Speed Management & Cycle Planning/Design

Presentation to AA Canterbury/Westland
25 Mar 2021

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TRANSPORT PLANNING AND DESIGN

Speed Management Options

	Engineering DOWN	NO Engineering	Engineering UP
Increase speed limit			
No speed change			
Decrease speed limit			
Variable speed limit			

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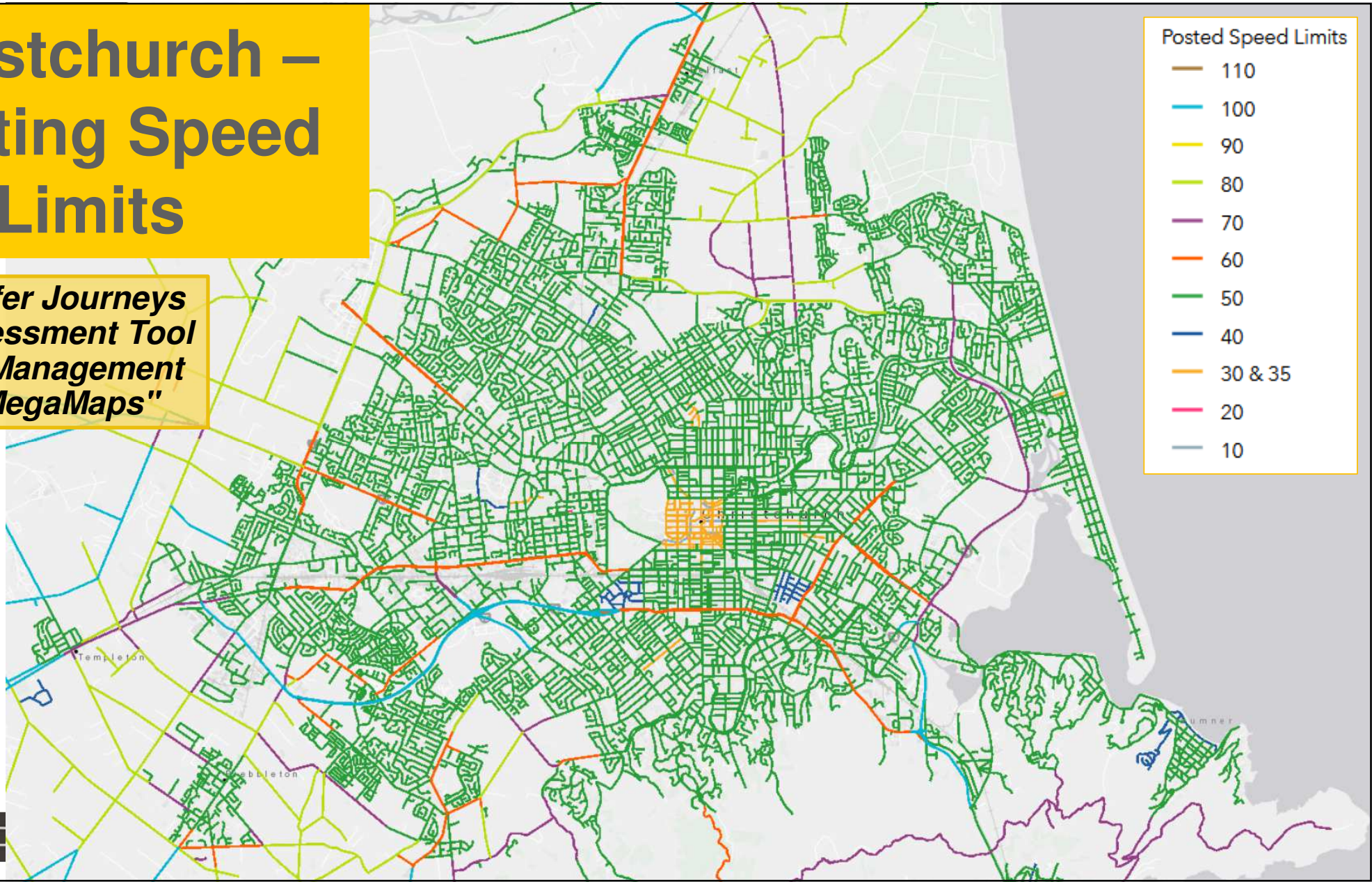
Christchurch – Existing Speed Limits

NZTA Safer Journeys Risk Assessment Tool - Speed Management AKA "MegaMaps"



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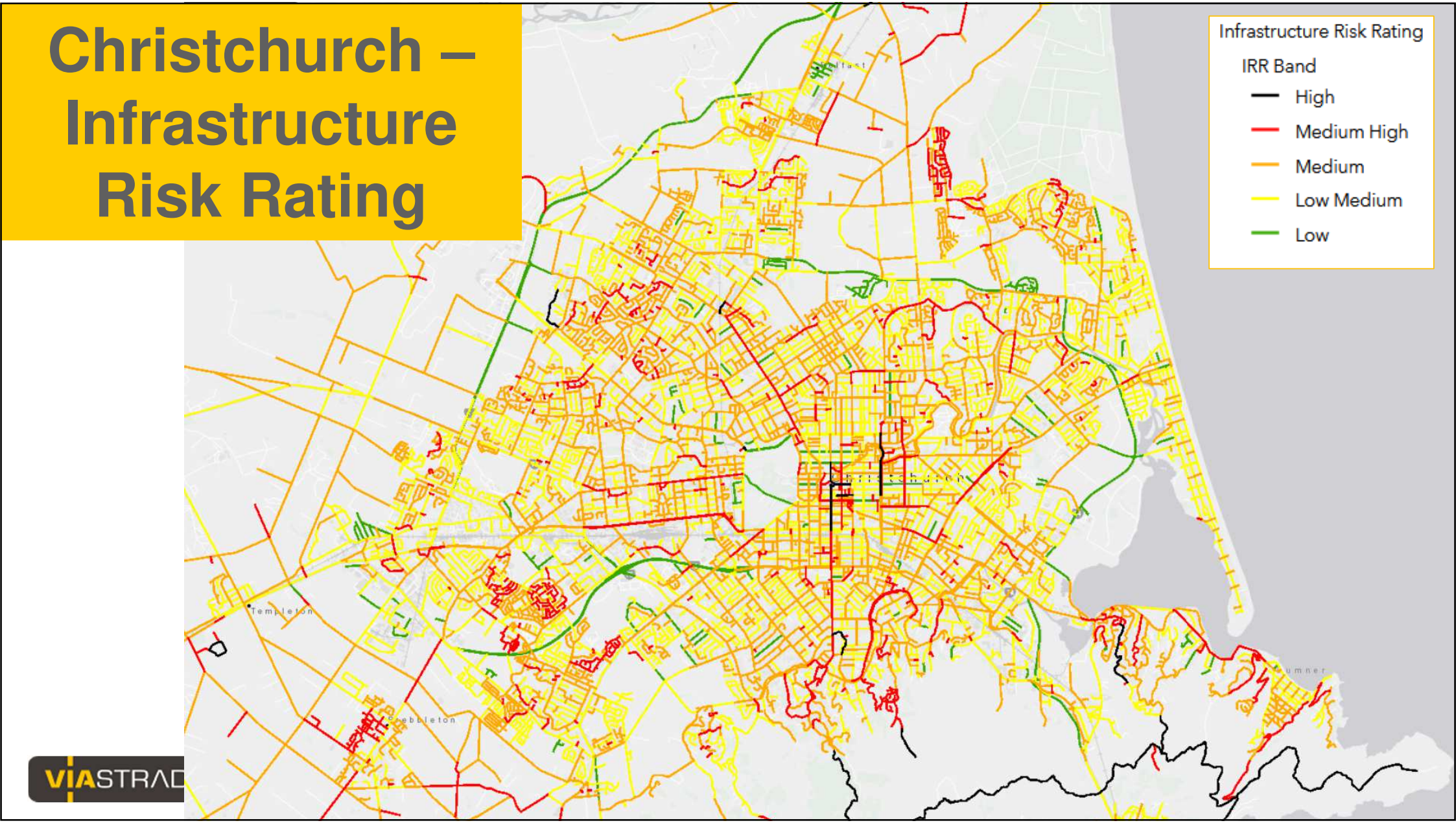
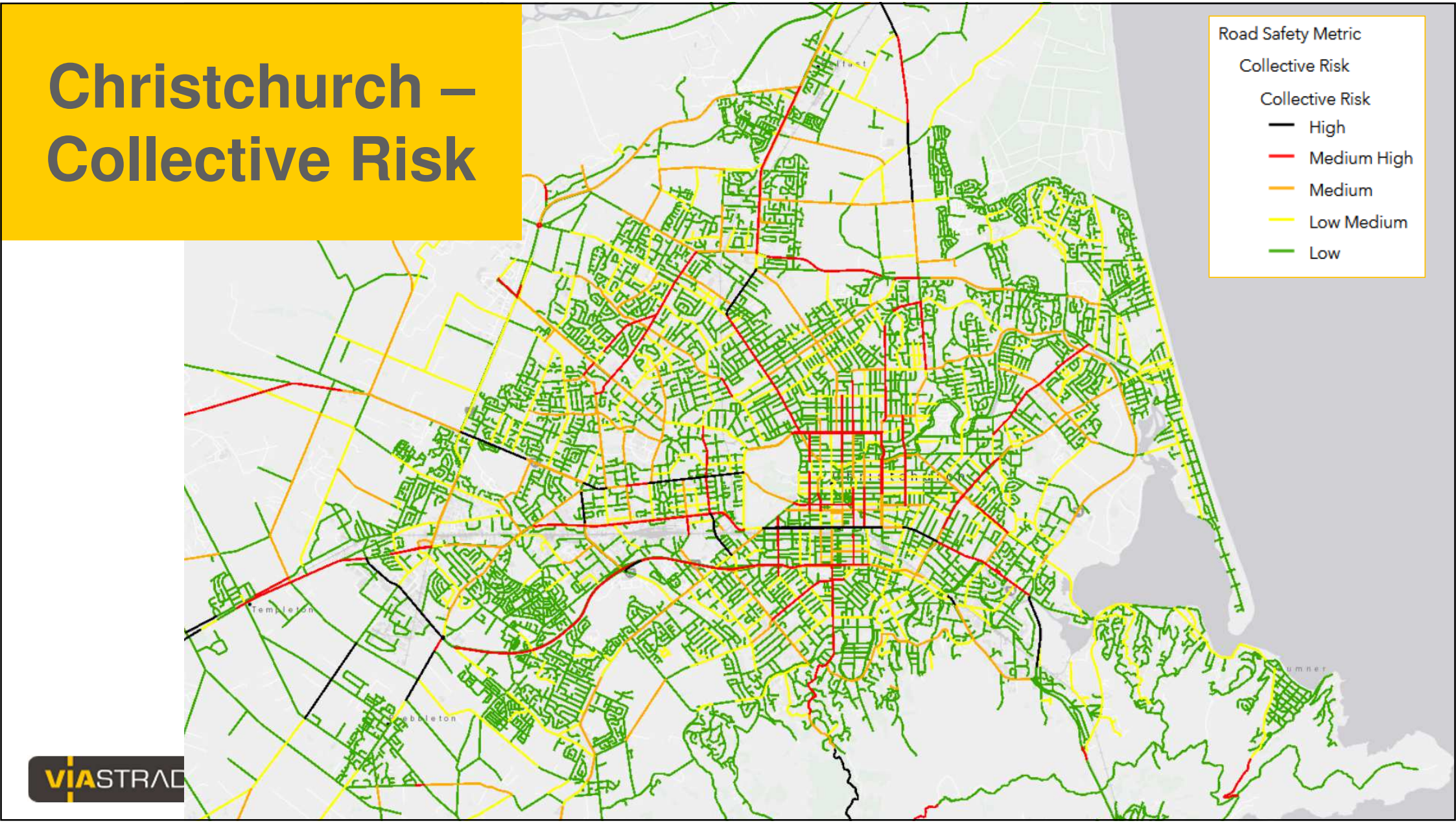
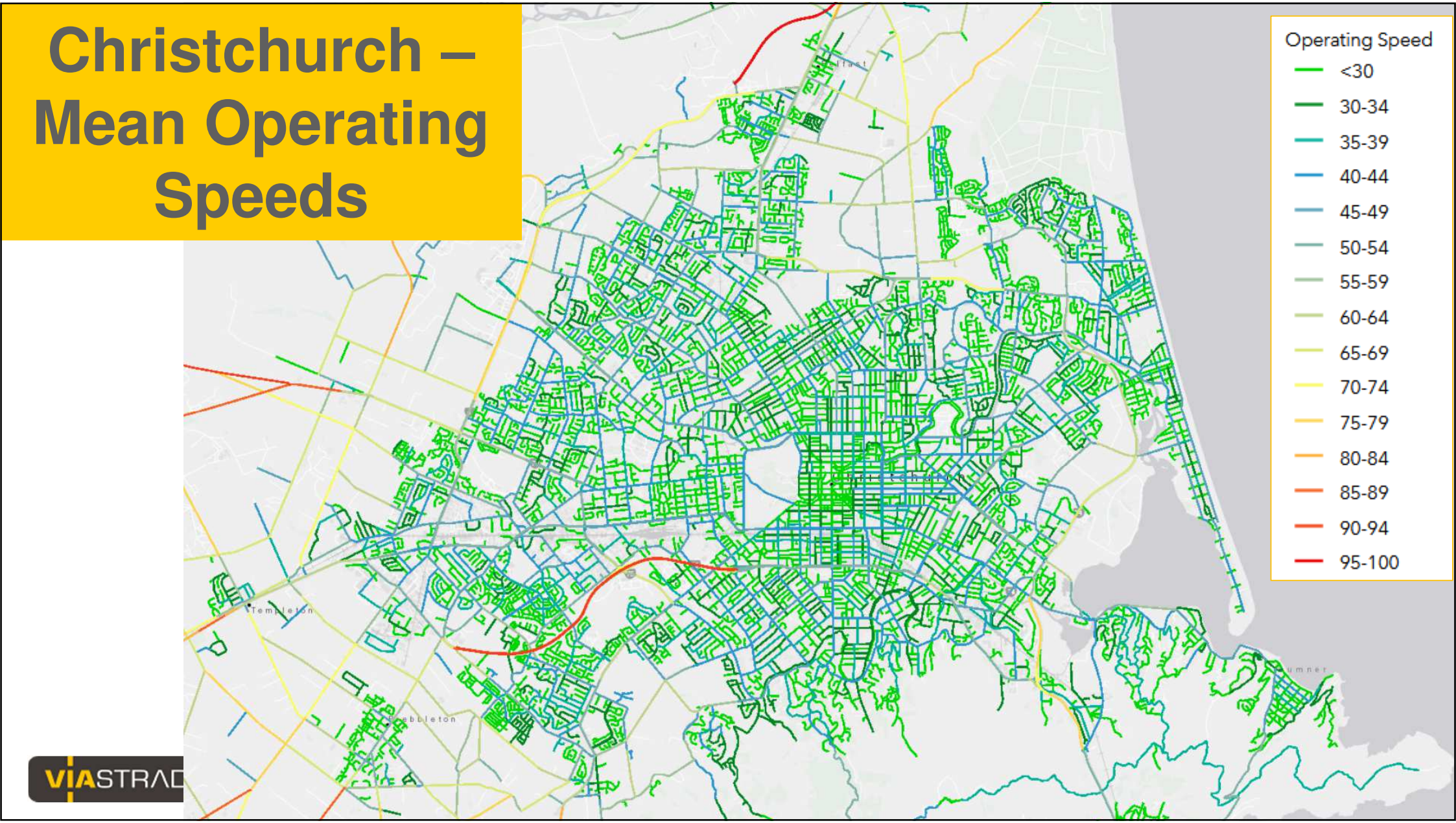
Christchurch – Infrastructure Risk Rating



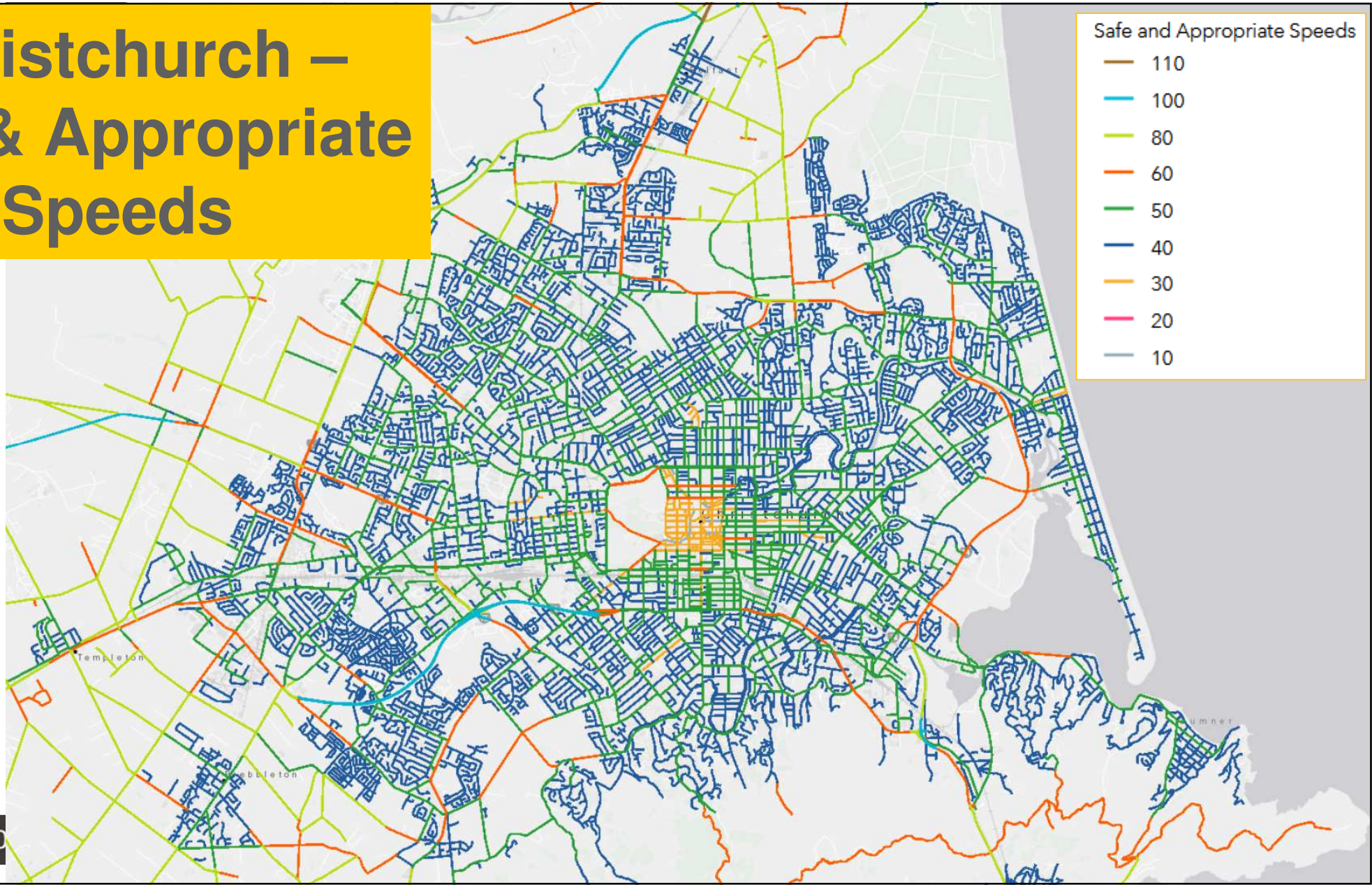
Christchurch – Collective Risk



Christchurch – Mean Operating Speeds



Christchurch – Safe & Appropriate Speeds



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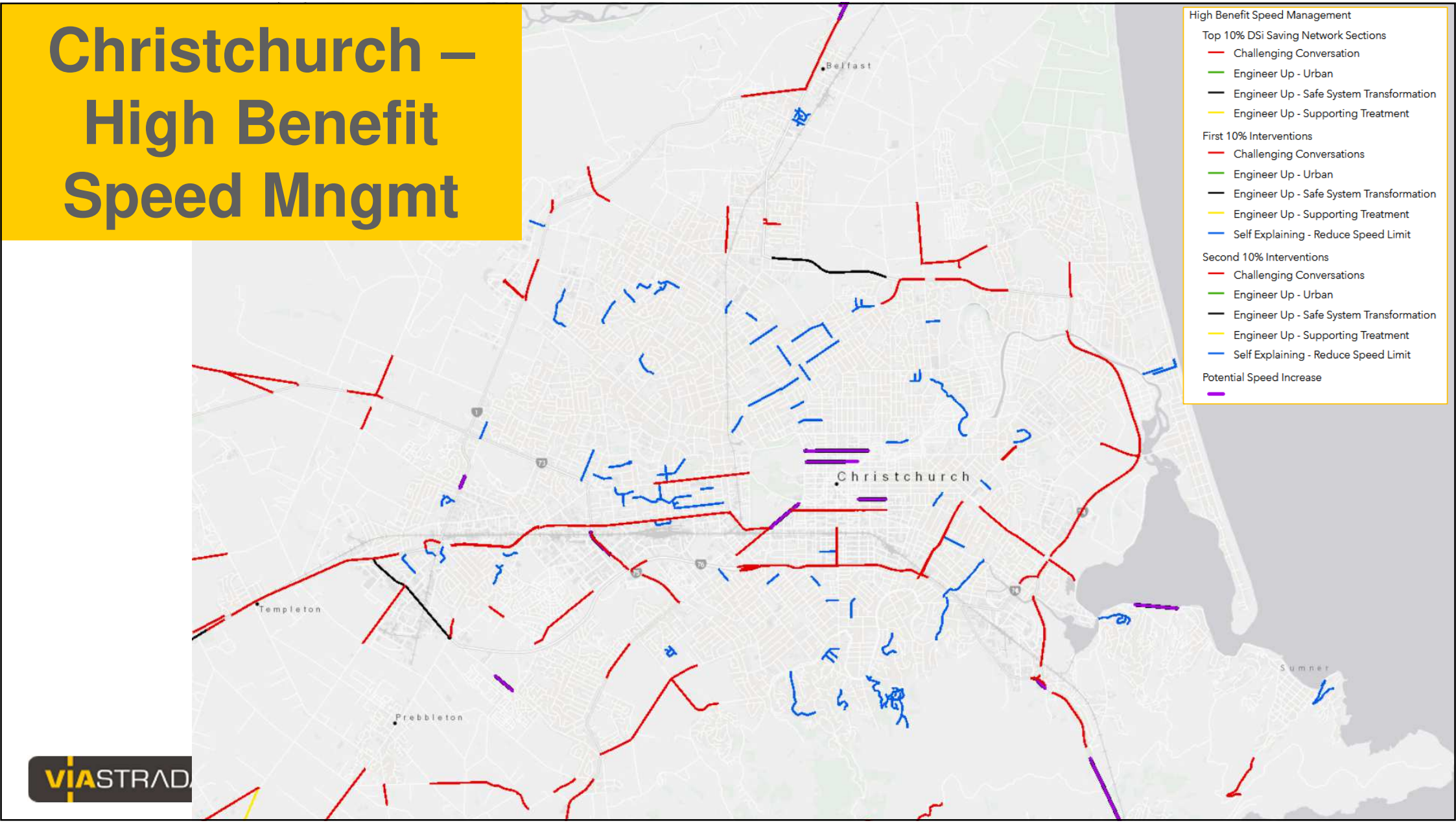
Christchurch – High Benefit Speed Mngmt



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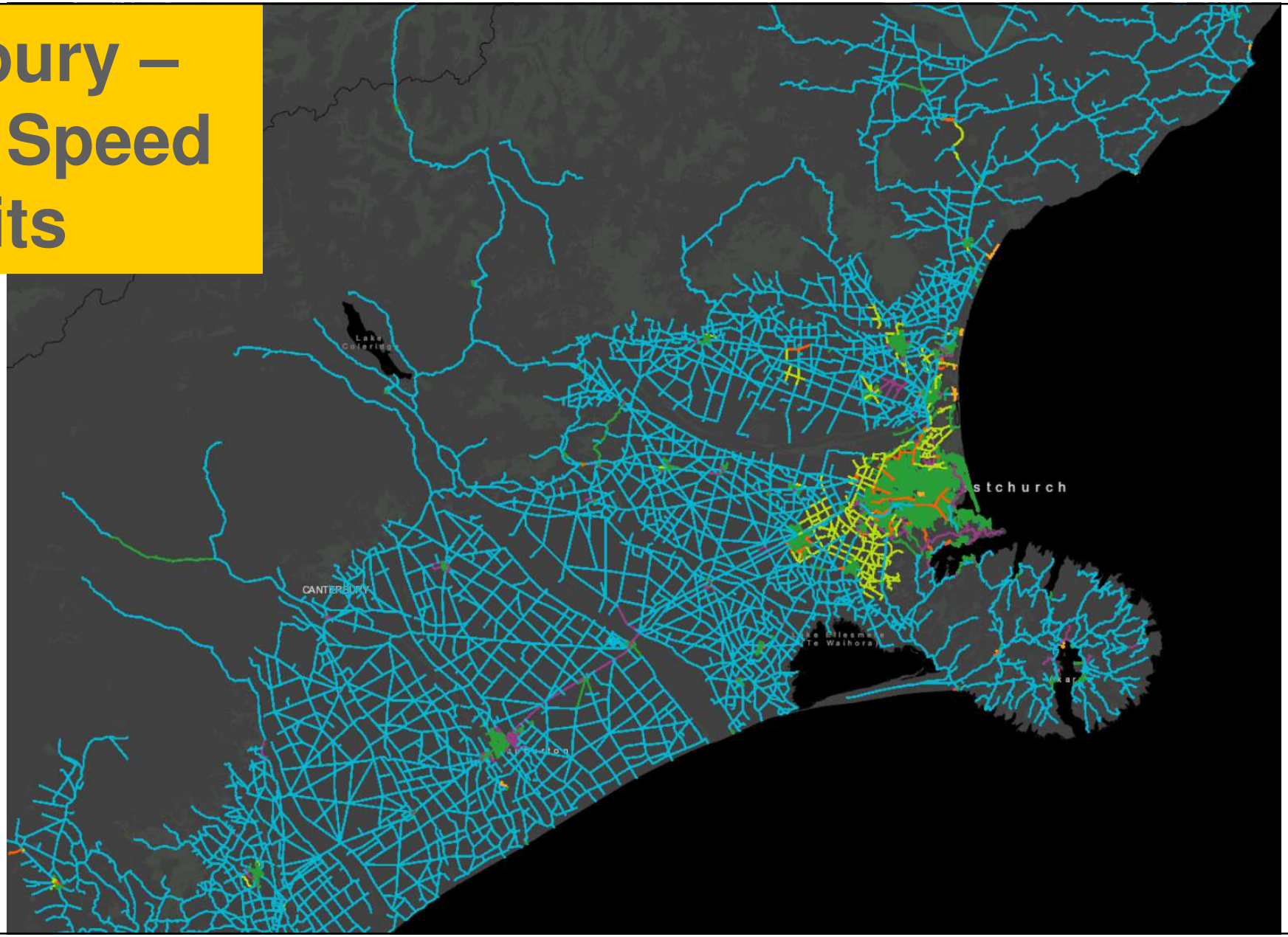
Canterbury – Existing Speed Limits



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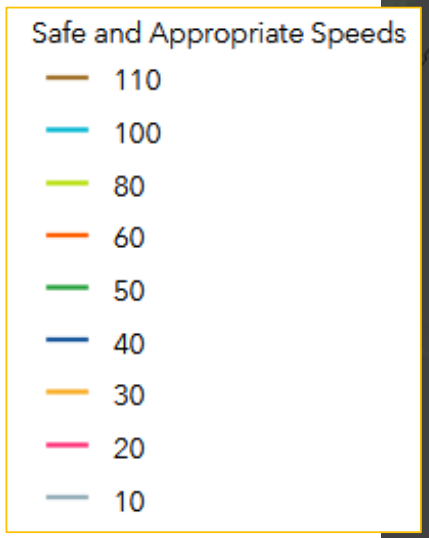
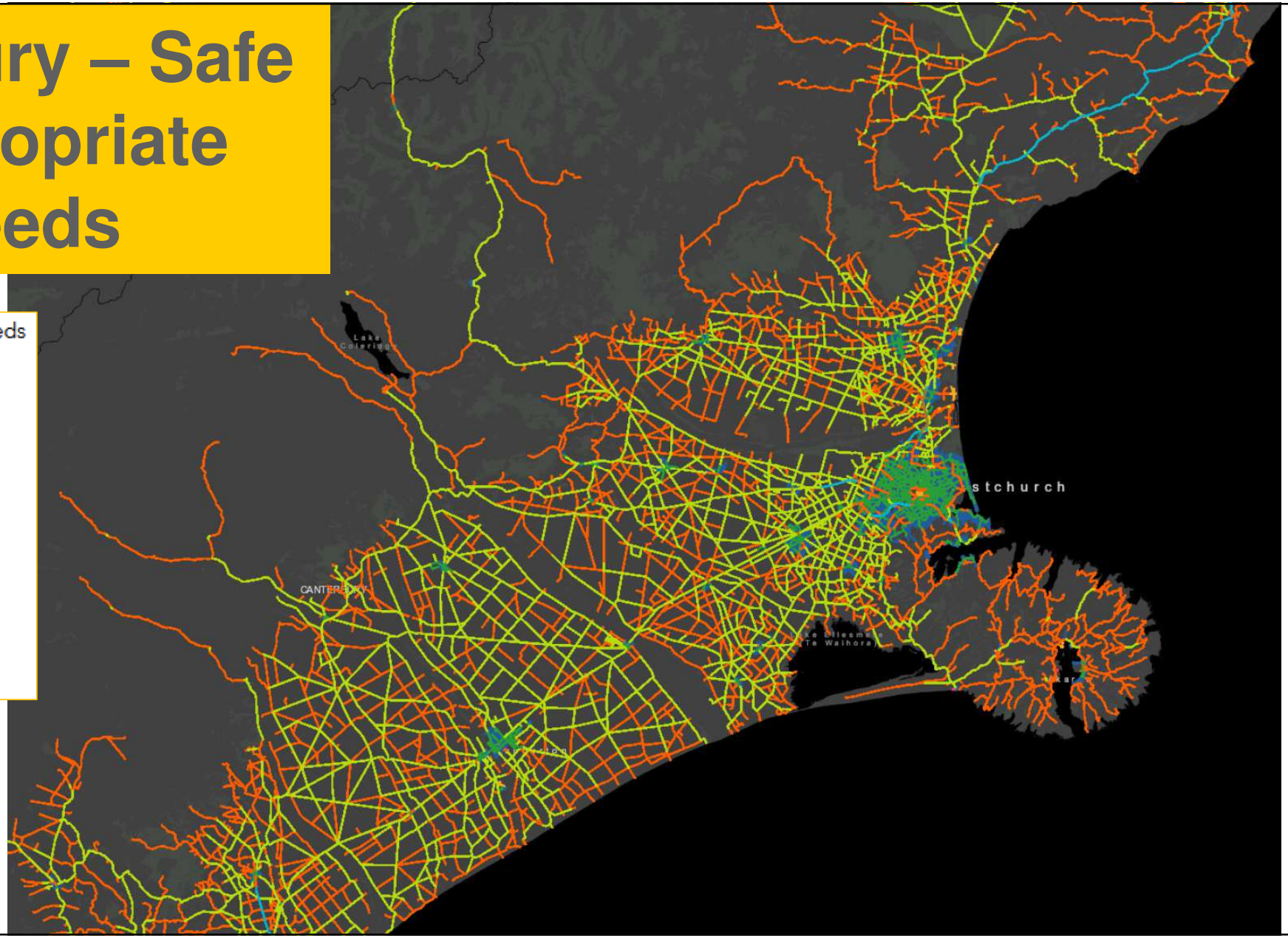
Canterbury – Safe & Appropriate Speeds





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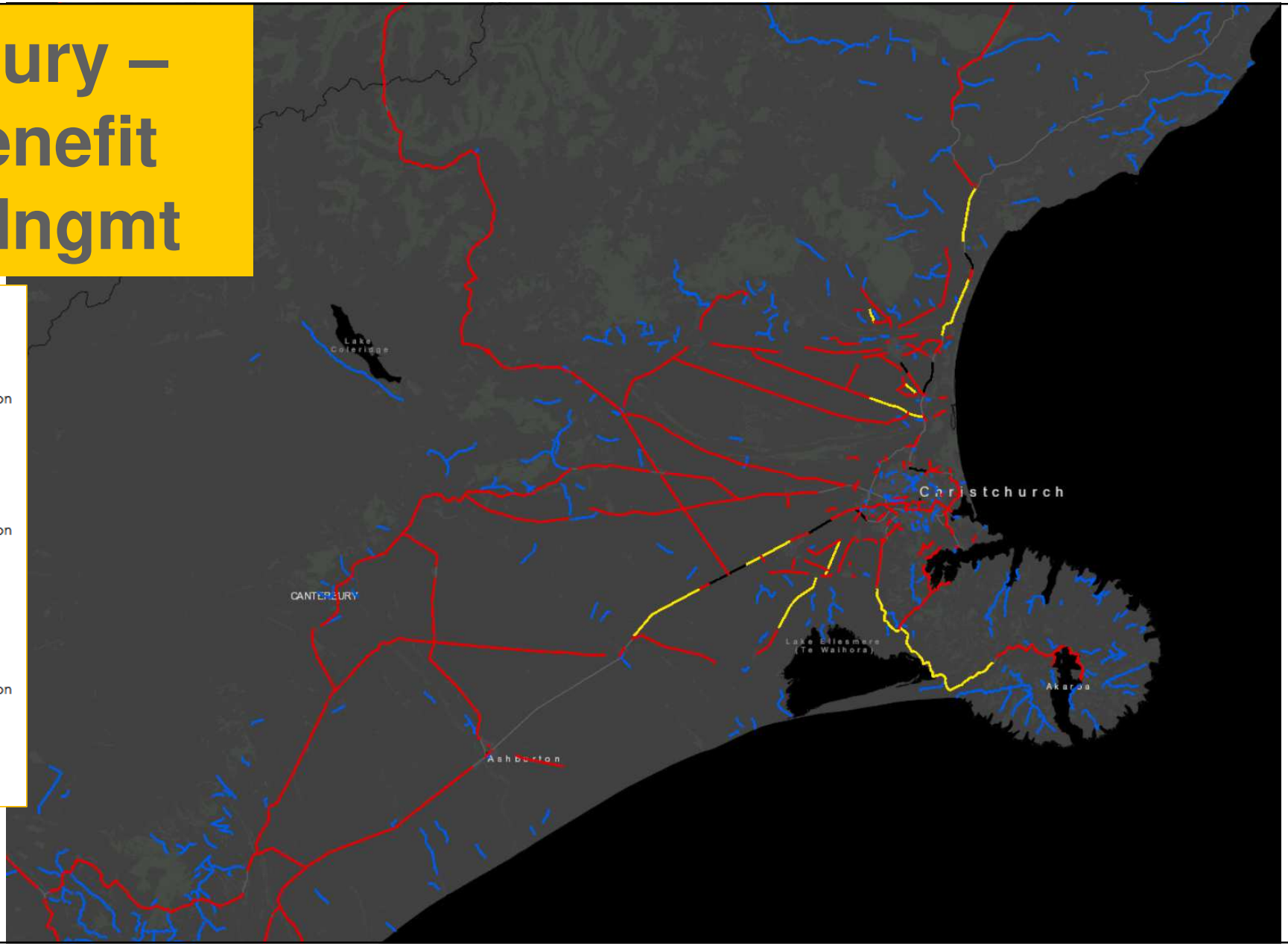
Canterbury – High Benefit Speed Mngmt



High Benefit Speed Management

Top 10% DSi Saving Network Sections
- Challenging Conversation
- Engineer Up - Urban
- Engineer Up - Safe System Transformation
- Engineer Up - Supporting Treatment

First 10% Interventions
- Challenging Conversations
- Engineer Up - Urban
- Engineer Up - Safe System Transformation
- Engineer Up - Supporting Treatment
- Self Explaining - Reduce Speed Limit

Second 10% Interventions
- Challenging Conversations
- Engineer Up - Urban
- Engineer Up - Safe System Transformation
- Engineer Up - Supporting Treatment
- Self Explaining - Reduce Speed Limit

Potential Speed Increase

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Start with the ‘Low Hanging Fruit’

- Suburban/CBD shopping streets

- Residential traffic calmed areas

- School zones

- Unsealed/winding/narrow rural roads

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Cycling Network Guidance (CNG)

https://nzta.govt.nz/cng

Home › Walking, cycling and public transport › Cycling › Cycling standards and guidance ›

Cycling network guidance

CNG home | Site map | Planning a cycling network | Designing a cycling facility | More

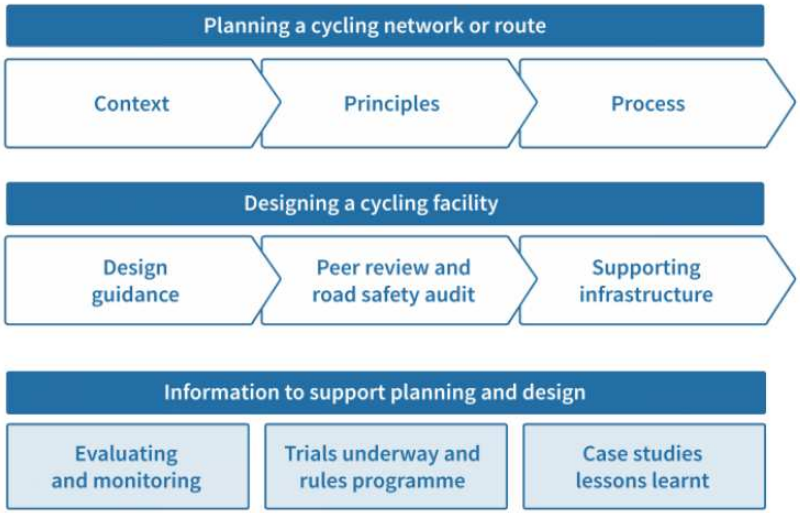
- Evaluating and monitoring
- Trials underway and rules changes
- Case studies
- What's new
- Guidance notes and tools

Cycling network guidance – planning and design

What provision should be made for people cycling within our transport network, and where?

Cycling Network Guidance – planning and design (CNG) aims to promote a consistent, best-practice approach to cycling network and route planning throughout New Zealand. It sets out a principles-based process for deciding what cycling provision is desirable, and provides best-practice guidance for the design of cycleways.

The figure below provides an overview of the CNG's content.



Overall the guidance provides the essential ingredients of good planning and design but also encourages innovation!

The guidance is not solely for 'cycle-specific' projects; it also adds value to planning and design of general transport projects. The inclusion of case studies and trials is important for the

CNG wins Highly Commended at Bike to the Future Awards

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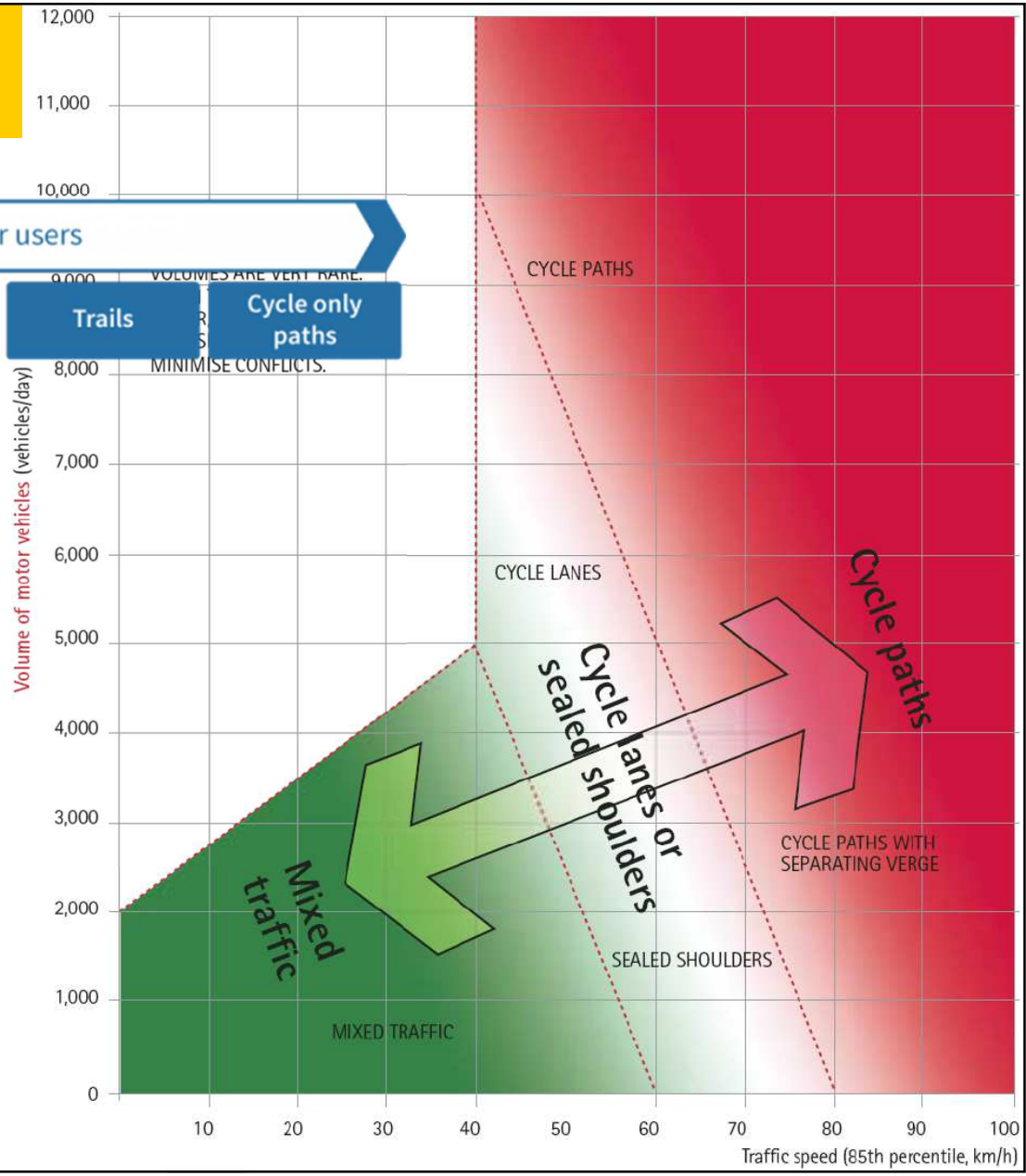
Choice of cycleway type

Increasing degree of separation from motor traffic and other users

Shared roadway	Sealed shoulders	Cycle lanes	Separated cycleways	Shared paths	Trails	Cycle only paths

- Neighbourhood greenways
- Bus lanes
- Transit lanes
- Shared zones
- Mixed traffic



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Neighbourhood Greenways

- Comprehensive **signage & markings**
  - Make people aware of route and its destinations
- Intersection controls that **slow/divert** traffic
  e.g. mini-roundabouts, one-way entrances
- Facilities to assist **crossing** busy roads
  e.g. central islands, traffic signals

- **Lower speed** limits along route (30-40km/h)
  - Mid-block devices to slow down or restrict traffic (humps, islands)

Where necessary, short lengths of pathway or cycle track to help "join the dots"

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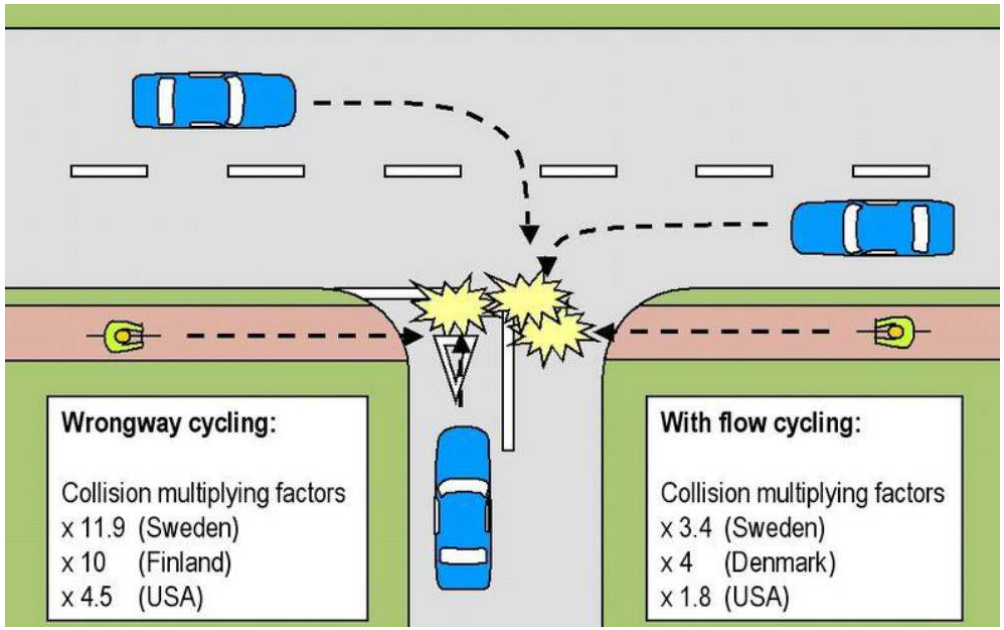
1-way vs 2-way Cycleways

Safety vs practicality:

- 2-way same-side facilities have a greater crash risk if there are side roads and driveways
- Two 1-way facilities each side can take up more width
- Don't want wrong-way downhill
- Good sightlines + platforms help

CNG has a tool to help calculate the relative risk of each option - SCOT



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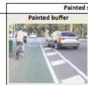
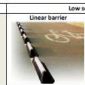
Separated cycleway design issues

CNG: Designing a cycling facility > Between intersections > Separated cycleways > Choice of separator or protection

- Side roads and driveways
  - Bend in or out?
  - Contra-flow cycleway treatments?
- Choice of separator:
  - Width/height of separator
  - Permeability
  - Conspicuity and aesthetics
  - Temporary/permanent …etc
  - Refer to selection matrix →

	Very Good	Good	Neutral	Poor	Very Poor
Key	★★★★	★★★	★★	★	0

	Painted separators		Vertical separators		Vertical + Low	Low separators	
	Painted buffer	Parked cars plus buffer	Rigid bollards	Flexible posts	Linear barrier + posts	Linear barrier	Mountable rubber thresholds
							
Cost/benefit							
Affordability (purchase & installation in preferred conditions)	★★★★	★★★★	★★	★★★	★★★	★★★	★★★
Cyclist perceived safety	★★	★★★	★★★★	★★★	★★★★	★★★	★★★
Other Considerations							
Durability / maintenance	★★	★★★★	★★	★	★★	★★★	★★
Traffic compatibility (Motor vehicle / barrier interactions)	★★★★	★★★	★★	★★★★	★★★★	★★★	★★★★
Aesthetics	★★	★★★	★★★	★	★	★★	★★
Low impact construction	★★★★	★★★★	★★★	★★★★	★★★	★★★	★★★
Min width of separator device (m) Ideal shy space to cyclist (m) Ideal shy space to traffic (m)	0.5 0 0	0.9 0 2.0 (parking space)	0.3 0.25 0.3	0.4 0.25 0.3	0.3 0.25 0.2	0.3 0.25 0.2	0.75 0 0.2
Notes							
General (incl. visibility/conspicuity)	By itself, does not meet definition of "protected" as it does not physically separate cars and cycles.	Requires on-street parking - only effective if parked cars are present, therefore less effective at off-peak parking times. Poorly parked cars may encroach into buffer.	Requires solid anchoring below pavement surface. Colour of vertical element should reflect immediately adjacent road marking colour.	Plastic / rubber product that are bolted / glued to roadway surface. Flexible and frangible when hit by motor vehicles. Colour of vertical element should reflect immediately adjacent road marking colour.	Separators attached to ground, posts attached to separators. Colour of vertical element should reflect immediately adjacent road marking colour.	Generally narrow and low, with various means of fixing to surface and connecting between components.	Should only be used where it is intended for vehicles to cross cycleway. E.g. Quay St Auckland, Papanui Parallel, Christchurch.
Cost	Least expensive option.	Biggest "cost" is space.	Utility conflicts could affect cost.	Spacing of devices affects cost.		Spacing of devices affects cost.	Spacing of devices affects cost.
Cyclist perceived safety	Poor due to no physical element.	Parked cars provides strong deterrent for motorists, but only if present. Some people may find visibility at driveway/side-roads is compromised.	Strong deterrent for motorist. Good vertical element.	Good vertical element - studies show cyclists perceive this as similarly safe to a physically strong barrier.	Good vertical element - studies show cyclists perceive this as similarly safe to a physically strong barrier.	Good deterrent for motorist.	Some deterrent for motorist - good conspicuity - but designed to be driven over.
Durability / maintenance	Thermoplastic / paint needs to be maintained.	Thermoplastic / paint needs to be maintained.	Good durability, but damaged bollards may be expensive to replace.	Flexible posts will be damaged when hit / run over by motor vehicles - may require frequent replacement (but could be seen as sacrificial element).	Flexible posts will be damaged when hit / run over by motor vehicles, may be detached and stolen by vandals - may require frequent replacement (but could be seen as sacrificial element).	Good durability.	Good durability.
Traffic compatibility (Motor vehicle / barrier interactions)	No high speed motor vehicle traffic concerns.	Appropriate for moderate traffic speeds.	Appropriate for moderate traffic speeds.	No high speed motor vehicle traffic concerns.	Appropriate for moderate traffic speeds.	Appropriate for moderate traffic speeds.	Appropriate for moderate traffic speeds.
Aesthetics	Neutral aesthetics.	Good aesthetics over barrier life.	Good aesthetics over barrier life. Potential for damage to bollards so could quickly become ragged looking.	Damaged barriers quickly become ragged looking.	Separators with damaged posts become unpleasant looking.	Neutral aesthetics.	Neutral aesthetics.
Low impact construction	Road marking changes only.	Road marking changes only.	Installation of bollards may have utility conflicts.	Typically glued onto road surface.	Some installation issues on NZ roads - must be bolted into substrate.	Some installation issues on NZ roads - must be bolted into substrate.	Some installation issues on NZ roads - must be bolted into substrate.
Width required	Minimum width is for painted buffer including the edge lines. No shy space required for either cyclist or vehicle.	0.9m is the car door opening zone. The width is taken to the outside of the edge lines. Good if on-street parking is existing and in high demand.	0.25 metres (measured from the inside face of the bollard) should be provided in addition to the cycle lane width for people riding adjacent to vertical elements. However, the associated road marking if provided such as painted buffer could sit within the cycle lane. 0.3m should be provided from the outside of the bollard to the traffic lane and would comprise some of the painted buffer if provided.	0.25 metres (measured from the inside face of the bollard) should be provided in addition to the cycle lane width for people riding adjacent to vertical elements. However, the associated road marking if provided such as painted buffer could sit within the cycle lane. 0.3m should be provided from the outside of the bollard to the traffic lane and would comprise some of the painted buffer if provided.	0.25 metres (measured from the inside kerb face) should be provided in addition to the cycle lane width for people riding adjacent to vertical kerbs. This should be increased to 0.5m if posts are higher than standard handlebars. 0.2m should be provided from the kerb to the traffic lane and could take the form of a 0.1m edge line offset 0.1m from the face of the kerb.	0.25 metres (measured from the inside kerb face) should be provided in addition to the cycle lane width for people riding adjacent to vertical kerbs. 0.2m should be provided from the kerb to the traffic lane and could take the form of a 0.1m edge line offset 0.1m from the face of the kerb.	No shy line is required in addition to the cycle lane width for people riding adjacent to the low profile threshold. 0.2m should be provided from the kerb to the traffic lane and could take the form of a 0.1m edge line offset 0.1m from the face of the kerb.
	Painted buffer	Parked cars plus buffer	Rigid bollards	Flexible posts	Linear barrier + posts	Linear barrier	Mountable rubber thresholds

	Kerb separators			Other separators	
	Cast-in-place barrier kerb	Precast barrier kerb	Raised cycle track (Copenhagen)	Jersey barriers	Planter boxes
					
Cost/benefit					
Affordability (purchase & installation in preferred conditions)	★	★★	★	★★	★★
Cyclist perceived safety	★★★★	★★★★	★★★	★★★★	★★★★
Other Considerations					
Durability / maintenance	★★★	★★★	★★★★	★★★★	★★
Traffic compatibility (Motor vehicle / barrier interactions)	★★★	★★★	★★★★	★★★	★★★
Aesthetics	★★★	★★★	★★★	★	★★★★
Low impact construction	★★	★★★	★	★★★★	★★★
Min width of separator device (m) Ideal shy space to cyclist (m) Ideal shy space to traffic (m)	0.3 0.25 0.2	0.5 0.25 0.2	0.2 0 0.2	0.75 0.45 0.4	0.4 0.45 0.2
Notes					
General (incl. visibility/conspicuity)	Width and height can vary. Designed to fit curves in road, could include lowered sections at driveways.	Constructed off-site and bolted / glued to pavement surface.	Half-height between roadway and footpath. Low mountable kerb could encourage cars to park in cycle track.	Could be pre-cast concrete, or plastic shells that are easy to transport then filled with water to make heavy. Need to consider pedestrian crossing movements.	Of varying widths, heights, materials and fixtures. Involve some central planted feature.
Cost	More handling / traffic management time for on-site installation.	Cost will increase if road surface is not flat / smooth and more effort is required to fit kerbs to road.	Reconstruction including storm-water improvements is likely.	Provide gaps along the facility to allow water to access existing drainage infrastrcuture.	Spacing of planters affects cost. Will have ongoing requirements to tend to contents (plantings).
Cyclist perceived safety	Strong deterrent for motorist. Horizontal separation.	Strong deterrent for motorist. Horizontal separation.	Cyclists may feel too close to motor vehicles if no buffer provided, provide additional width in the cycle facility and minimise any drainage infrastructre alongside the kerb so can choose to ride further from traffic.	Strong deterrent for motorist. Good vertical element plus suitable horizontal separation.	Strong deterrent for motorist. Good vertical element plus suitable horizontal separation.
Durability / maintenance	Less durable than pre-stressed concrete options.	Very good durability if pre-stressed concrete.	Very durable design.	Very durable barriers.	Consider maintenance partner for watering etc; on busier roads may require temporary traffic management.
Traffic compatibility (Motor vehicle / barrier interactions)	Appropriate for moderate traffic speeds.	Appropriate for moderate traffic speeds.	No high speed motor vehicle traffic concerns.	Compatible with higher speed traffic. Care must be given to end treatments.	Appropriate for moderate traffic speeds.
Aesthetics	Good aesthetics over barrier life.	Good aesthetics over barrier life.	Good aesthetics over barrier life.	Strong visual impact on street. Can be painted for improved aesthetics.	Barrier with plantings enhances street aesthetics if well maintained.
Low impact construction	Kerbs have to be poured in place and pinned into the carriageway.	Some installation issues on NZ roads - must be bolted into substrate.	Complete reconstruction is likely required.	Minimal - heavy objects that simply need to be placed in the correct position.	Barrier installation is quick and non-invasive. If protected by kerbs this will require more invasive construction. Water-filled barriers are a quickly installed temporary option.
Width required	0.25 metres (measured from the inside kerb face) should be provided in addition to the cycle lane width for people riding adjacent to vertical kerbs. 0.2m should be provided from the kerb to the traffic lane and could take the form of a 0.1m edge line offset 0.1m from the face of the kerb.	0.25 metres (measured from the inside kerb face) should be provided in addition to the cycle lane width for people riding adjacent to vertical kerbs. 0.2m should be provided from the kerb to the traffic lane and could take the form of a 0.1m edge line offset 0.1m from the face of the kerb.	No shy space provided. To address the height difference issue between the cycle lane and carriageway, provide additional space in the cycle track.	0.45 metres (measured from the inside face of the concrete shells) should be provided in addition to the cycle lane width for people riding adjacent to vertical elements. 0.4m should be provided from the kerb to the traffic lane and could take the form of a 0.1m edge line offset 0.3m from the face of the kerb.	0.45 metres (measured from the inside face of the concrete shells) should be provided in addition to the cycle lane width for people riding adjacent to vertical elements. 0.2m should be provided from the kerb to the traffic lane and could take the form of a 0.1m edge line offset 0.1m from the face of the kerb.
	Cast-in-place barrier kerb	Precast barrier kerb	Raised cycle track (Copenhagen)	Jersey barriers	Planter boxes

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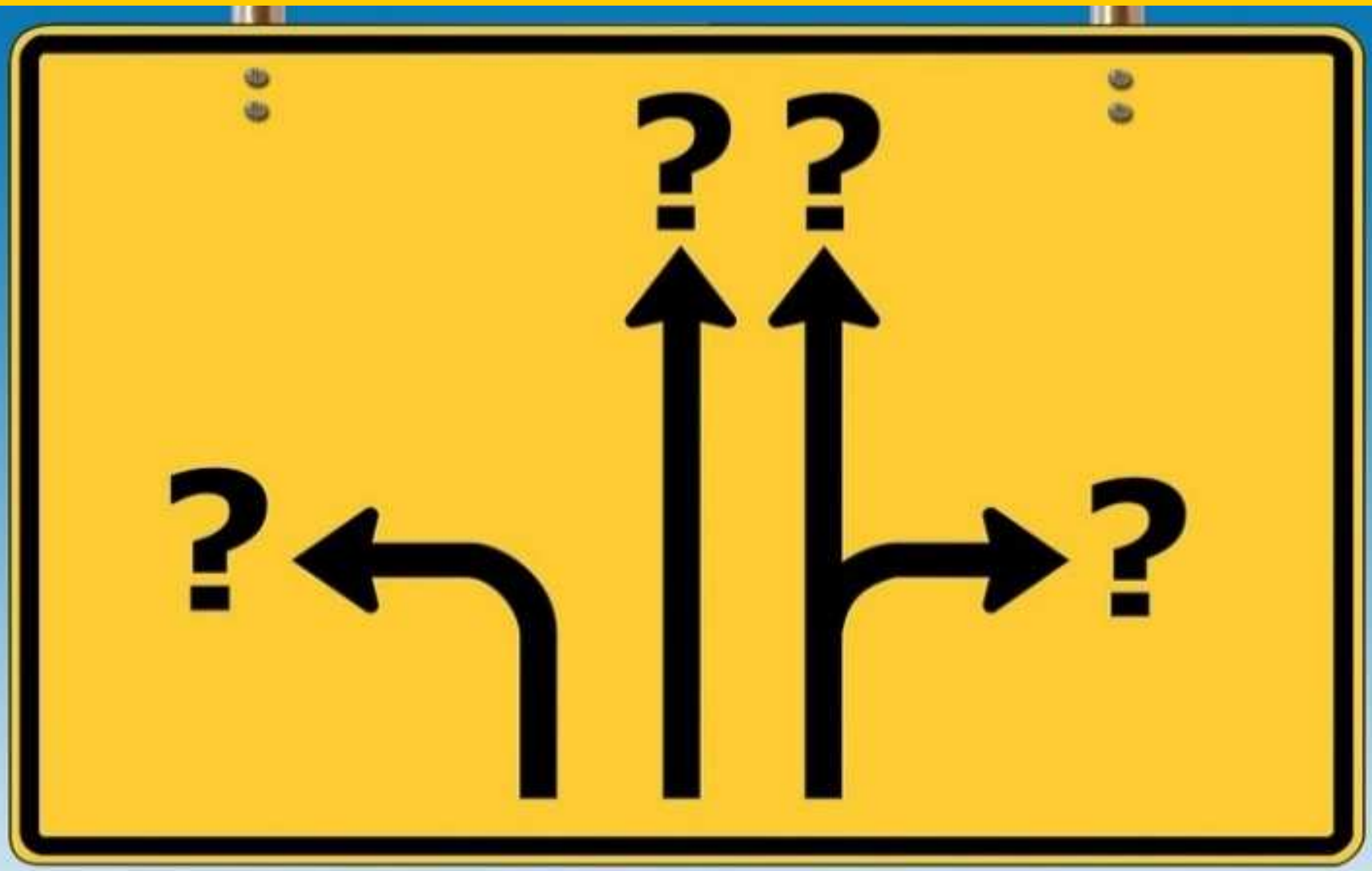
Thank you, are there any questions?



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