Spotlight on Safety – the role of road infrastructure

Dr Blair Turner, 3 May 2019

Contents

- The role of infrastructure in road safety
- How can infrastructure help improve safety?
- A look to the future

Role of infrastructure in road safety

When a crash occurs, road infrastructure has the most significant influence on the severity outcome of a crash. Improvements to infrastructure can contribute substantially to reductions in death and serious injury.

Source: Road Safety Manual, World Road Association (PIARC)

- Up to 80% reduction in fatal and serious injury
  - Roundabouts, barrier systems, speed management
- BCRs very high - 8:1 for targeted improvements

Key crash types

- Key fatal and serious crash types:
  - Run-of-road (30%)
  - Intersections (20%)
  - Head-on (5%)
  - Rear end (15%)

- Key road users
  - Motorcycles (18%)
  - Pedestrians (10%)
  - Cyclists (7%)

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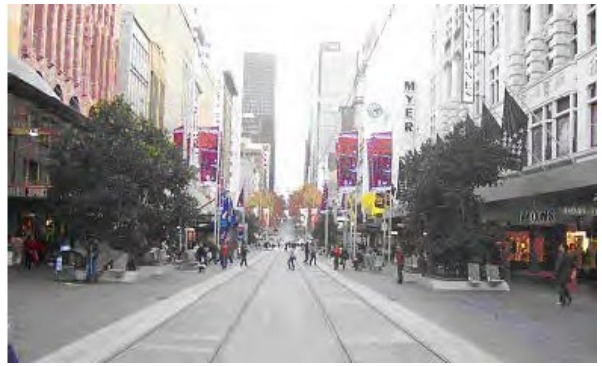

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The future – new vehicle technologies

- Some technologies rely on infrastructure e.g.
  - Collision avoidance and hazard detection, including intersections
  - Speed management
  - In-vehicle signage (e.g. Speed Zone Warning, Stop Sign Warning)
  - Road weather alert systems
  - Post-crash notification systems (e.g. eCall)
  - Lane keeping systems…..

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CAV Lane confidence (HIGH)

CAV Lane confidence (MED)

CAV Lane confidence (LOW)

Class	Lane conf.	Line quality		
		High	Med	Low
1	98%	97%	3%	0%
2	90%	88%	11%	1%
3	77%	78%	20%	2%
4	66%	73%	25%	2%
5	12%	48%	45%	7%

Melbourne

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The future - Infrastructure solutions

- Need to embed safety in all projects
  - Safety metrics
  - Road stereotypes / LOS
- Need to increase public understanding
- Quicker adoption of new solutions required

Road description: rural highway, single carriageway, two-lane two-way, AADT 4000-12000															
ID	Star rating (Global iRAP) (Stars)		Predicted FSI crashes/100 million vkt (ANRAM)		Formation width (m)	Lane width (m)	Shoulder width (left) (m)	Sealed shoulder width (left) (m)	Runout distance (roadside) (m)	Verge (batter) slope (1:x)	Safety barrier - roadside	Centre barrier	Wide centreline width (m)	Audiotactile edgeline marking (Y/N)	Audiotactile centeline marking (Y/N)
	Curvature/grade: straight/ 0 to <7.5% - moderate/ 0 to <7.5%		Curvature/grade: straight/ 0 to <4% - moderate/ 5 to <7.5%												
	110 km/h	100 km/h	110 km/h	100 km/h											
1	4.9	5.2	0.02	0.02	15.0	3.5	2.5	2.5	-	-	Flexible	Flexible	2.0-3.0	Y	Y
2	3.7	3.9	2.18-2.24	1.63-1.68	13.0	3.5	2.5	2.5	-	-	Flexible	-	1.0	Y	N
3	3.6	3.8	2.23-2.29	1.68-1.72	11.0	3.5	1.5	0.5	4.0	6.0	Flexible (targeted)	-	1.0	Y	Y
4	3.6	3.9	2.60-2.68	1.96-2.01	12.0	3.5	2.5	2.5	-	-	Flexible	-	-	N	N
5	3.4	3.7	2.65-2.72	1.99-2.05	11.0	3.5	1.5	0.5	4.0	6.0	-	-	1.0	Y	Y
6	3.0	3.4	3.47-3.57	2.61-2.69	9.0	3.5	1.0	1.0	4.0	3.0	-	-	-	Y	Y
7	2.7	3.2-3.1	4.25-4.38	3.19-3.29	9.0	3.5	1.0	1.0	4.0	3.0	-	-	-	N	N
8	2.2-2.1	2.7	5.30-5.46	3.98-4.10	8.0	3.5	0.5	0.5	4.0	3.0	-	-	-	N	N

Concluding comments

- Infrastructure solutions bring substantial benefit at reasonable cost
- Know many of the solutions – need to apply more widely
- Vehicle technologies will mean a different infrastructure response is required
- Are challenges to introducing effective infrastructure solutions
  - Embedding safety
  - Public understanding
  - Innovation

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