



NZ TRANSPORT AGENCY
WAKA KOTAHI

SAFER ROADS AND ROADSIDES

RCA Forum: 4 December 2009

PRESENTER: Colin Brodie, Principal Safety Advisor, HNO

Safer Journeys Proposed Priority Areas

High Concern



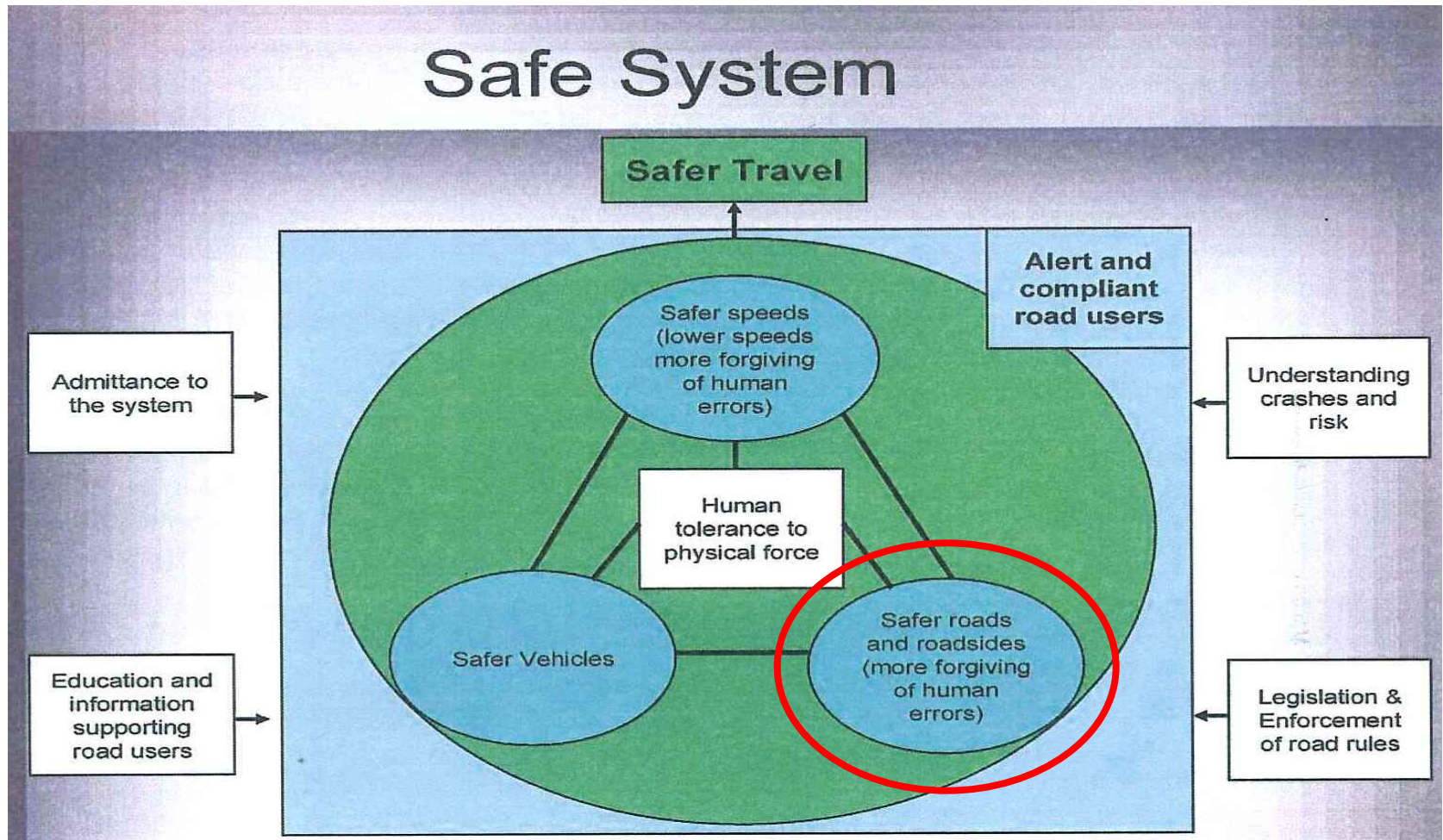
Medium concern



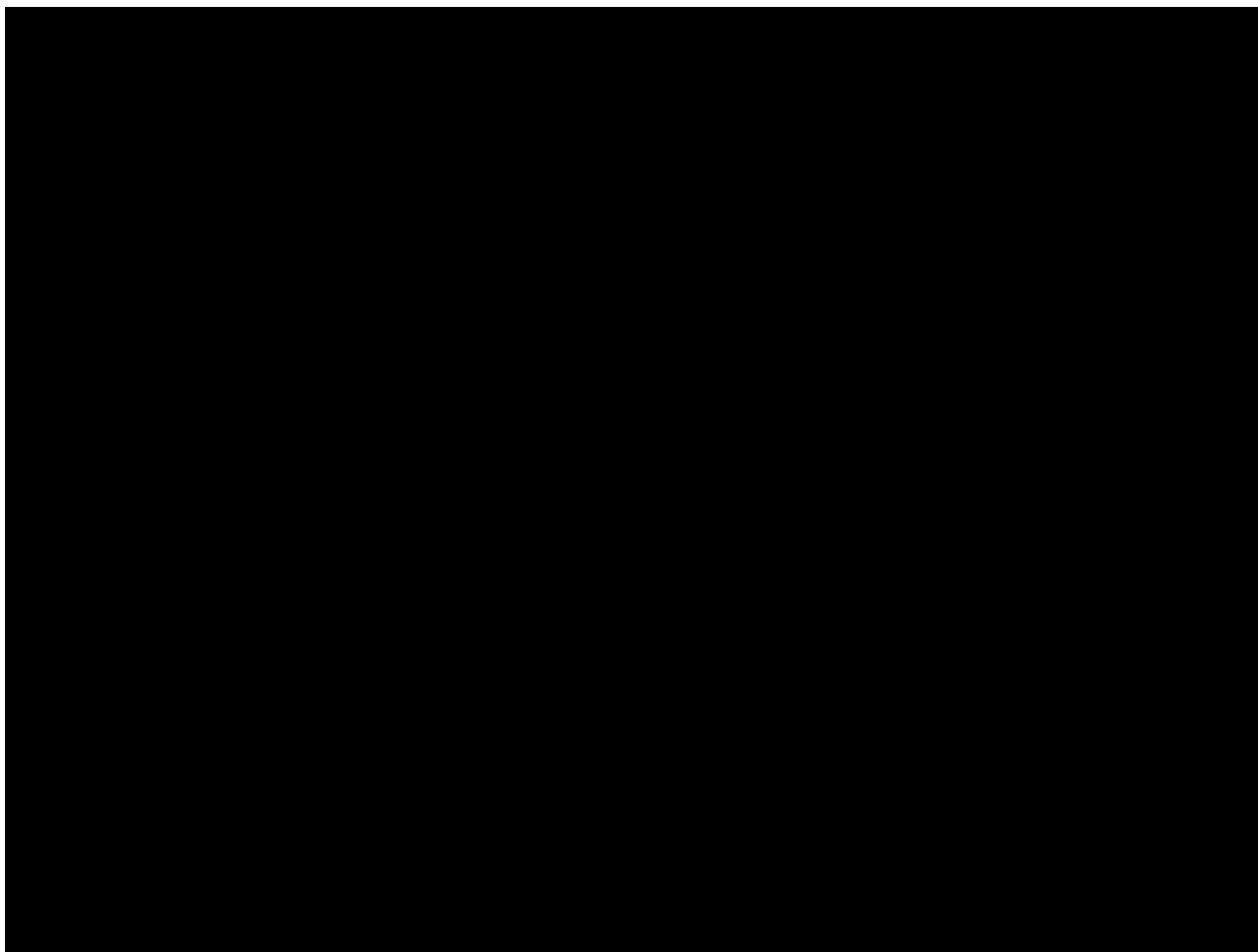
Areas for continued focus/emerging issues



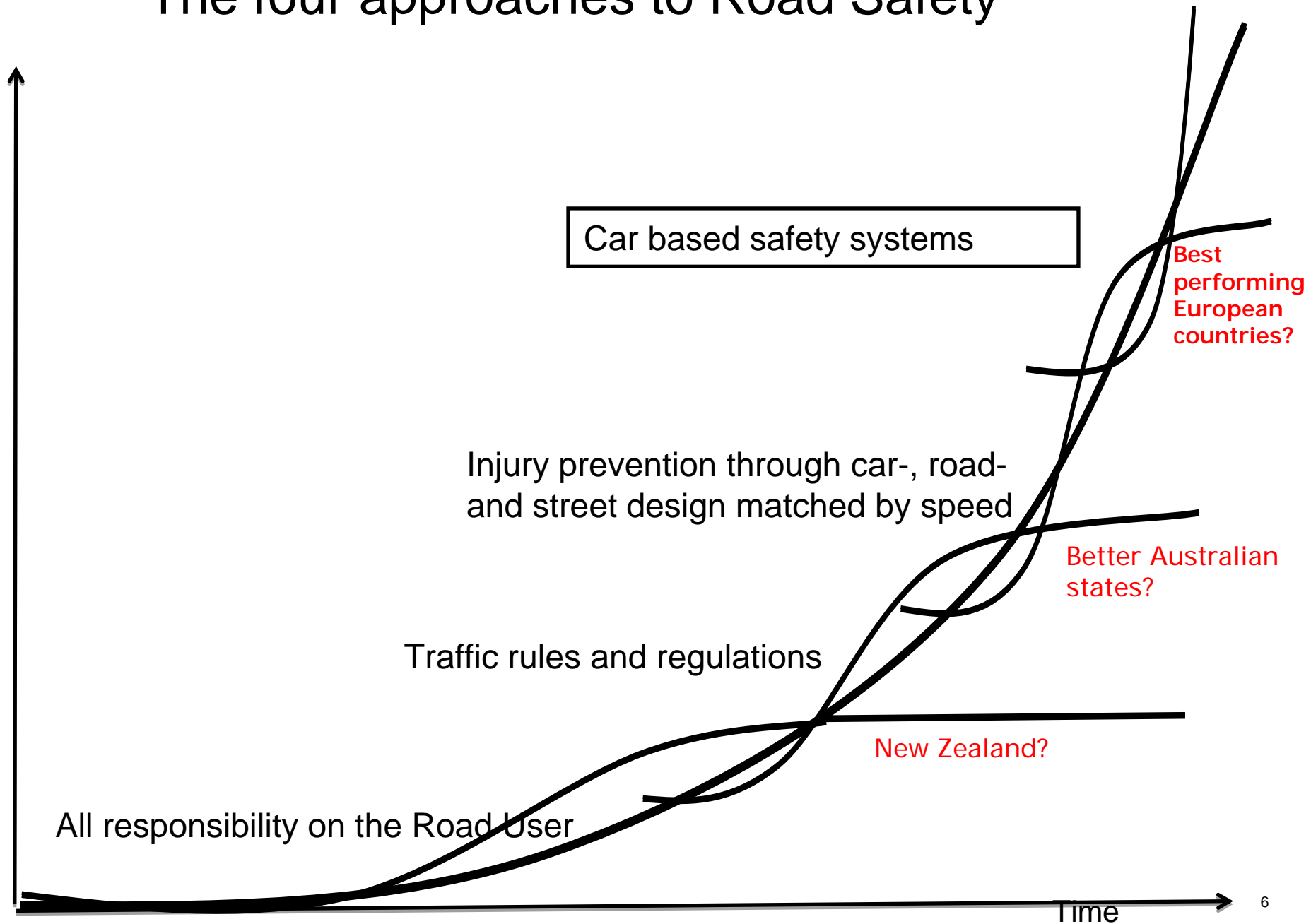
Safe System Approaches: Austroads Model



European Campaign for Safe Roads Design



The four approaches to Road Safety



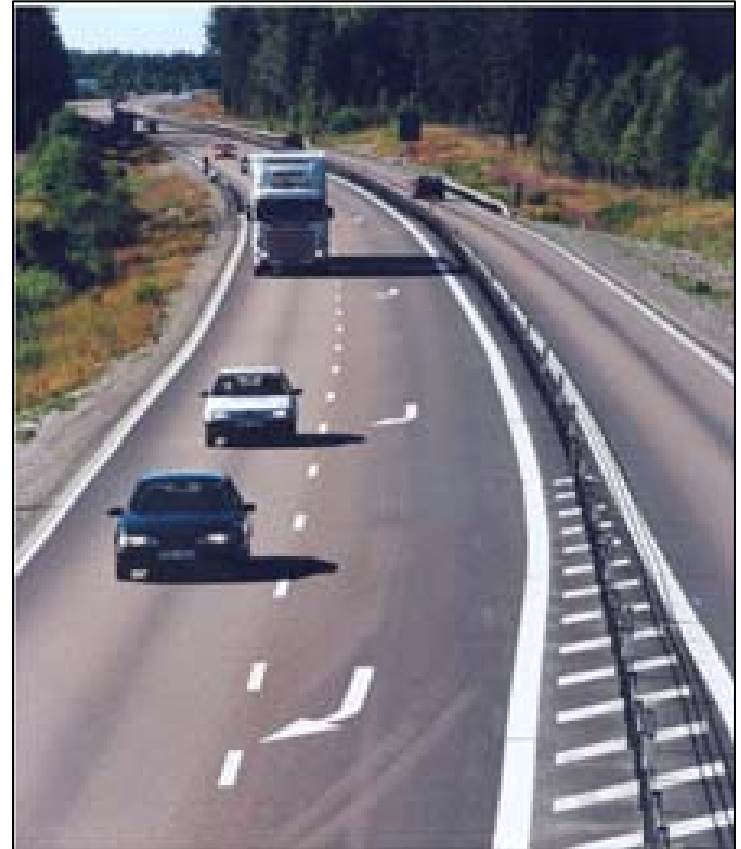
European Safer Roads and roadsides examples



Forgiving roadsides



Tactile markings



"2+1" highway improvements



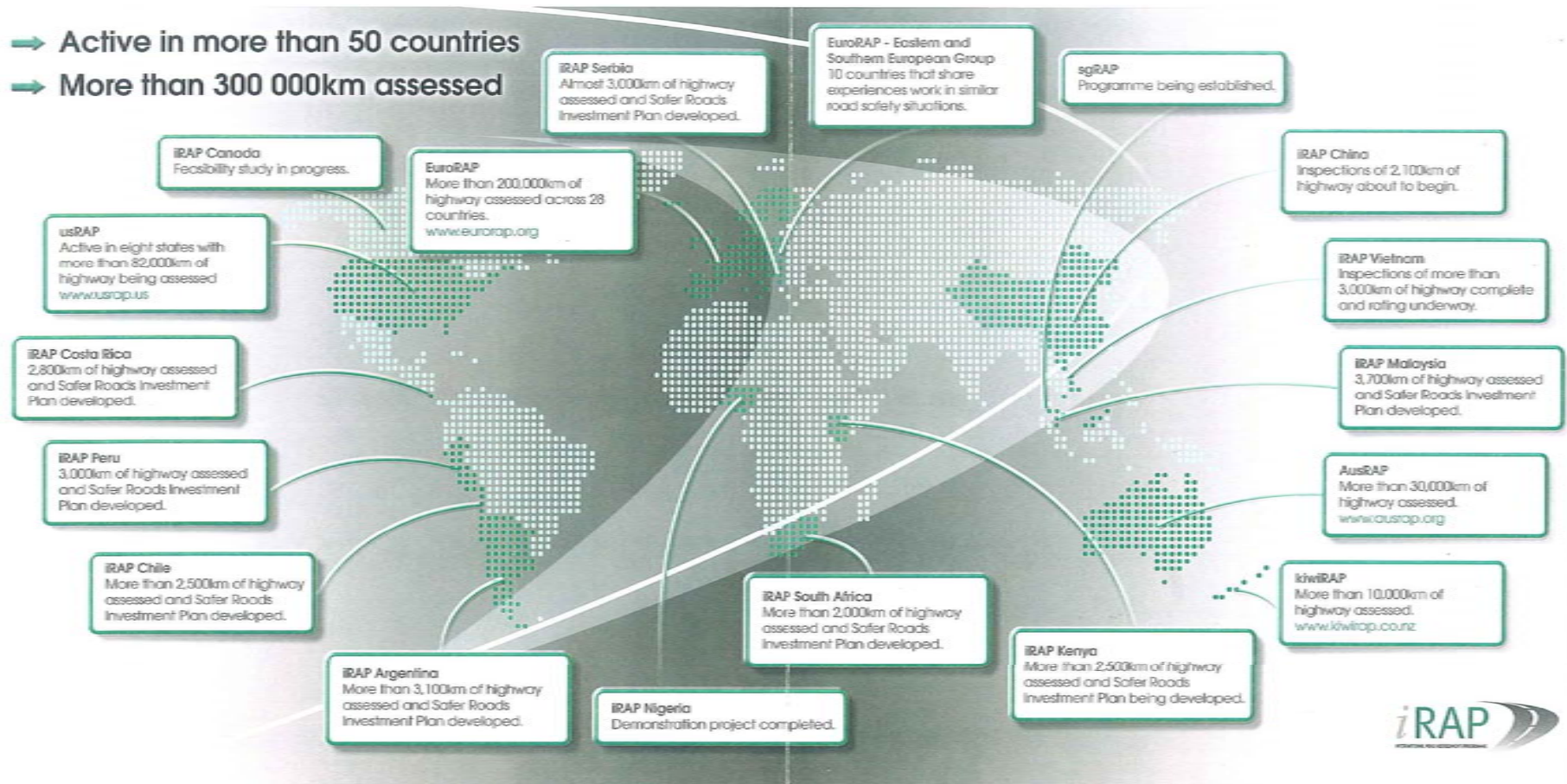
International Road Assessment Programmes



International Road Assessment Programmes:

→ Active in more than 50 countries

→ More than 300 000km assessed



KiwiRAP Objectives

- To reduce deaths and injuries on New Zealand's roads by **systematically assessing risk and identifying safety shortcomings** that can be addressed with practical road improvement measures
- To have risk assessment as a **key factor in strategic decisions** on road improvements, crash protection and standards of road management
- To provide meaningful information on where the greatest levels of risk are faced, and in turn to **influence behaviour**



“RAP” Protocols

Road Assessment Programmes internationally consist of three protocols:

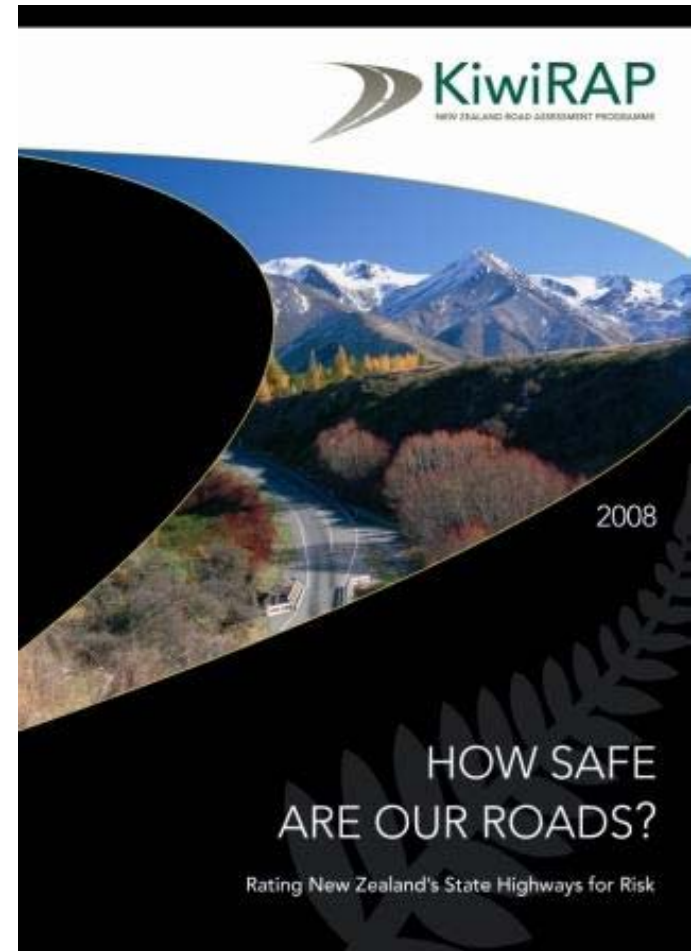
Risk Mapping – crash statistics displayed on a map to visually distinguish between high and low risk routes

Star Rating – rating of between 1 and 5 stars based on how well the road itself is engineered for safety.

Performance Tracking – measures changes in risk over time

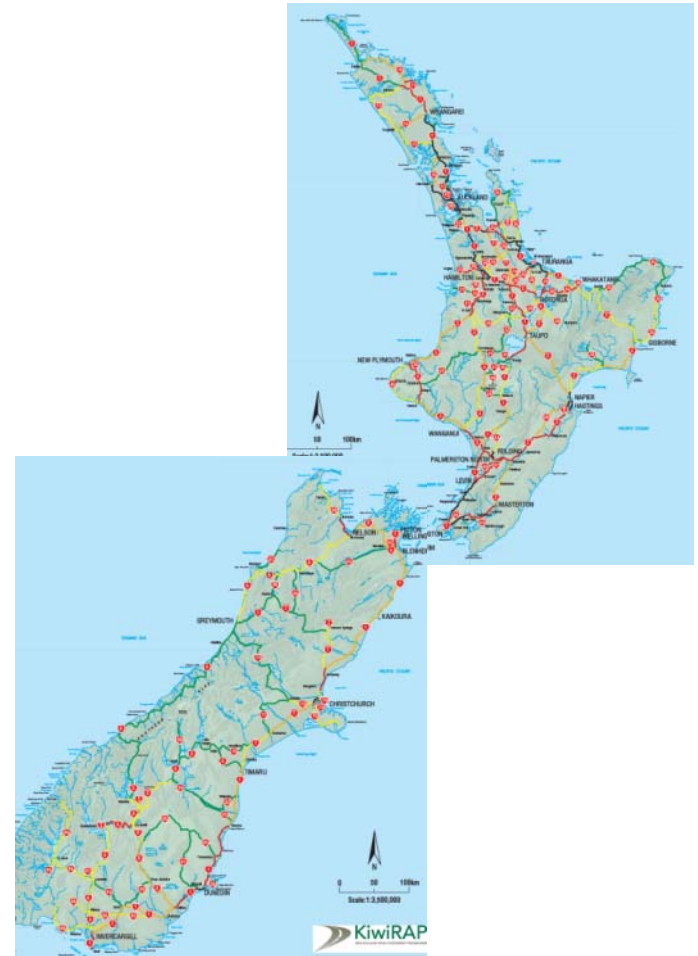
Progress

- Formally launched KiwiRAP in New Zealand through the release of our first set of *Risk Maps* in January 2008
- Currently working on *Star Ratings*



Risk Maps

- State Highway Network
- 172 links
- Average length 63 km
- 2002-2006 crash data
- Fatal and serious injuries



Collective Risk

*Average annual fatal and serious injury crashes
per km*

Density of crashes

Of most interest to road controlling authority

Highlights where greatest gains from road safety investment can be made

Personal Risk

*Average annual fatal and serious injury crashes
per 100 million vehicle-km*

Includes traffic volumes

Exposure to the individual

Likelihood of being involved in a fatal or serious
crash on road

Star Ratings

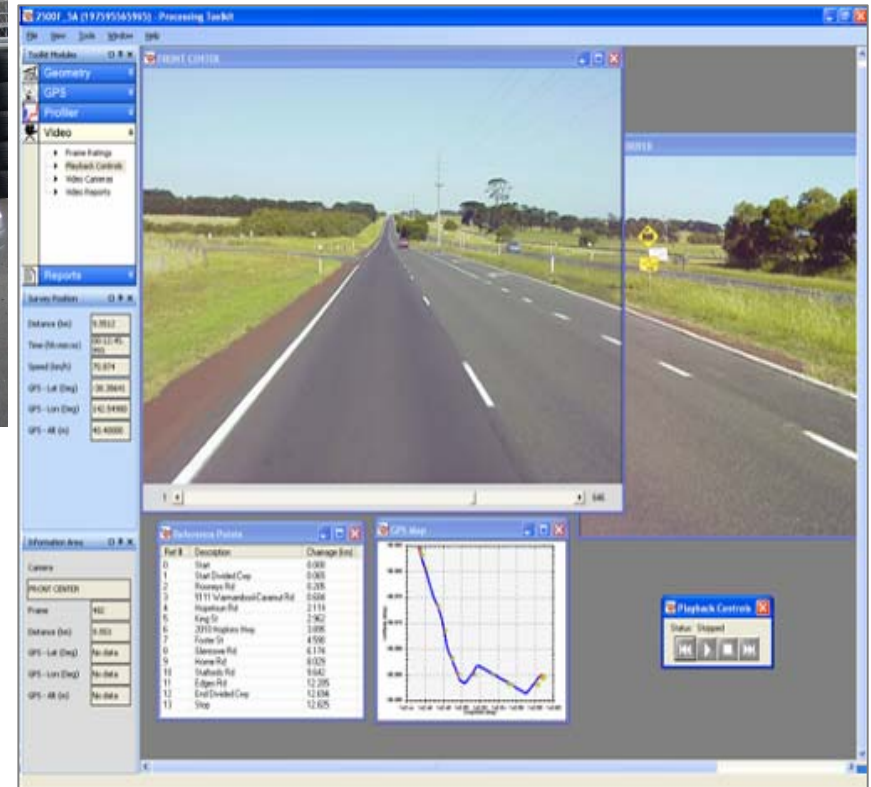
- Risk Maps show us **where** crashes are occurring but not **why**
- Next step is Star Ratings
- Measure the safety that is ***built-in*** to the road
- Independent of crash statistics
- Will enable sections of road that are likely to be risky to be identified and fixed

How is the Data Collected?

- cameras on a vehicle



- Road rating from video



What Elements are Rated?

Mid-block characteristics -

RPS

- Road section type
- Lane width
- Sealed shoulder
- Horizontal alignment*
- Terrain*
- Delineation
- Overtaking line marking
- Overtaking requirements*
- Speed environment*
- Offset and severity of roadside hazards

Intersection characteristics

- Intersection type
- Side road risk adjustment (volume of side road)*
- Alignment of legs
- Sight distance
- Right turn provision
- Left turn provision
- Speed environment (of through road)

- * Assess off-line in KiwiRAP based on speed data at 10 m intervals





Road ID: 60

Section Name: 012-0089

From: 0.000 To: 0.100

Rate By:

Do Not Show Message Box

Area Type

- Rural
- Urban

Road Type

- Divided road
- Undivided road

Number of Lanes

- One
- Two
- Three
- Four or more

Delineation

- Excellent
- Good
- Medium
- Poor

Overtaking Opps

- Divided multi-lanes, overtaking lanes both directions
- Overtaking lane - one direction only
- Dashed (broken) white centrelines
- Single solid yellow line and dashed white centrelines
- Double solid yellow centrelines
- None (unsealed)

Lane Width

- > 3.6 m
- 3.5 - 3.6 m
- 3.4 - 3.5 m
- 3.3 - 3.4 m
- 3.2 - 3.3 m
- 3.1 - 3.2 m
- 3 - 3.1 m
- 2.9 - 3 m
- 2.8 - 2.9 m
- 2.7 - 2.8 m
- 2.6 - 2.7 m
- < 2.6 m

Sealed Shoulder

- >= 2.4 m
- 1.7 - 2.4 m
- 1.2 - 1.7 m
- 0.6 - 1.2 m
- 0 - 0.6 m
- 0 m

Roadside Severity - Left hand side

Severity Outcome

- Negligible/ Wire Rope
- Rigid Barrier
- Moderate Injury
- Fatal/Serious injury likely

Offset

- 0 - 4 m
- 4 - 9 m
- 9 - 15 m
- 15 m+

Roadside Severity - Right hand side

Severity Outcome

- Negligible/ Wire Rope
- Rigid Barrier
- Moderate Injury
- Fatal/Serious injury likely
- Head-On

Offset

- 0 - 4 m
- 4 - 9 m
- 9 - 15 m
- 15 m+

Speed Limit

- <=50km/h
- 60 km/h
- 70 km/h
- 80 km/h
- 90 km/h
- 100 km/h
- 110 km/h

Comments



Delete

Save

Special Comment Flag

Close

MidBlocks

0.000	0.100	0.200	0.300	0.400	0.500	0.600	0.700	0.800	0.900	1.000	1.100	1.200	1.300	1.400	1.500	1.600	1.700	1.800
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Add Intersection

SH1 (RS 502/4.8): 4 Lane Waikato Expressway



- 4 lane, divided highway
- Good overtaking
- Good alignment
- Good delineation
- Wide lanes and shoulders
- **Moderate roadside hazards (Railway line)**
- **Some at-grade intersections**



SH50A: 2 lane Hawkes Bay Expressway



Linear: 50A-0000/01.34 | Spatial (NZMG): 2840590 E, 6173874 N

Surveyed 28/02/1982

- Good alignment
- Excellent delineation (ATP)
- Excellent roadsides
- Good lane and shoulder width
- **Undivided. Star Rating drops to 3 star as traffic volume increases**



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SH2 (RS 497/11.5) Napier to Gisborne



- Good alignment
- Reasonable roadsides
- Good delineation
- **Narrow lanes and shoulders**
- **Limited overtaking**



SH2 (RS361/5.5) Napier to Gisborne



Linear: 002-0361/06.51-1 Spatial (NZMG): 2900276 E, 6304305 N

Surveyed 27/11/2008

- Good delineation
- Moderate to poor horizontal alignment
- Narrow shoulders
- Severe roadside
- Poor overtaking



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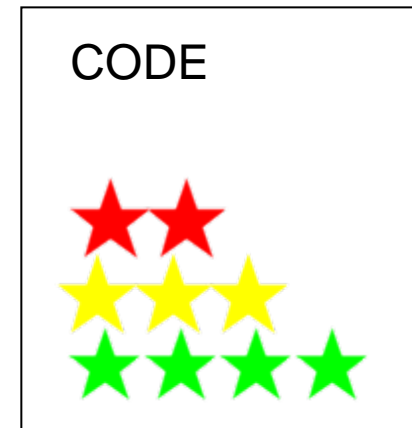
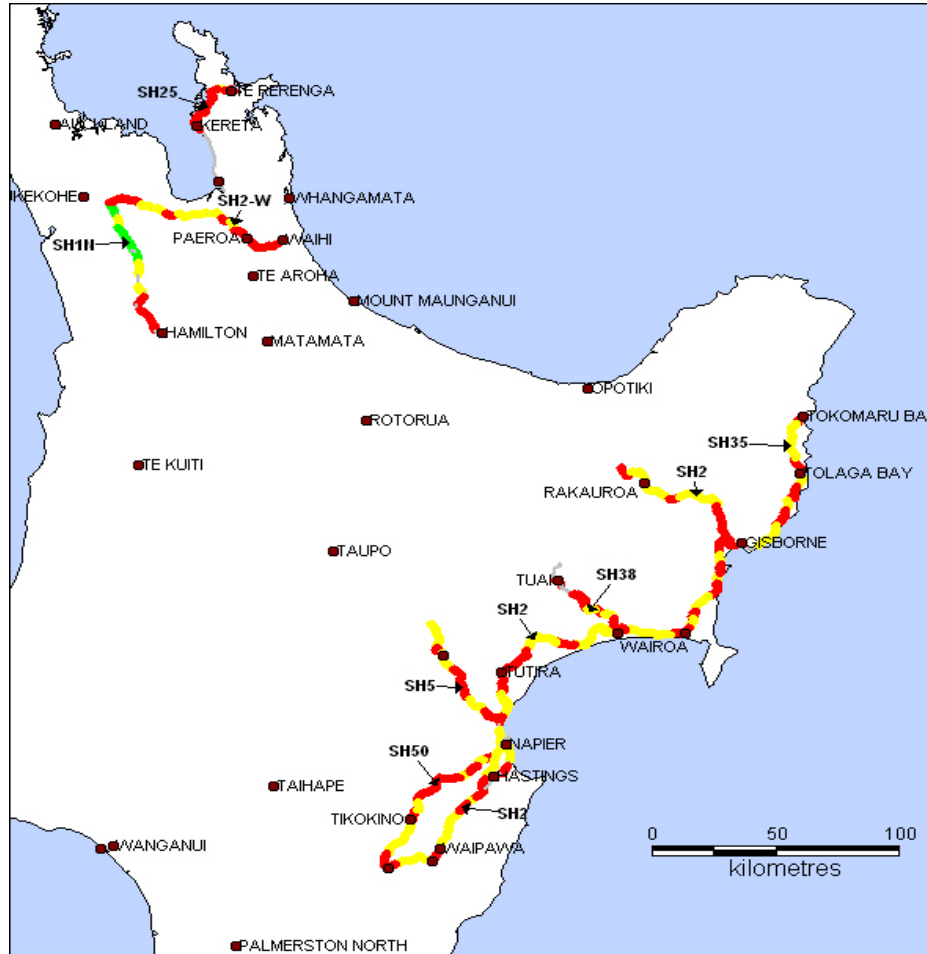
SH2 (RS 661/6.7) Napier



- Good alignment
- Good lane and shoulder widths
- Good delineation
- Good overtaking
- Severe roadside hazards



Results Map



Risk Worm

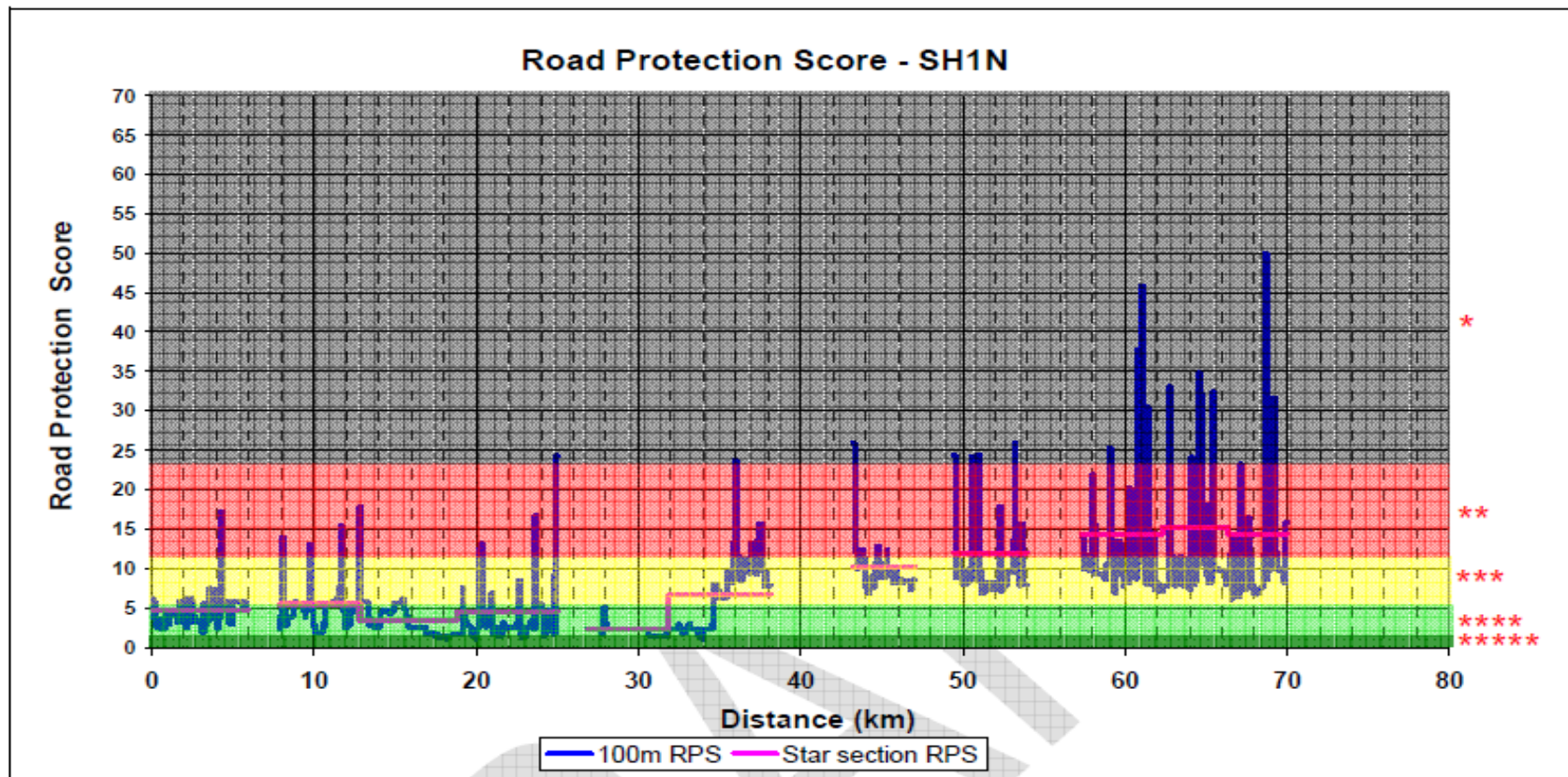
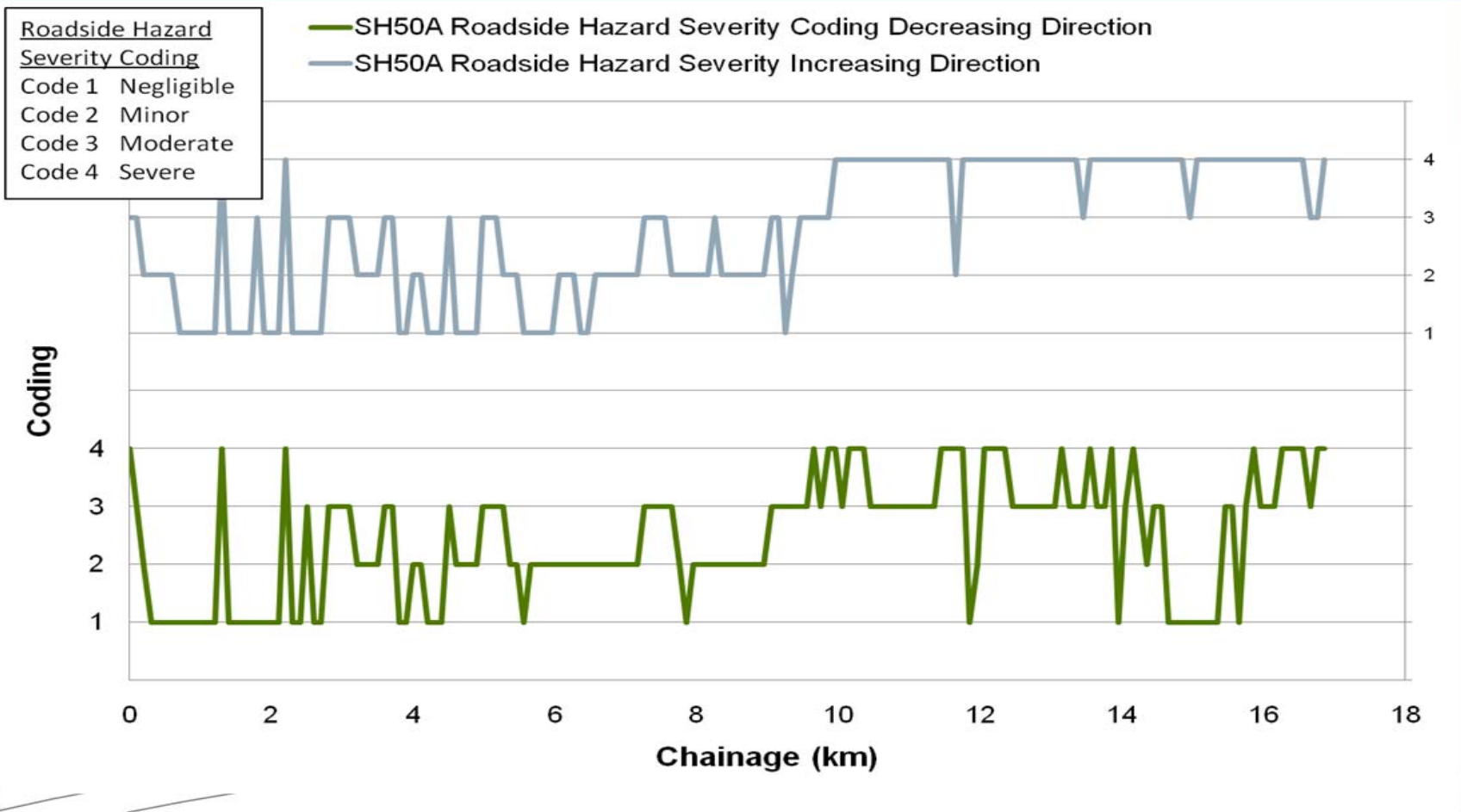


Figure 3-4: Road Protection Score – SH1N

Roadside Risk Worm



Next Steps

- Region by region rating currently underway
- Tentative launch date of Mid 2010
- Project plan preparation
- Communications strategy developing
- Have KiwiRAP methodology accepted by iRAP technical committee
- Continue the relationship with iRAP and international programmes

Summary

- The Safe System and 2020 Road Safety Strategy requires **safer roads and roadsides** that are more forgiving to driver error.
- There is **still the potential for huge safety gains from improved roads**, however we need to target to risk.
- **KiwiRAP** will be one of the key tools **for identifying high risk areas** on the state highway network.
- The Star Rating of State Highways is underway and should be released mid 2010.
- Consideration will need to be given to extending KiwiRAP to other roads.



QUESTIONS