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Transport Infrastructure Ireland

# TII Publications



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## Road Safety Inspection Guidelines

**AM-STY-06043**

February 2023

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<b>TII Publication Title</b>	<i>Road Safety Inspection Guidelines</i>
<b>TII Publication Number</b>	<i>AM-STY-06043</i>

<b>Activity</b>	<i>Asset Management &amp; Maintenance (AM)</i>		<b>Document Set</b>	<i>Standards</i>
<b>Stream</b>	<i>Safety (STY)</i>		<b>Publication Date</b>	<i>February 2023</i>
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## TII Publications



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<b>Activity:</b>	Asset Management & Maintenance (AM)
<b>Stream:</b>	Safety (STY)
<b>TII Publication Title:</b>	Road Safety Inspection Guidelines
<b>TII Publication Number:</b>	AM-STY-06043
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**Updates to TII Publications resulting in changes to  
Road Safety Inspection Guidelines AM-STY-06043**

**Date:** February 2023

**Page No:**

**Section No:**

**Amendment Details:**

This Standard supersedes the December 2017 version of AM-STY-06043. The principle changes are outlined below:

- a) Appendix A (Inspection Report) updated
- b) Appendix A1 (Excel Template) and Appendix A4 (Maintenance Issues) updated
- c) Appendix B (Checklist) updated
- d) Appendix C (Road Safety Factors) updated

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# **1. Introduction**

This document provides guidance on undertaking Road Safety Inspections on national roads and should be read in conjunction with AM-STY-06044 Road Safety Inspection.

## **2. Contents of Appendices**

### **2.1 Appendix A – Inspection Report**

The Inspection Team will prepare a written report, which will be forwarded directly to the Authority.

Standardisation of the report format is desirable for the following reasons:

- a) It indicates to the Inspection Team the quantity and quality of the information required;
- b) It enables TII to directly compare the safety performance of various routes, by reference to common report information;
- c) It enables the changes in assessed safety performance of a route to be easily monitored over the years, from inspection to inspection;
- d) It enables easier monitoring of the quality and consistency of Road Safety Inspections.

The standard template report format is provided in Appendix A. The text in *Italics* is sample text, guidance notes or items requiring a response.

### **2.2 Appendix B – Checklist**

It is worthwhile to provide a non-exhaustive list of the general items that will need inspection by the team, both on video and on site. An example of a road safety inspection checklist is given in Appendix B. Inspection Teams may use this or other lists when carrying out their work. However, checklists should be used intelligently, and not simply as a “tick box” system. They should be used to inform a robust set of elements to be reviewed and assessed at the beginning of the process. It is recommended that they are also used at the end of the process, to ensure that no major potential safety issue has been overlooked.

### **2.3 Appendix C – Road Safety Factors**

A list of recurrent road safety factors is provided in Appendix C. These are factors that are well documented, are understood to have a significant impact on safety and relate to the road environment; it is not intended that the inspector would use this as a checklist.

### **2.4 Appendix D – Flowchart of RSI Process**

A flowchart of the Road Safety Inspection process is contained in Appendix D.

## 3. References

The collective experience of road safety professionals, both national and international, is an invaluable resource for the Inspection Team, and the following is a list of documents which can be consulted for guidance on the assessment of road safety issues:

### 3.1 TII Publications (Standards)

Transport Infrastructure Ireland. AM-STY-06044 (HD17) Road Safety Inspection Guidelines. TII Publications.

Transport Infrastructure Ireland. GE-STY-01024 (HD19) Road Safety Audit. TII Publications.

Transport Infrastructure Ireland. CC-STY-04002 (HD16) Temporary Safety Measures Inspection. TII Publications.

Transport Infrastructure Ireland. GE-STY-01027 Road Safety Audit Guidelines. TII Publications.

### 3.2 TII Publications (Technical)

Transport Infrastructure Ireland. AM-STY-06046 Road Safety Inspections - Inspection Team Qualifications. TII Publications.

Transport Infrastructure Ireland. PE-PMG-02041 Project Management Guidelines. TII Publications.

### 3.3 Other Publications

Institution of Highways and Transportation. Guidelines for the Safety Audit of Highways. IHT, London, 1996. European Parliament and the Council of the European Union, 2008.

DIRECTIVE (EU) 2019/1936 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2019 amending Directive 2008/96/EC on Road Infrastructure Safety Management

Crash Modification Factors (CMF) Clearinghouse. Federal Highway Administration. Available online at: [www.cmfclearinghouse.org](http://www.cmfclearinghouse.org)

KW. Ogden, Department of Civil Engineering, Monash University, a report prepared for the Federal Office of Road Safety, "Traffic Engineering Road Safety: A Practitioner's Guide", Australia, 1994

PIARC, The World Road Association, "Road Safety Manual", France, 2003.

CEDR (Conference of European Directors of Roads), "Existing Treatment for the Design of Forgiving Roadsides. State of the Art Report", France, 2011.

University of Catania, European Union, Province of Catania, "Operative Procedures for Safety Inspections on Two-Lane Rural Roads", Italy, 2005.

Service d'études sur les transports, les routes et leurs aménagements, "Road Safety Inspections – Methodological Guide", France 2008.

Transfund New Zealand, "Safety Audit Procedures for Existing Roads", New Zealand, 1998.

Norwegian Public Roads Administration, "Road Safety Audits and Inspections", Norway, 2006.



PIARC, The World Road Association, "Road Safety Inspection Guideline for Safety Check of Existing Roads", 2007.

## **Appendix A:**

### Sample Road Safety Inspection Report

The text in italics is sample text, guidance notes or text requiring a response.

## Executive Summary

*Brief description of the;*

- i) Route, (Number, length)*
- ii) Dates (Appointment, site visits, draft report, final report)*
- iii) Number of issues identified*
- iv) Route wide issues*

## Introduction

### 1.0 Report

This report has been prepared in respect of the Road Safety Inspection (RSI) of the *[Insert route number including Section ID start and Section ID end]*. The RSI has been carried out by *[Insert entity]*.

The Inspection Team consisted of *[Insert names of Team Leader, Team Member(s) & Team Trainee Observers]*.

The RSI has taken place between *[insert date of appointment, include milestone dates for site visits, dates of meetings with stakeholders and each draft of this report]* and *[date of issue of final report]*

### Description of the Route

The *[insert route number]* extends from *[insert town, junction no. with other motorway and county or suitable starting point description]* to *[insert town, junction no. with other motorway and county or suitable end-point description]*

The route is *[Insert details of the route, length, urban/rural, 2 lane 3 lane mainline, number of interchanges, type of interchange/junctions, tolls, PPP /MMaRC Operator etc.]*.

#### Figure 1 Route Location Map

*[Min 0.5 A4 page with background mapping with route clearly highlighted]*

## Scope of the RSI

The scope of work required for the Road Safety Inspection was as follows;

- i. Review of data supplied by TII and Road Operators (*list data made available*)
- ii. Meetings with stakeholders for motorway inspections (MMaRC/PPP/Other RSI teams, toll/tunnel operators etc)
- iii. Carry out the site visits taking video and photographs with suitable approved equipment (*describe equipment used*).
- iv. Team Meeting to agree safety issues to be recorded
- v. Upload the video and photo footage using approved software (*describe equipment used*).
- vi. For each issue identified assign and describe the following;
  - Unique Tag Identification number, some tags have linear information.
  - Associated TII Site ID and Tag ID based on the section (usually 1km) of the network that the issue is located
  - Whether the issue occurs on the mainline, side road, ramp, junction, or overbridge.
  - Latitude and Longitude of the issue location
  - A broad summary of the safety issue
  - A detailed description of the safety issue
  - The primary collision type
  - The severity of the primary collision taking location on mainline junction/sideroad into account.
  - The likelihood of the primary collision taking location on mainline or junction/sideroad into account.
  - The risk rating of the collision
  - A broad solution to eliminate or mitigate the safety issue
  - A description (including a sketch if the solution cannot be easily described in text) of an initial feasibility solution to eliminate or mitigate the safety issue.
  - The Application of a Collision Modification Factor (CMF) appropriate to the proposed solution/countermeasure.
- vii. Produce a list of the issues in excel or similar format.
- viii. Produce an overall route wide PDF report.

## 2.0 Methodology

### Data Gathering

- i. Video survey undertaken [insert dates and equipment used]
- ii. Videos were uploaded to [insert location and names of videos]
- iii. [Note: The following Channel naming convention should be used];

Higher Level Channels: **RSI P3 – MXX – 20XX**

General Channels/Sub Channels: **RSI P3 – MXX - Direction X – Mainline– 20XX**

**RSI P3 – MXX - Direction X – Mainline Lane Y – 20XX**

**RSI P3 – MXX - Direction X – Side Roads – 20XX**

**RSI P3 – MXX -- Overbridges – 20XX**

Direction X can be either 1 or 2. Direction 1 is driving as the number on the marker plates on the motorway increase. Direction 2 is driving as the number on the marker plates on the motorway decrease.

'Mainline Lane Y' channels are only to be used on 3 lane motorways and lanes can be 1, 2 or 3 (lane 1 is adjacent to the hard shoulder and lane 3 is adjacent to the central median)

The text "Final Tags" is added into the description of all channels that contain the final tags to allow for TII to easily identify final tagged channel(s) for each route.

- i. [Add steps taken including any changes from the scope outlined above]

### Summary of Quantity of Issues Identified

The number of issues identified in the RSI was [insert total]. Of that number;

- [Insert number] of issues [insert %] relate to the mainline,
- [Insert number] of issues [insert %] relate to the side roads/junctions,
- [Insert number] of issues [insert %] relate to the ramps,
- [Insert number] of issues [insert %] relate to overbridges.

### Route Wide Items

A number of issues occur throughout the route that are a safety concern and have been addressed separately as part of the RSI process. These issues will be highlighted to the relevant sections of TII to be addressed when larger schemes or large-scale retrofitting is being undertaken.

These route wide issues include but are not limited to;

- i. [Example: Median Hedging adjacent to safety barriers]

- ii. [Example: Long lengths of open channel within the Clear Zone]

Linear attributes are to be associated with such tags and all route wide issues are recorded in Appendix A.

## 3.0 Prioritisation of Tagged Items

### Methodology

Each tagged item and its associated proposed solution will be assigned a Risk Rating (RR). These risk ratings are used as a prioritisation guide for local authorities.

### Risk Rating

The risk rating is the product of the likelihood and severity (consequence) of a collision due to the tagged item identified. Default values have been provided by TII. The risk rating (RR) for each issue can be amended by the Inspection Team where they felt that the default rating did not accurately reflect the issue identified.

## 4.0 Collision Modification Factor

Once the potential solutions were identified, a Collision Modification Factor (CMF) is applied to each tagged item. The description and CMF value are recorded.

CMF is the ratio of the expected collision frequency after a solution is implemented to the estimated collision frequency beforehand;

e.g. if a particular solution is expected to reduce the number of collisions by 23% the CMF will be;

$$1 - (23/100) = 0.77.$$

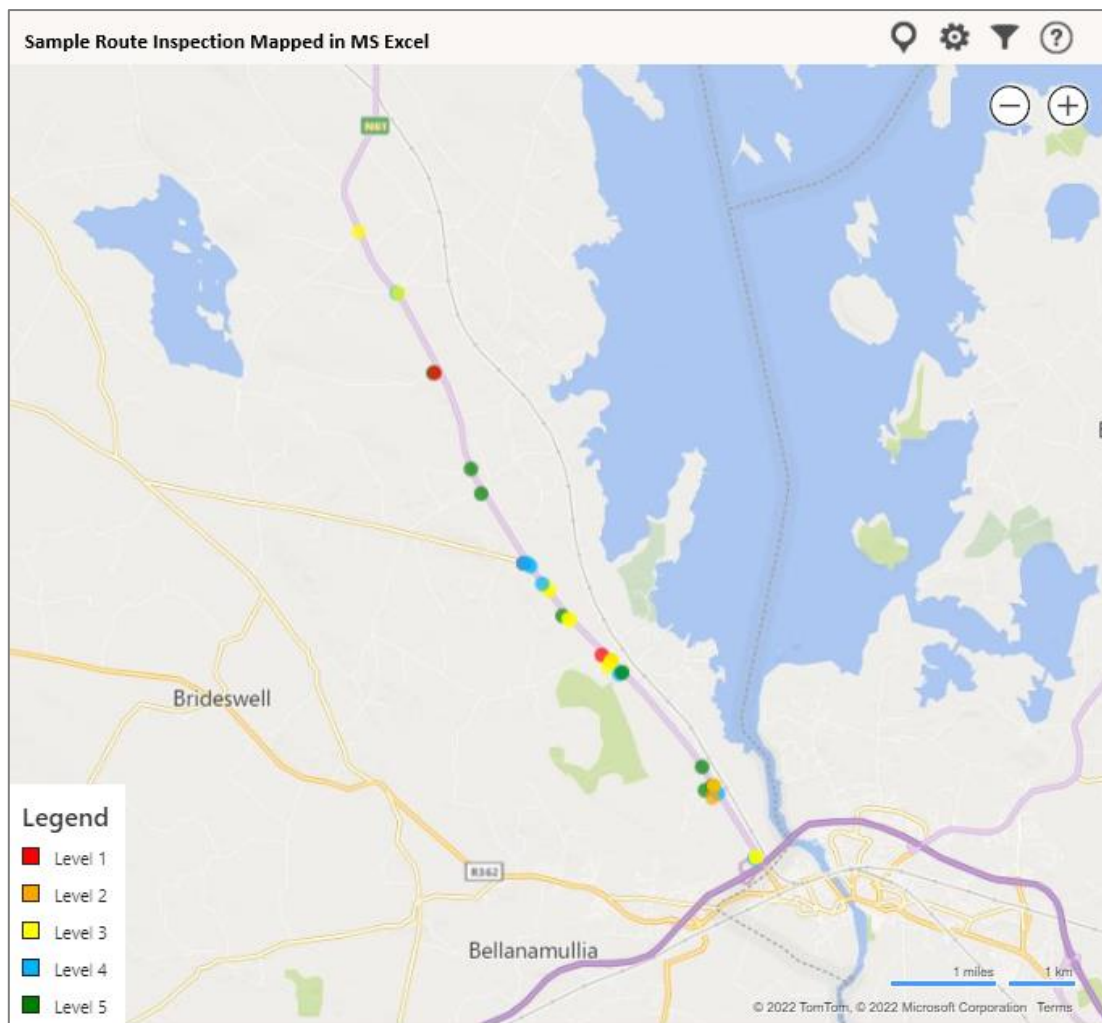
A CMF of 1 would mean that there is an anticipation of no changes in the collision frequency and a CMF of 0 would mean an anticipation that the collision would no longer occur after the solution is implemented.

CMFs based on various solutions can be found through CMF Clearing House and the PRACT online repository.

## 5.0 Summary of Review

### Location and Risk Rating

Figure 2 shows the location of each of the issues raised. The locations are colour coded based on their ranking by Risk. This example was created using Bing maps in Microsoft Excel. Any similar graph or map that includes items plot by Lat/Long and colour coded by risk can be used.



**Figure 2 Tag Location by Risk Rating**

*[Note: Issues plotted by Long/Lat and colour coded based on Risk Rating of Level 1, Level 2, Level 3, Level 4 or Level 5 may need to be over a number of A4 pages for longer routes with continuity lines to be easily read.]*

## Categories of Solutions

The tables below show the count of items by broad solution for each of the unresolved design issues.

### Entire Route

Feasibility Stage - Broad Solution	% of Items
Drainage	<i>[insert percent]</i>
Safety Barrier	<i>[insert percent]</i>
Illumination	<i>[insert percent]</i>
Delineation	<i>[insert percent]</i>
Signage	<i>[insert percent]</i>
Third Party Signage	<i>[insert percent]</i>
Surface / Pavement	<i>[insert percent]</i>
VRU Provision	<i>[insert percent]</i>
Alignment	<i>[insert percent]</i>
Informal Parking / Rest Areas	<i>[insert percent]</i>
Roadside Hazard Review	<i>[insert percent]</i>
<b>Additional Items</b>	<i>[insert percent]</i>
<b>TOTAL</b>	<i>[insert percent]</i>



## **Appendix A1**

Summary spreadsheet of all issues.

## **Appendix A2**

Sketches of proposed solutions where applicable.

## **Appendix A3**

Summary sheet of each issue.

## **Appendix A4**

List of Maintenance type issues.

*[These are not to be recorded by the RSI Process as they are being identified by separate departments within TII]*

**Appendix A1**

To be produced on an overall route level and on a county-by-county level.

TAG ID	ITEM CHAINAGE	ROUTE	LATITUDE	LONGITUDE	TII SITE ID	LOCATION	ELEMENT	SURVEY DATE	LINK URL	ITEM_1	ITEM_2	DESCRIPTION	PROBLEM	COLLISION TYPE	SEVERITY (SYSTEM)	LIKELIHOOD (SYSTEM)	RISK (SYSTEM)	SEVERITY (USER)	LIKELIHOOD (USER)	RISK (USER)	BROAD SOLUTION	INITIAL FEASIBILITY SOLUTION	INTERNAL OR EXTERNAL	UPLOAD TAG ATTACHMENTS	CMF DESCRIPTION	CMF VALUE
	[Table to be sorted in order of increasing chainage]																									

[Note: MS Excel (or similar) versions of this table to be provided along with each Route Inspection Report]

[Note: A template is available on SharePoint and all tabs in the Appendix A1 (A1\_General and A1\_Routewide) are to be completed]

## **Appendix A2**

*[Note: A4 sketch per issue as required, to include Tag and SITE ID references, to include north point. Background mapping subject to licence]*

## **Appendix A3**

*[Note sample sheet given below, it may be used for consistency by each Review Team but is not necessary once the information listed below is contained within each sheet]*

*[Note: A4 sheet for each unresolved issue, to include;*

*Route*

*Tag ID*

*TII Site ID*

*RSI date*

*Screenshot of issue and location map showing tag suitable scale for others to identify location]*

*Latitude/Longitude*

*Mainline/Sideroad/Ramp/Junction*

*Severity, Likelihood, Risk*

*Problem category*

*Issue*

*Broad solution*

*Initial Feasibility Solution*

*Sketch reference*

*Link to video/GPS on a single line.]*

[Header; Company Logo and TII Logo]

TII, RSI NXX

**Route:** [Insert Route No.]

**TII Site ID:** [Insert TII Site ID]

**Tag ID:** [Insert Tag ID]

*Insert screen grab from video or  
photograph of issue*

**Mainline or Side Road:** X

**Lat/Long:** [Insert latitude/longitude ITM]

**Link to Video/GPS:**  
[Insert link as a single line]

**RSI Date:** [Insert Date]

**Problem Category XX** [Items to be broken into categories]

**Problem Description:**  
[Insert problem description]

**Severity:** X **Likelihood:** X **Risk Rating:** X

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**Broad Solution:** [Insert category]

**Feasibility Stage Solution:** [Insert recommendation]

**Sketch Reference:** [Insert Where applicable]

## **Appendix A4**

List of maintenance issues or issues being resolved by others. These are not to be recorded by the RSI Process as they are being identified by separate departments within TII.

[Note: These Tables may be expanded upon and updated in a shared platform on a regular basis]

**Table Routine Maintenance Issues**

<b>Ref</b>	<b>Routine Maintenance Issue</b>	<b>Explanation</b>
1	Vegetation	<i>The routine maintenance issue includes growth between maintenance cycles. If vegetation needs to be cut back to a greater extent, this should be raised as an issue</i>
2	Faded Road Markings	<i>Faded markings will be renewed as part of a maintenance contract for TII/Other Roads Authority/Operator on a more regular basis that RSI is carried out.</i>
3	Low skid resistance of pavement surfacing	<i>Pavement surfaces are inspected and any skid resistance issues will be identified as on an annual basis as part of a separate contract</i>
4	Faded signage	<i>Faded signs will be renewed as part of a maintenance contract for TII/Other Roads Authority/Operator on a more regular basis that RSI is carried out.</i>
5	Twisted signs	<i>Twisted signs will be renewed as part of a maintenance contract for TII/Other Roads Authority/Operator on a more regular basis that RSI is carried out.</i>
6	Falling signs	<i>Falling signs will be renewed as part of a maintenance contract for TII/Other Roads Authority/Operator on a more regular basis that RSI is carried out.</i>
7	Repairs or upgrades to safety barriers & bridge parapets.	<i>Safety barrier repair and upgrade works are being carried out by the Network Operations Department within TII. This includes upgrades to barrier terminals and transitions to parapets. The length of need or need for new barriers is not included and should be identified during the RSI process. The RSI process should also identify areas where safety barriers may no longer be required and may be unnecessary hazards.</i>
8	Public lighting lamps not working	<i>Public lighting lamps not working will be renewed as part of a maintenance contract for TII/Other Roads Authority/Operator on a more regular basis that RSI is carried out. New or extended lengths of lighting should be identified in the RSI process.</i>
9	Traffic signal heads not functioning	<i>Traffic signal heads not working will be renewed as part of a maintenance contract for TII/Other Roads Authority/Operator on a more regular basis that RSI is carried out. New traffic signals installations or revised layouts/ phasing/ staging should be identified in the RSI process.</i>
10	Sweeping	<i>The sweeping of loose material on the pavement surface will be undertaken by road authorities/operators and need not be raised as part of the RSI process.</i>
11	Drainage- Ponding	<i>Ponding items are to be classified as design or maintenance dependent on site specific cases. It is up to the individual inspection team to determine what type each ponding occurrence is.</i>

Ref	Routine Maintenance Issue	Explanation
		<p><i>Example</i></p> <p><i>If the ponding is at the edge of the carriageway is because a water cut/grip has not been cleaned out, then that is classified as maintenance as it will most likely be rectified by the area engineer during the annual programme but if the pond is in the middle of the carriageway due to a flat spot in the alignment then it is a design issue.</i></p> <p><i>Ponding in the middle of the carriageway due to pavement failure/ subsidence would be maintenance issue will be picked up by TII pavements section.</i></p>
12	<i>Drainage – Gully cleaning</i>	<i>Collected by Area Engineers / MMarC Contractor (Using the GeoApp)</i>
13	<i>Damage to Footpaths/Cycletracks</i>	<i>Collected by Area Engineers / MMarC Contractor (Using the GeoApp)</i>
14	<i>Pavement (potholes, cracking. Edge breakup, wheel rutting, Ironworks repairs)</i>	<i>Collected by Area Engineers / MMarC Contractor (Using the GeoApp)</i>
15	<i>Missing or damaged JDPs</i>	<i>Collected by Area Engineers / MMarC Contractor (Using the GeoApp)</i>

## **Appendix B:** Road Safety Checklist

The list of common changes to roads that need to be considered in periodic road safety inspections is:

- a) Improved road design and road safety standards;
- b) New products and technology which improve road safety;
- c) Layout changes arising from improvement works, such as road realignment, the occurrence of cut-off roads arising from improvement works, or junction improvement;
- d) Layout changes arising from works consented to in planning, such as additional roadside accesses;

The following is a non-exhaustive list of the general items that will need inspection by the team, both on video and on site:

- a) Roadside /verge area
  - i) Clear zones;
  - ii) Ditch profiles;
  - iii) Manholes;
  - iv) Poles and pylons;
  - v) Emergency phones (location, protection, exposure of users to passing traffic);
  - vi) Weather stations/IT equipment/traffic counter equipment;
  - vii) Trees;
  - viii) Walls and noise barriers;
  - ix) Non passively safe fences – e.g., post and rail fencing inside the clear zone;
  - x) Guardrails – both unnecessary and missing guardrail;
  - xi) Facilities for vulnerable road users.
- b) Roadway
  - i) Passing – passing opportunities and visibility;
  - ii) Stopping sight distance, hidden dips;
  - iii) Road curvature and super-elevation;
  - iv) Signing –superfluous and missing signs;
  - v) Inappropriate Markings;
  - vi) Illumination;
  - vii) Facilities for vulnerable road users;
  - viii) Road pavement
- c) Junctions and accesses
  - i) Visibility provision at junctions and accesses;
  - ii) Junctions – location, design;
  - iii) Signing – directional, warning and regulatory signage, clutter;
  - iv) Markings;



- v) Pedestrian crossings – location, design, visibility.
- vi) Facilities for vulnerable road users
- d) Bridges
  - i) Alignment of bridge approach;
  - ii) Visibility at crest;
  - iii) Visibility at intersections beside bridges (ramps of diamond junctions);
  - iv) Bridge parapet – height, transition to road guardrail, length of need, visibility obstruction;
  - v) Provision for pedestrian and bicycle traffic.
- e) Other Risks
  - i) Evidence of informal parking
  - ii) Evidence of drop-offs / pick-ups

## **Appendix C:** Road Safety Factors

The following list has been gathered from various sources and it represents the principal factors encountered by professionals involved in road safety assessment. It may be of use to inspectors to refresh their thoughts in advance of inspections.

## Two-way Roads

- a) Overall legibility of the road
  - i) non-appropriateness of the road layout;
  - ii) consistency of road type;
  - iii) discontinuity in the layout.
- b) Bends
  - i) Geometry
    - presence of an isolated bend with a small radius or a bend after a straight section (radius less than about 150 m);
    - presence of a bend with a moderate radius (less than about 250m) after either a larger radius or with low side friction;
    - unprotected hazards on outside of isolated bends.
  - ii) Legibility
    - presence of a bend with poor legibility; users do not clearly see the bend;
    - inconsistent bend signage.
  - iii) Visibility
    - presence of a bend hidden by a crest, leading to insufficient visibility of the bend.
  - iv) Roadside
    - Possibility of avoidance and recovery:
    - presence of grass or hard verge;
    - presence of loose gravel;
    - presence and depth of vee drain and distance from carriageway edge;
    - presence of a height difference between the road and the verge (edge drop-off).
  - v) Limitation of the severity of collisions
    - presence of obstacles in the safety zone: trees, posts, headwalls, masonry items, large sign supports, heavy guardrails, lighting columns;
    - presence of an abrupt change in level;
    - superfluous or improperly fixed restraint systems: unnecessary items, improper terminals, insufficient heights, insufficient lengths.
- c) Junctions and access roads
  - i) Type of junction
    - type of junction inconsistent with traffic flows;

- proliferation of junctions.
- ii) Reciprocal visibility
  - For drivers crossing the mainline or turning right at junctions with heavy intersecting traffic:
  - presence of hidden markings on the horizontal alignment or the longitudinal profile;
  - presence of occasional masking due to signing or vegetation;
  - excessive width of a secondary road that encourages users to form two queues on approach.
- iii) Legibility
  - For users of a secondary road:
  - poor legibility of the presence of a junction, its priority or the driving lines to be followed.
- iv) Accesses
  - presence of numerous accesses;
  - presence of numerous gate posts within the clear zone.
- d) Cross-section
  - iii. Three-lane sections (including climbing lanes)
    - absence of lane for turning right at junctions;
    - Accesses or junctions on climbing lanes.
  - iv. Overtaking zone
    - absence of a merging area at the end of an overtaking zone;
    - presence of a conflict point upstream: junction, urban crossing without anything to encourage users to slow down;
    - long overtaking zone that encourages users to get accustomed to driving at speed.
  - v. Carriageway width
    - poor distribution of carriageway width and shoulder width, carriageway overly wide or too narrow.
  - vi. Vulnerable users
    - absence of or discontinuity in pedestrian and cycle paths;
    - presence of a zone of conflict between different types of users;
  - vii. Signage
    - discontinuity, lack of homogeneity, inconsistency, lack of legibility and visibility;
    - speed limit inappropriate for location and users.

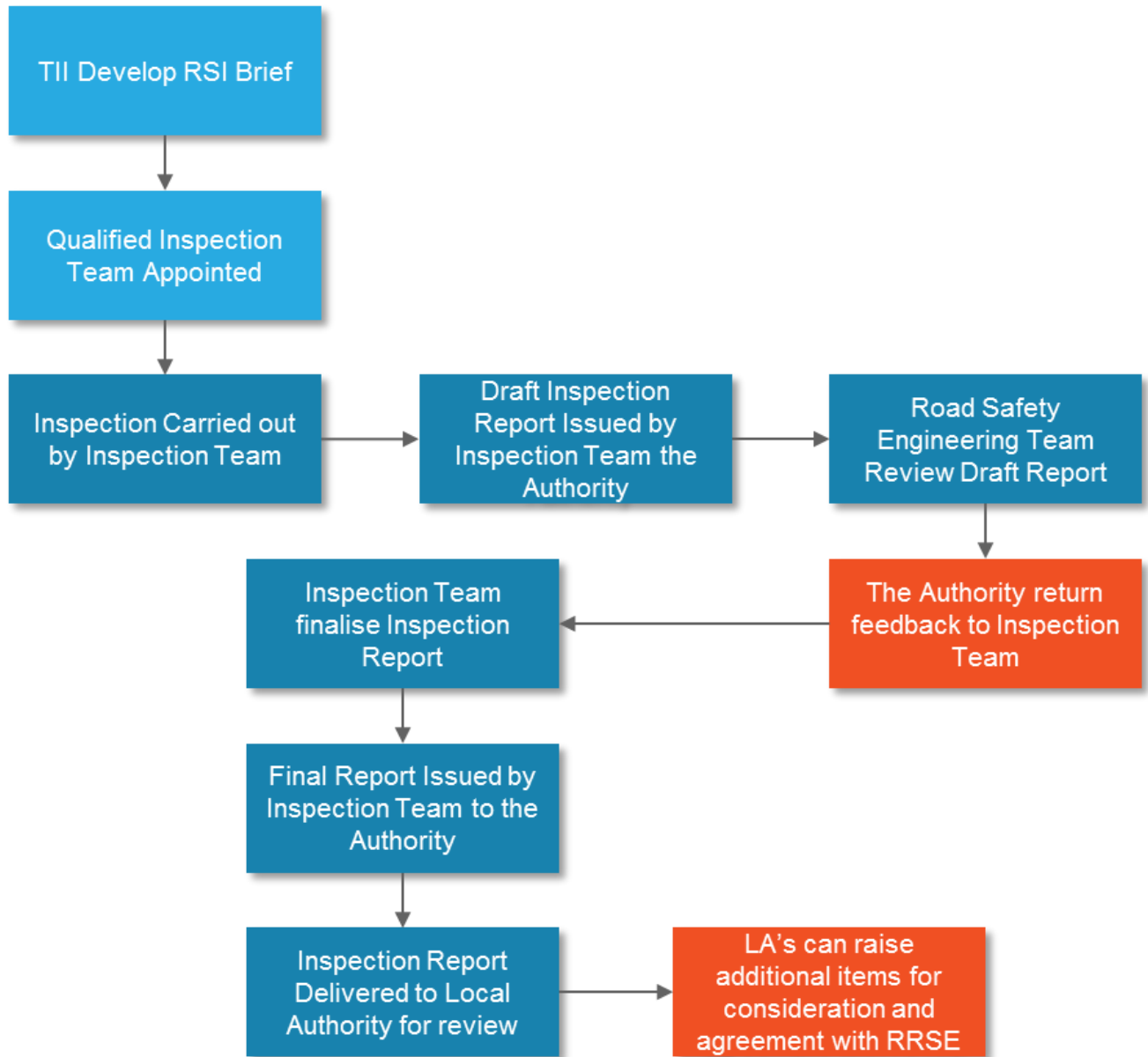
## Divided Roads

- a) Overall legibility of road
  - i) unsuitability of road layout;

- ii) consistency of road type;
- iii) termination and transition from divided road to single carriageway
- b) The roadside
  - i) Possibilities of avoidance and recovery, and emergency stops
    - absence or insufficient width of the hard shoulder;
    - absence of median strip.
  - ii) Limitation of severity of crashes
    - absence of restraint system on the central median on motorways;
    - presence of obstacles in the clear zone: trees, posts, non-chamfered pipe heads, masonry, overly large sign supports, overly large guardrails, lighting columns;
    - superfluous or improperly fixed restraint systems: unnecessary items, insufficient heights, insufficient lengths;
    - presence of items within the working width of the barrier;
    - absence of restraint systems for trucks at a sensitive installation (railway, road, river etc.) or on a structure for crossing a route (road, railway, river).
- c) Junctions and access roads
  - i) Type of junction
    - geometry accommodating entry in the wrong direction;
    - presence of non-isolated fixed obstacles inside a wider section of road or on the central island of a roundabout: trees, posts, headwalls, masonry, overly large sign supports, overly large guardrails, lighting columns.
  - ii) Legibility and visibility
    - poor visibility or legibility at interchange entries or exits;
    - gap in the median on dual sections.
  - iii) Roundabouts
    - Clarity of lane destination on all approaches for exits
- d) Vulnerable Road Users
- e) Consider facilities at junctions and transition terminations and continuity;
- f) Obvious lack of maintenance of active travel facilities;
- g) Evidence of non-motorised user use with no facilities.
- h) Discontinuity of cross-section
  - i) poor change from a dual-carriageway cross-section to a single-carriageway cross-section.
- i) Vertical and horizontal signing
  - lack of consistency, legibility, visibility;

## **Appendix D:**


### Road Safety Inspection Flow Chart









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