ROAD SAFETY PERFORMANCE REVIEW
Capacity Building Workshop for Uganda

Status of Road Infrastructure

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Introduction

Driver behaviour is often sighted as the major cause of crashes. The safe systems approach is based on a more foundational understanding of the underlying causes of traffic fatalities and injuries, particularly human fallibility and human vulnerability

Mistakes are inevitable but traffic fatalities and injuries should not be. The road system should be designed so that human error does not have a serious or fatal outcome.

Introduction

Vulnerable Road Users comprise a large proportion of injuries and deaths on Ugandan Roads. This is an issue that has plagued the world over and some simple principles have be identified to guide roadway and infrastructure design for improved pedestrian and bicyclist safety.

Introduction

Strategic attack for enhancement of safer roads

1. ***Reduce Exposure***. E.g. Build separate facilities for pedestrians/cyclists; and Define space/time for pedestrians/cyclists within existing roadway network.

The feasibility of this approach depends largely on the availability of land, resources for construction and maintenance.

This requires a critical re-examination of traditional roadway and traffic engineering principles that allocate space and time on the basis of facilitating or optimizing the roadway's motor vehicle capacity and re-directs them to accommodate the needs of all road users

Introduction

Strategic attack for enhancement of safer roads

2. ***Reduce Probability of a collision given exposure*** - if 1. above cannot be accomplished, or can only be accomplished in a limited fashion.

- Increase driver's awareness of pedestrians / cyclists
- Increase pedestrian/cyclist awareness of vehicles

3. Where 1 and 2 cannot be achieved, ***Reduce the Probability of Fatality / Serious Injury given a collision***

- Reduce vehicle speed

Presentation outline

ROAD INFRASTRUCTURE

- Condition of Road Infrastructure 2011-2017
- Recommendations for Improvement

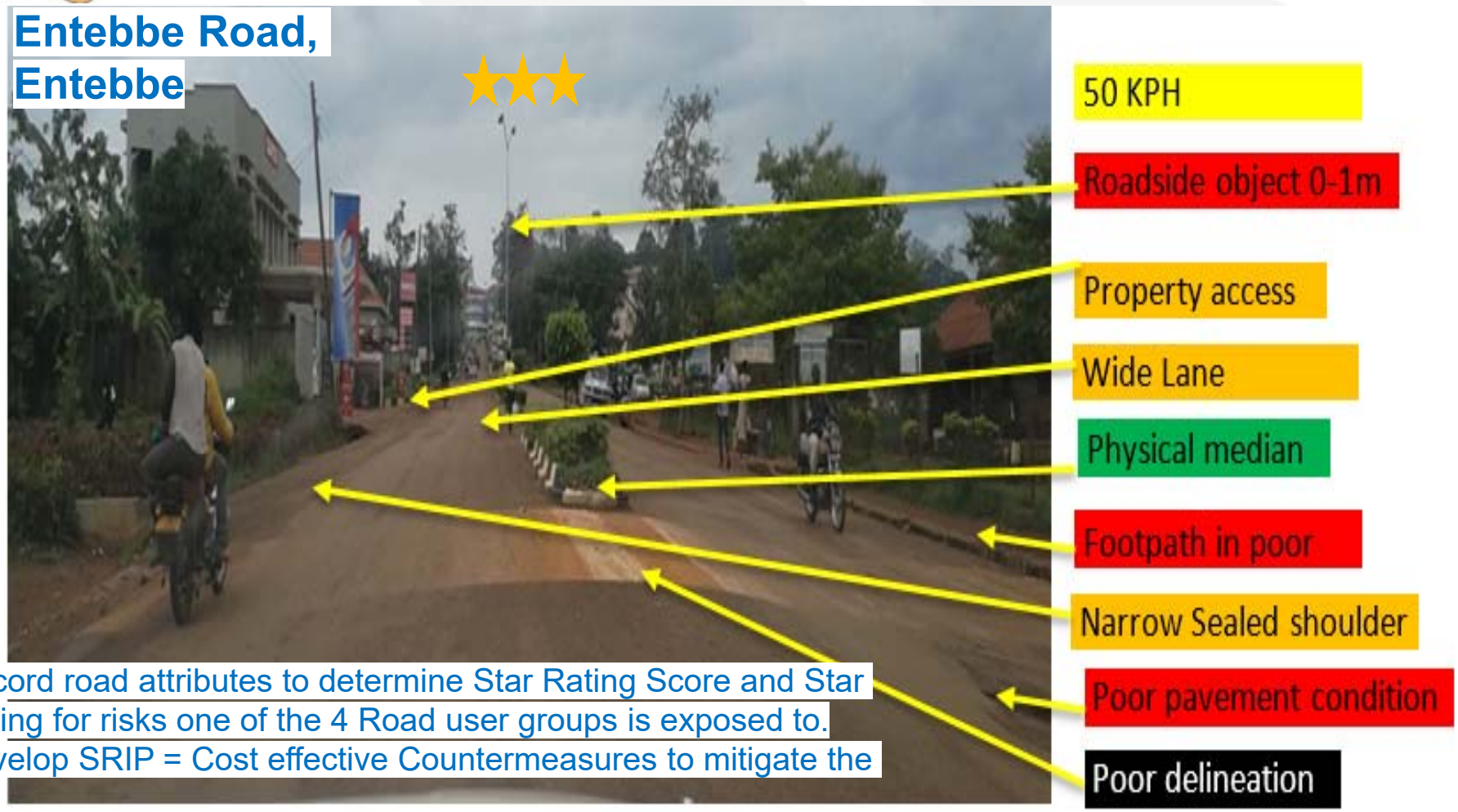
DESIGN STANDARDS

- Existing Design Standards and Implementation
- Recommendations

INFRASTRUCTURE POLICY

- Existing Policies
- Recommended Amendments

What we do



- Record road attributes to determine Star Rating Score and Star Rating for risks one of the 4 Road user groups is exposed to.
- Develop SRIP = Cost effective Countermeasures to mitigate the risk
- Monitor to determine whether the recommendations achieved the expected goal

Road Infrastructure - findings

Status of Roads in 2010

In 2010, an iRAP assessment was done on 2,380km of the National Roads and 92km of the Kampala City roads. This showed:-

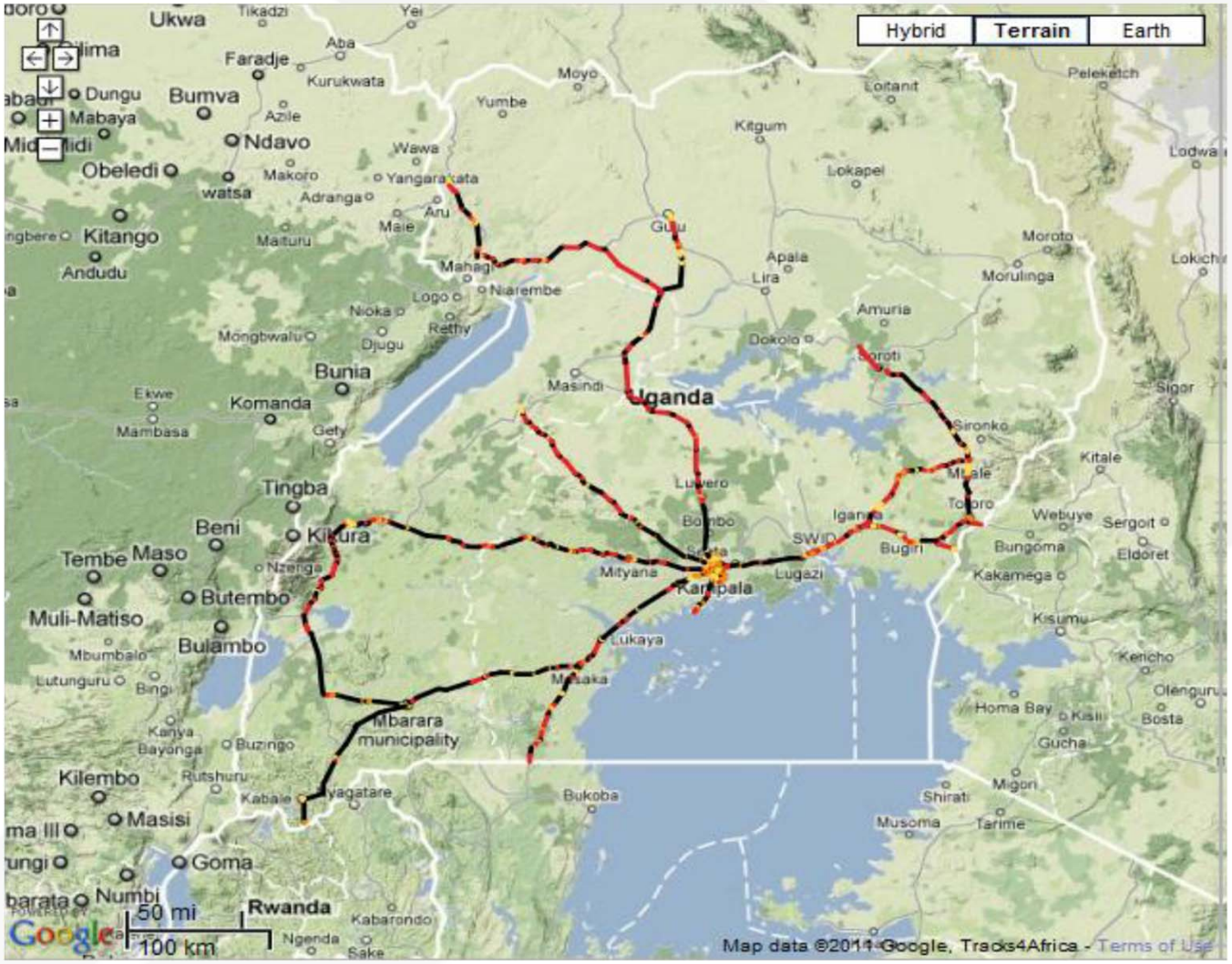
Start ratings – Nationwide Road Network – Baseline situation 2010

Star Ratings	Vehicle Occupant		Motorcyclist		Pedestrian		Bicyclist	
	Length (Km)	Percent (%)	Length (Km)	Percent (%)	Length (Km)	Percent (%)	Length (Km)	Percent (%)
5 Stars	-	-	-	-	-	-	-	-
4 Stars	222	9	124	5	-	-	-	-
3 Stars	198	8	222	9	840	34	99	4
2 Stars	791	32	519	21	1,632	66	1,384	56
1 Stars	1,261	51	1,434	58	-	-	915	37
Not Applicable	-	-	173	7	-	-	74	3
TOTALS	**2,472**	**100**	**2,472**	**100**	**2,472**	**100**	**2,472**	**100**

3-Star or Better:

- 17% = Vehicle occupants
- 34% = pedestrians
- 4% = Cyclists
- 14% = Motorcyclists

Road Infrastructure - findings



Road Infrastructure - findings

iRAP developed a 20-year Safer Roads Investment Plan (SRIP) with a number of cost effective countermeasures. The top 5 low cost - high impact recommendations are listed below:

Top 5 most cost effective countermeasures Nationwide Road Network – Baseline situation 2010						
Countermeasure type	**Sites / length**	**Estimated Cost (20years)**	**KSI Saved (20 years)**	**Value of Safety Benefit (20 Years)**	**Cost per KSI saved**	**BCR**
Pedestrian Footpath	588km	$7m	19,810	$184.3m	$354	26
Shoulder widening	1366km	$14.2m	36,170	$336.6m	$393	24
central hatching	2340km	$13.6m	28,440	$264.6m	$477	20
Bicycle facilities	358 km	$2m	3,830	$35.7m	$524	18
Intersection delineation	315 sites	$2.6m	4,650	$43.3m	$567	16

Road Infrastructure - findings

Status of 185km of roads in the city (2010)

Start ratings – City Road Network – Baseline situation 2010								
Star Ratings	Vehicle Occupant		Motorcyclist		Pedestrian		Bicyclist	
	Length (Km)	Percent (%)	Length (Km)	Percent (%)	Length (Km)	Percent (%)	Length (Km)	Percent (%)
5 Stars	-	-	-	-	-	-	-	-
4 Stars	-	-	-	-	-	-	-	-
3 Stars	44	24	9	5	1	1	-	-
2 Stars	73	40	75	41	18	10	22	12
1 Stars	59	32	92	50	157	85	154	84
N/A	9	4	9	4	9	4	9	4
TOTALS	**185**	**100**	**185**	**100**	**185**	**100**	**185**	**100**

3-Star or Better:

24% = Vehicle occupants 1% = pedestrians

Road Infrastructure - findings

Along portions of the 92kms in the city, the following countermeasures have been implemented

Countermeasure	Action undertaken to date
Pedestrian Footpath	Provided along 37km of the surveyed road network through enforcing parking regulations, clearing street vendors from the footways and / or constructing footways
Central Median Barrier	Some central medians have been installed along the newly rehabilitated road sections. Beautification exercises along the main roads in Kampala City have also seen central Islands becoming more effective as pedestrian refuges.
Delineation	Road Markings have been installed at a number of rehabilitated road sections especially within the city centre. This is only apparent where major roadworks have been undertaken.
Traffic Calming	At numerous locations throughout the city. Rumble strips and road humps have been installed.

Road Infrastructure - findings

Status of 185km of roads in the city (2017)

Start ratings – City Road Network – Baseline situation 2010								
Star Ratings	Vehicle Occupant		Motorcyclist		Pedestrian		Bicyclist	
	Length (Km)	Percent (%)	Length (Km)	Percent (%)	Length (Km)	Percent (%)	Length (Km)	Percent (%)
5 Stars	-	-	-	-	-	-	-	-
4 Stars	1	1	-	-	-	-	-	-
3 Stars	46	25	9	5	1	1	-	-
2 Stars	71	38	75	41	25	14	23	12
1 Stars	59	32	92	50	150	81	153	83
N/A	9	4	9	4	9	4	9	5
TOTALS	**185**	**100**	**185**	**100**	**185**	**100**	**185**	**100**

3-Star or Better:

26% = Vehicle occupants 15% = pedestrians

Road Infrastructure - findings

Improvements in Ped & Vehicle Occupant star ratings can be attributed to the following actions on some roads:

- Improvement in pavement quality
- Widening of a number of road links to increase capacity and enable recovery in Loss of Control (LOC) situations
- Improved directional road markings especially where junction re-alignments have taken place enabling early decision making by drivers thus minimizing conflicts
- Physical separation of vehicles travelling in opposite directions by widening central reserves or installing physical medians thus minimizing Head-on collisions
- Clearing roadsides and protecting road reserves from encroachers resulting in less roadside friction and better visibility
- Provision of or freeing up pedestrian footpaths through enforcement of illegal parking, clearing footpaths from street vendors, etc
- Provision and widening of pedestrian refuges

Road Infrastructure Conclusion

1. Road Infrastructure development has been prioritized over the last 10 years however there is;
   - Majority focus on vehicle mobility
   - little effort to accommodate pedestrians
   - no effort to accommodate 2-wheelers
   - lack of support for enforcement efforts

2. Road Safety Audits and / or Assessments are rarely carried out. Recommendations are often neglected resulting in the loss of opportunities to construct safer roads.

Road Infrastructure Conclusion

3. Although there are Road Safety Units / departments at UNRA & KCCA and there is a NRSC, these departments are poorly resourced and not empowered to undertake their roles effectively

4. Human resource to undertake road safety is inadequate nationwide – not undertaken in Higher education

5. The road network in most urban areas in Uganda has not adequately considered the movement of pedestrians, who represent the dominant mode

Road Infrastructure Recommendations

1. Prioritize the development of safer streets and mobility for vulnerable road users especially in the urban centres
2. Carry out Road Safety Audits or Assessments on all road development schemes and implement viable recommendations
3. Implement cost effective countermeasures recommended in the iRAP assessment of 2010 or undertake a new iRAP assessment and implement the recommended outcomes

Road Infrastructure Recommendations

4. For 185km in & around Kampala, these key countermeasures are recommended for implementation

Top 5 most cost effective countermeasures 185km Kampala Road Network – Current situation 2017						
Countermeasure Type	**Sites / length**	**Estimated Cost (10years)**	**KSI Saved (10 years)**	**Value of Safety Benefit (10 Years)**	**Cost per KSI saved**	**BCR**
Roadside safety hazard removal	60.9km	$0.8m	5,988	$42m	$134	52
Improve curve delineation	37km	$0.8m	5,453	$38.2m	$153	46
Traffic calming	164.6km	$4.0m	19,990	$119.1m	$223	30
Shoulder sealing	53.3 km	$1.4m	4,897	$34.3m	$279	25
Pedestrian footpath with barriers	67.8km	$10.7m	19,810	$184.3m	$672	10

Road Infrastructure Recommendations

If all recommendations are implemented over 10 years, the effect on Star Ratings will be…

Start ratings – City Road Network – Baseline situation 2010								
Star Ratings	Vehicle Occupant		Motorcyclist		Pedestrian		Bicyclist	
	Length (Km)	Percent (%)	Length (Km)	Percent (%)	Length (Km)	Percent (%)	Length (Km)	Percent (%)
5 Stars	14	8	-	-	2	1	-	-
4 Stars	37	20	12	6	151	82	-	-
3 Stars	104	56	117	64	22	12	73	40
2 Stars	14	8	32	17	-	-	84	45
1 Stars	7	4	15	8	2	1	19	10
N/A	9	4	9	5	8	4	9	5
TOTALS	**185**	**100**	**185**	**100**	**185**	**100**	**185**	**100**

3-Star or Better:

84% = Vehicle occupants

70% = Motorcyclist

95% = pedestrians

40% = Cyclist

Road Infrastructure Recommendations

5. Agencies should take advantage of the available training both Nationally and Internationally to develop internal capacity for road safety Engineers.
6. Prioritize NMT and enhance safety by giving Pedestrian movements the highest design priority and making them the rationale which determines where and what infrastructure improvements or maintenance works are carried out

Road Infrastructure Recommendations

7. Establish and support Road Safety Units / departments in each road implementation agency ensuring they are well staffed; financially resourced; roles clearly defined in line with their agency mandate; work in collaboration with; and accountable to the NRSC. The NRSC is to have a stronger coordinating role.

Policy and Standards Conclusion

1. Informed by the articles of the African Road Safety Charter, the African Union has developed a Decade of Action for Road Safety “African Action plan” which elaborates expected outcomes, actions and outputs as well as a monitoring indicators and timelines. These provide a good reference point for Uganda to follow on the relevant policy actions in order to address the road safety. Uganda is yet to domesticate the recommendations of the Charter.
2. Uganda was one of the first African Countries to have an NMT policy (2012). The implementation of this is lacking though.

Policy and Standards Conclusion

3. Laws in Uganda exist for use of pedestrian facilities such as crossings and footways, however enforcement of these laws is lacking resulting in the abuse and deterioration of these facilities making them ineffective.
4. The standards for signage, road markings and street furniture exist however, the implementation of these in inconsistent and varies widely from contractor to contractor – even when the agencies supervising the works are the same.
5. In 2010, the road design manuals were updated to conform to international standards. However, the implementation is unsatisfactory.

Policy and Standards Recommendations

1. The government should develop a Road Safety strategy and a design standard specifically for Urban Centres focussing on global best practices for safer streets and mobility of VRU.
2. Government should consider enhancing road safety in education especially at graduate levels.
3. Professional Institutions should require Road Engineers to demonstrate knowledge of Road Safety

Policy and Standards Recommendations

4. Implementation of the National NMT Policy as well as the National Road safety policy
5. The iRAP protocols and methodology should be embedded into the routines of the government Engineers to ensure that development and maintenance regimes are focused on safety.
6. Consider setting a 3-Star minimum iRAP target on all new and rehabilitation projects
7. Domesticate the various requirements of the 1949 UN Convention and it's protocols - for which Uganda is a signatory

The solutions are known

Road Safety Toolkit toolkit.irap.org

ROAD SAFETY TOOLKIT

Crash Types | Road Users | Treatments | Management | About

Home

new! Search...

iRAP

gTKP global Transport Knowledge Partnership

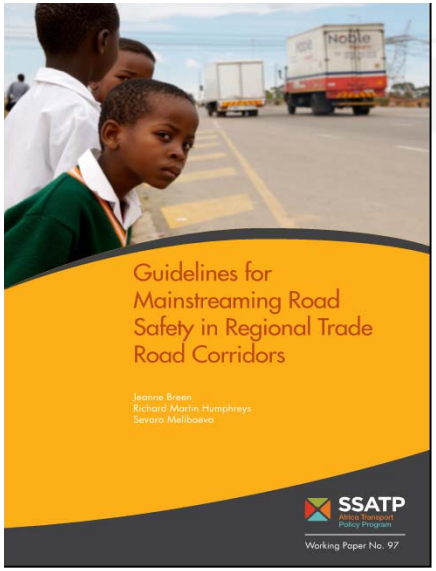
Welcome to the new Road Safety Toolkit. It has a fresh new look and the content has been expanded to include information on Safer People and Safer Vehicle treatments.

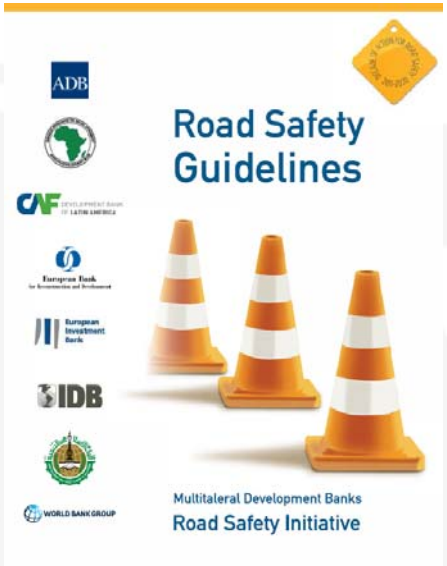
Quickfind

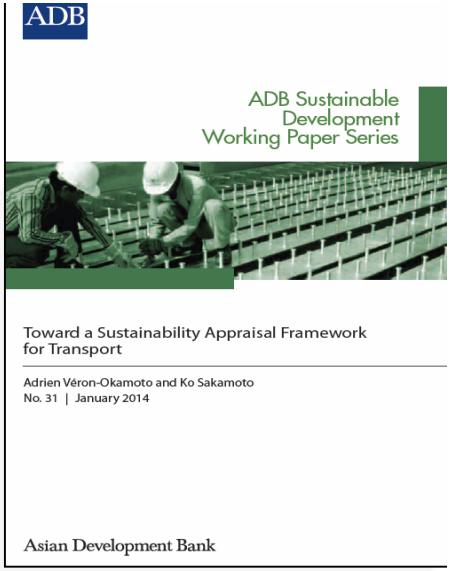
- Intersection - Roundabout
- Seatbelts
- Median Barrier
- Traffic Calming
- Realignment - Horizontal

How governments use the results?

- National Transport Strategy/Road Safety Strategy
  - Introduce safety management systems for identifying and mitigating risk from road layout and use
- Mass action treatment of hazardous locations
- Set road safety policies and targets
- Asset inventory data and speed limit reviews
- Maintenance management - comprehensive signing, line marking and delineation programmes
- Address the needs of vulnerable road users in urban and rural locations







Thank you

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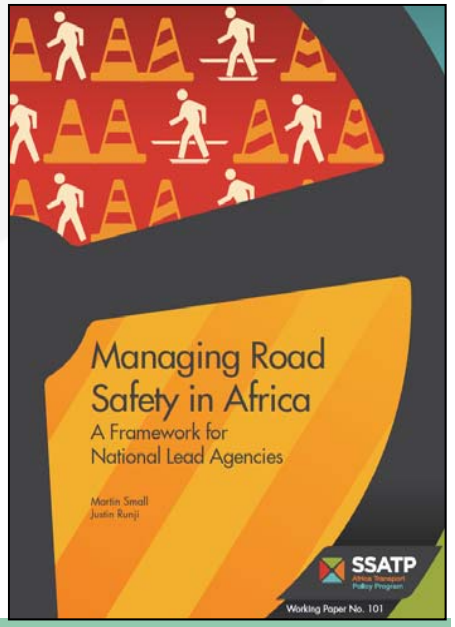

For more information

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- Website: http://www.irap.org
- Road Safety Toolkit: http://toolkit.irap.org
- iRAP online software: http://vida.irap.org