

Road Infrastructure Safety Assessment

Ian Appleton New Zealand Transport Agency

4th IRTAD CONFERENCE Road safety data: collection and analysis for target setting and monitoring performances and progress

Seoul, 16-17 September 2009







NZ TRANSPORT AGENCY WAKA KOTAHI



























New Zealand and Republic of Korea

| | New Zealand | Republic of Korea | | | | | | | |
|------------|-------------|-------------------|--|--|--|--|--|--|--|
| Population | 4.2 million | 48.4 million | | | | | | | |
| Land Area | 268,689 km² | 91,190 km² | | | | | | | |
| Latitude | 41° 29' S | 37° 32' N | | | | | | | |
| | Wellington | Seoul | | | | | | | |
| Roads | 93,459 km | 103,029 km | | | | | | | |
| History | Recent | Ancient | | | | | | | |
| World Cups | Rugby 2011 | Soccer 2002 | | | | | | | |





Outline of Presentation

- Describe RISA
- Component parts
- Real outputs
- Validation





What is RISA?

- Performance Measure
- Tool to help Road Authorities
- Evidence-based
- Rural Networks
- Assess risks infrastructure
- Strategic advice





Basis of RISA

- Research Data
- Risk Model
- Sampling
- Assessment
- Performance Measure





Research Data

- World-wide
- Austroads Research
- Use in the Risk Model
- Example
 - Add Edgelines, crash rates reduce by 10%





Risk Model

- Benchmark Road
- Comparison
- Risk Factors
- Combine





Sampling

- Based on VKT by volume band
- Stratified Random Sample
- Confidence in scaling up to Network level
- Target sample 100km.





Assessment

- 3 Assessors
- Midblock
 - Cross Section
 - Alignment
 - Surface & Miscellaneous
- Intersections





Results – Mid-block Personal Risk

Midblock Personal Risk by Feature Theme (18/03/2009)

Cross Section/Hazards Alignment/Delineation Surface/Misc



Personal and Collective Risk Scores

International Traffic Safety Data

and Analysis Group

OECD

IRTA

International

Transport

Forum





Network Risk Number (NRN)

- Performance measure
- Scale up sample to network
- Contribution of infrastructure
- Scenario testing
- Repeat for improvements





What if an authority planned to:

- 1. improve shoulder widths
- 2. Realign Severe Curves
- 3. protect point hazards (trees & poles)
- 4. provide warning for all 'out-of-context' curves
- 5. widen 'very narrow' lanes
- 6. fix the delineation and road marking defects

What difference would these make?





Reduction in Network Risk

| - | | | | | | | | | | |
|-----------------------|-------------|--------------------------------------|----------------------|----------------------------|----------------------|-----------------------------------|----------------------------------|--------------------------------|------------------------------------|---|
| | | | | | | | | | | |
| ease Sho /idths to | ulder 1m | Realign Sev Curves to Moderate | rere Prote o Side | ct Point Roa de Hazards | ad Inst War Cl | all Curve nings and hevrons | Increase Lane Widths to 3.25m | Install Delineation to RTS5 | Protect Severe Roadside Hazards | Repair Excessive Flushing and/or Patchy |



















Risk Scores .v. Crash Rates

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Network Risk Number .v. Crash Numbers







RISA Summary

- Practical tool
- Evidence based
- Credible results
- Performance Measure
- Improvements









Example of Survey Form

| RCA Assessment Your N | | ame D | ate | | Road Name | | | Start | | | | End | | | | AADT | | | Length | | | | | | | | | |
|-----------------------|--|---------------------|---|----------|------------|-------------------------------|------|----------|--------|----------|-------|----------|----------|----------|--|------|---------|-------|------------|--------|----------|------------|----------------|------|--------|------------|----------------|------------------|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CRO | SS SECTION | | Exposure | | | | | | | | | | | | | | | | | | | | | | | | | |
| Item | | | Length (km) | 0 | | 1 | | | | | 2 | | | | | 3 | | | | | | 4 | | | | | | 5 |
| lazards thin 6m | Peint Moderate | | | | | | | | | | | | | | | | | | | 100000 | | | | | | | | |
| <u> </u> | Severe d Charddan | | | | | | | | | | | 1188 | | | | | 自然 | | 推制的 | | | | 御 | 1 M | | | 鼎傳 | |
| oulder width | ed Shoulder >1 Qm 0.5 - 1.0n | n N | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | No Edgelin | es | | 1118250 | 1061019195 | 8250302 | | | BERNEY | 22222 | | | | | | 1923 | 翻翅 | | 1693 | 國制度 | | <u>199</u> | 3 9 310 | 建铁油 | | <u>SSI</u> | <u>988 618</u> | ETERSIBLE |
| Lane width | 3.5m+ 3.25m 3m 2.75m- | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lane width | 2.75m- 3m 3.25m 3.5m+ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shoulder width | No Edgelin < 0.5m 0.5 - 1.0m > 1.0m | es 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Unseal | ed Shoulder | Gendensensensensen. | 101010000000000000000000000000000000000 | STORIGHE | 0020000 | or and a difficult of the off | 2264 | 01000000 | | 20071122 | 11000 | 10110123 | CARGEORE | ETCHES S | | | 1259766 | 10040 | nizieri | 99195 | 1917 H S | 346-16 | 1000 | 9996 | 100000 | 2442222 | 20515040 | 616450164503 |
| Hazards within 6m | Severe Moderate Point | 9013331 • | | | | | | | | | | | | | | | | | | | | | | | | | | |