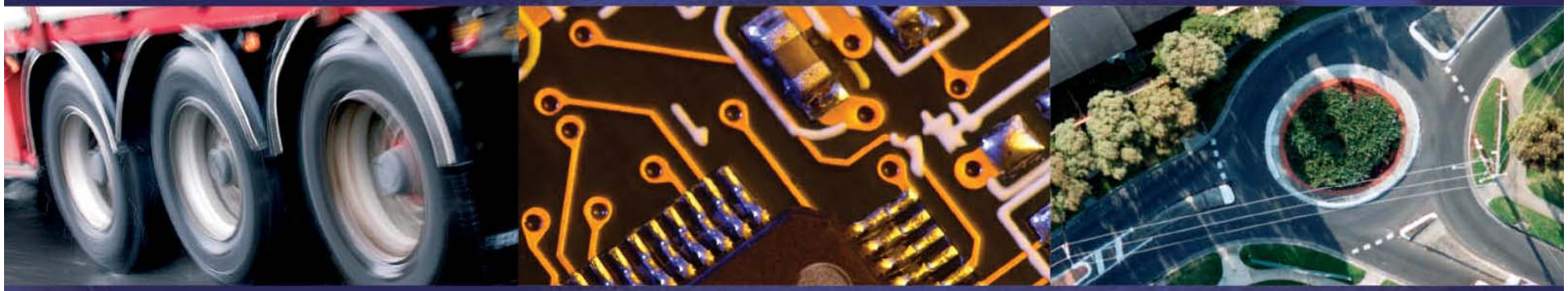


Risk management approach to reducing road injury

Chris Jurewicz, Senior Research Engineer

Submission to Victorian Parliament Road Safety Committee

arrb GROUP

Two approaches…

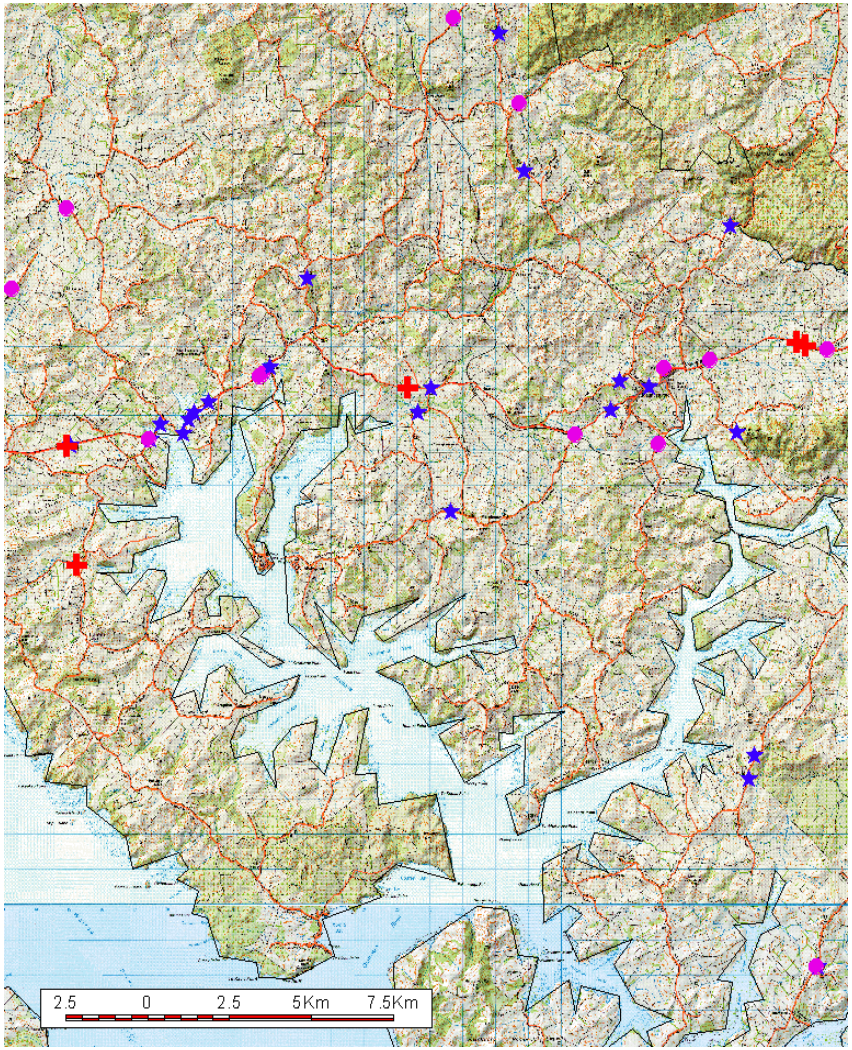
Two approaches to reduction of road trauma through road engineering:

1. Reactive approach: treat crash sites only
   - Blackspots qualified for funding due to ‘crash reduction’

2. Proactive approach: find high risk sites and treat them
   - Identify problematic road features that cause crashes
   - Estimates of risk are based on measured road features, traffic flow and speeds
   - May include crash history
   - Treat highest risk sites first

Context

- Diminishing blackspots
- Only 1/3 of fatal crashes occur at blackspots
- More than 1/2 are the first crash to occur at a site
- Fatal and serious injury crashes scattered on rural and LGA roads – few blackspots to treat



Context

- Safe System vision – focus on prevention of death and serious injury everywhere, not just at blackspots
- Need to look beyond traditional solutions – proactively address complex mixes of crash risk factors
- Prevention rather than cure
- Supportive national & Victorian road safety strategies

Development of crash risk assessment

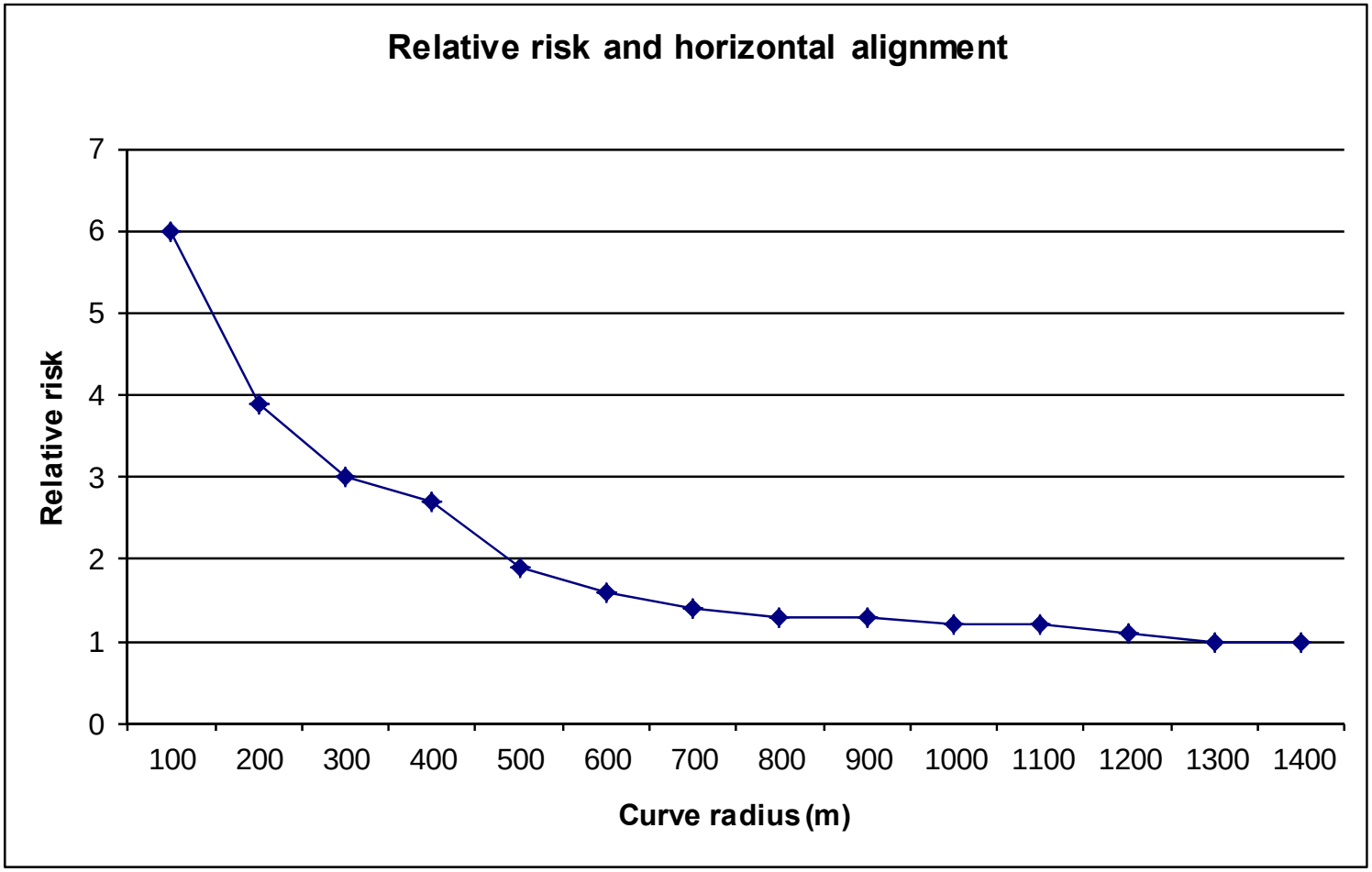
- Road safety audits common since 1990s
- Austroads and VicRoads investment in research, > 10 years
- Focus on fatal and serious injury crashes
- Results:
  - better understanding of severe crash risk
  - increasing familiarity / change in culture
  - confidence in application.
- e.g. SRIP program guidelines, setting of speed limits

What are severe crash risk features?

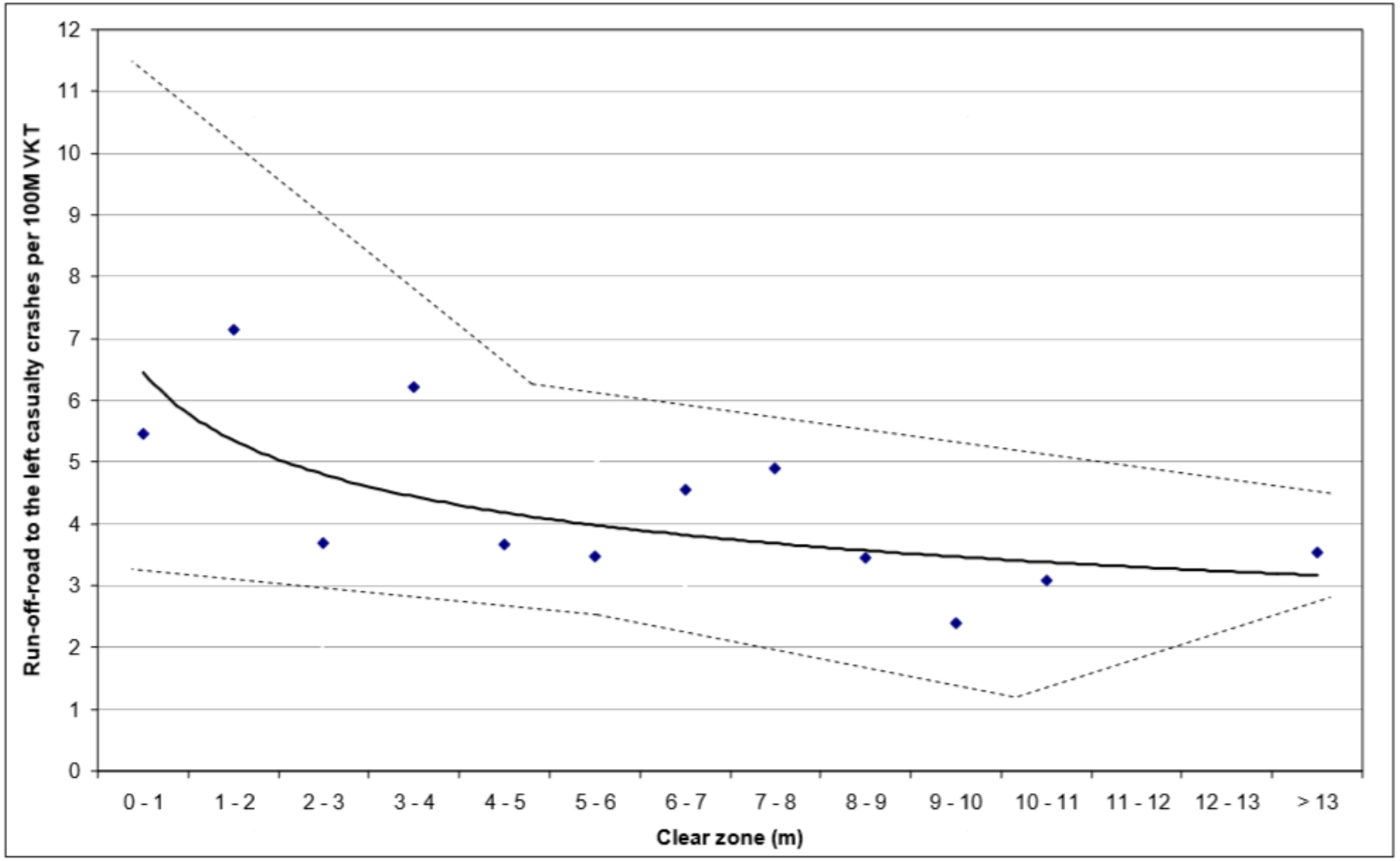
Road features which make a difference in number of severe crashes likely to occur:

- traffic flow
- pedestrian & cyclist movements
- speed
- horizontal alignment
- road slope
- lane and shoulder width
- clear zone width
- road surface condition
- median / no median
- line marking, signs
- street lighting
- intersections / access points
- sight distance
- pedestrian facilities

Horizontal alignment – curve sharpness



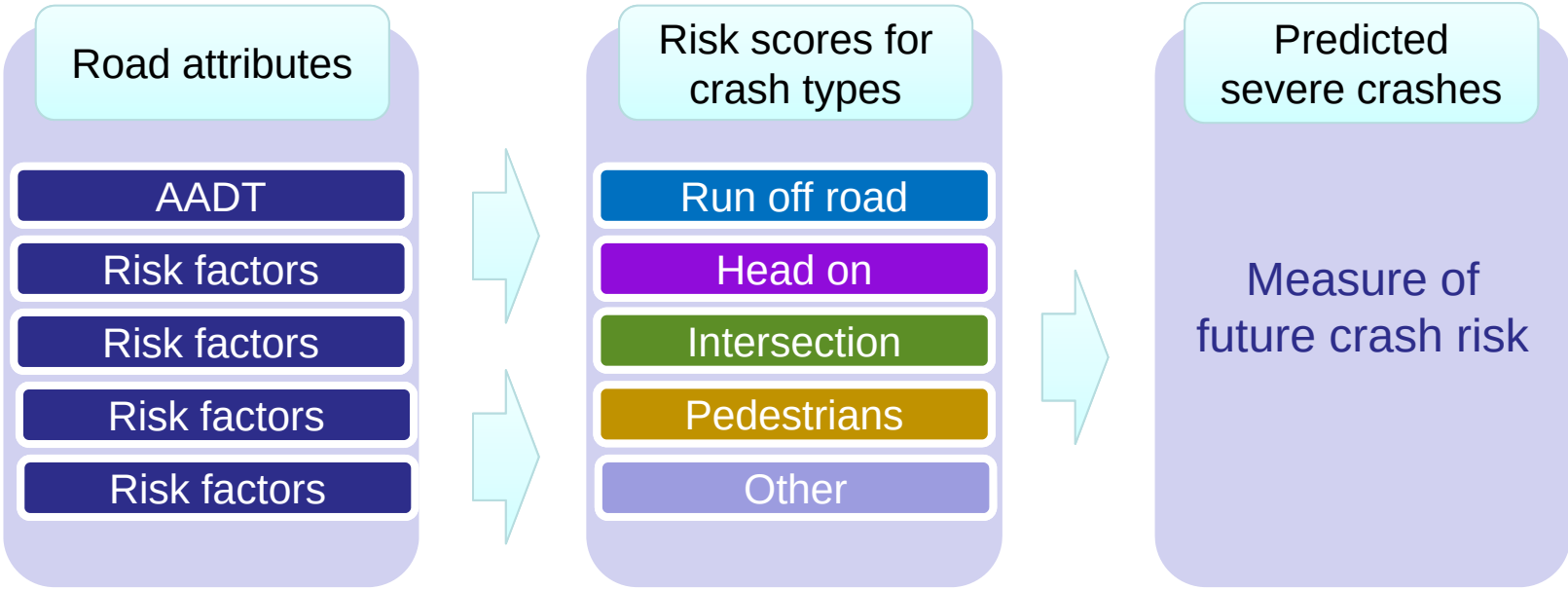
Clear zones – offset to roadside hazards



Severe crash risk assessment methods

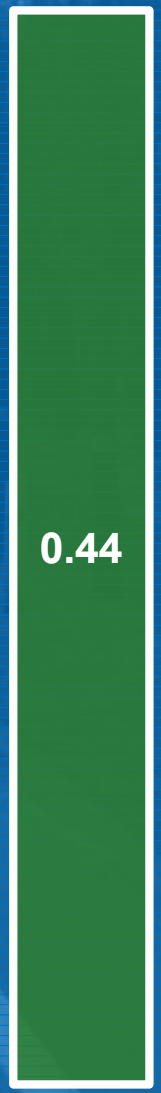
- Many different approaches developed over last 15 years
- Some specific, e.g. to pedestrians, other universal
- Examples:
  - NetRisk – simple and effective approach to identifying high-risk rural roads
  - AusRAP – road assessment program, part of the iRAP family used in 70 countries, RACV
  - Australian National Risk Assessment Program (ANRAM) – road agencies, local government

Crash risk assessment in ANRAM

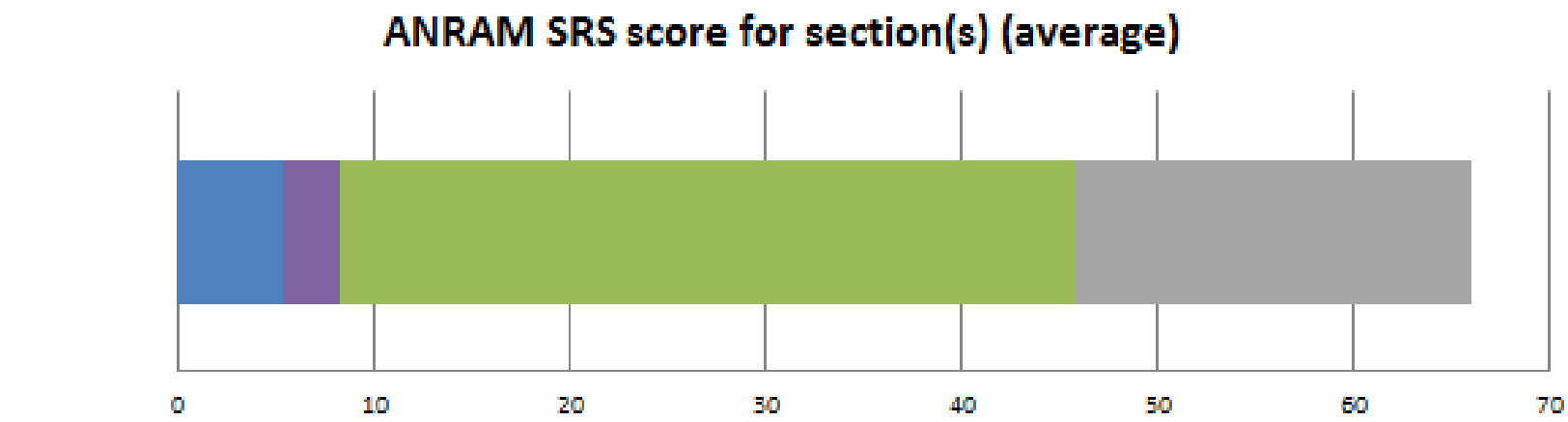


Run-off road risk score

Speed	80km/h	0.67
Lane width	2.75m to 3.25m	1.1
Curvature	Straight	1.0
Quality of curve	Adequate	1.0
Delineation	Adequate	1.0
Shoulder width	≤ 1m	1.3
Shoulder rumble strips	No	1.0
Road condition	Good	1.0
Roadside distance (left)	Object 0-5 m	5.0
Roadside severity (left)	Wire rope	0.1
Roadside distance (right)	Object 0-5 m	5.0
Roadside severity (right)	Drainage	5.0

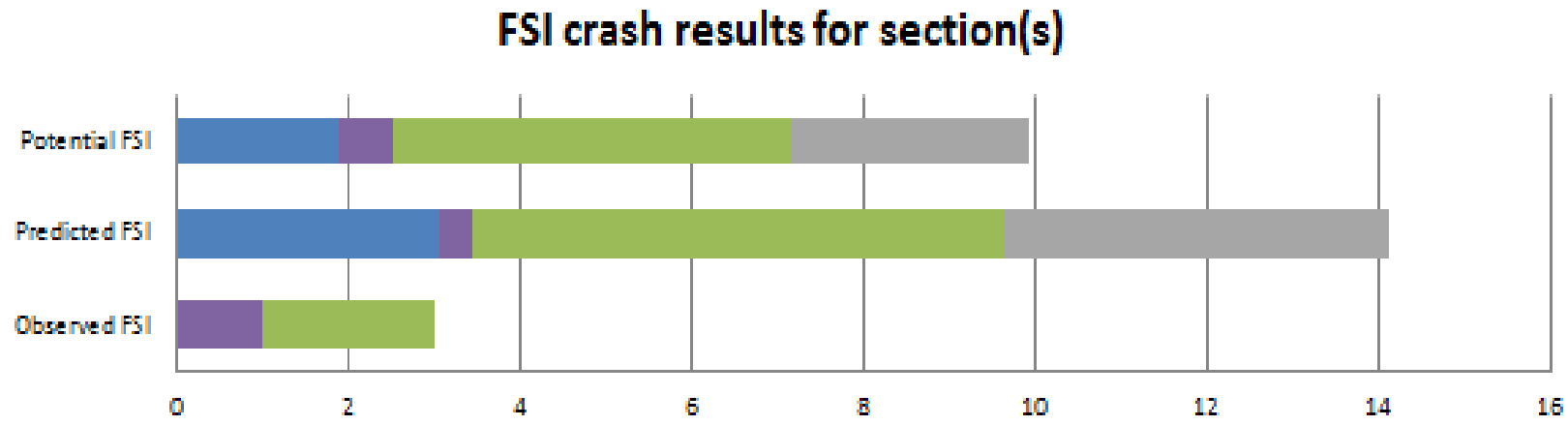


ANRAM Analysis and Outputs



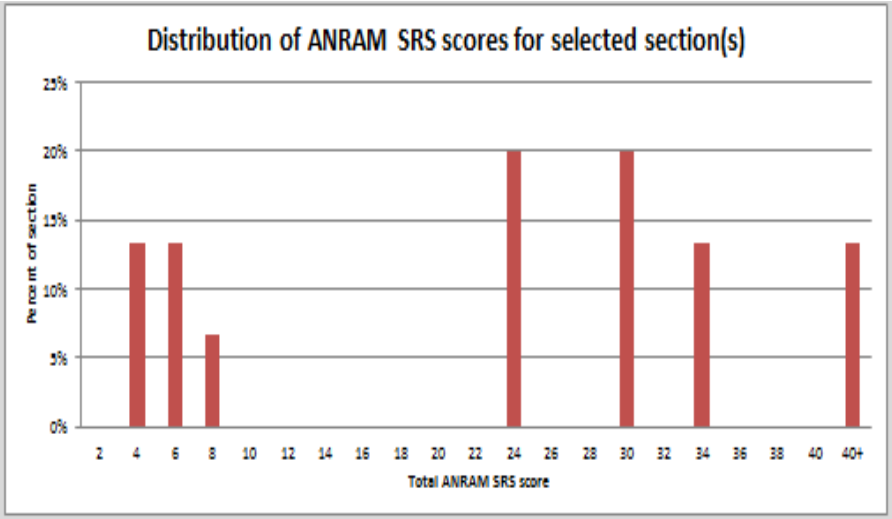
	1
Run-off-road	5.41
Head-on	2.96
Intersection	37.48
Pedestrian	
Other	20.22

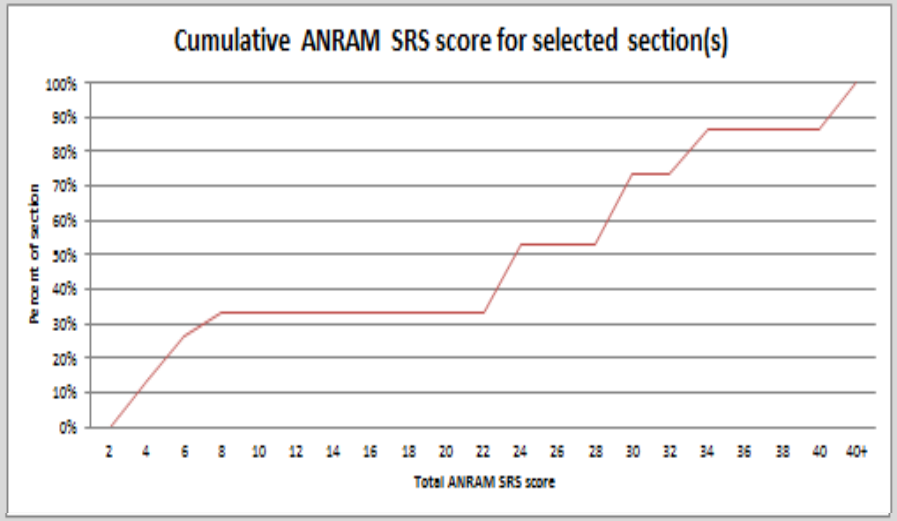
ANRAM Analysis and Outputs

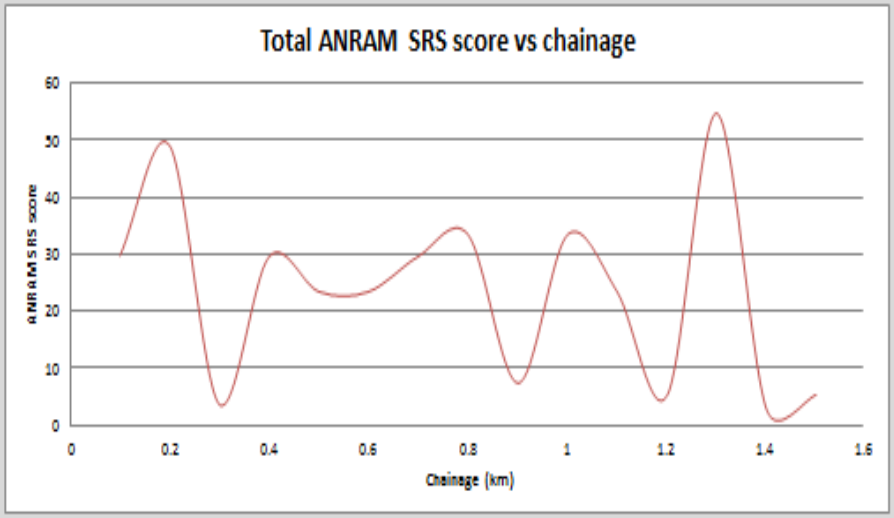


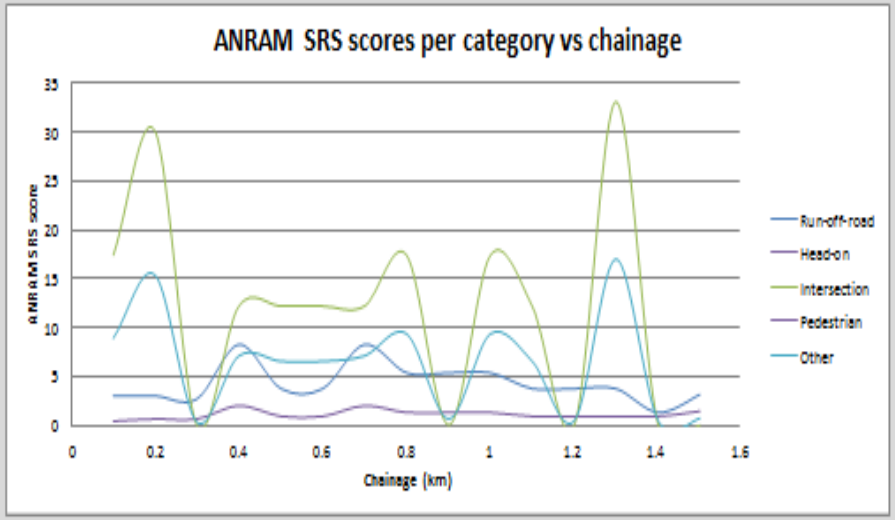
	Observed FSI	Predicted FSI	Potential FSI
Run-off-road	0.00	3.06	1.91
Head-on	1.00	0.40	0.61
Intersection	2.00	6.16	4.63
Pedestrian	0.00		
Other	0.00	4.48	2.79

ANRAM Analysis and Toolkit









ANRAM inputs/outputs

- Outputs
  - SRS risk scores
  - Predicted FSI crashes per 5 years per road section
  - Information on specific treatable crash risk factors
  - Road safety program development tools

- Inputs:
  - Road type, state
  - Observed severe crashes per each section, 5 years
  - Coded road feature data, traffic flow