User and interpretation guide

MegaMaps Road to Zero Edition 2

WAKA KOTAHI
NZ TRANSPORT
AGENCY

New Zealand Government

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More information

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This document is available on Waka Kotahi NZ Transport Agency's website at www.nzta.govt.nz

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Getting Started

MegaMaps: Road to Zero Edition 2 is a Waka Kotahi managed application that can be accessed through your Waka Kotahi Okta account. The MegaMaps application URL is https://maphub.nzta.govt.nz/megamaps/

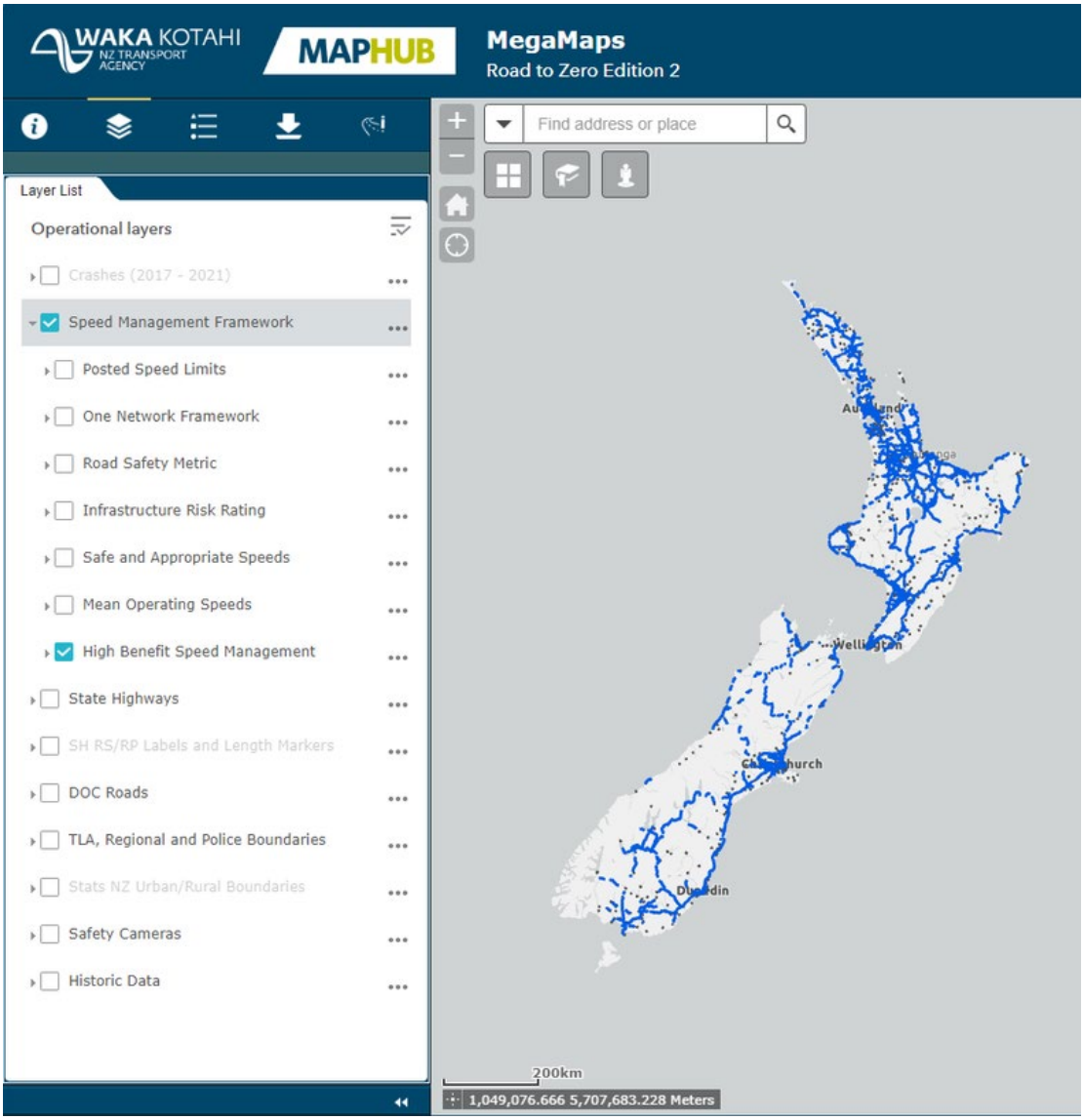
You will be prompted to enter the ArcGIS Online (AGOL) username and password you have been provided.

About

MegaMaps will open to the **About** tab that provides an outline of the changes and enhancements made to MegaMaps since the previous edition.

Layer List

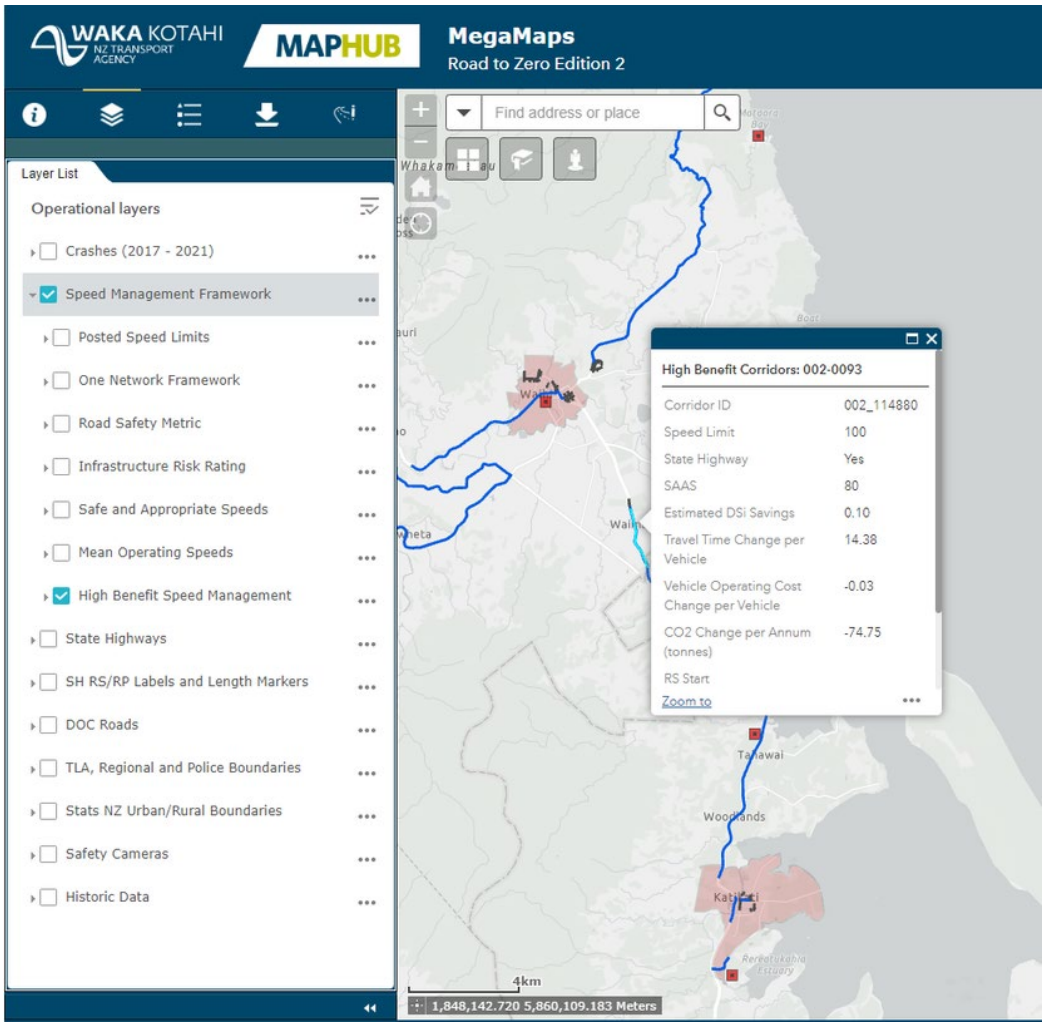
The information layers can be opened be selecting the **Layer List** button.



The **Layer list** will default to show the **Highest Benefit Speed Management** sublayer.

Other layers can be turned on by selecting the layer and sublayer in the layer list. **Note:** If multiple layers are selected, only the top layer in the list will be visible.

Information regarding each of the layers can be accessed by clicking on a map feature. Available information will appear in a popup box.



In the **Layer list**, some layers are only viewable when zoomed in close. If a layer is not visible, try zooming in and waiting for the layer to load. Some of the more complex layers can take a few seconds to load. A rotating circle bottom right of screen indicates that a layer (or layers) is loading.

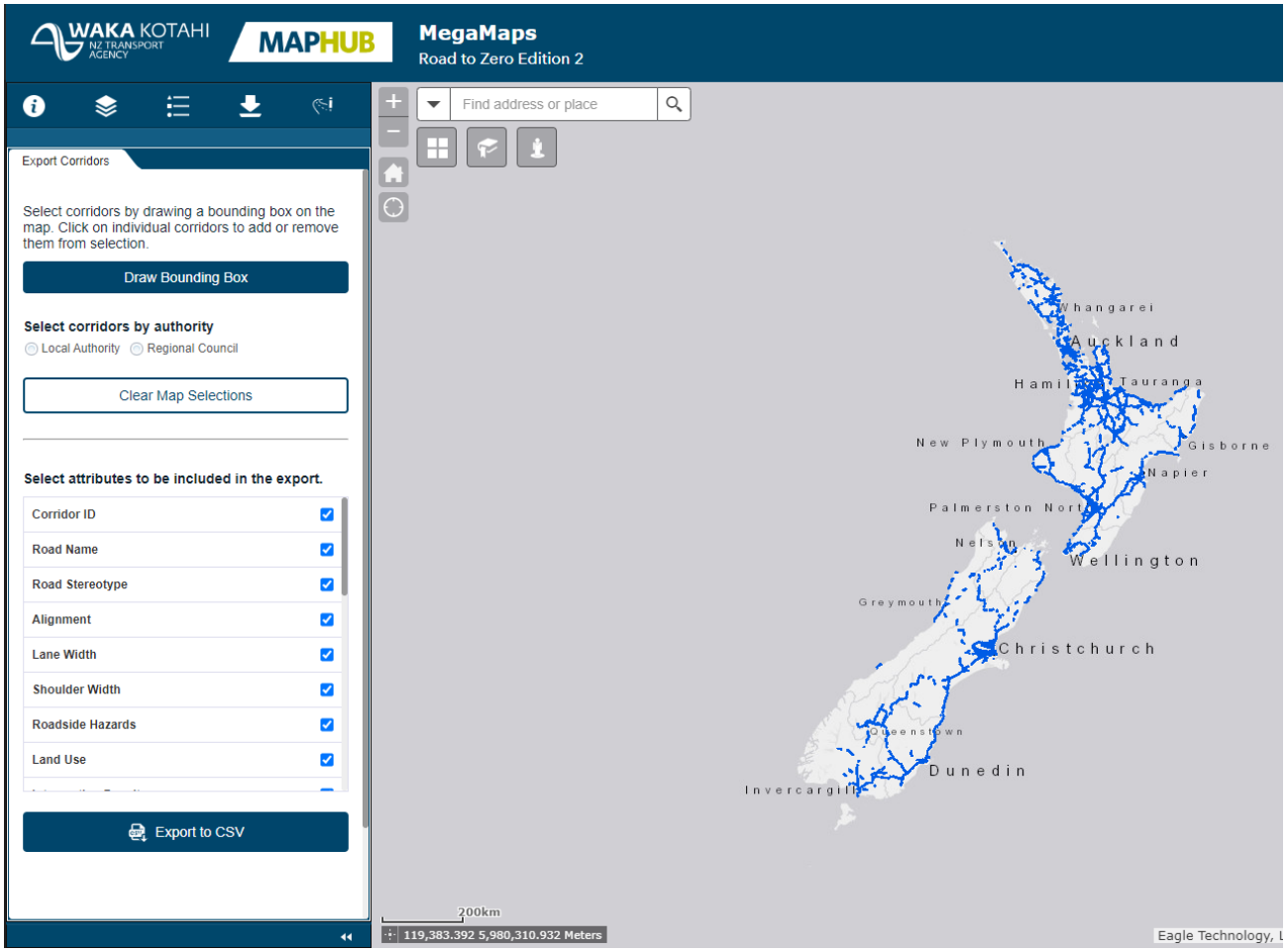
Legend

The map legend can be opened be selecting the **Legend** button, which is to the right of the **Layers** button. The **Legend** will display the key for all selected layers.

Export Corridors

The **Export Corridors** function allows you to export input and output metrics in csv format. Metrics can be extracted for single or multiple roads of interest either by:

- selecting individual roads,
- drawing a bounding box, which will include all roads in a geographical area, or
- selecting by local or regional authority.



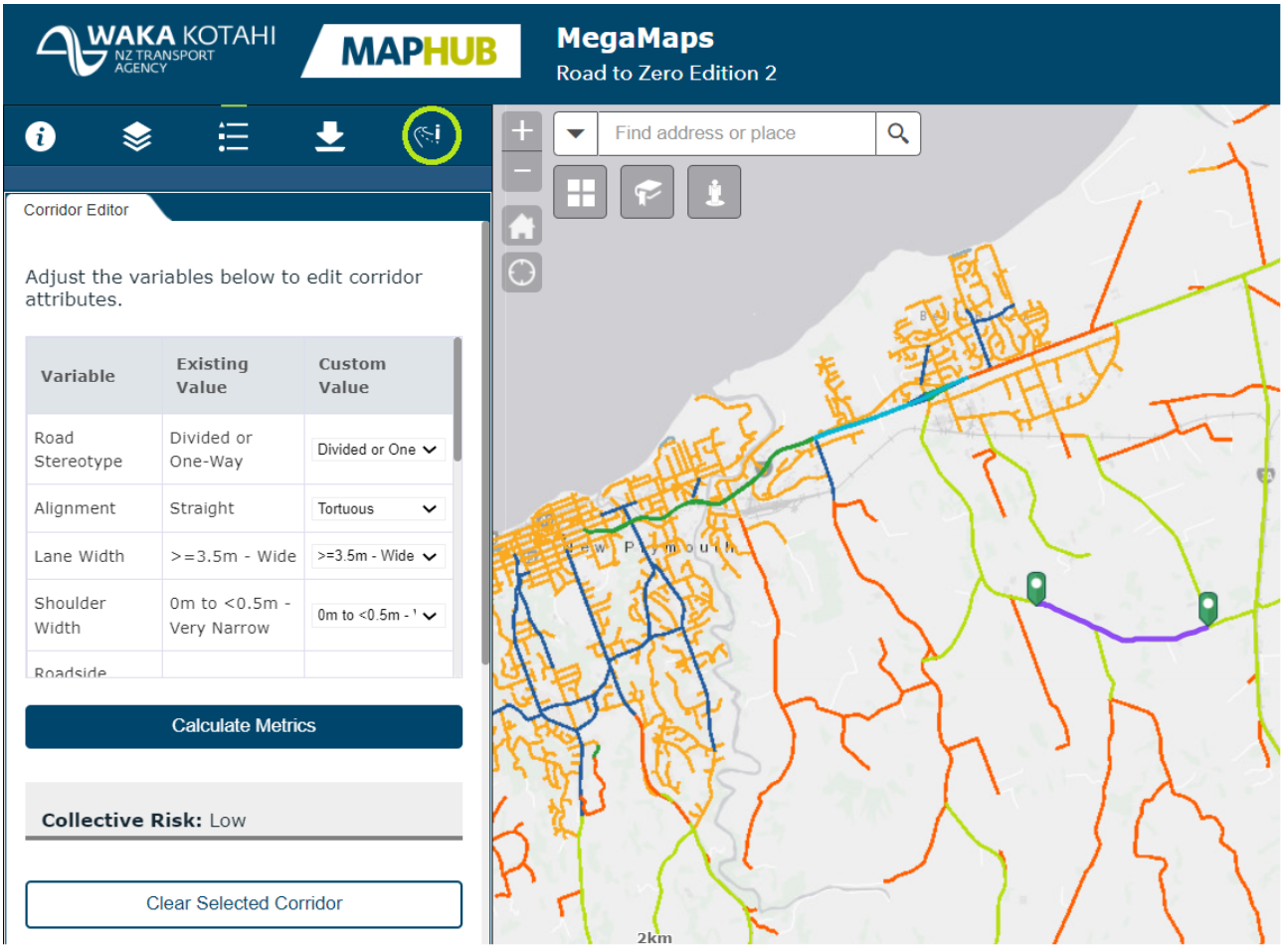
Corridor Editor

The **Corridor Editor** function enables users to review and edit the following variables that are assigned to a corridor:

- All Infrastructure Risk Rating attributes (refer to the Infrastructure Risk Rating (IRR) section on page 15)
- Speed limit
- One Network Framework (ONF) street category (refer to the Speed Management Framework section on page 10 for a description)
- Traffic volume
- Free flow speed.

Edited variables are not saved but are used for the purpose of informing you about the impact of the editing variable on a range of speed management metrics including the Road Safety Metrics, Infrastructure Risk Rating, Safe and Appropriate Speed and Estimated DSi Saved.

The **Corridor Editor** also enables you to modify the length of the corridor by dragging pins at either end of the pre-defined corridor to better reflect the corridor being reviewed.



Navigation

Navigation in the map uses standard zoom (scroll) and pan (click-drag) functionality.

An address bar is provided to help search for an address or locality.

Basemap Gallery, Bookmarks and Street View

MegaMaps includes features that allow you to:

Select the **Basemap** you wish to display

Create **Bookmarks** or Zoom to pre-defined **Bookmarks**

Activate **Street View**.

Resources

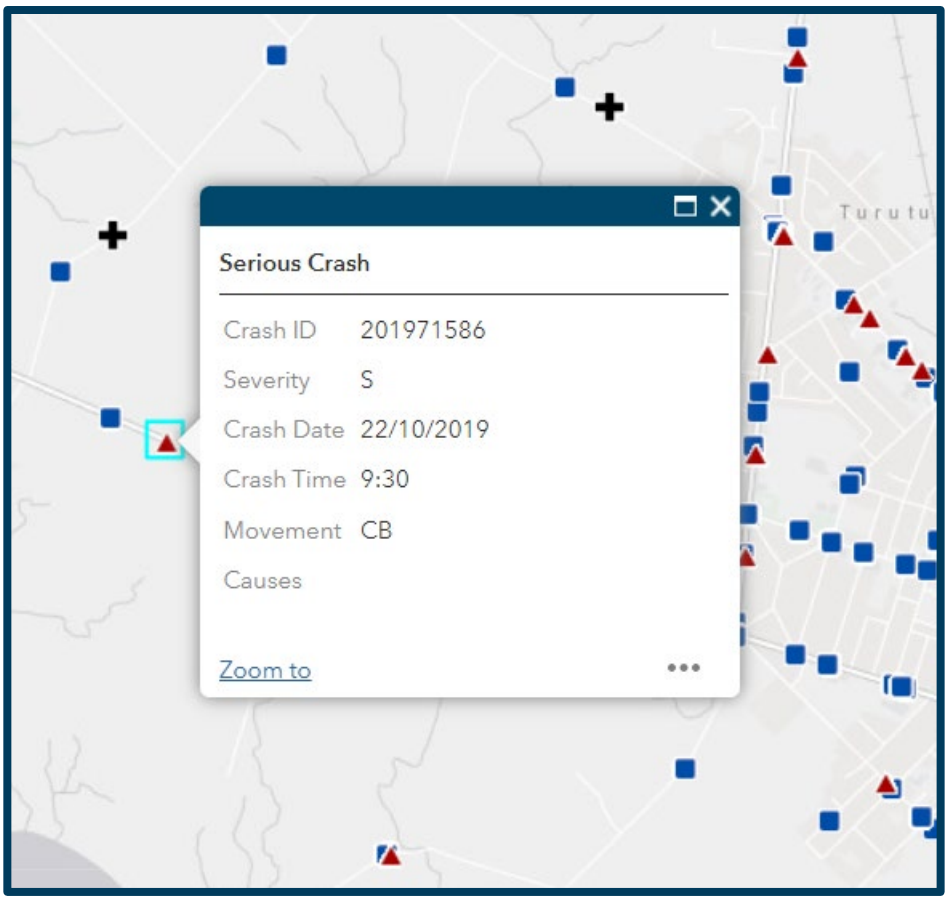
The tool includes links to Waka Kotahi **Speed Management Resources**, the Communities at Risk Register and Training Material, including this user and interpretation guide. The links can be found in the top right corner of the screen.

Layer descriptions

The following provides a description of the information presented in each layer.

Crashes (2017 - 2021)

The **Crashes (2017 – 2021)** layer displays injury crashes for the 2017 - 2021 period inclusive. Symbology denotes the worst injury outcome for each reported injury crash. You can select to display crashes based on injury outcome. A selection of attributes associated with each crash can be viewed in a popup box by left clicking on a crash.



Note: The **Crash** layer is 'greyed out' until you zoom in to a scale where the crashes can be displayed in a legible way.

Speed Management Framework

The Speed Management Framework layer contains critical speed management inputs and outputs.

Posted Speed Limits

Displays permanent and variable speed limits for each road segment (refer to Section 5 FAQ's for how road segments are defined). Posted speed limits are sourced from the National Speed Limit Register (NSLR) which is maintained and operated by Waka Kotahi.

One Network Framework

Displays the One Network Framework (ONF) for each road segment. The ONF is an evolution of the One Network Road Classification (ONRC) and has been designed to take a more human-centric approach to classifying the road and street network. It is part of a national response to ensure delivery of a safe transport

system that protects and prioritises human life and is particularly needed in our urban areas where communities are striving to create great places to live, work and play.

The framework also seeks to bring more distinction to both our urban and rural networks by introducing a stronger multi-modal focus that highlights the strategic importance of each mode in achieving the overall objective of moving people and goods efficiently and effectively.

The evolution of the ONRC to the ONF also recognises the value of integrated land-use and transport planning for creating greater liveability and increased economic prosperity, as well as acknowledging the distinct geographical challenges and diversity of our country's land transport network.

The ONF is specified by each Road Controlling Authority (RCA) and is sourced from a Waka Kotahi centreline dataset that is maintained by CoreLogic.

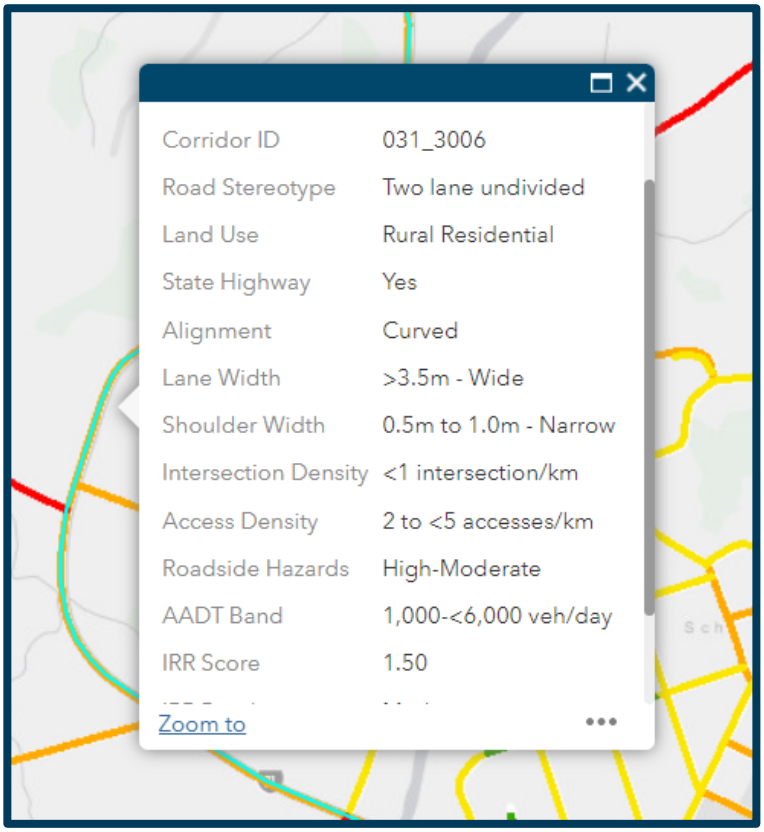
Road Safety Metric

This layer alone does not display any information. To display data, select one of the sublayers. The sublayers are **Collective Risk** and **Personal Risk** for each road segment. Refer to **Section 3.1** for the definition of these metrics and to **Section 5 FAQs** for how road segments are defined.

Infrastructure Risk Rating

Displays the Infrastructure Risk Rating (IRR) for each road segment. The IRR Manual that describes the assessment methodology and presents the risk bands for urban and rural environments can be accessed through the **Speed Management Resources** link in the top right corner of the screen.

The IRR attributes that have been collated from input datasets and derived from geospatial processes are displayed in a popup box.



Each of the nine attributes that comprise the IRR score can also be displayed by selecting an appropriate sublayer.

Safe and Appropriate Speeds

Displays the Safe and Appropriate Speed (SAAS) for a road segment based on the criteria specified in the Speed Management Guide: Road to Zero edition adopting a principles-based approach to determining SAAS with the four core principles being Safety, Community Wellbeing, Movement & Place and System Thinking. It is important when using MegaMaps you understand that the SAAS criteria in the Speed Management Guide: Road to Zero edition is entirely different to the previous edition. That said, analysis indicates there is no change in the SAAS for approximately 70% of network VKT between this version and the previous version of MegaMaps.

The primary determinant of SAAS is the ONF. A safe speed limit or a range of safe speed limits is specified for each ONF. Where a range of safe speed limits is specified, further criteria is stipulated to inform the SAAS. Some of these criteria can be modelled and some cannot, such as the presence of cycling infrastructure. Those factors that cannot be modelled are referred to as **moderating factors** and need to be considered when finalising the SAAS.

Mean Operating Speeds

Displays the average free-flow speed band for each road segment based on TomTom data. Speed bands are in 5 km/h increments. The actual operating speed value is displayed in a popup box.

High Benefit Speed Management

This layer alone does not display any information. To display data, select one of the sublayers:

- Corridors
- Schools
- Areas (incl Marae)

High benefit corridors are identified from the estimated DSi savings derived using Nilsson's Power Model. The thresholds used to identify the highest priority corridors are:

- Total corridor DSi reduction is > 0.5 DSi / 5-years, or
- DSi reduction per km is > 0.1 DSi / 5-years.

High benefit areas are identified using Statistics Area 2 (SA2) geography. These are conceptually the same as Census Area Units (CAU), however their boundaries and names have changed to reflect changes in land use and population patterns since the area unit geography was created in 1992.

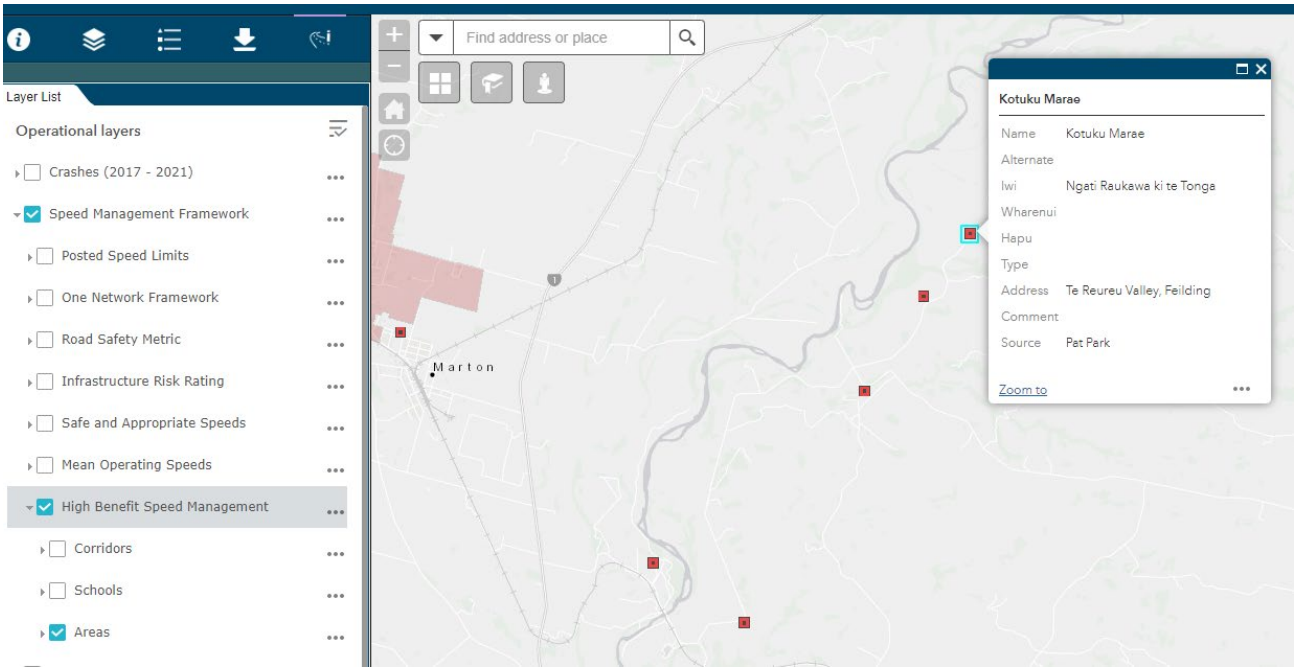
For each SA2 area, the following statistics are produced:

- Population per road length
- School roll per road length
- Jobs per road length
- Injury crashes involving pedestrians and cyclists per road length.

Highest weighting is placed on job density and school roll density, as these metrics are most likely to produce the highest concentrations of vulnerable road user activity.

Those roads in each SA2 where the SAAS is lower than the current speed limit are highlighted and included in the short-medium term implementation priorities.

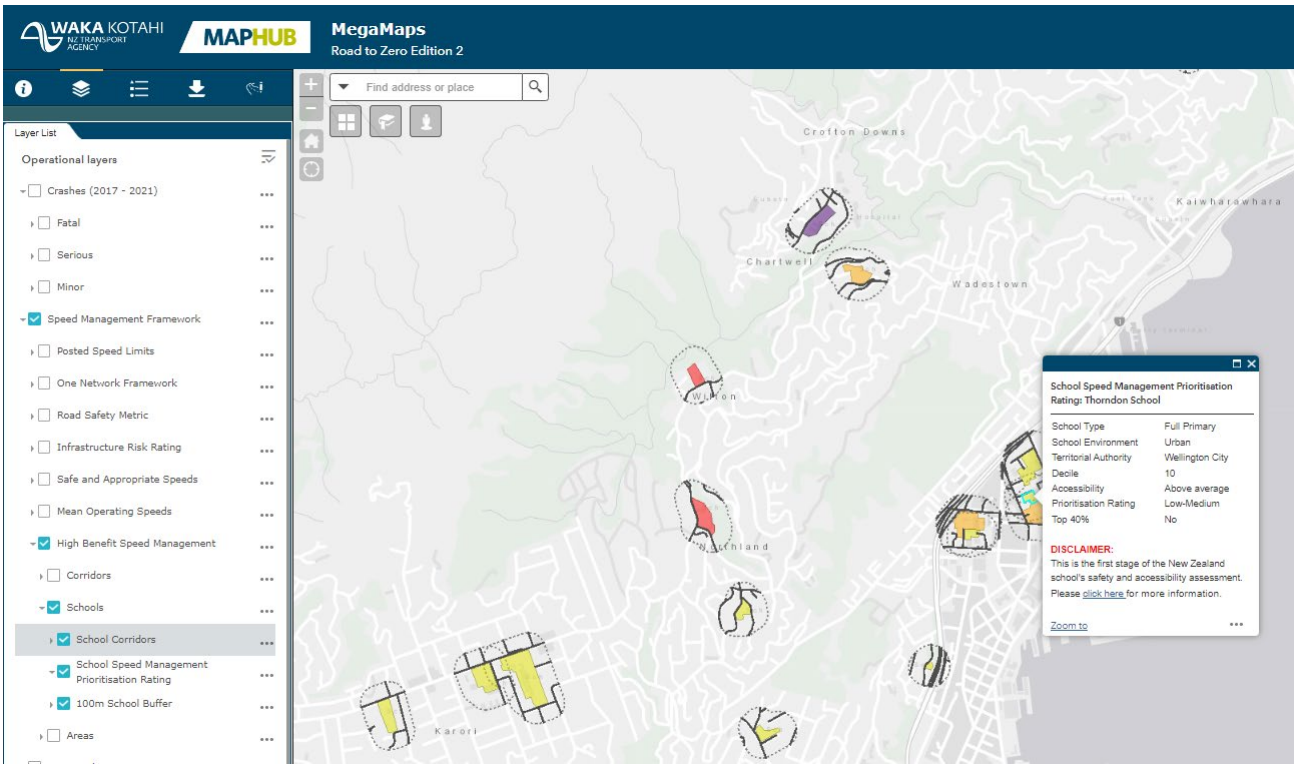
Marae can be found in the high benefit/areas layer. This is a new addition to MegaMaps that will be further developed for the next edition.



Schools

Displays information on all schools and kura in New Zealand. This layer contains a recommended prioritisation order, roads that may be considered to be directly ‘outside a school’, as per the Setting of Speed Limits Rule 2022, and a breakdown of mean operating speeds by peak school start and finish times (8-9am and 3-4pm).

The information in the schools layer should be viewed alongside the high benefit corridor and area layers. In most cases permanent area-based approaches around schools are more likely to achieve the twin objectives of improving safety and encouraging active travel.



State Highway

Highlights the State Highway network.

SH RS/RP Labels and Length Markers

Adds route station (RS) and route position (RP) labels to all state highways. 500m and 1000m markers can be turned on by selecting the relevant sublayer.

DOC Roads

Presents the following information in sublayers for roads that are managed by the Department of Conservation (DOC):

- Posted Speed Limits
- One Network Framework
- Road Safety Metric – Collective Risk
- Road Safety Metric – Personal Risk
- Infrastructure Risk Rating
- Safe and Appropriate Speeds.

TLA, Regional and Police Boundaries

Displays the boundaries for Territorial Authorities, Regional Authorities and Police Districts. Boundaries can be displayed for one or more of these regions by selection in the sublayers.

Stats NZ Urban/Rural Boundaries

Displays the urban/rural land use boundaries as defined by Statistics New Zealand.

This layer is ‘greyed out’ until you zoom in to a scale where the boundaries can be displayed at a legible scale.

Safety Cameras

Displays the location of permanent speed cameras throughout New Zealand.

Historic Data

Displays data that has been superseded by this edition of MegaMaps:

- One Network Road Classification (ONRC)
- ACC High Risk Motorcycle Routes
- High Risk Intersections

Calculation Methods

Road Safety Metrics

Road Safety Metrics are no longer directly used in the determination of SAAS. However, these metrics are used in the calculation of safety benefits associated with speed limit changes.

Road Safety Metrics are calculated using the estimated death and serious injuries (DSi) casualty equivalents approach, as used in the High-Risk Intersections Guide and Urban KiwiRAP analysis.

Estimated DSi casualty equivalents represent the likelihood of an injury crash resulting in a death or serious injury. Estimated DSi casualty equivalents are calculated by multiplying each injury crash (extracted from the NZ Transport Agency's Crash Analysis System (CAS)) on a road segment by the corresponding severity index and speed scaling factor.

DSi severity indices represent the average number of people killed and seriously injured for every reported injury crash. Severity indices are calculated for different speed environments (urban and rural), intersection and midblock locations, different intersection controls, different road user groups and for different crash movement types. For the latter, the severity indices are associated with the primary CAS movement code ie the first letter of the two-letter crash movement code. DSi severity indices for Pedestrians, Cyclists and Motorcyclists are not disaggregated by Primary Movement Code.

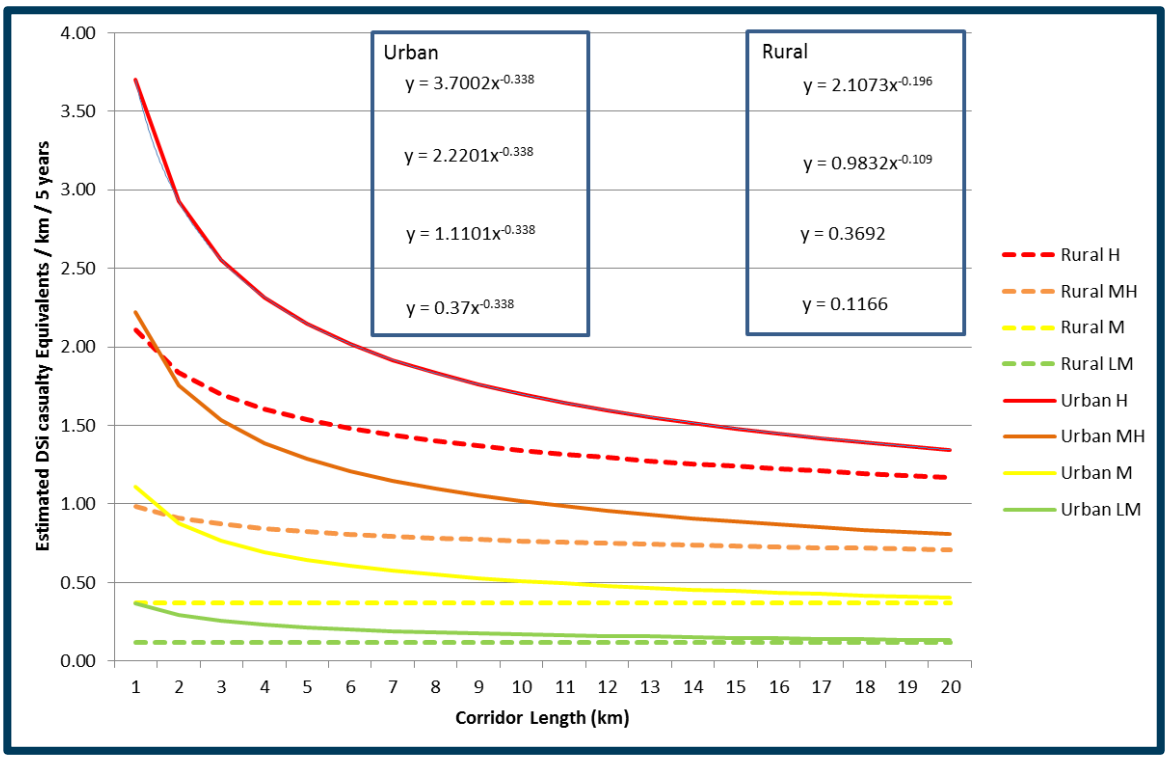
Speed scaling factors apply to different speed limits within urban and rural speed areas. The speed scaling factors represent the influence of the speed limit on DSi severity indices within each category.

The estimated DSi casualty equivalents approach is the Waka Kotahi preferred approach to measuring risk based on historic crash data, as it reduces emphasis on locations with a high number of low severity crash types, such as rear-end, and ensures sites where a fatality has occurred do not receive heightened bias.

Collective Risk

Collective Risk is a measure of the total estimated DSi casualty equivalents per km for a road segment. It is effectively a measure of the number of deaths and serious injuries per km that can be expected on a road segment over the next five years.

The **Collective Risk** thresholds for corridors are shown below.



Personal Risk

Personal Risk is a measure of the risk of an individual dying or being seriously injured on a road corridor. It is calculated by dividing Collective Risk by traffic volume exposure.

The Personal Risk thresholds for corridors are shown below. Specific exemptions are applied to Medium-High and High risk categories to ensure only those corridors with three or more injury crashes can be defined as High, and two injury crashes as Medium-High.

Risk Category	Corridor Personal Risk Value
Low	< 2
Low Medium	2 - <5
Medium	5 - <12
Medium High	12 - <20 * Where Corridor Personal Risk is 12 - <20, and has only 1 injury crash, Personal Risk is categorised as “Medium”
High	≥ 20 Where Corridor Personal Risk is >=20, and has only 1 injury crash, Personal Risk is categorised as “Medium” Where Corridor Personal Risk is >=20, and has only 2 injury crashes, Personal Risk is categorised as “Medium High”

Infrastructure Risk Rating (IRR)

Infrastructure Risk Rating in MegaMaps is calculated in accordance with the automated process described in the Infrastructure Risk Rating Manual. You need to be aware that the automated process relies on information contained in datasets and from geospatial processes to calculate IRR factor attributes. A summary of the derivation / calculation of each IRR factor attribute in MegaMaps is detailed in this section. We recommend that you refer to the Infrastructure Risk Rating Manual more detail.

Land Use

Land use classification is modelled using urban and rural boundaries, ONF Street Categories and the density of residential and commercial developments sourced from Open Street Map (OSM) and Land Information New Zealand (LINZ) datasets.

It should be noted that it is possible for the IRR urban land use category **Urban Fringe** to be applied to a road segment that does not have an urban classification in the Statistics NZ Urban Rural 2021 boundary dataset ie by inference it is rural. This can happen for very small settlements and rural areas with higher-than-normal housing densities.

Road Stereotype

Road stereotype is determined based on information contained in a Waka Kotahi centreline dataset that is maintained by CoreLogic.

Alignment

Horizontal alignment is calculated using a geospatial process that calculates degrees of curvature per km. Alignment classification follows the banding specified in Table **A121** of the Waka Kotahi Monetised Benefits and Costs Manual.

AADT

The Average Annual Daily Traffic (AADT) is determined based on information contained in a Waka Kotahi centreline dataset that is maintained by CoreLogic.

Intersection Density

Intersection density is calculated using a geospatial process that calculates intersection density along a road segment based on the underlying road centreline.

Lane and Shoulder Width

Lane width is determined based on information contained in a Waka Kotahi centreline dataset that is maintained by CoreLogic. Separate lane and shoulder width information is not available within the dataset, so assumptions are made based on the carriageway width. These assumptions are:

- Local roads have a maximum lane width of 3.3m with the shoulder forming the balance of the carriageway.
- State Highways have a lane width of 3.6m with the shoulder forming the balance of the carriageway.

Roadside Hazards

Roadsides hazards play an important role in influencing the severity of a crash when a vehicle departs the road. Therefore, it forms an integral part of the IRR calculation. Unfortunately, there is no national dataset that contains information on the nature and severity of roadside hazards. As such, roadsides hazard severity needs to be calculated based on other variables. Manual coding of roadside hazards in a variety of road environments showed that roadside hazards can be estimated from a combination of land use classification and road alignment.

The automated process for classifying roadside hazard risk is shown in the table below.

Land Use Code	Alignment Code	RoadsideHazard Risk
No Access	Any alignment	Minor
Controlled Access	Any alignment	High/Moderate*
Urban Residential	Any alignment	Severe/Moderate*

Commercial Big Box/Industrial	Any alignment	Severe/Moderate*
Commercial Strip Shopping	Any alignment	Severe/Moderate*
Remote Rural	Tortuous alignment	High
Remote Rural	Not tortuous alignment	Moderate
Rural Residential	Any alignment	High/Moderate*
Rural Towns	Any alignment	Severe/Moderate*

* Where more than one category is shown the average risk score associated with the categories listed is used.

Access Density

Like Roadside Hazards, Access Density is also estimated from other datasets. For MegaMaps, Access Density is estimated from adjacent land parcels, where it is assumed that each land parcel has one access point to the frontage road.

IRR Bands

IRR adopts a 5-band risk rating system like Road Safety Metrics. Separate thresholds apply for rural and urban land use classifications, as shown in the following table. Road segments with a **Commercial Strip Shopping** land use classification are banded separated to other urban land uses due to the significantly different safety outcomes for roads.

IRR score	Rural	Urban	Commercial Strip Shopping
0 to <0.1	Low	Low	Medium
0.1 to < 0.2	Low	Low	Medium
0.2 to < 0.3	Low	Low	Medium
0.3 to < 0.4	Low	Low	Medium
0.4 to < 0.5	Low	Low	Medium
0.5 to < 0.6	Low	Low	Medium
0.6 to < 0.7	Low	Low	Medium
0.7 to < 0.8	Low-Medium	Low	Medium
0.8 to < 0.9	Low-Medium	Low	Medium
0.9 to < 1.0	Low-Medium	Low	Medium
1.0 to < 1.1	Low-Medium	Low	Medium-High
1.1 to < 1.2	Low-Medium	Low	Medium-High
1.2 to < 1.3	Medium	Low	Medium-High
1.3 to < 1.4	Medium	Low-Medium	Medium-High
1.4 to < 1.5	Medium	Low-Medium	Medium-High
1.5 to < 1.6	Medium	Low-Medium	Medium-High
1.6 to < 1.7	Medium-High	Low-Medium	Medium-High

IRR score	Rural	Urban	Commercial Strip Shopping
1.7 to < 1.8	Medium-High	Low-Medium	Medium-High
1.8 to < 1.9	Medium-High	Low-Medium	Medium-High
1.9 to < 2.0	Medium-High	Medium	Medium-High
2.0 to < 2.1	Medium-High	Medium	Medium-High
2.1 to < 2.2	High	Medium	Medium-High
2.2 to < 2.3	High	Medium	Medium-High
2.3 to < 2.4	High	Medium	Medium-High
2.4 to < 2.5	High	Medium	Medium-High
2.5 to < 2.6	High	Medium	High
2.6 to < 2.7	High	Medium	High
2.7 to < 2.8	High	Medium-High	High
2.8 to < 2.9	High	Medium-High	High
2.9 to < 3.0	High	Medium-High	High
3.0 to < 3.1	High	Medium-High	High
3.1 to <3.2	High	Medium-High	High
≥ 3.2	High	High	High

The IRR land use categories that apply to the rural thresholds are:

- No Access
- Rural Residential
- Remote Rural.

The IRR land use categories that apply to the urban thresholds are:

- Commercial Big Box / Industrial
- Urban Residential
- Controlled Access
- Urban Fringe / Rural Town.

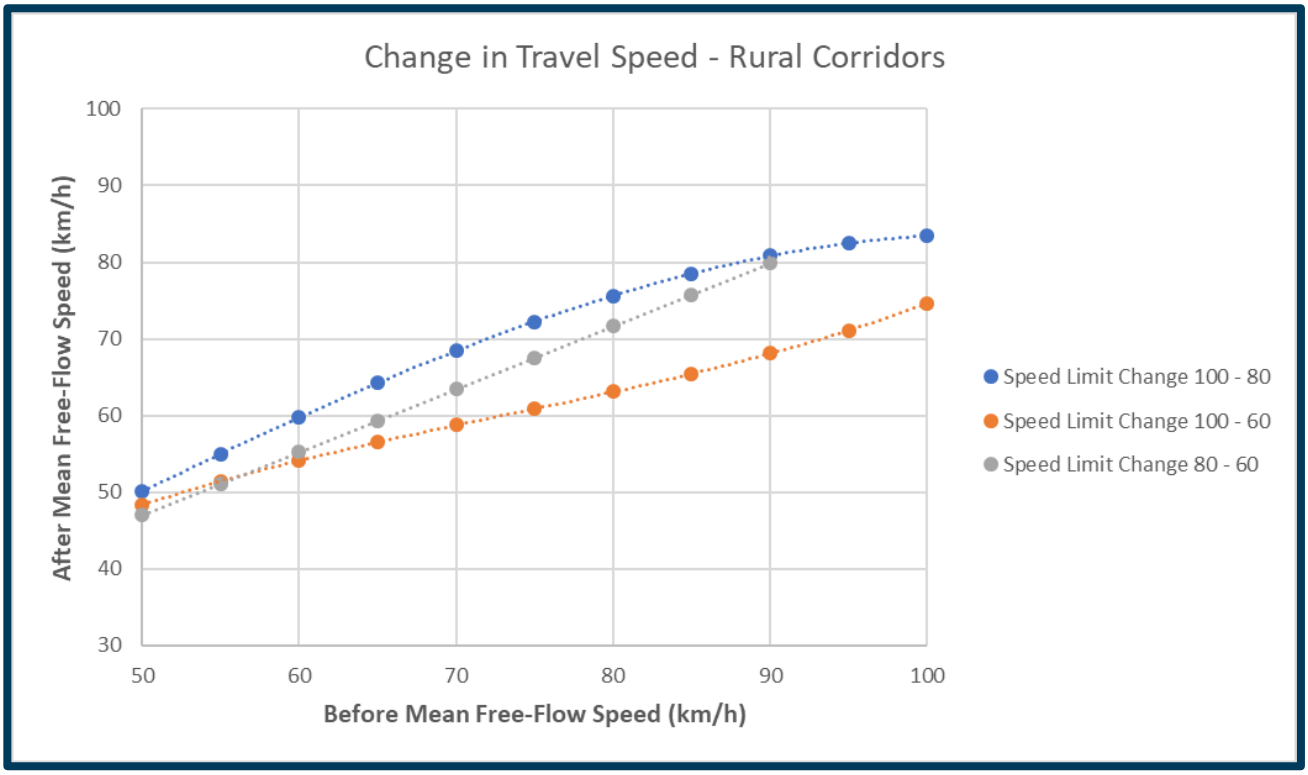
Impact of Speed Limit Changes

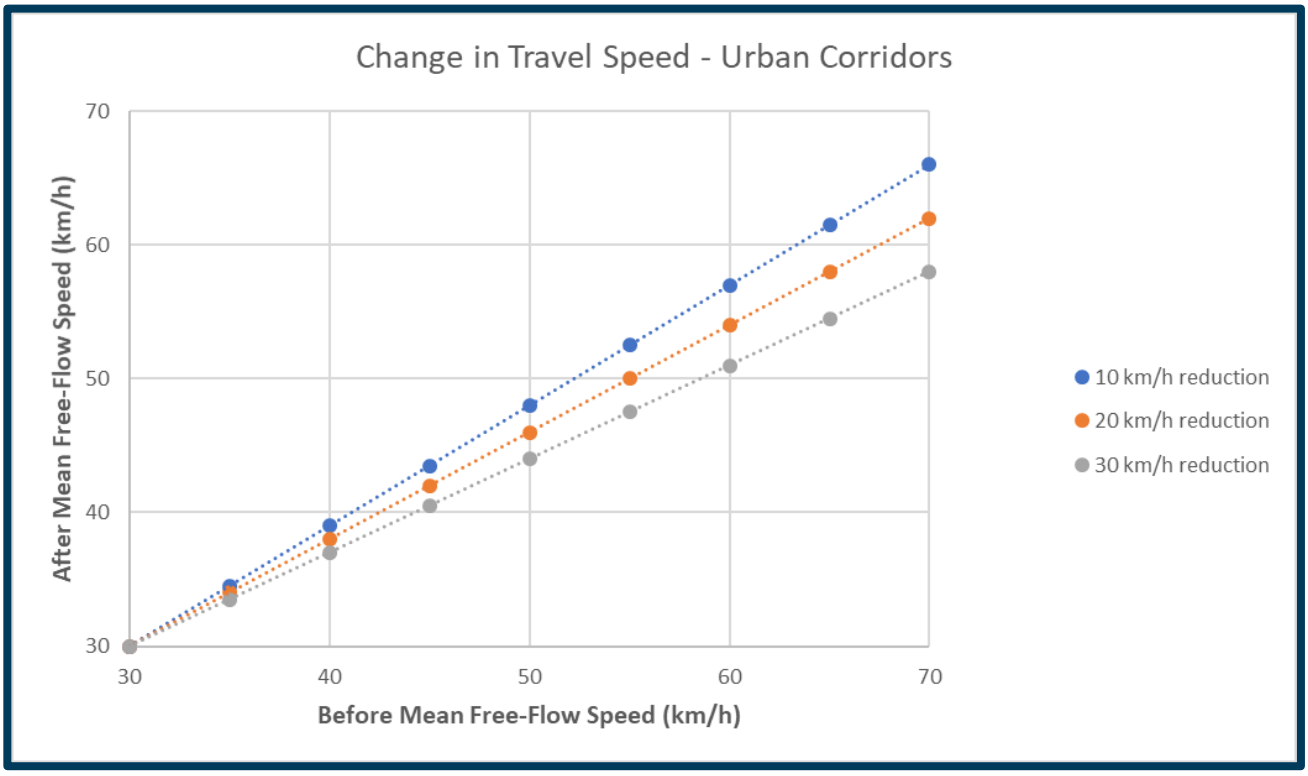
Change in Operating Speed

The basis for determining the change in safety performance, travel time, VOC and CO_2 emissions is dictated by the expected change in travel speed resulting from a change in speed limit. The existing mean free-flow travel speeds are derived from a TomTom dataset purchased by Waka Kotahi.

Future mean free-flow speeds are estimated differently for rural and urban environments. In rural areas, these are based on modelled relationships between existing travel speeds and future travel speeds on the

Waikato and Top of the South (Marlborough, Nelson and Tasman districts) networks using the Austroads Operating Speed Model. In urban areas, the relationship between the change in speed limit and change in travel speed was developed collaboratively with Waka Kotahi and agreed to be a linear relationship. The relationships applied in MegaMaps are shown in the following two charts.





Note: That the maximum rate of travel speed change is capped at 5 km/h for every 10 km/h change in speed limit, which aligns with international findings.

Safety Benefits

The DSi savings per annum is estimated using a modified form of Nilsson's Power Model. The relationship between changes in mean travel speed and consequent changes in crashes and crash severity was originally described in research by Nilsson in 1981 through a series of power functions. In 2004, Elvik, Christensen and Amundsen conducted conventional and regression meta-analysis of the research and found the original power models proposed by Nilsson were robust, but suggested amendments to the model parameters.

The results of both studies show that small changes in travel speeds have a similar percentage change in property damage crashes, but a larger percentage change in casualties-particularly serious casualties.

The modified form of Nilsson's Power Model is:

$$Estimated\ DSi\ After = Estimated\ DSi\ Before\ x\ (\frac{Speed\ After}{Speed\ Before})^{exponent}$$

Where the exponent is 3.5 on rural corridors and 2.0 on urban corridors.

Travel Time Change

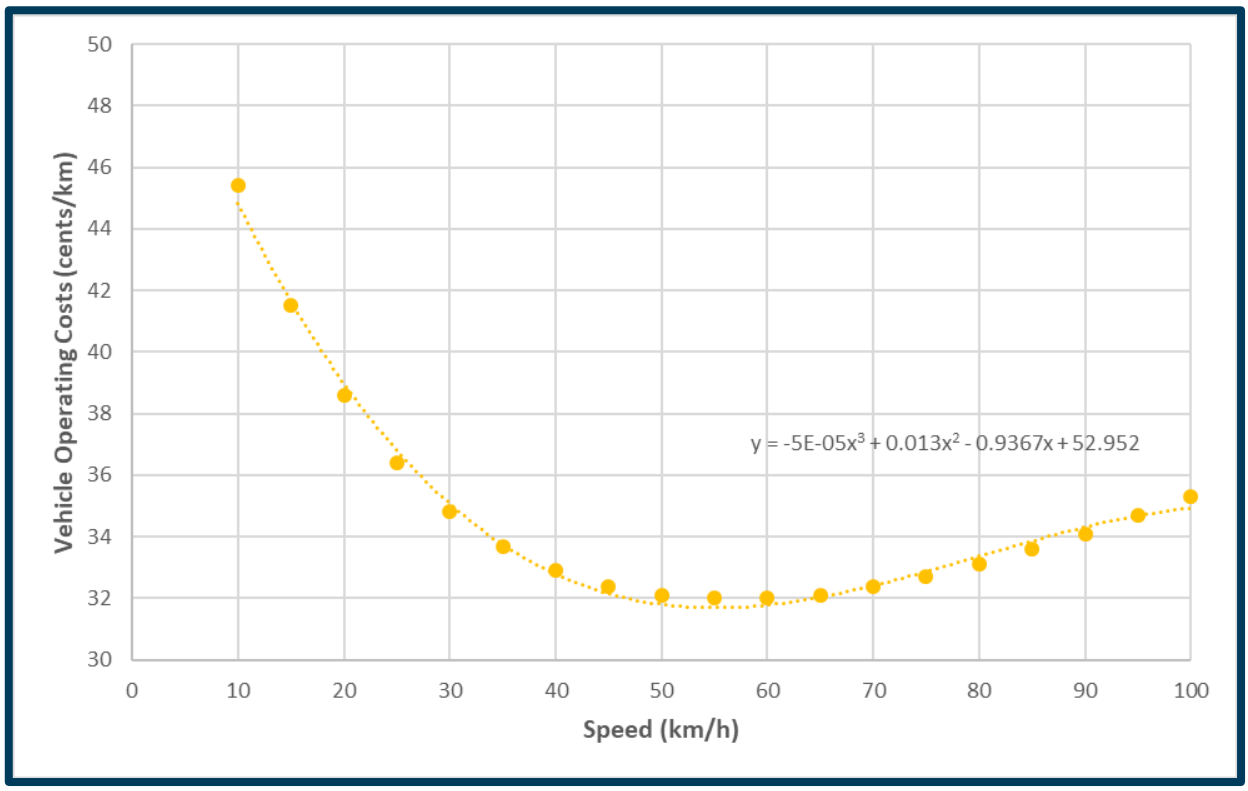
Travel time change for a road segment is determined by comparing the existing travel time using 'Speed Before' with the future travel time using 'Speed After'. Note that these are travel speeds and not speed limits.

For example:

- Corridor length = 4 km
- Mean speed before = 91 km/h
- Mean speed after = 81 km/h
- Travel time change = -19.5 seconds (slower) *calculation = ((4/91 – 4/81)/3600).*

Vehicle Operating Cost Change

Vehicle Operating Cost (VOC) change for a road segment is estimated using Table A87 of the Waka Kotahi Monetised Benefits and Costs Manual. For simplicity, MegaMaps uses the VOC for Rural Strategic roads assuming 0% gradient, a copy of which is reproduced below.



As with the travel time change calculation, VOC change for a road segment is determined by comparing the existing VOC (using 'Speed Before') with the future VOC (using 'Speed After') using the polynomial equation in the figure above. **Note:** These are travel speeds and not speed limits.

For example:

- Corridor length = 4 km
- Mean speed before = 91 km/h
- Mean speed after = 81 km/h
- VOC change = -$0.06 per vehicle (less).

Change in CO_2 Emissions

The change in CO_2 emissions is calculated as a function of VOC. This is based on the now superseded Waka Kotahi Economic Evaluation Manual, which states that CO_2 emissions (in tonnes) can be estimated for road links as 0.09% of VOC (in $) for light vehicles and 0.16% of VOC for heavy vehicles. MegaMaps uses a value of 0.0935% of VOC on the assumption that light vehicles typically comprise 95% of all traffic.

In MegaMaps, the change in CO_2 emissions is expressed in tonnes per year. For example:

- Corridor length = 4 km
- Mean speed before = 91 km/h
- Mean speed after = 81 km/h
- VOC change for road segment per annum = -$223,990 (less)
- Change in CO_2 emissions = -209.43 tonnes per annum *calculation (Annual VOC x 0.0935%).*

It is recommended that the CO_2 emissions calculations are updated to reflect the latest guidance contained in the Waka Kotahi Monetised Benefits and Costs Manual.

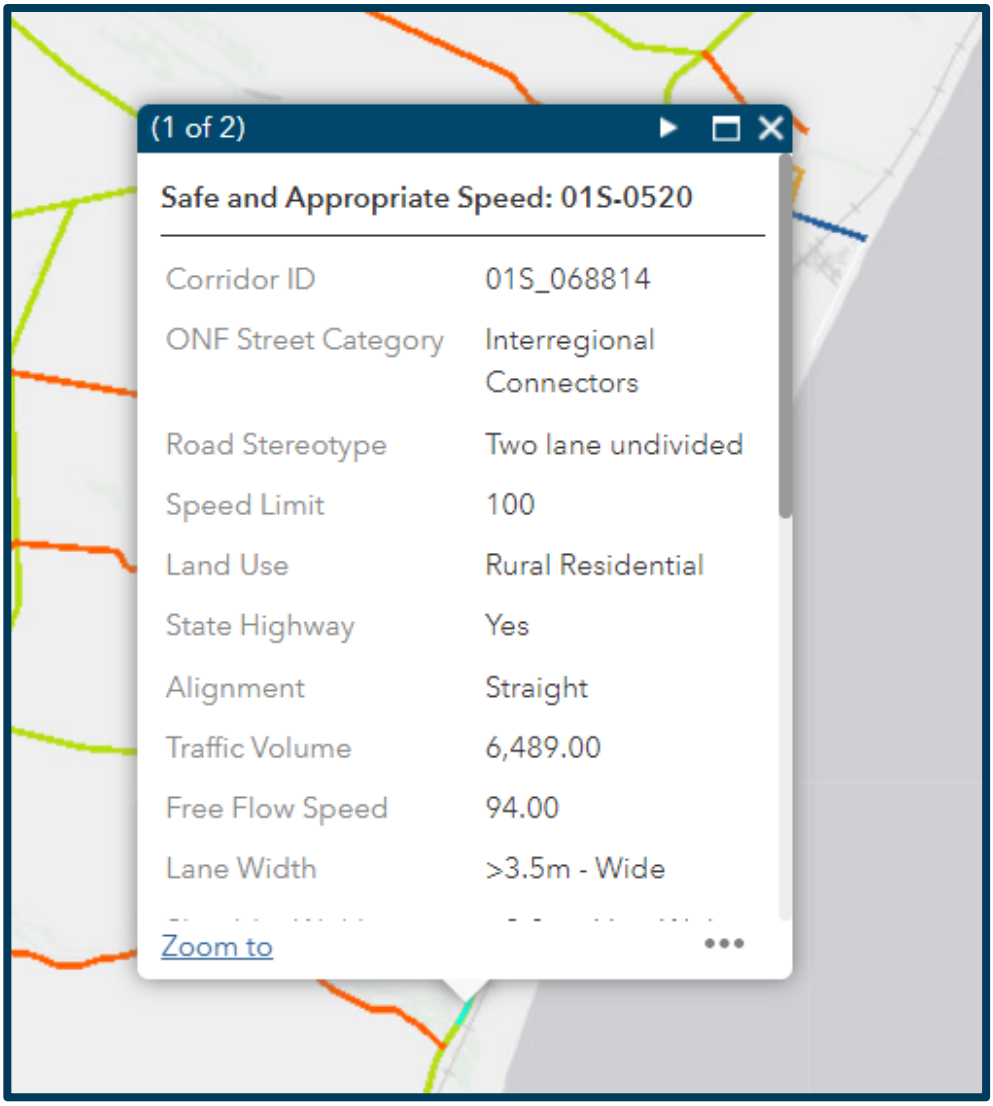
Reviewing the Inputs and Outputs

The preceding sections of this guide describe the key functionality, information sources and calculation processes used in MegaMaps. This section describes some of the checks and balances that are recommended.

Safe and Appropriate Speeds

The SAAS shown in MegaMaps is based on the SAAS criteria presented in the Speed Management Guide: Road to Zero edition and the input variables used to determine the SAAS. If any of the input variables are inaccurate or incorrect, then the resulting SAAS may also be inaccurate. You are expected to check the accuracy of the input variables before relying on the outputs.

The simplest way of checking the inputs is to select the road segment and review the information in the popup box.



In the example above, we see the ONF Street Category is an Interregional Connector. The safe speed limit range for an Interregional Connector is 60 – 110 km/h. This road segment has a SAAS of 80 km/h, which can be confirmed by reviewing the SAAS criteria for Interregional Connectors set out in the Speed Management Guide: Road to Zero edition.

If you find that an input variable is incorrect and would have an impact on the SAAS, for instance, the road stereotype is 'Divided' then please bring this to the attention of Waka Kotahi along with supporting evidence so the base data can be updated, and the analysis rectified in MegaMaps in the next update.

Key things to remember when reviewing SAAS outputs are:

- The primary determinant of SAAS in the Speed Management Guide: Road to Zero edition is the ONF. A safe speed limit or a range of safe speed limits is specified for each ONF and the SAAS cannot be outside of this range. Disagreeing with the ONF specified by the RCA does not constitute an error with MegaMaps. We recommend any issues with the ONF classification are raised with the RCA.
- Some of the SAAS criteria cannot be modelled, such as the presence of cycling infrastructure. Those factors that cannot be modelled are referred to as moderating factors. You will need to take moderating factors into consideration when finalising the SAAS.

High Benefit Speed Management

The corridors, schools and areas highlighted in the **High Benefit Speed Management** layer are designed to assist RCAs focus their speed management efforts in the short-medium term. The high priority locations comprise:

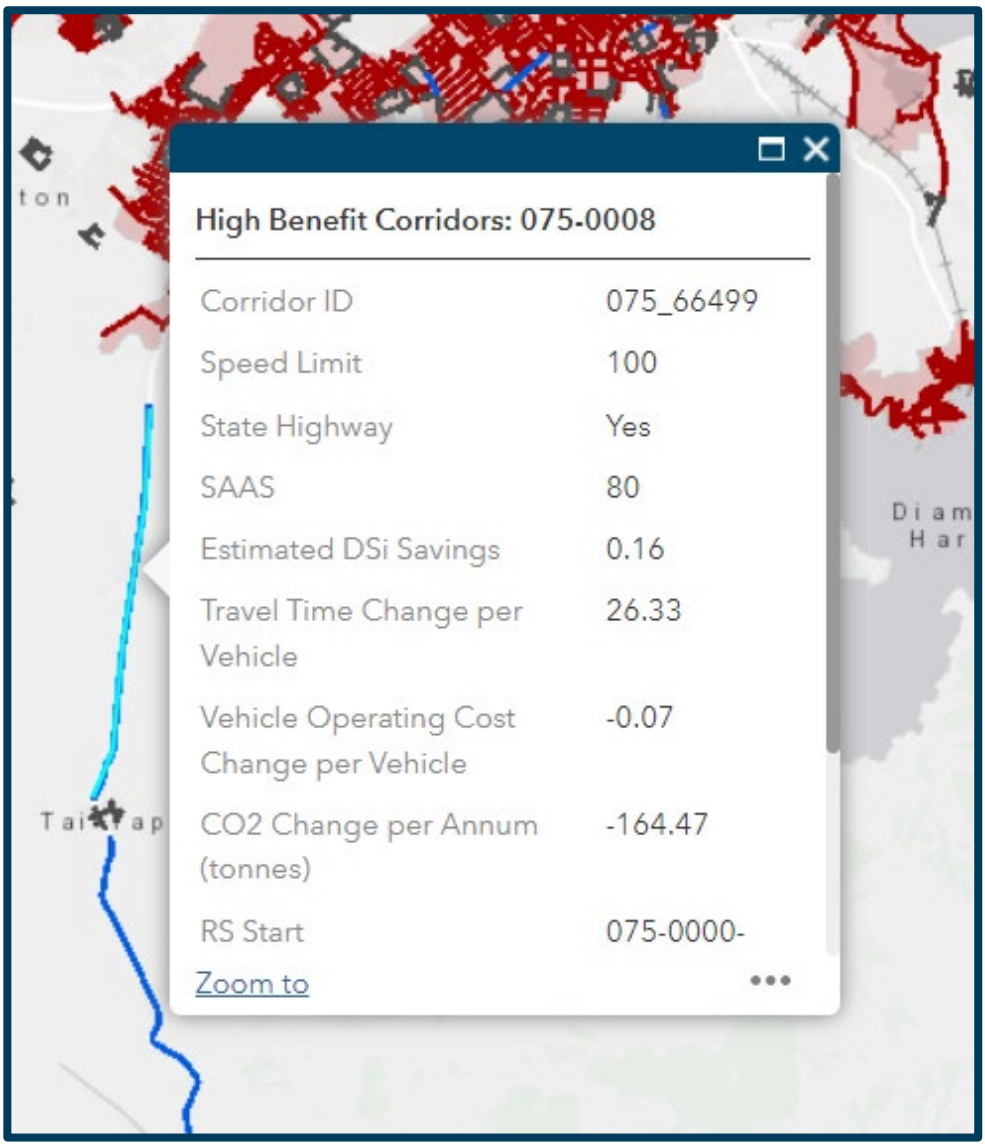
- The highest benefit corridors where lowering speed limits to align with the SAAS will produce the most safety benefits. These corridors primarily comprise Interregional Connectors, Rural Connectors and Urban Connectors.
- Prioritisation of schools where reducing speed limits will achieve the greatest safety and accessibility benefits first. Also contains all streets within 100M of a school boundary that may or may not have a frontage to the school. This layer should be viewed alongside the high priority corridors and areas layers.
- The highest benefit areas where the highest concentrations of active road users are expected, such as Town Centres, employment areas, other commercial areas and surrounding local streets.

Collectively, the high benefit areas capture approximately 21,500 km of roads, which represents 25% of all roads where the SAAS is less than the current posted speed limit. The vast majority of the remaining 75% of roads not highlighted as high benefit, are sealed and unsealed Rural Roads, which typically carry low traffic volumes and have very low levels of active road use.

When preparing a speed management plan under the Setting of Speed Limits Rule, RCAs should focus on those roads and areas identified as high benefit for implementation. However, that does not mean these roads and areas should be the sole focus for short-medium term delivery and a network approach is recommended to deliver sensible, consistent and intuitive speed limits.

The impact of speed limit changes on any roads highlighted in the **High Benefit Speed Management** layer is shown in a popup box when the road segment is selected, including:

- Current speed limit
- SAAS
- Estimated DSi savings per annum
- Travel time change (in seconds) per vehicle traversing the road segment
- Vehicle Operating Cost (VOC) change per vehicle traversing the road segment
- The change in CO_2 emissions per annum.



Note: The information shown in these popup boxes assumes the speed limit is changed to the SAAS.

The **Corridor Editor** tool can be used to see these metrics for corridors not included in the **High Benefit Speed Management** layer. This tool can also be used to see the impact on metrics where an input variable is adjusted, such as the road segment length, traffic volume or free flow speed.