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Transport Infrastructure Ireland

TII Publications



Network Safety Analysis

GE-STY-01022
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**Updates to TII Publications resulting in changes to
Network Safety Analysis GE-STY-01022**

Date: December 2017

Amendment Details:

This Standard supersedes GE-STY-01022 dated December 2014. The principle changes from the previous standard are:

- a) The title of the Standard has been changed from Network Safety Ranking to Network Safety Analysis.
- b) GE-STY-01023 - NRA HD 15 Network Safety Ranking - Site Assessment Qualifications has been withdrawn.
- c) A new Standard GE-STY-01036 Network Safety Analysis Procedures has been introduced to help explain the processes used to implement Network Safety Analysis on the national road network.
- d) The wording in Section 1 Introduction has been standardised in line with the other TII road safety Standards.
- e) Unnecessary definitions have been removed.
- f) Section 3 Identification of High Collision Locations has been condensed with further details now included in GE-STY-01036 Network Safety Analysis Procedures.

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1. Introduction

1.1 General

This Standard outlines the requirements for Network Safety Analysis in the management of road safety on the Irish national road infrastructure. It describes the roles and responsibilities of those engaged in the management of road safety and it outlines the procedures to be followed to address the requirements for Network Safety Ranking of the EU Directive 2008/96/EC on Road Infrastructure Safety Management (RISM) and its transposition into Irish Law under SI 472 of 2011.

The objective of this Standard is to identify sections of routes or specific locations on the national road network which have a high concentration of collisions. This process feeds into additional work carried out by the TII Road and Tunnel Safety section to identify issues at a macro level on the Network. Further information on this is outlined in GE-STY-01036 Network Safety Analysis Procedures.

1.2 Scope

This Standard applies to all national roads to ensure compliance with the EU RISM Directive in respect of analysing the safety of the national road network. This standard sets out the required procedures for this task.

1.3 Definitions

High Collision Location (HCL):

A site on the national road network which exceeds two thresholds. The first based on collision frequency and a second based on a collision rate.

Network Safety Analysis:

Means of classifying parts of the existing road network according to their potential for safety development and accident cost savings. (EU RISM Directive).

Review Team:

A site review is undertaken by a competent team under the direction of the TII Road and Tunnel Safety section.

Authority:

For national roads the Authority is Transport Infrastructure Ireland (TII).

Accident / Collision:

A road collision is a rare, random, multi-factor event preceded by a situation in which one or more road users have failed to cope with their environment (DoE, 1996).

Road collisions that have occurred on a public road, that have been reported to and recorded by the Gardaí, are classified as fatal, serious, minor injury or material damage according to the most severe injury sustained in the collision.

In the context of this document, the analysis of road collisions by TII is based only upon collisions that have occurred on a public road and have been reported to and recorded by the Gardaí.

Fatal Collision:

Where at least one person is killed as a result of the collision and death occurs within 30 days. (Road Safety Authority, 2012)

Serious Injury Collision:

Where there are no deaths, but a person or persons are seriously injured. The definition of “serious injury” is an injury for which the person is detained in hospital as an ‘in-patient’, or any of the following injuries whether or not detained in hospital: fractures, concussion, internal injuries, crushing, severe cuts and lacerations, severe general shock requiring medical treatment. (Road Safety Authority, 2012)

Minor Injury Collision:

An injury of a minor character such as a sprain or bruise. (Road Safety Authority, 2012)

Material Damage Collision:

Where there are no deaths or injuries but damage is caused to a vehicle or property. (Road Safety Authority, 2012)

Network:

The Network refers to all national roads as prescribed in the Schedule of National Roads. (Roads Act 1993, Order 2012, as amended)

Reference Populations (RP):

Reference Populations are sub sets of the Network which have similar features and, as such are expected to have a similar safety performance (PIARC, 2003).

Collision Frequency (C_i):

The total number of collisions which occur along a section of the Network.

Collision Rates (R_{rp}) & (R_j):

A Collision Rate is the ratio between the frequency of collisions over a length of road and an exposure measure, typically in the form of vehicle kilometres of travel over the same section. The Average Collision Rate (R_{rp}) is the collision rate for a Reference Population, while the Site Collision Rate (R_j) is the collision rate for a specific site on the Network.

The EU RISM Directive requires the identification of High Collision Locations to be based on fatal accidents numbers. The calculation of the Collision Rate on the national road network is calculated based on all fatal, serious and minor injury collisions. As the density of fatal collisions that occur on the national road network is low, TII supplements the Network Safety Ranking Analysis process with all injury collision data in order to establish more robust collision rates.

The vehicle kilometres of travel used when calculating the Collision Rate is usually the middle year of the assessment.

Base Analysis Period

Means the benchmark Network Safety Analysis period at which current high collision locations are compared against. This analysis is usually conducted less than ten years previously.

2. Identification of High Collision Locations

2.1 Roads to be Reviewed

Analysis of High Collision Locations shall apply to all national roads except as noted in Section 2.2.

2.2 Exemption

To complete a review of the collisions on the national road network, it is necessary to have a sufficient number of years of historic collision data. Therefore, sections of the Network may be exempt from the Network Safety Analysis process within this Standard if the section of the Network has been opened within the last three years.

2.3 Scope of Analysis of High Collision Locations

The primary purpose of analysing High Collision Locations (HCL) is to identify sections of the Network which have a high collision frequency and high collision rate within their respective reference population.

The initial desktop study of identifying HCL's is based on a spatial analysis of all reported injury collision data, exposure data typically in the form of vehicle kilometres travelled, and road lengths. Subsequently, collision rates can be calculated with these data inputs. A more detailed explanation of the process involved in calculating HCL's is provided in GE-STY-01036 Network Safety Analysis Procedures.

2.4 Review Periods

The Authority is responsible for initiating the review of the national road network and for ensuring that the Network Safety Analysis review is repeated at the appropriate time interval. The process is typically conducted on an annual basis.

3. Review of High Collision Locations

3.1 Site Review

Following the identification of sites, each HCL is then reviewed by a suitably qualified review team to ensure that all data used in identifying the location during the initial desktop review is correct. The review itself includes an examination of the collisions that were used to establish the site as a HCL. Typically these collisions are assessed to help establish if any particular collision pattern is present. These patterns may help establish any deficiencies within the road environment that may be counteracted by engineering measures.

When the review has been undertaken, the review team may decide that a site visit is required. The review team document any safety issues and specify any counter measures that may help mitigate the occurrence of future collisions (or at least reduce the severity of any future collisions) at the site. Following completion of the review, reports are compiled by the TII Road and Tunnel Safety section and sent to the relevant local authorities or road operator for further analysis.

This process, and the subsequent steps, are further detailed within the Network Safety Analysis Scheme Development Flowchart contained in GE-STY-01036 Network Safety Analysis Procedures.

3.2 Safety Health and Welfare at Work Act

The Assessment Team complies with current legislation and best practice in relation to safety and health while undertaking the assessment of High Collision Locations.

4. References

4.1 TII Publications (Standards)

Transport Infrastructure Ireland. GE-STY-01036 Network Safety Analysis Procedures. TII Publications.

4.2 Other documents

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