Uganda Road Safety Capacity Building Workshop
1-2\textsuperscript{nd} March 2018
Kampala, Uganda
Principles of Road Safety Engineering

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Road Safety Engineering

Accident Reduction
- Action to reduce accidents to a lower level, often by the introduction of remedial measures.

Accident Prevention
- Action to prevent accidents in the future at sites and in circumstances not yet existing, often by Safety Audits.
Accident Reduction

Basic Principles

• High numbers of accidents of a similar type can indicate a problem related to the road.
• Accidents of this type will continue to occur unless the problem is treated.
• Making changes to a road environment can change driver behaviour and reduce road accidents.
Accident Problem Locations

- Single sites
- Mass action
- Routes
- Areas
Single Sites

Investigation Methodology

• Identify the problem sites
• Rank the sites
• Analyse accidents at each site
• Visit the site
• Define the accident problem(s)
• Look at possible remedial measures
• Estimate accident savings and cost savings
• Decide on remedial measure(s)
• Implement the measures
• Monitor
Mass Action

Investigation Methodology

• Identify treatable problems at isolated locations over an area
• Implement known remedial measures
• Monitor
Route Investigations

Similar methodology as for single sites:
• Identify problem routes
• Analyse accidents to define the problem(s)
• Series of single sites? Or route-wide problem?
• Look at ways to reduce accidents
• Decide on most cost-effective measure(s)
• Implement
• Monitor
Area Wide Investigations

Similar methodology to single sites and routes:

- Identify problem areas – rank the areas
- Analyse accidents to define the problem
- Look at ways to reduce accidents
- Decide on most cost-effective
- Implement
- Monitor
Road Accident Data

- Accident involving injury occurs
- Accident reported to Police
- Accident details recorded by police or STATS-19 form
- Local authority/Police put accidents onto computer
- Accident data ready for analysis by local authority
Road Accident Data

• Accuracy of data - Police concerns on site
  ✓ Attend to casualties
  ✓ Investigates offences
  ✓ Get traffic moving

• Accuracy of data - Police local knowledge
  ✓ Location can be suspect
  ✓ Engineering knowledge
What should an accident system be able to do?

- Provide a list, ranked in descending order, of sites, routes and areas with high accident numbers and/or severity (hotspot list)
- Provide a list, ranked in descending order, of locations with high accident numbers of a pre-determined type (mass action list e.g. loss of control on bends)
Road Accident Data Analysis Systems

• Provide detailed accident data from a single enquiry at a location where complaints have arisen

• Provide tables and charts describing accident trends

• Provide an automatic monitor of success of schemes

• Have a wide and easy access to all traffic and road safety staff
Road Accident Data Analysis Systems

Individual workshop exercise:
Does your accident analysis system;
• Provide a hotspot list of sites/routes/areas?
• Provide hotspot data by severity?
• Provide mass action lists?
• Do site specific enquiries?
• Provide tables and charts showing accident trends?
• Do automatic monitoring of accident schemes?
• Have wide access to staff?
Single Sites & Routes – Ranking Methods

• **Single sites**
  ✓ Accident number in 3 (or 5) years

• **Routes**
  ✓ Accidents/km/ in 3 (or 5) years
  ✓ Accident rates (accidents/100 million vehicle km)

• **Timescale**
  ✓ 3 years less likely that conditions have changed
  ✓ 5 years provides more data
Example of Ranking System

- **Single sites**
  - ✓ 8 or more accidents in 3 years (hotspot)

- **Routes**
  - ✓ At least 10 accidents in 3 years
  - ✓ Listing of those with at least 25% more than above
  - ✓ Accident frequency compared with accidents per 100m veh kms
Accident Prevention

• “Prevention is better than cure”
• Change behaviour
• Change attitudes
• Improve vehicle safety
• Road Safety Audits
Safety Audit

- Engineering side of accident prevention
- Mandatory on Trunk Roads
- Recommended on local roads
- Stages (F), 1, 2, 3 & 4
- Stage 4 is monitoring after 1 and 3 years
- Interim audits
Thank you

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