Making Safer Speeds Happen

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CAN Do Workshop, Jul 2018

VIASTRADA
TRAFFIC ENGINEERING AND PLANNING

Session Outline

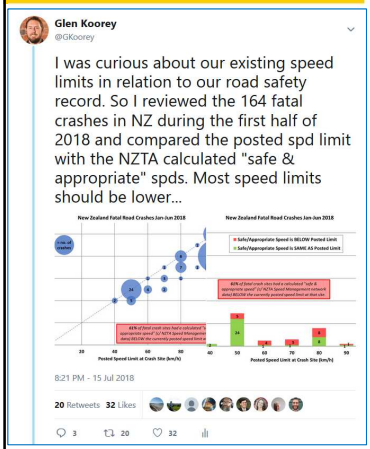
- Effect of Speed on Safety
  - What Influences Driver Speed Choice?
- Speed Limits
  - What determines Speed Limits?
  - NZ Setting of Speed Limits Rule 2017
- Process for Setting speed limits
  - NZTA Data Map examples
- Common Concerns with Lower Speeds
- Keys to limiting Vehicle Speed

Speed in New Zealand

- Speed is a major factor in crash occurrence & severity
  - Illegal speed over speed limit
  - Inappropriate speed for conditions
- 2014-16 in NZ (MoT crash stats)
  - **16%** of minor injury crashes had a speed factor
  - **21%** of serious injury crashes had a speed factor
  - **29%** of fatal crashes had a speed factor

On par with drink-driving as our biggest road safety problem

Those stats may be under-estimating things…

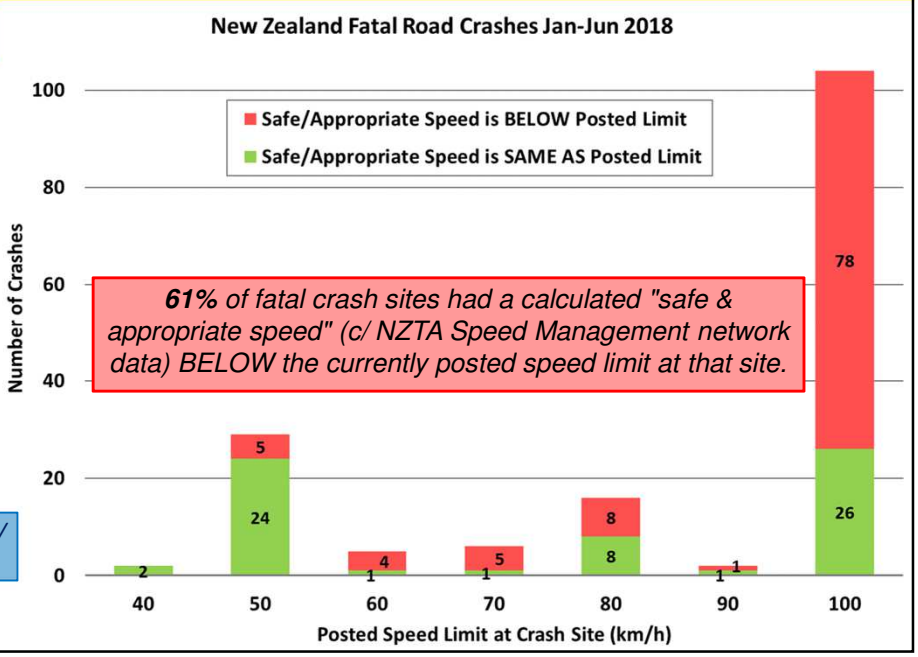

Glen Koorey
@GKoorey

I was curious about our existing speed limits in relation to our road safety record. So I reviewed the 164 fatal crashes in NZ during the first half of 2018 and compared the posted spd limit with the NZTA calculated "safe & appropriate" spds. Most speed limits should be lower...

8:21 PM - 15 Jul 2018

20 Retweets 32 Likes

https://twitter.com/GKoorey/status/1018410307004162048



What Influences Driver Speed Choice?

- User Factors
  - Age, Gender
  - Hazard Perception
  - Peer Pressure
  - Societal Norms
  - Risk Acceptance
- Vehicle Factors
  - Engine Power
  - Steering (ESC)
  - Tyres, Brakes (ABS)
- Road/Environment Factors
  - Traffic/Pedestrian Density
  - Road Surface Condition
  - Lighting/Visibility
  - Traffic Management/Calming
  - Speed Limits
  - Enforcement Levels/Penalties
  - Weather Conditions
  - Sight Distances
  - Road/Lane Widths
  - Signs/Markings

What Determines Speed Limits?

- Road function / role
- Adjacent land use
- Observed travel speeds
- Traffic volumes
- Presence of active users
- Road alignment / x-section
- Intersections / driveways
- Crash history
- Local community concern
- Also public consultation incl.
  - NZ Police & NZTA
  - Any adjacent RCAs
  - NZ Automobile Assn
  - Road Transport Forum NZ

  (but not walk/cycle groups…)
  - Local communities affected
  - *"any other organisation or road user group that the RCA considers to be affected by the proposed speed limit"*

Speed Limits

- A balance between
  - A safe road network
  - Efficient movement of people and goods
  - Encouragement of active transport modes
  - Preservation of amenity
- To achieve these objectives, limits must be
  - Credible & compatible with user experience
  - Consistently applied throughout our road networks
  - Clear and unambiguous ("self-explaining")

NZ Setting of Speed Limits Rule (2017)

1.3 Purpose

https://nzta.govt.nz/resources/rules/setting-of-speed-limits-2017

The purpose of this Rule is to—

(a) give effect to a nationally-consistent and evidence-based approach to speed management; and

(b) provide a mechanism for road controlling authorities to set speed limits for roads in their jurisdictions; and

(c) require road controlling authorities, when reviewing speed limits, to decide which speed limit is safe and appropriate for a road; and

(d) encourage road controlling authorities to prioritise the review of roads where achieving travel speeds that are safe and appropriate is likely to deliver the highest benefits.

Good Speed Limit Practices

- Limit is appropriate to road function
  - High conflict areas may have lower limits
- Speed zones of adequate length
  - Avoid frequent changes of speed limit
- Clear and regular signposting
  - Ensure regulatory requirements met at least
- Don't apply to compensate for hazards
  - Fix deficiency or use advisory speed sign

Is it the speed limit that needs changing?

"Survivable" Speed Limits

- Match speed limits and road environments, based on the potential damage and survivability of a situation:
  - Where pedestrians and cyclists are present (e.g. residential areas): **30 km/h**
  - Where side-on crashes could occur (e.g. intersections): **50 km/h**
  - Where head-on crashes could occur (e.g. overtaking, roadside poles): **70 km/h**
  - Where traffic is fully protected from the above dangers: **90 km/h+**

NZTA Speed Data

2.4 Supply of information about speed management to road controlling authorities

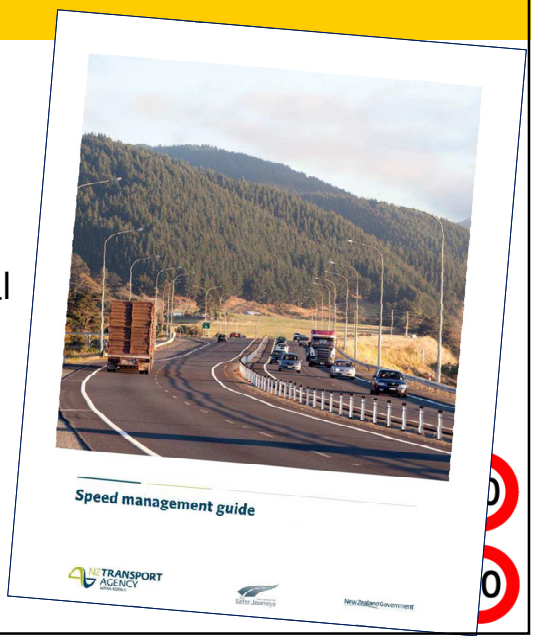
2.4(1) The Agency must supply, to each road controlling authority, information about speed management for public roads within that road controlling authority's jurisdiction.

2.4(2) The Agency must, in supplying information under *2.4(1)*, prioritise information about public roads where achieving travel speeds that are safe and appropriate is likely to deliver the highest benefits in terms of safety and efficiency.

2.4(3) A road controlling authority may request from the Agency information about speed management for any road within that road controlling authority's jurisdiction and, if requested by a road controlling authority, the Agency must supply such information if that information is available.

NZTA Speed Management Guide

- Released Nov 2016 (39pp)
  - *www.nzta.govt.nz/safety/speed-management-resources/*
  - Also toolbox and appendices (153pp)
  - Also Infrastructure Risk Rating manual
- Used to inform development of NZTA data maps ("MegaMaps")

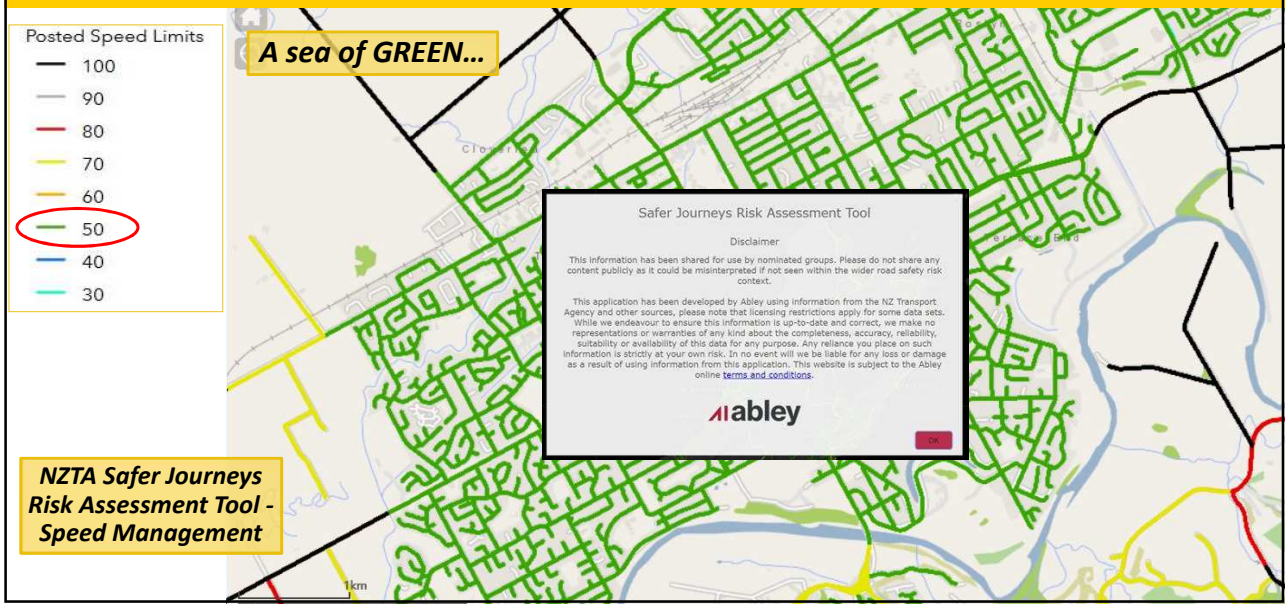


Speed Limit Setting Process

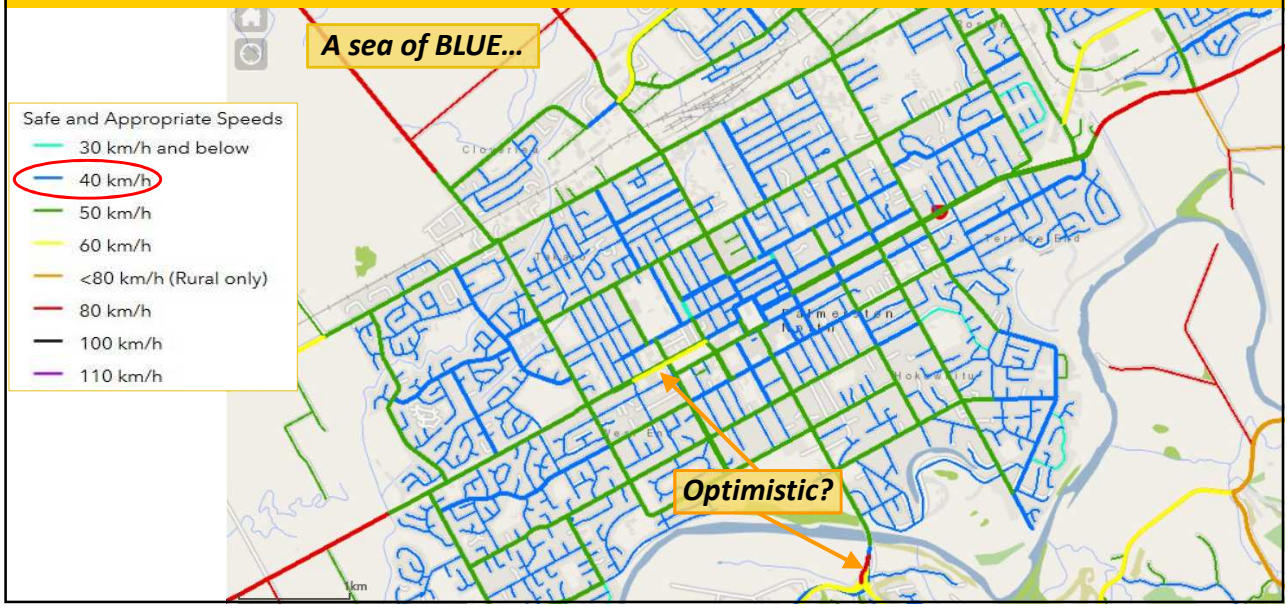
- Default urban (50 km/h) and rural (100 km/h) limits still enshrined *(for now…)*
  - Can also set 10 / 20 / 30 / 40 / 60 / 70 / 80 / 90 / 110 km/h limits
  - All other limits must be specifically noted
  - Can set seasonal / temporary / emergency / variable limits
- Rule has set procedures for RCAs reviewing speed limits
  - Use NZTA MegaMaps data and local context
  - Undertake public consultation on proposed changes
  - Set speed limits using the Bylaw process

Quite a process…

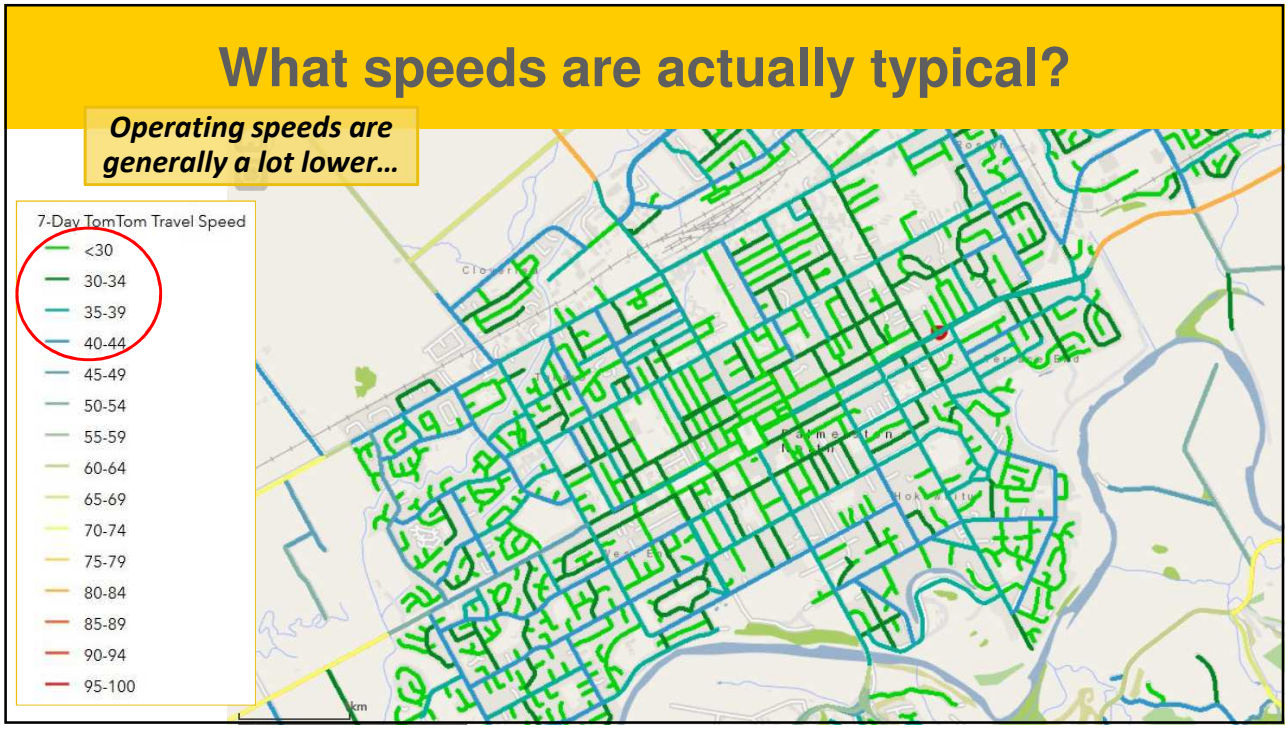
Current Speed Limits in Palmerston North



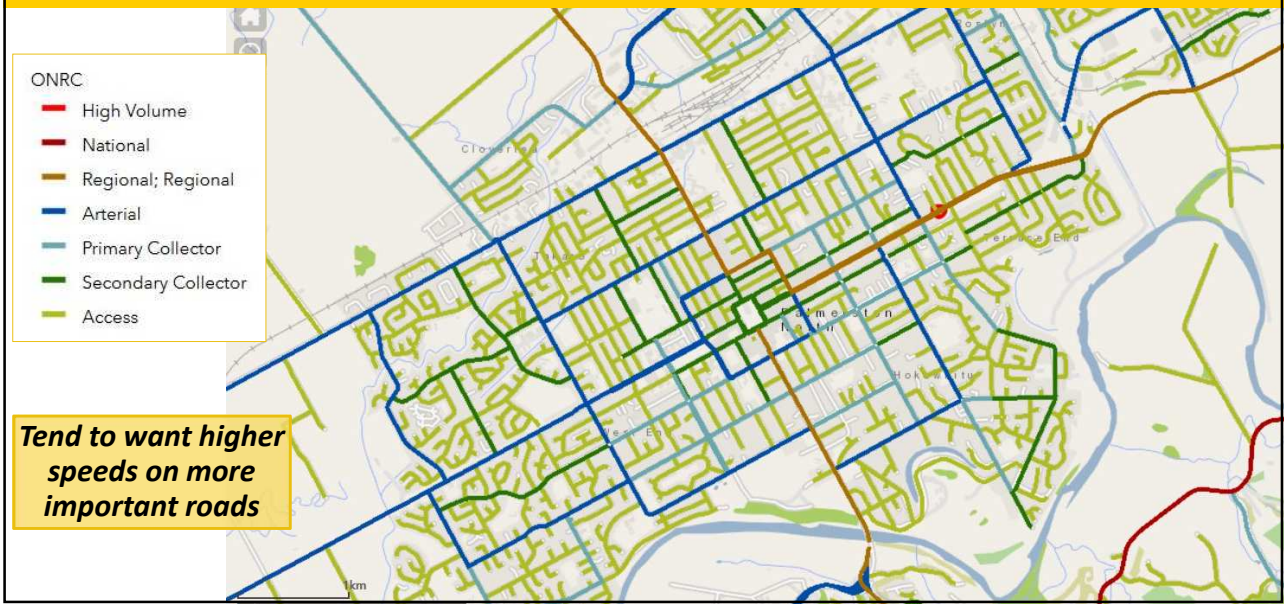
Calculated "Safe and Appropriate" Speeds



What speeds are actually typical?

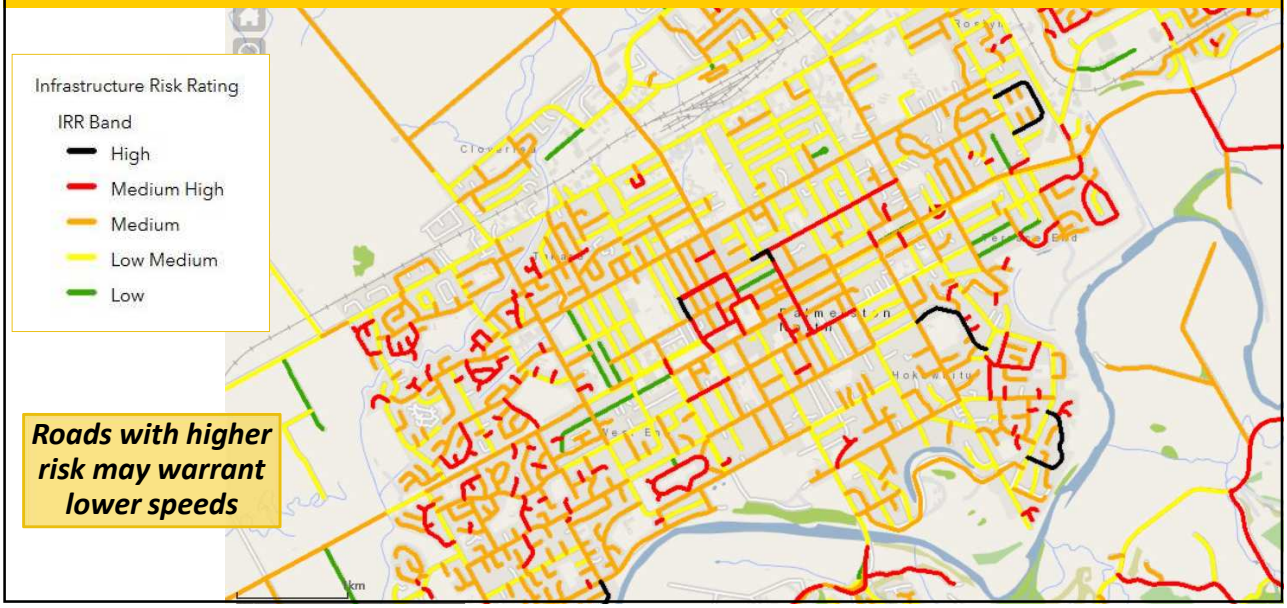


"One Network" Road Classification (ONRC)



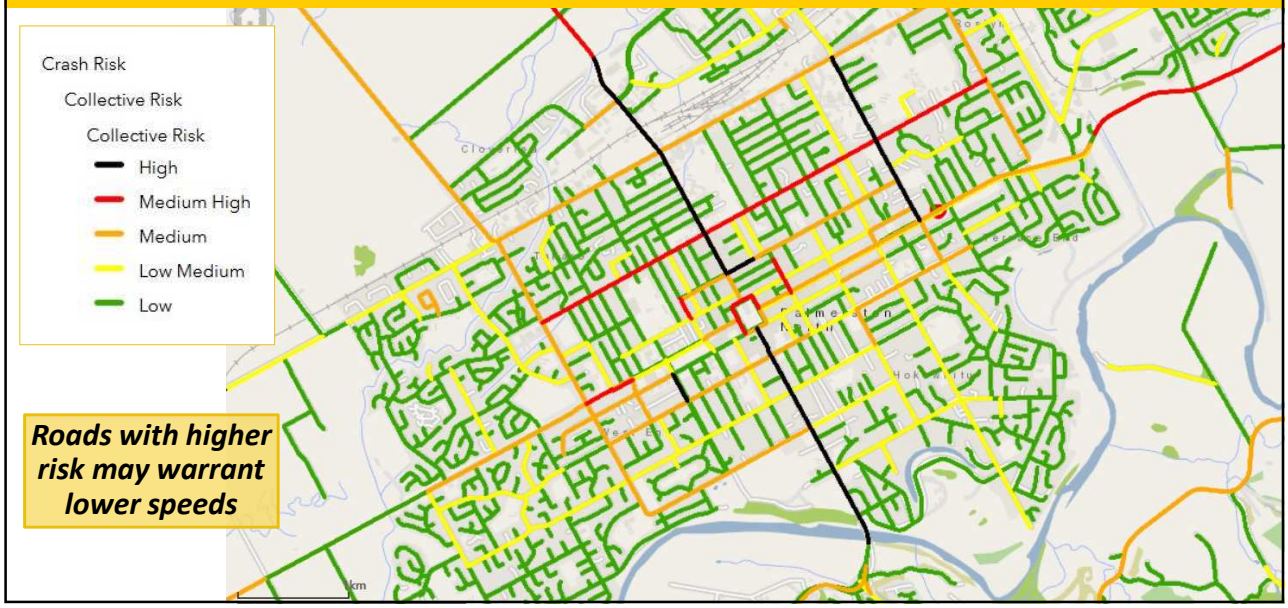
Tend to want higher speeds on more important roads

Infrastructure Risk Rating

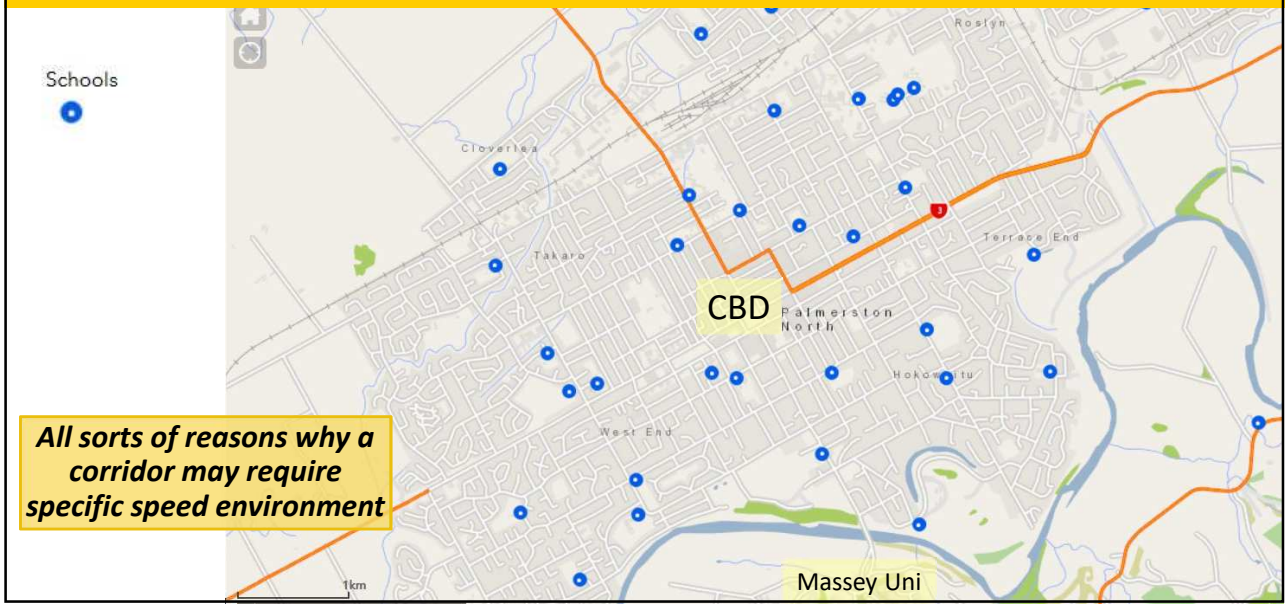


Roads with higher risk may warrant lower speeds

Crash Risk (Individual and Collective)



Local Context



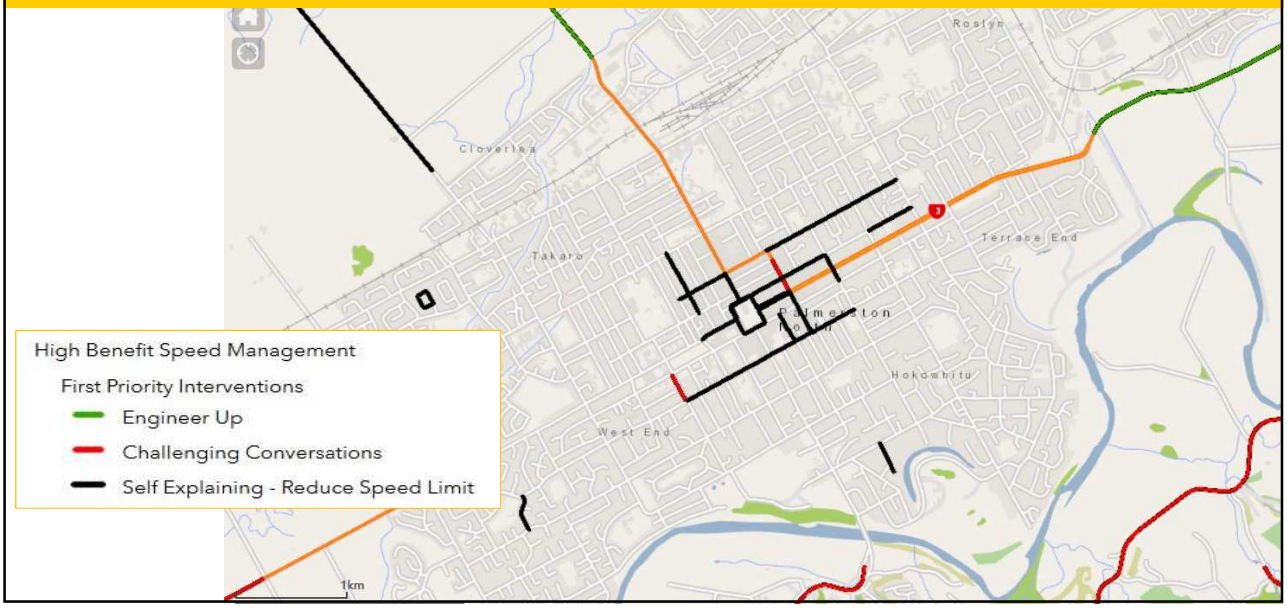
Speed Management Options

Strategy options:

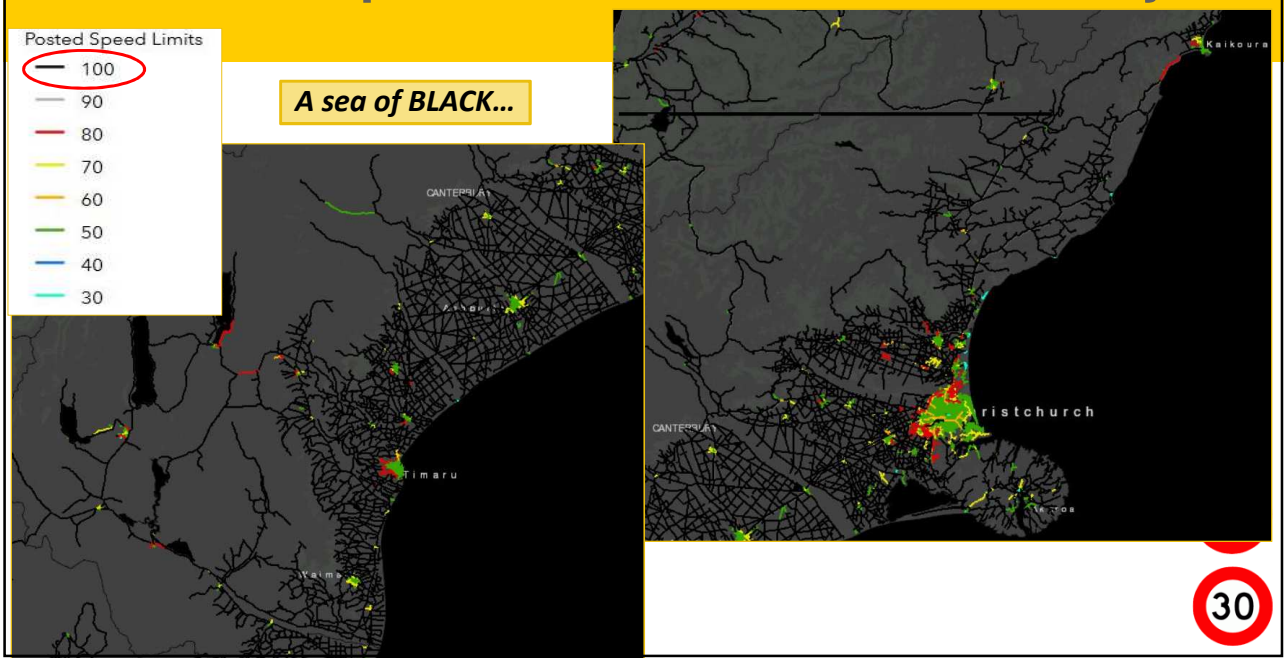
- Raise/lower speed limits
  - Without any road changes ("self-explaining")
  - Variable speed limits? (e.g. school zones)
  - Temporary reduction until road improvements
- "Engineering up/down" (physical works)
  - To support existing / lower / higher speed limit
- No change to existing limit – fine as is

Some options may be challenging

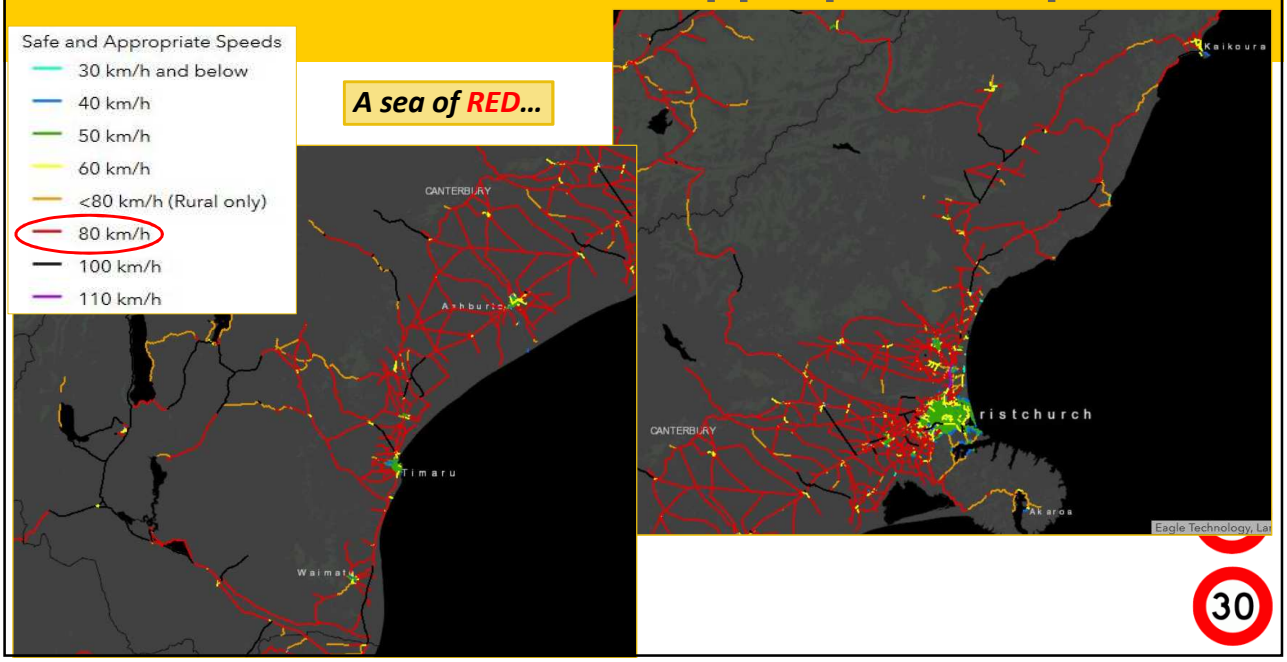
Suggested Speed Management Strategy



Current Speed Limits in Rural Canterbury



Calculated "Safe and Appropriate" Speed



A region-wide approach suggested

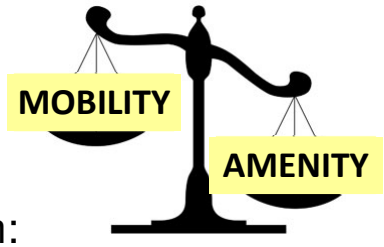
- Identify common principles, e.g.
  - Similar roads should have similar treatments
  - Consistency across district boundaries
  - Crash blackspots should be slowed down or engineered up
  - Look for "low hanging fruit" - winding/narrow/unsealed rural roads
  - Aim for a certain percentage of "change limit/road" kms each year
  - Road hierarchy should dictate who to listen to (locals v road users)
- Use NZTA maps as a starting point
  - But may have other local knowledge/strategies
- Find out about local active mode uses & crashes/concerns

Public engagement

- Focus on **risk** – highlight safety record and relative severities
- Have **data**! Risk ratings, Speeds, Community concerns, etc
- Explain the **link** between speed and casualty rates
  - Lots of research, in NZ and overseas
- Demonstrate a **strategy** that is considering all options
- Talk to **everyone** (residents, schools, active users, etc)
  - Not just motorists (AA, RTF, etc)
- Have ready answers to **pre-empt** the usual concerns
  - Such as…

"But won't lowering speed limits greatly increase Travel Times?"

- Maybe a little, but…
  - Most traffic delay is due to **other traffic**
  - Most traffic delay occurs at **intersections**
  - Arterial routes generally ***won't*** be targeted



- You will gain more economic benefits from:
  - **Safety** benefits of reduced speeds
  - **Health** benefits of encouraging more active trpt
  - **Retail** benefits from encouraging passing trade
  - **Property Value** benefits due to more liveability

*Trading a little mobility for vastly improved **amenity***

"The average speed is already well below the speed limit"

- So reinforce that with an **enforceable** speed limit!

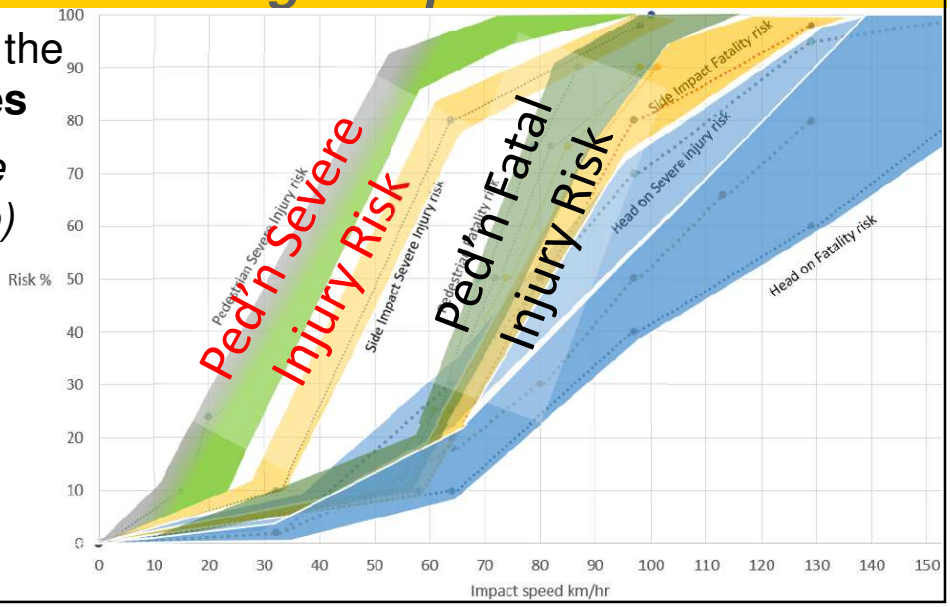
- *Also sends a clear encouraging message to those who wish to walk or cycle*

"It's not speed that causes crashes, it's poor driving and poor roads"

- Speed affects the **consequences**

  (it affects the likelihood too)

Scott & Mackie 2014



"The public don't want reduced speeds"

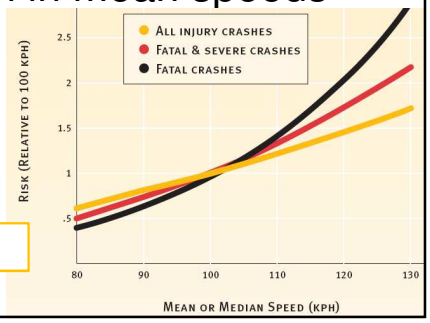
- **WHO are you asking?**

"Lower posted speed limits alone won't change traffic speeds"

- So add some minor additional traffic management features to get the speeds down a bit more
  - e.g. remove centrelines on local streets, add central islands
- However, for every 10 km/h posted speed limit reduction, typically we observe a **2-3 km/h** reduction in mean speeds

(NB: 1% speed reduction = -2% crashes & -4% fatals)

Nilsson (2004)



Contributors to higher vehicle speeds

- Street **Length** – visual and physical
  - *Treatments: Have street sections < 250m, Limit forward sight distance (plantings, realignment)*
- Street **Width** – perceived and actual
  - *Treatments: Reduction in visual or actual width (kerbs extensions, plantings), Pavement deflections (chicanes/islands)*
- Smooth **Surfaces**
  - *Treatments: Cobbled/tiled pavements, Vertical deflections (humps/platforms)*

Typical "Local Street" in Somerfield, Chch

80

30

Treated "Local Street" in Somerfield, Chch

80

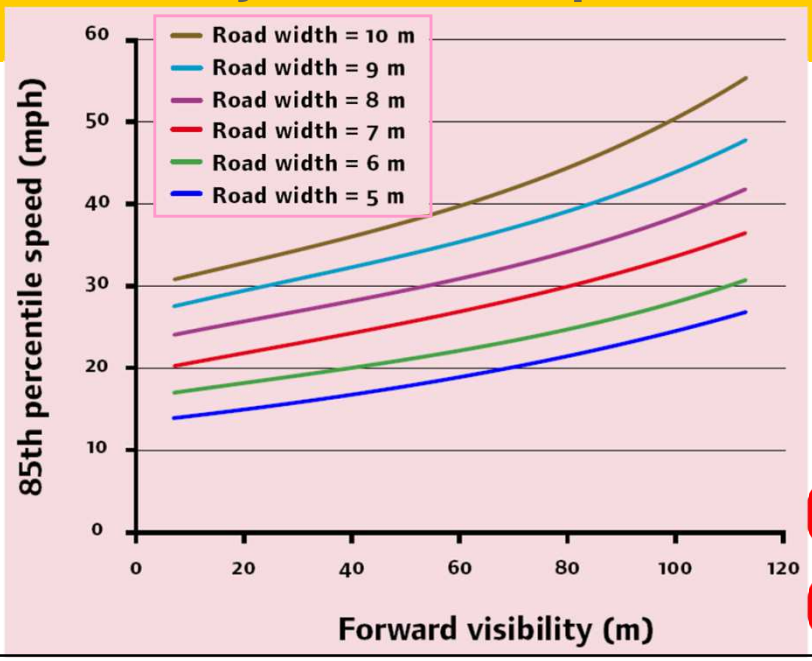
30

Keys to Limiting Vehicle Speed

- Limit total street length
  - Or perceived length (visibility)
- Limit the length of straights
- Curvilinear horizontal alignment
  - Tributary vs Grid network
- Introducing "slow" or "stop" conditions (LATM)
  - Vertical/horizontal deflection
  - Surface treatments
  - Perceived width, etc

Effect of Geometry on Traffic Speeds

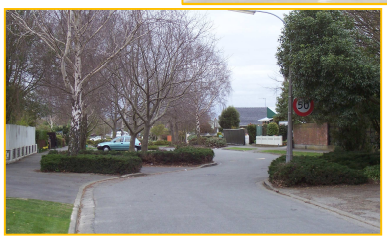
- TRL Report #661 (2007)



Key physical tools for lower speeds

Start with the Low Hanging Fruit

- Suburban/CBD shopping streets



- Residential traffic calmed areas

- School zones

- Unsealed/winding/narrow rural roads

Explain WHY people should slow down

Conclusions

- Speed continues to be a problem in NZ
  - Driver speed greatly affected by road environment
  - Inappropriate speed limits for the conditions
- Setting speed limits easier now in NZ
  - But required review/consultation process still onerous
- Lower speed limits (+ traffic calming) still under-used in NZ
  - Plenty of "low hanging fruit"

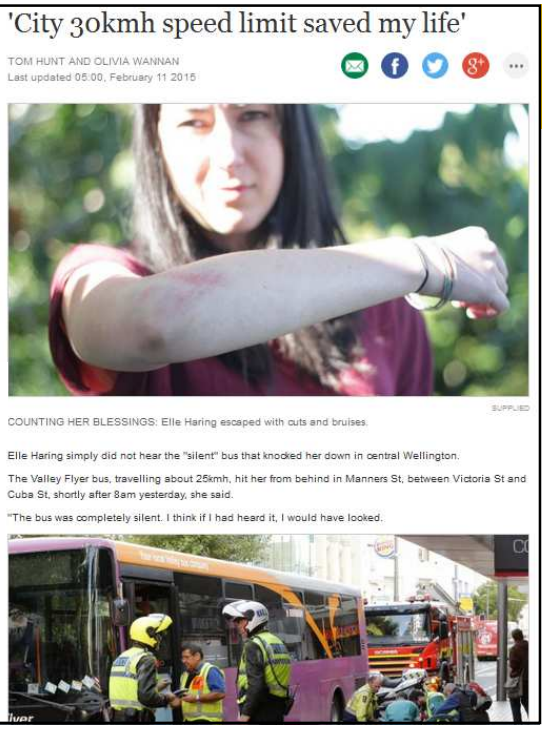
Do we fit the speed limit to the road
or fit the road to the speed limit?

Thank You!

- Any Questions?

- *glen@viastrada.nz*

Dominion Post, 11 Feb 2015



'City 30kmh speed limit saved my life'

TOM HUNT AND OLIVIA WANNAN
Last updated 05:00, February 11 2015

COUNTING HER BLESSINGS: Elle Haring escaped with cuts and bruises.

Elle Haring simply did not hear the "silent" bus that knocked her down in central Wellington.

The Valley Flyer bus, travelling about 25kmh, hit her from behind in Manners St, between Victoria St and Cuba St, shortly after 8am yesterday, she said.

"The bus was completely silent. I think if I had heard it, I would have looked.