Session 2.7 Technology and useful resources

Conducting Road Safety Audits & Appraisals

Presented by: RTS & AGTT

January 2022

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Content

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Content

1. Role of Technology in Road Safety
2. Available Technology
3. Application of Technology
4. Useful Resources

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ROLE OF TECHNOLOGY IN ROAD SAFETY

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Role of Technology in Road Safety

How can technology contribute to the road safety audit process

- Capture status of road environment at a specific point in time.
- Ability to log information about large networks
- Database of road infrastructure/ furniture /crash data
- Scan networks for road safety hotspots

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Role of Technology in Road Safety

Risks of technology

- Only a snapshot in time
- Quality - garbage in – garbage out
- Reliability and calibration of algorithms
- Can be time consuming
- Information overload - not all data is equal

Incorrect application of technology - will probably have the same fatal result as texting and driving.

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Role of Technology in Road Safety

Warning

- The is no substitute for an experienced Road Safety Engineer
- Sophisticated systems will only identify potential hotspots – it still has to be confirmed.
- The value of site visit(s) shall not be under estimated.

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ROAD SAFETY AUDIT REPORT CONTENT AND STRUCTURE

AVAILABLE TECHNOLOGY

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The Available Technology – the Basics

Smart Phone (camera)

GPS

Dashcam

Measuring Wheel

Pen & paper

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The Available Technology – Dashcam sample video

Video captured on site using a commercially available dashcam

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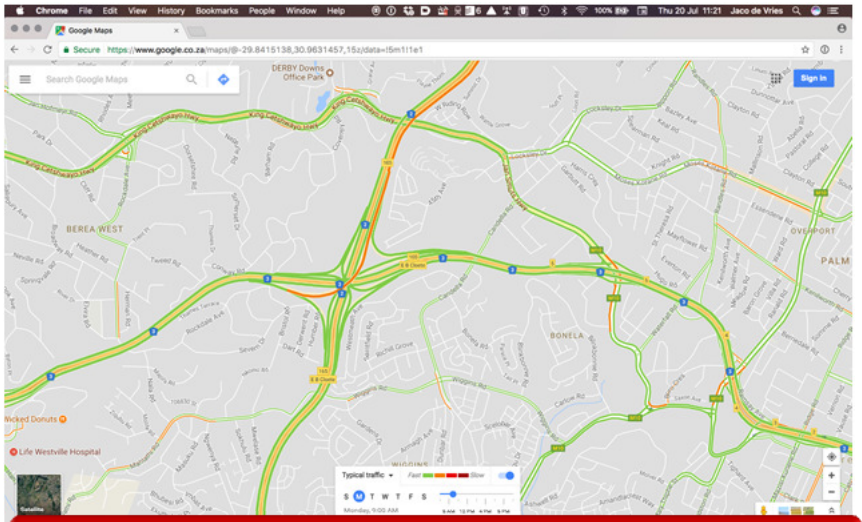
The Available Technology - Available internet resources



Google Traffic – provides general sense of flow and congestion

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The Available Technology - Available internet resources

Google Streetview – useful, often out of date. Audits cannot be done online!

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APPLICATION OF TECHNOLOGY

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Application of Technology– SANRAL NetSafe©

- **NetSafe©**
  - Identify and prioritize locations where road safety improvements and/or interventions are likely to be most effective
  - Locations for further investigations
    - Further safety investigations must be undertaken at a particular site in order to:
    - To identify appropriate safety improvements
    - Cost efficiency of safety improvements
    - Other remedial measures such as Road safety education and awareness, and traffic law enforcement, that could compliment engineering/infrastructure interventions

Source: Randall Cable PrEng, SANRAL, Road Safety Tools for Authorities, SATC 2016

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Application of Technology– SANRAL NetSAfe©

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NetSafe©

Clip slide

Risk Index

$$Ri = R_L + \frac{\sum R_P}{\Delta L}$$

- Where:
- Ri = Risk index per km road length
- R_L = Risk index related to length-based factors (per km)
- R_P = Risk Index related to point-based factors (e.g. intersections)
- ΔL = Length of section road (e.g. 10 m)

Source: Randall Cable PrEng, SANRAL, Road Safety Tools for Authorities, SATC 2016

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$$R_L = F_S \times R_{LO} \times F_{1L} \times F_{2L} \ldots\ldots$$

- Where:
- R_L = Risk index related to length based factors
- F_S = Adjustment factor for accident severity
- R_{LO} = Baseline risk index per km road length
- F_{1L}, F_{2L} = Length based accident factors

$$R_P = F_S \times R_{PO} \times F_{1P} \times F_{2P} \ldots\ldots$$

Where:

R_P = Risk index related to point based factors

F_S = Adjustment factor for accident severity

R_{PO} = Baseline risk index per point

F_{1P}, F_{2P} = Point based accident factors

Source: Randall Cable PrEng, SANRAL, Road Safety Tools for Authorities, SATC 2016

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- Video Data Collection

Source: Randall Cable PrEng, SANRAL, Road Safety Tools for Authorities, SATC 2016

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SECTION 1 (MAP 1, flat section)

	Chainage	Length	FACTORS									Factor	Normalised
			Speed	Gradient	Curve	Land Use	Verge	Guardrail	No of lanes	Shoulder	Barrier Line		
5	76552	0	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.00	[illegible]
6	76492	60	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.05	[illegible]
7	76432	60	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.05	[illegible]
8	76302	130	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.11	[illegible]
9	76113	189	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.17	[illegible]
10	76034	79	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.07	[illegible]
11	76004	30	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.03	[illegible]
12	75934	70	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.06	[illegible]
13	75864	70	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.06	[illegible]
14	75545	319	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.28	[illegible]
15	75305	240	1.00	1.00	1.08	1.00	0.87	1.00	1.00	1.02	1.00	0.23	[illegible]
16	75135	169	1.00	1.00	1.00	1.00	0.87	1.00	1.00	1.02	1.00	0.15	[illegible]
17	74996	149	1.00	1.00	1.08	1.00	0.87	1.00	1.00	1.02	1.00	0.14	0.95
18	74846	140	1.00	1.00	1.08	1.00	0.87	1.00	1.00	1.02	1.00	0.13	0.95
19	74717	129	1.00	1.00	1.00	1.00	1.07	1.00	1.00	1.02	1.00	0.14	1.09
20	74657	60	1.00	1.00	1.00	1.00	1.07	1.00	1.00	1.02	1.00	0.07	1.09
21	74507	150	1.00	1.00	1.00	1.00	1.07	1.00	1.00	1.02	1.00	0.16	1.09
22	74378	130	1.00	1.00	[illegible]	1.00	1.07	1.00	1.00	1.02	1.00	0.16	[illegible]
23	74209	169	1.00	1.00	[illegible]	1.00	1.07	1.00	1.00	1.02	1.00	0.21	[illegible]
24	74179	30	1.00	1.00	[illegible]	1.00	1.07	1.00	1.00	1.02	1.00	0.04	[illegible]
25	74149	30	1.00	1.00	[illegible]	1.00	1.07	1.00	1.00	1.02	1.00	0.04	[illegible]
26	73970	179	1.00	1.00	[illegible]	1.00	1.07	1.00	1.00	1.02	1.00	0.22	[illegible]
27	73890	80	1.00	1.00	1.00	1.00	1.07	1.00	1.00	1.02	1.00	0.09	1.09
28	73721	169	1.00	1.00	1.00	1.00	1.07	1.00	1.00	1.02	1.00	0.21	1.09
29	73680	20	1.00	1.00	1.00	1.00	1.07	1.00	0.75	1.00	1.00	0.02	[illegible]
30	73471	210	1.00	1.00	1.00	1.00	1.07	1.00	0.75	1.00	1.00	0.17	[illegible]
31	72732	738	1.00	1.00	1.00	1.00	1.07	1.00	0.75	1.00	1.00	0.59	[illegible]
32	72543	189	1.00	1.00	1.13	1.00	1.07	1.00	0.75	1.00	1.00	0.17	0.90
33	72473	70	1.00	1.00	1.13	1.00	1.07	0.87	0.75	1.00	1.00	0.05	[illegible]
34	72204	269	1.00	1.00	1.13	1.00	1.07	1.00	0.75	1.00	1.00	0.24	[illegible]
35	71696	508	1.00	1.00	1.13	1.00	1.07	1.00	0.75	1.00	1.00	0.46	[illegible]
36	71576	120	1.00	1.00	1.13	1.00	1.07	1.00	0.75	1.00	1.00	0.11	[illegible]
37	71507	70	1.00	1.00	1.13	1.00	1.07	0.87	0.75	1.00	1.00	0.05	[illegible]
38	71507	0	1.00	1.00	1.13	1.00	1.07	0.87	0.75	1.00	1.00	0.00	[illegible]

Data for GIS map

Source: Randall Cable PrEng, SANRAL, Road Safety Tools for Authorities, SATC 2016

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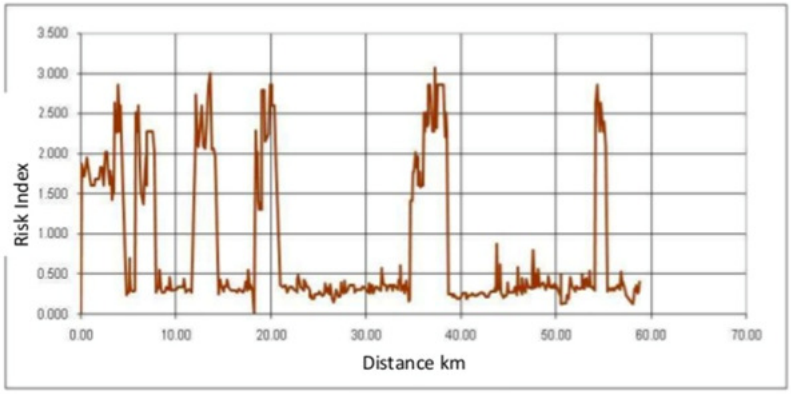

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Identifies Hazardous Locations by analysing

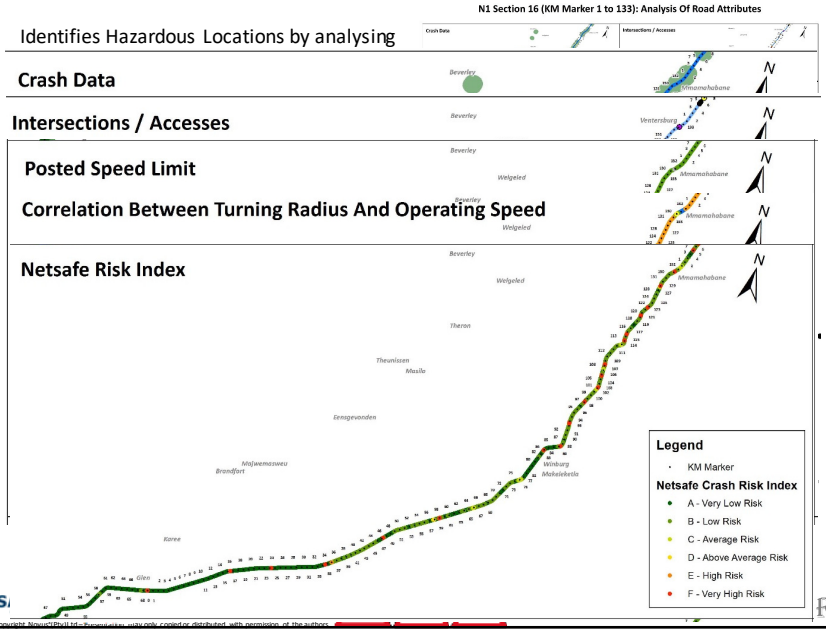
Crash Data

Intersections / Accesses

Posted Speed Limit

Correlation Between Turning Radius And Operating Speed

Netsafe Risk Index



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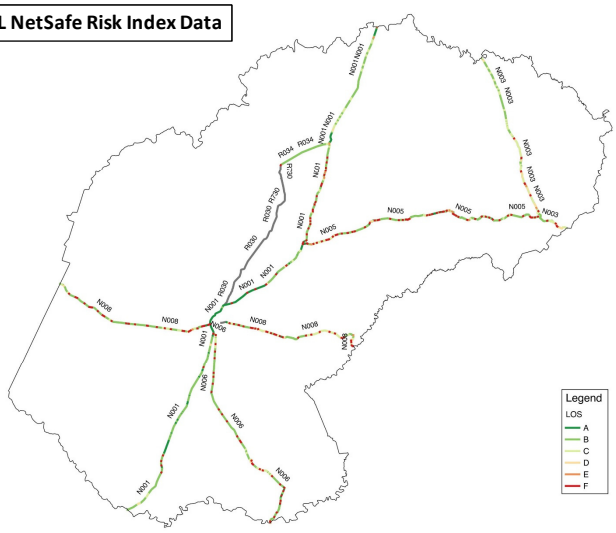
SANRAL NetSafe Risk Index Data



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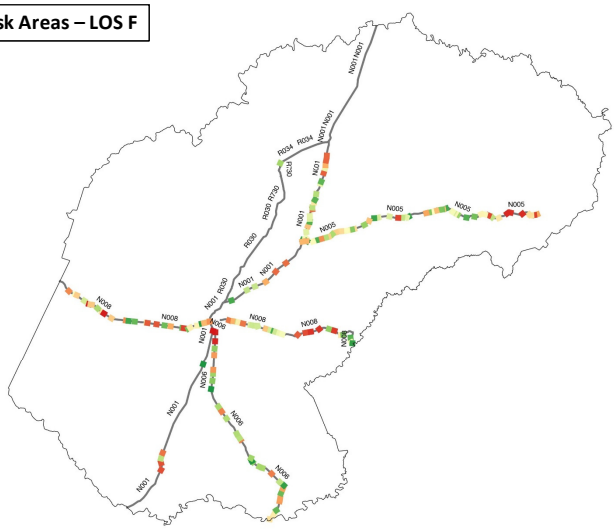
High Risk Areas – LOS F



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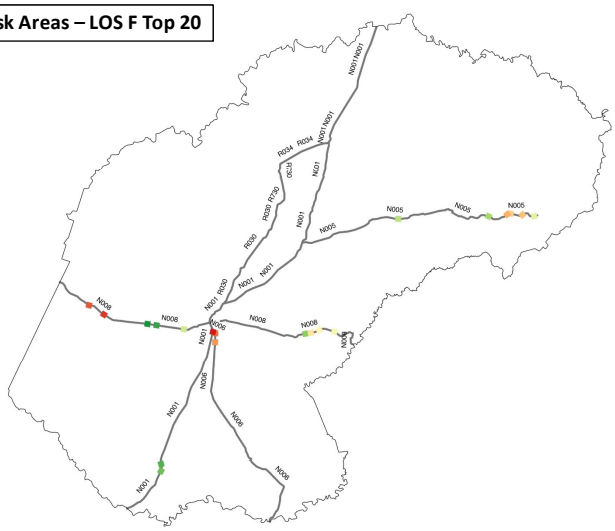
High Risk Areas – LOS F Top 20



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Application of Technology – iRAP

iRAP
INTERNATIONAL ROAD ASSESSMENT PROGRAMME

Systematically inspection of roads, to develop an understanding of the level of risk of road networks.

Provides a basis for targeting high-risk sections of road.

Inspections are especially useful when crash data is unavailable or unreliable.

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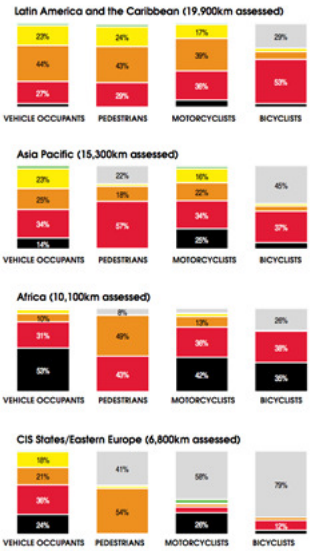
Application of Technology – iRAP

iRAP
INTERNATIONAL ROAD ASSESSMENT PROGRAMME



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Application of Technology – iRAP

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Useful Resources

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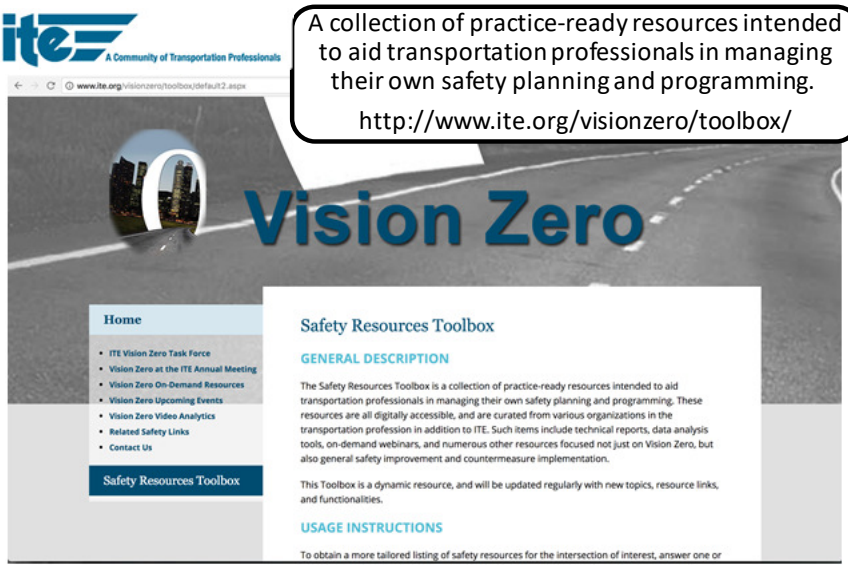
Useful resources – ITE Vision Zero Toolbox

A collection of practice-ready resources intended to aid transportation professionals in managing their own safety planning and programming.

http://www.ite.org/visionzero/toolbox/



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Useful resources – ITE Vision Zero Toolbox

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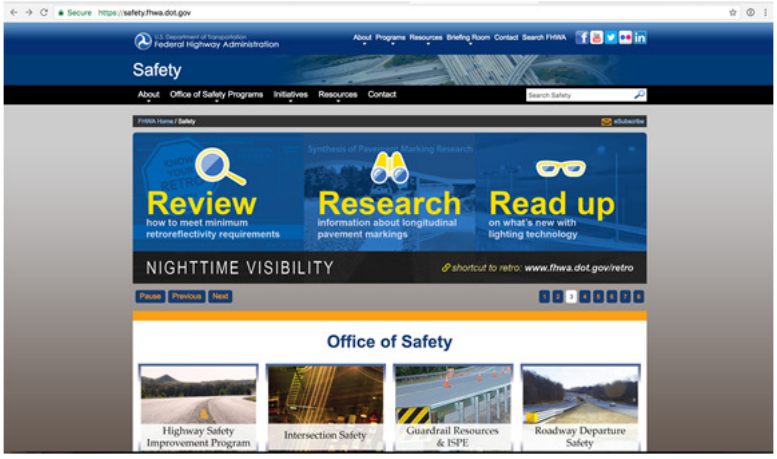
Useful resources – FHWA

U.S. Department of Transportation
Federal Highway Administration

safety.fhwa.dot.gov



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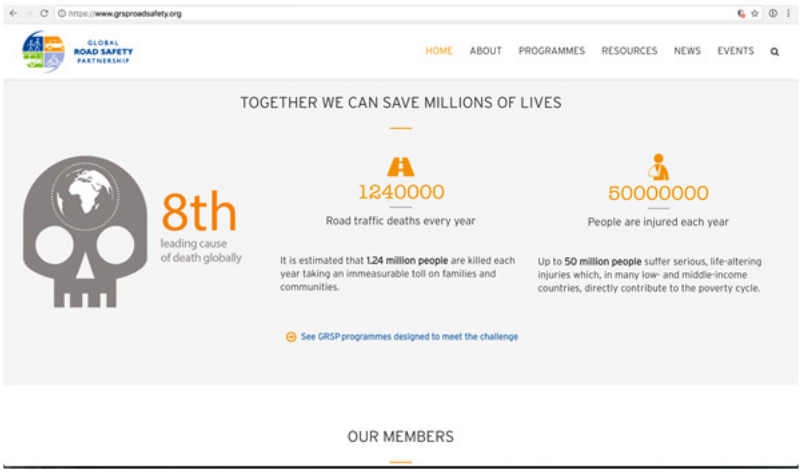
Useful resources – GRSP

GLOBAL ROAD SAFETY PARTNERSHIP

www.grsproadsafety.org



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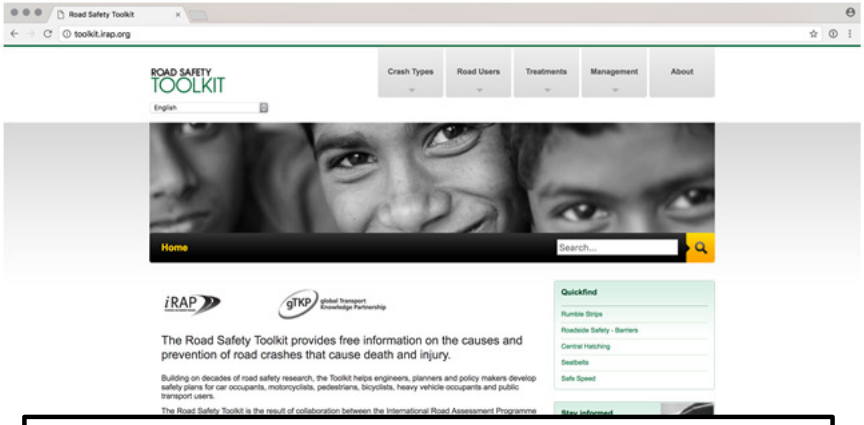
Useful resources - iRAP Toolkit



- http://toolkit.irap.org/
- Provides free information on the causes and prevention of road crashes that cause death and injury.
- Not RSA data, but provides good info about the effectiveness of mitigating measures.

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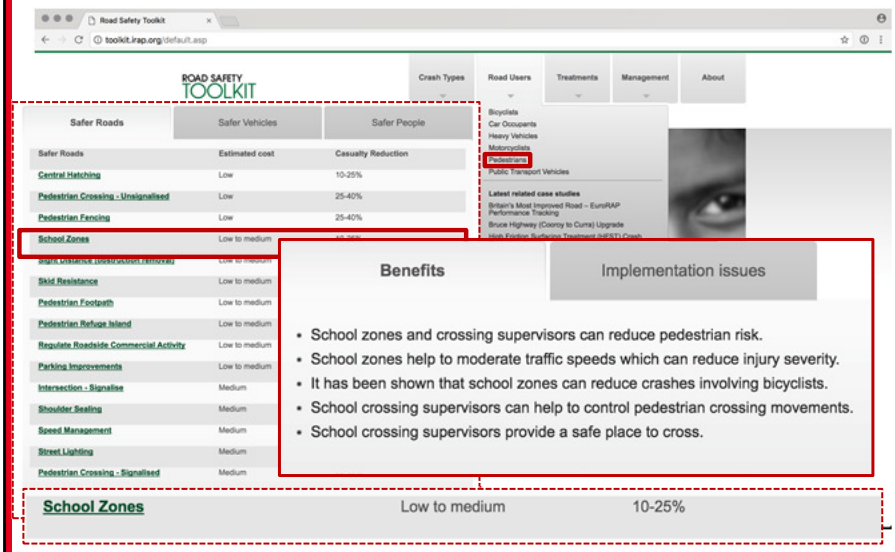
Useful resources - iRAP Toolkit



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END OF LECTURE

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