Speed Management: From Vision to Practice

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Objectives

• Learning Objectives: understand the importance of speed as a major RTI risk factor, and the key characteristics of successful speed management programs.

• Outcomes: attendees will be able to formulate specific interventions and campaigns to effectively address excessive speeding.
Terminology

- Road traffic crash: “a collision or incident occurring on a public road involving at least one moving vehicle”
- Road traffic injury (RTI): “a fatal or nonfatal injury that results from a road traffic crash”
- Road traffic fatality: a fatality that results from a road traffic crash
“RTIs are largely preventable and predictable; they are a human-made problem amenable to rational analysis and countermeasure”

WHO World Report on Road Traffic Injury Preventions, 2004
A typical road in Denmark....
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1. Introduction to Risk Factors
2. Speed Management Fundamentals
3. Intervention areas:
   a. Legislation
   b. Campaigns
   c. Traffic calming
   d. Automated Speed Enforcement
“A risk factor is any attribute, characteristic or exposure of an individual that increases the likelihood of developing an injury”
# Risk factors

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## Risk Factors

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“Key behavioral risk factor”
Risk Factors

- Speed Limit Law
- Drink Driving Law
- Motorcyclist Helmet Law
- Seatbelt Law
- Child Restraint Law
- Cell Phone Law
- Drug Driving Law
Risk Factors

New countries with laws meeting best practice vs. Countries with laws meeting best practice

- **Number of countries**
  - Speed: 2 (New), 45 (Existing)
  - Drink-driving: 8 (New), 26 (Existing)
  - Helmets: 3 (New), 41 (Existing)
  - Seat belts: 5 (New), 100 (Existing)
  - Child restraints: 7 (New), 46 (Existing)

- **Population (millions)**
  - Speed: 1 (New), 2 (Existing)
  - Drink-driving: 4 (New), 10 (Existing)
  - Helmets: 2 (New), 5 (Existing)
  - Seat belts: 1 (New), 3 (Existing)
  - Child restraints: 1 (New), 5 (Existing)
Risk Factors

- Results
- Interventions
- Institutional management functions
Risk Factors

- Rapid motorization
- Road safety crisis
- Road safety initiatives
- Effective road safety management
- Sustained road fatality reduction
- National targets
Risk Factors

1970 Seatbelts in all new vehicles
1973 Legislation for compulsory wearing of seatbelts & helmets
1976 Random breath testing
1976-82 legislation for mandatory child restraints
1988 Speed cameras instituted.
1989: 10 Point Plan for dangerous road user behavior and enforcement
1990 National Program for treating black-spots
1992 First national road safety strategy with defined targets
1998 Lowering speed limits in high risk areas
2002-Present New national road safety strategy (2011-2020) with continued multi-sectoral interventions
Summary

A risk factor is any attribute, characteristic or exposure of an individual that increases the likelihood of developing an injury.

Using the Haddon matrix, it is possible to identify factors that contribute to the likelihood and severity of road crashes.

Effective risk factor management flows from the adoption of sound road safety management principles at all levels of government.
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1. Overview of Risk Factors

2. **Speed Management Fundamentals**

3. Intervention areas:
   a. Legislation
   b. Campaigns
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“Speed remains a very important risk factor. It has a greater effect on the number of accidents and injury severity than almost all other known risk factors.”


“Speed is at the core of the road traffic injury problem. 1 in 3 road traffic deaths occur because someone has been driving too fast".

Dr Margaret Chan, Director-General of the World Health Organization (2017)
Higher speeds increase the risk of a crash…

Source: (6) adapted from the Australian Transport Safety Bureau
Speed Management Fundamentals

…and the severity of injuries

![Graph showing the relationship between impact speed and injury severity](source: [6])
Factors that contribute to speeding:

- shorter journey time vs. perception of injury risk
- perception of driving skills
- circumstances of individual trip
- productivity / fleet management
- road environment: design speed vs. posted speed limit
Speed Management Fundamentals

Apply the laws of physics...

- if there are large numbers of vulnerable road users on a section of road they should not be exposed to motorized vehicles travelling at speeds exceeding 30 km/h
- car occupants should not be exposed to other motorized vehicles at intersections where right-angle, side-impact crashes are possible at speeds exceeding 50 km/h
- car occupants should not be exposed to oncoming traffic where their speed and that of the traffic travelling towards them, in each instance, exceeds 70 km/h, and there are no separating barriers between opposing flows
- if there are unshielded poles or other roadside hazards, the speed limits need to be reduced to 50 km/h or less.
Speed Management Fundamentals

…and combine with local factors:

- Traffic mix
- Road shoulder width and pavement quality
- Lane width
- Quality of delineation
- Presence and type of intersections
- Intensity of land development abutting the road
- Traffic volume and flow
- Ability to overtake safely
- Time-based concerns (e.g. school start/finish times)
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Intervention areas

Effective speed management:

- employs a range of measures that will include enforcement, engineering and education
- is grounded in the hierarchy of roads (arterial, sub-arterial, local)
- is accepted by the motoring public
- factors multiple criteria (current speed measurements, traffic flow & mix, crash rates, presence of VRUs, physical characteristics of the roads, etc.) in setting legal limits
Intervention Areas

Start with data:

• What is the scale of the problem of speed related crashes?
• What proportion of overall road traffic crashes does this comprise?
• What does the crash data indicate about current speed limits?
• Who are those most likely to be involved as drivers or riders in speed related crashes?
• Where are the locations where pedestrian and other VRUs form a high proportion of total crash numbers?
• What are the characteristics of drivers involved in serious or fatal pedestrian crashes?
Intervention Areas

Percent Speeding by Vehicle Type
Cairo Ring Road 2011

- Car: 25.00%
- Taxi: 4.00%
- Light Truck: 30.00%
- Large Truck: 50.00%
- Bus: 30.00%
- Microbus: 45.00%

> Speed Limit
#1 Legislation

Legislation:

- Usually includes limits, sanctions for people who break them (fines, suspension) and specifications of equipment used for enforcement by the police
- Set by the government road authority for arterial routes, and municipalities for local roads and streets
- Communicated through signs to the road user
#1 Legislation
75% road signs, traffic signals in Delhi are faulty: study

Nearly 75% of road signs, traffic signals and road markings in Delhi are not up to the mark and lead to millions of traffic violations without road users being at fault, says a study.

Mayank Aggarwal

Most traffic signals at intersections in Delhi were not functioning as per the prescribed standards or are wrongly installed, said the study. Photo: Mint
#1 Legislation
#2 Campaigns

Don’t fool yourself, speed kills.
#2 Campaigns

Scoring campaigns:

- Comprehensibility: What messages are viewers taking from the ads? Do they understand what the ad is saying?
- Acceptability: Do they accept what the ad is saying as credible, as relevant to them?
- Do viewers respond to the ads in a way that generates the relevant concern and motivation for adopting safer road safety behaviors (e.g. not speeding)?
Underlying theories:

Theory of Planned Behavior (TPB): personal decisions to carry out certain behaviors are based on 1) attitudes toward the behavior; 2) subjective norms; and, 3) perceived behavioral control.

Health Belief Model (HBM): the main motivator for people to preserve or protect their health is to avoid negative health outcomes.

Social Norms Theory: behavior influenced by perceptions of how other members of their social group think and behave.
#2 Campaigns

Fear-based approaches:

Confronts viewers with depictions or associations of negative consequences of risky behaviors by capitalizing on their fears through graphic imagery to scare and shock individuals, or invoke shame or guilt.

These campaigns are not equally effective with all audiences, younger and male audiences are more difficult to influence using this approach, and the effects of fear-based appeals are often short-lived.
#2 Campaigns
#2 Campaigns

Limitations to assessing campaigns:

- Campaigns are rarely systematically and empirically evaluated.
- Difficult to determine how to accurately and objectively measure the impact of a campaign.
- Variety of methodological research design challenges.
- Many campaigns consist of multiple strategies (e.g., enforcement, TV advertisements, billboards). What is the effectiveness of each component?
#2 Campaigns

Campaigns that are based on a solid theoretical foundation are more likely to successfully influence behavior. Social norms should not be overlooked in the development of campaign

Well-executed campaigns carefully consider the use of various campaign tools and select those that are most accessible, practical, and likely to reach the target audience, at a given budget

The combination of public relations and enforcement as supporting activities shows particularly large effects
#3 Engineering Treatments
#3 Engineering Treatments

Engineering Treatments:

- Conspicuous street signs
- Speed humps and raised platforms at pedestrian crossing locations and at intersections
- Gateway treatment at entrances to towns and villages
- Roundabouts
- Separation of vulnerable road users
- Variable speed limits
#3 Engineering Treatments
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#3 Engineering Treatments
#3 Engineering Treatments
Summary

• The laws of physics apply everywhere
• Substantial reductions in speed are possible within extremely limited budgets
• Substantial reductions in speed and the capture of the benefits of these reductions are feasible within the timeframe of the 2020 target
Sources

Speed:

*Speed management, a road safety manual for decision makers & practitioners*, WHO, 2009

*Automated speed enforcement systems to reduce traffic-related injuries: closing the policy implementation gap*, Stephanie R Morain et al., 2015
Thank you for your attention

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