit Signs for New Setting of Speed Limits 2022)* clause 4.9(1)(b)(iv). This will also include:

i. consultation,
ii. speed management plan certification,
iii. submitting to the National Speed Limits Register,
iv. speed changes only on the major approaches – not the side roads.

ISZ signs change the posted speed limit, whether 80, 90 or 100km/h, to 60 or 70km/h.

2.3 Vehicle detection criteria

An ISZ system has detectors which are located at the side roads to ensure the ISZ signs are activating at the appropriate time. The device (advance detector) detects when motorists are approaching the intersection at the side road. The limit line detectors extend the sign activation until a predefined time after motorists turn out of the intersection from the side road.

These detectors are identified as follows:

i. **Advance detectors** detect motorists approaching the intersection from the side roads and/or RTB and activate the ISZ signs for a predefined amount of time.
ii. **Limit line detectors** detect the presence of motorists waiting to turn out of the side road and/or RTB and activate the ISZ signs for a predefined amount of time (this shall include an extension allowance for when motorists leave the detection area).

The selection of detector devices shall be determined by the Consultant, and the device shall be fully approved by the Client.

Other devices such as a CCTV camera, wireless magnetometer detector or light detection and ranging (LIDAR) device shall meet the Client's functionality requirements for vehicle detection.

Locations of devices shall be indicated on the appropriate plan by the Consultant.

2.3.1 Location of side road advance detection

The location and placement of the advance detector is 55m away from the vehicle limit line. To determine if the 55m placement is suitable will depend on site and existing environmental factors. The Consultant must consider the:

i. physical road layout and geometrical features,
ii. legal speed limit, including the time it takes for a motorist to reach the intersection,
iii. placement of the ISZ signs at the major road (200m away from the intersection).

In the event of the ISZ signs being relocated further back (than the 200m) due to lack of sight distance, the Consultant must reconsider the placement of the advance detector location at the side road. This is to ensure the advance detector and predefined timing parameters for ISZ sign activation are adequate for approaching drivers on the major road.

2.3.2 Location of limit line detection

The limit line detector shall be positioned so that a motorist, when stationary at the intersection, can be accurately detected. The ISZ signs will activate at the major road for a predefined time, until the motorist has left or turned out of the side road detection area.

This shall also include any areas or detection zones where there are two vehicle turning lanes at the side road. Additional detectors shall be considered to ensure that turning vehicles are reliably detected.

2.3.3 Location of RTB detection

RTB detectors are located in two areas:

i. **Advance detectors** are positioned further away from the intersection – at the start of a hatched flush median, painted RTB or right turn lane entry point on the road.
ii. **Limit line detectors** are positioned to detect stationary vehicles waiting to turn right at the intersection –at the limit line of the RTB.

The Consultant shall consult the Client regarding an RTB ISZ design. This is to ensure that the design allows for the most suitable and up-to-date practices and techniques to allow for adequate activations of the ISZ signs, and to meet the minimum requirements of the ISZ system.

2.3.4 High-definition radar detectors

High-definition radar sensors are an above ground device and detect approaching motorists at the side road.

This method of detection is a lower cost option for advance detection compared to inductive loops. A high-definition radar detector avoids using long lengths of extensive ducting and loop feeder cable.

2.3.4.1 Positioning of high-definition radar detectors

High-definition radar detectors shall be positioned 55m from the side road limit line.

The detector shall have adequate line of sight to the central cabinet positioned at the intersection.

Vegetation shall be cleared where appropriate to ensure a clear path.

Communication devices shall not be located on sloping verges. In the event of significant tree cover, wireless signal booster locations shall be considered.

The wireless network shall be compliant with *New Zealand Radio Spectrum Management Compliance Guide* specifications and operate in accordance with Radiocommunications Regulations (General User Radio Licence for Short Range Devices) Notice 2022.

2.3.4.2 Existing infrastructure

The practicality and relative economics of utilising any existing power distribution poles shall be considered where this would result in the overall minimum number of roadside poles exposed to traffic.

Joint use (or shared) traffic signal/road lighting poles, or shared traffic sign support poles shall be used to limit the number of poles, reduce vehicle conflict exposure and improve side road aesthetics.

2.3.5 In-ground vehicle loop detectors

In-ground inductive loops are single core polypropylene insulated cables that are double looped and located in the surface of the road.

Inductive loops shall be positioned at the vehicle limit lines or in locations which are closer to the ISZ PLC.

2.3.5.1 Pavement condition for in-ground detector loops

Good pavement condition (e.g. fully sealed) is a requirement for the performance of detector loops.

If poor pavement condition is observed, the Consultant shall provide suitable pavement for the area or choose another type of detection method (such as above-ground detection).

When there is a new treatment of pavement asphalt at the intersection, detector loops shall be pre-formed within the asphalt surface.

2.4 Power

ISZ signs shall be designed to allow for solar power. In the event of extensive tree cover, differing topography, latitude and high activation frequency, the signs shall be designed to allow for mains power.

In rural areas, access to power can be limited, therefore using solar power shall be used to support the system PLC and cabinet equipment.

2.5 Communications

Communications to the site shall use commercial services such as broadband or cellular service provided by a Client-approved telecommunications provider.

2.5.1 Wide-area network (WAN)

WAN is a large network of information that is not tied to a single location or site.

The design of the ISZ system shall align with the Client's WAN network requirements, including the ability for monitoring the site by the Client's administration users.

2.6 Roadside cabinets

For the positioning and power requirements of roadside cabinet infrastructure, refer to the latest version of ITS design standard: *Cabinets*.

2.7 Monitoring

The ISZ system shall be in a known state at all times and report operational status and health through an appropriate non-proprietary monitoring product capable of interfacing with the Client's monitoring system.

2.7.1 CCTV camera for monitoring (optional)

CCTV shall be designed based on Client request.

For CCTV requirements, refer to the latest versions of ITS design standard: *Closed-circuit television* and ITS delivery specification: *Closed-circuit television – operational cameras*.

2.7.2 Speed monitoring (optional)

In order to measure the effectiveness of the ISZ system, speed monitoring and data collection equipment shall be designed on Client request.

3 Designing for safety

This section defines the requirements to ensure the ITS can be operated and serviced safely.

3.1 Health and safety

All ITS equipment must be designed to ensure installation and maintenance can be carried out in accordance with the Health and Safety at Work Act 2015.

A safety-in-design process must be undertaken.

3.2 Design safety

The Client requires the following key outcomes to be met so ITS can be operated and serviced safely:

i. Safety must be included and maintained within the design.
ii. Safe access for maintenance is provided.

3.2.1 Accessibility

The design must allow vehicle access for ISZ system activities.

Where necessary, temporary traffic management shall be used to ensure the safety of any installation and maintenance of the ISZ system.

Where detectors and roadside cabinets are located in a high-speed environment, the designer shall indicate in the design how the equipment shall be accessed safely from the side road.

Sufficient space for manoeuvring shall be provided. If this is not applicable, a safe location to stop shall be identified.

3.2.2 Working at heights

If working at heights is applicable, refer to the latest version of ITS core requirements standard: *Commissioning and handover requirements*.

3.2.3 Electrical safety

The design shall comply with electrical arrangements in accordance with Electricity (Safety) Regulations 2010 (SR 2010/36) and AS/NZS 3000:2018 *Electrical installations (known as the Australian/New Zealand Wiring Rules*).

3.3 Site assessment

A site visit shall be undertaken by the Consultant and subject matter expert to understand the project site and constraints (i.e. pavement and geometric conditions).

A safe stopping location shall be identified for installation and maintenance vehicles of ISZ systems.

3.3.1 Below the ground

3.3.1.1 BeforeUdig

The Consultant shall prepare underground service utility plans to fully identify the location of cables, pipes and other utility assets. SCALA penetrometer shall be implemented as part of the site assessment before any works are undertaken.

3.3.1.2 Potholing investigations

Potholing investigations shall be undertaken if there is a risk of potential conflicts with underground services.

3.3.2 Above the ground

For adequate safe distances from low and high voltage power lines, refer to NZECP 34:2001 *New Zealand Electrical Code of Practice for Electrical Safe Distances*.

Sensors shall not be located directly under or above any power lines. If unavoidable, the designer shall contact the local power providers for direction.

4 Designing for maintainability

This section defines the requirements to ensure the ITS can be maintained.

4.1 Maintenance

For maintenance conditions and obligations, refer to the Maintenance Contract for ISZ.

4.1.1 Access

The ISZ system shall be designed to allow for safe and efficient access to and from the equipment for maintenance purposes.

Location shall be such that temporary traffic management is not required but is located for safe routine maintenance.

4.2 Asset numbering

All ITS assets must be numbered in accordance with the Client's ITS numbering system and shall be subsequently recorded appropriately in the Client's ITS asset database, along with its location, status and condition data etc. Refer to the latest version of ITS core requirements standard: *Requirements for intelligent transport systems*.

4.3 Enforcement

To be effective, the ISZ must be enforceable. The length of the zone, visibility of the signs, proof of display (ie orange LED light displayed on the back of the ISZ sign when activated) and other issues are all matters the Police must take into account in determining whether they are able to proceed with enforcement and subsequent action. It is therefore imperative any associated variable speed limit considerations involve the District Road Policing Manager of NZ Police.

Refer to section 8 in the Austroads *Guide to Road Safety Part 3: Safe Speed*.

5 Design for security

This section defines the requirements to ensure the ITS can be secured and maintain integrity.

5.1 Security

ISZ will be left unattended on the roadside and therefore, security is required to prevent:

i. removal of the complete unit from site,
ii. removal of major and minor components,
iii. dismantling of the equipment,
iv. operation of the equipment.

For physical and digital security measures, refer to section titled ‘Design for Security’ in the latest version of ITS design standard: *Electronic signs*.

For security measures for the cabinet, refer to the latest version of ITS design standard: *Cabinets*.

For pole security requirements, refer to the section titled ‘Pole security’ in the latest version of ITS design standard: *Closed-circuit television*.

5.2 CCTV

If the site is using CCTV, refer to the section titled ‘Security requirements’ in the latest version of ITS delivery specification: *Closed-circuit television – operational cameras*.

6 Appendix A – Concept of operations for X intersection

Logic system and function

1. Sign and detector placements need to be calculated based on information for each approach, taking into account typical approach speed along a route with physical geometry and layout.
2. All system nodes (e.g. above-ground detectors or inductive loops) and active devices must be monitored continuously, and any defects quickly detected and displayed on the site monitoring system. Any anomalies or outages are to be reported via email or text alerts.

There are ***[e.g. 12]*** nodes all linked together via ***[e.g. 50mm diameter orange underground PVC ducting, loop feeder cable and industrial grade wireless network]*** for above-ground detectors at the side roads.

[Road names] – Side road 1 approach

[e.g. Add road name] approach above-ground detector is to be positioned 55m from the intersection and is to serve as an advance warning detector. The device shall detect when a vehicle passes over a point within the approach vehicle lane.

[Road names] – Side road 2 approach

[e.g. Add road name] approach above-ground detector is to be positioned 55m from the intersection and is to serve as an advance warning detector. The device shall detect when a vehicle passes over a point within the approach vehicle lane.

Vehicles passing ***[e.g. add road names]*** approach detectors will activate the ISZ signs for approximately _ ***seconds (to be confirmed on site).***

[Road names] – Side road limit lines

Inductive loops are to be positioned at the side road ***[e.g. add road names]*** limit lines to detect the presence of left turn (LT) and right turn (RT) vehicle movements.

Vehicles present at the limit line (loop detectors) will activate the ISZ signs at the ***[add direction approach e.g. NW]*** and ***[e.g. SE]*** approach ISZ signs for approximately _ ***seconds (to be confirmed on site).***

Right turn bay detectors *(to be confirmed by the Client if used)*

Two nodes ***[e.g. inductive loop detectors]*** are required to be positioned in the right turn bays and upstream flush medians.

RT into [e.g. add side road name] approach detector

An inductive loop is be installed approximately _***metres (m) upstream*** in the flush median.

RT limit line detector into [add side road names].

To be installed at the limit line of the RTB.

Vehicles passing the RT nodes inductive loop detectors will activate the ISZ sign at the ***[add direction approach e.g. NW]*** for _ ***seconds (to be confirmed on site).***

7 Appendix B – Theoretical basis of an ISZ design

Consultants designing for ISZ systems shall understand the key principles of an ISZ.

7.1 Operating speed

In New Zealand, the operating speed is considered the highest overall speed, exclusive of stops, at which a driver can safely travel on a given section of road under the prevailing traffic conditions (refer to the section titled 'Operating Speed (85th percentile)' of Austroads Guide to Road Design Part 3: Geometric Design).

The 85th percentile speed (km/h) is the speed 85 percent (%) of motorists are travelling at or below on a road segment. Motorists travelling above the 85th percentile speed are exceeding the safe and reasonable speed for the road and traffic conditions.

The 15% of drivers who exceed this speed are the motorists at which the ISZ intervention is attempting to target. Adopting the 85th percentile is considered to provide safe, practical, and economic design solutions compared to higher percentile speeds (e.g. 100th percentile).

7.2 Operating conditions

ISZ designs are affected by the following existing road environmental and operating conditions at the major and minor roads:

i. uphill/downhill grade,
ii. existing cross-section and geometric condition,
iii. poor or broken surfaces,
iv. length of existing right turn bay (RTB) or hatched flush median,
v. vehicle lanes narrower than 3m,
vi. volume of vehicles at the minor roads,
vii. lack of dedicated turning lanes into the minor roads,
viii. location and placement of ISZ design elements (refer to **Figure 1** and **Figure 2**),
ix. not enough visibility for motorists to see approaching traffic from the minor road,
x. too much visibility, where there could be an increase in poor decision making from motorists at the minor road (e.g. judgement of safe gaps, size, and speed of approaching motorists at the at the major road).

7.3 Driver behaviour

Determining driver behaviour on rural roads is important for an ISZ site. This is to avoid the following:

i. installing minor road advance detectors too far or too close to the intersection, resulting in inconsistent ISZ sign activations for drivers approaching the intersection at the major road,
ii. installing ISZ signs too far from the intersection, increasing the potential for motorists to increase their vehicle speed prior to the intersection and vehicle conflict points,
iii. installing the ISZ signs too close the intersection, reducing their effectiveness and likelihood of drivers to reduce their speed prior to the intersection and vehicle conflict points.

7.4 Effectiveness of an ISZ design for operation

For an ISZ sign to be effective, the ISZ sign must be activated at a point in which approaching motorists at the major road have sufficient time to react to the speed limit change and reduce their speed prior to reaching the conflict points at the intersection.

To achieve this, there are two key factors that need to be identified:

i. operating speed,
ii. stopping sight distance (SSD).

7.5 Stopping sight distance (SSD)

SSD is the distance to enable a normally alert driver, travelling at the design speed on wet pavement, to perceive, react and brake to a stop before reaching a hazard on the road ahead (Austroads *Guide to Road Design Part 3 Geometric Design).*

The Consultant shall determine the major and minor road reaction and braking distances. This is based on the approach operating speed and geometrical factors prior to reaching the intersection (major road) or vehicle limit line (minor road).

The SSD is derived from two components:

i. the distance travelled during the total reaction time,
ii. the distance travelled during the braking time from the operating speed, and their relationship shown in (i) above.

(i) Reaction distance = $\frac{R_T V}{3.6}$

(ii) Braking distance = $\frac{V^2}{254(d+0.01a)}$

R_T = reaction time (seconds)
V = operating speed
d = coefficient of deceleration - longitudinal friction factor (if available)
a = longitudinal grade (if available percentage (%), (+) for upgrades and (-) for downgrades)

Refer to **Figure 4** for the braking profiles of motorists approaching the vehicle limit at the minor road for various operating speeds.

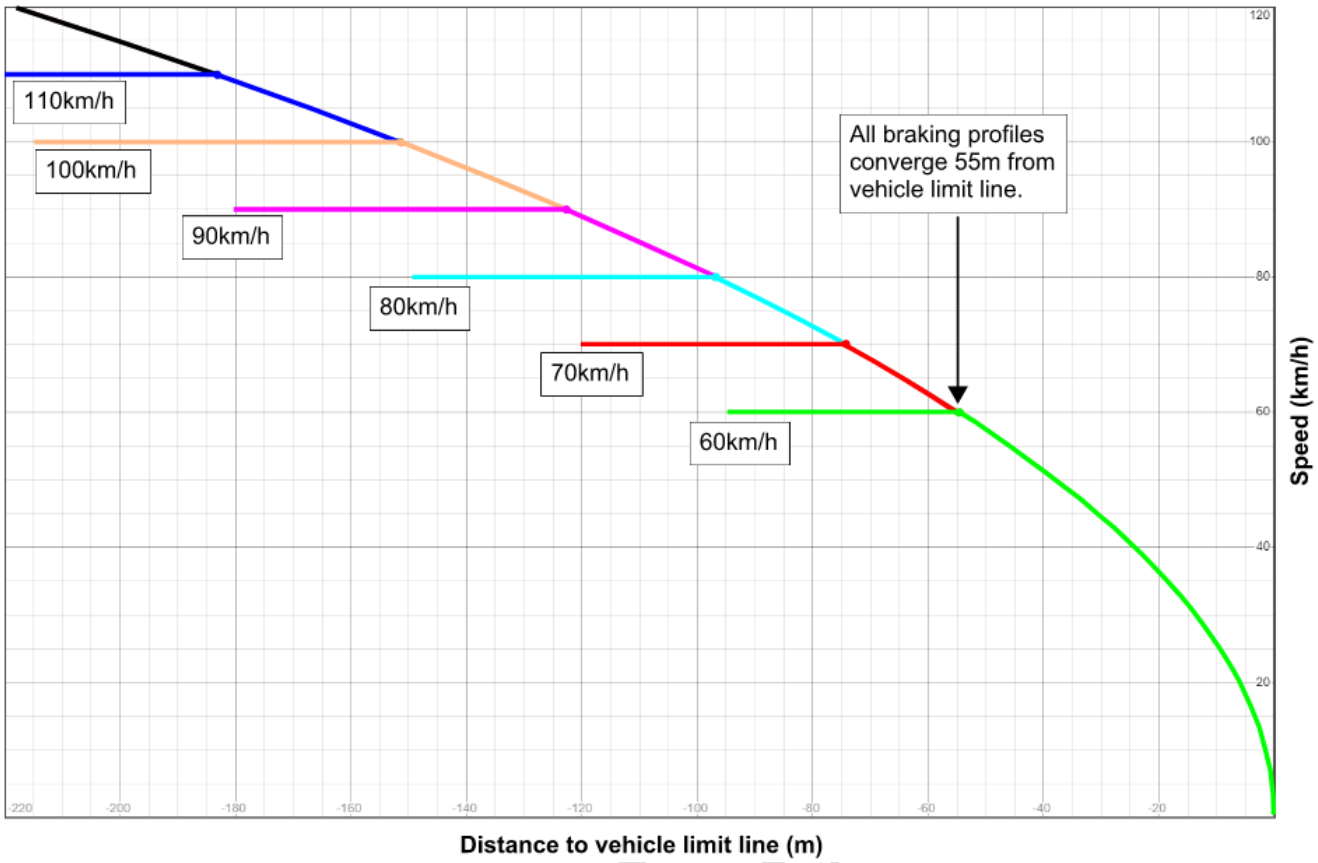

Figure 4: Braking profiles at the minor road approach based on the operating speeds (based on the principles in the section titled 'Car acceleration on curves graph' in Austroads Guide to Road Design Part 3: Geometric Design).

Installing advance detection at 55m back from the vehicle limit line shall take a motorist approximately 6.5 seconds to reach the intersection (time = distance / speed).

7.6 ISZ sign placement at the major road

When locating ISZ signs from the intersection, the following shall be considered:

i. ISZ sign placement and minor road detection is based on the relationship between minor road and major road distances (m), operating speeds (km/h) and geometric conditions,
ii. driver sight distance to the ISZ sign shall be considered regardless of the minor road detection points and estimated timing allocations,
iii. minor road motorists shall arrive at the intersection limit line before the major road motorists reach the conflict points at the intersection.

This results in an ISZ sign positioned at a point 200m from the intersection for a typical 100km/h operating speed.

Drivers shall be required to have at least 200m of clear sight distance to the ISZ sign (refer to section 2.1.1.1) to enable motorists to observe and react to an activated ISZ sign and adjust their speed to 60km/h by the time they reach the sign.

In the case of a late reaction by a motorist (i.e. the driver starts to react at the location of the ISZ sign), at 100km/h after the reaction and braking distance required, this still enables the motorist to be travelling at 60km/h for approximately 100m before they reach the intersection, and also arrive after the minor road vehicle has arrived at the intersection.

ISZ signs that cannot be located at 200m from the intersection due to constraints such as berm space or limited forward visibility to the sign or the speed of the approach may be overly high such as steep downhill grades, or lower approach speed with tight horizontal alignment.

In these instances, the Consultant shall confirm and adjust the location and the activation timing to ensure the minor road vehicle arrival coincides at or before the major road vehicle reaches the intersection.

8 References

This section lists all external and NZTA references included in this document.

8.1 Industry standards

Standard number/name
NZECP 34:2001 New Zealand Electrical Code of Practice for Electrical Safe Distances
AS/NZS 3000:2018 Electrical installations

8.2 NZTA standards, specifications and resources

8.2.1 Standards and specifications

See the NZTA website for the latest versions of the ITS S&S listed below.

Document name
ITS core requirements standard: Commissioning and handover requirements
ITS core requirements standard: Requirements for intelligent transport systems
ITS delivery specification: Closed-circuit television – operational cameras
ITS design standard: Active warning and regulatory signs
ITS design standard: Cabinets
ITS design standard: Closed-circuit television
ITS design standard: Electronic signs

8.2.2 Resources

Document name/code
Guide to Road Design Part 3: Geometric Design Edition 3.4 (AGRD03-16) austroads
Traffic control devices manual (TCD manual)
Guide to Road Safety Part 3: Safe Speed (AGRS03)

8.3 Legislation

Name
Health and Safety at Work Act 2015
Land Transport Rule: Setting of Speed Limits 2022
Radiocommunications Regulations (General User Radio Licence for Short Range Devices) Notice 2022
Electricity (Safety) Regulations 2010 (SR 2010/36)

8.4 Drawings

See NZTA website for the latest versions of the ITS standard drawings listed below.

Drawing number
000-0000-0-7104-03-R1 (Roadside control cabinet)
000-0000-0-7104-04-R1 (Roadside control cabinet apron details)
000-0000-0-7104-17-R1 (Advanced warning signs)
000-0000-0-7104-20-R1 (Advanced warning sign pole with shear base)
000-0000-0-7104-21-R1 (Advanced warning sign pole - ground plant)
000-0000-0-7104-22-R2 (Advanced warning sign pole - mounting brackets)
000-0000-0-7104-45-R2 (CCTV folding pole general layout)
000-0000-0-7104-46-R1 (CCTV fixed pole general layout)
000-0000-0-7104-47-R2 (CCTV pole foundation details)

8.5 Other resources

Name
New Zealand Radio Spectrum Management Compliance Guide

9 Terminology used in this document

Term	Definition
DRAFT	The document is being written and cannot be used outside of NZTA.
PENDING	The document has been finalised and is pending approval and ratification by NZTA. It can be used for procurement at this status.
RATIFIED	The document is an official NZTA document. Road controlling authorities are obliged to follow a document with this status.
RETIRED	The document is obsolete, and/or superseded.
AS/NZS	Australian/New Zealand standard
AWRS	Active warning and regulatory sign
CCTV	Closed-circuit television
CoO	Concept of operations
ISZ	Intersection speed zone
ITS	Intelligent transport systems
LED	Light-emitting diode
LIDAR	Light detection and ranging
LT	Left Turn
NZTA	NZ Transport Agency Waka Kotahi
PLC	Programmable logic controller
RCA	Road controlling authority
RIAWS	Rural intersection activated warning signs
RT	Right Turn
RTB	Right turn bay
SSD	Stopping sight distance
S&S	Standards and specifications
WAN	Wide-area network

10 Content to be redirected

This section records any circumstances where content from this document will be reclassified and moved into future documents. This table is then updated with a reference to the new location.

Section reference	Section name	Future document	Class

11 Document control

11.1 Document information

Document number	ITS-STND-ISZ-202410
Previous document number/s (if applicable)	
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11.2 Document owner

Role ITS S&S Steering Committee

Organisation NZTA

11.3 Document approvers

This table shows a record of the approvers for this document.

Approval date	Approver	Role	Organisation
DD/MM/YYYY			

11.4 Full version history

This table shows the full history of changes made to this document, both minor and major, in chronological order, since the document was first authored.

Minor versions are numbered 0.1, 0.2 etc until such point as the document is approved and published, then it becomes 1.0 (major version). Subsequent edited versions become 1.1, 1.2 etc, or if it's a major update 2.0, and so on.

Version	Date	Author	Role and organisation	Reason
0.1	23/02/2024	Alex Lumsdon Alyssa Greaney Allan Arora	Associate - Transportation Engineering Transport Planner Transportation Engineer	Initial Draft
0.2	22/04/2024	Alex Lumsdon Alyssa Greaney Allan Arora	Associate - Transportation Engineering Transport Planner Transportation Engineer	Second Draft
0.3	20/05/2024	Alex Lumsdon Alyssa Greaney	Associate - Transportation Engineering Transport Planner	Third Draft for Proofing
0.4	23/05/2024	Matthew Bauer	Editor – Clear Edit NZ	Copyedit
0.5	12/07/2024	Alex Lumsdon Alyssa Greaney	Associate - Transportation Engineering Transport Planner	Fourth Draft for ratification
0.6	4/10/2024	Alex Lumsdon James Ellison Alyssa Greaney	Associate - Transportation Engineering Principal Transport Engineer Transport Planner	Fifth Draft for ratification
0.7	17/10/2024	Alex Lumsdon James Ellison	Associate - Transportation Engineering Principal Transport Engineer	Proofing for ratification