SESSION 4.6 RECAP: IDENTIFICATION OF ROAD SAFETY RISKS

CONDUCTING ROAD SAFETY AUDITS & APPRAISALS

PRESENTED BY: RTS & AGTT

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1

Factors Influencing Exposure to Risk

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- **Economic factors**
  - E.g. Social deprivation

- **Demographic factors**
  - E.g. Population density

- **Land use planning**
  - Influences length of trip and mode choice

- **Commuter composition**
  - Mixture of speed differential

- **Road design**
  - Diligence, standards, adherence, audits, value engineering.

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Risk Factors Influencing Crash Involvement

Road user choices

- Inappropriate or excessive speed
- Travel in darkness
- Travel under influence/fatigued

Roads design factors maintenance

- Visibility,
- Radii,
- Crests/Sags (K-Values),
- Markings.

Vehicle factors

- Braking,
- Handling,
- Maintenance.

Road user factors

- Eyesight,
- Diabetes,
- Drugs, alcohol, medicine,
- Fatigue,
- Sex and age,
- Vulnerable users

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Risk Factors Influencing Crash Severity

Human Tolerance Factors

Inappro-priate or excessive speed

Seat-belts and child restraints not used

Crash helmets not used by cyclists/ motorcyclists

Road-side objects not crash protected

Insufficient vehicle crash protection

Use of alcohol and other drugs

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Risk Factors Influencing Severity of Post-Crash Injuries

Delay in detecting crash

Presence of fire resulting from crash

Leakage of hazardous materials

Presence of alcohol and other drugs

Difficulty rescuing or extracting people

Insufficient pre-hospital care

Insufficient emergency and hospital care

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Examples of factors affecting drivers' choice of speed

- **Road**
  - Width
  - Gradient
  - Alignment
  - Surroundings
  - Layout
  - Markings
  - Surface quality
- **Vehicle**
  - Type
  - Power/weight ratio
  - Maximum speed
  - Comfort
- **Traffic**
  - Density
  - Consumption
  - Prevailing speed

- **Environment**
  - Weather
  - Surface condition
  - Natural light
  - Road lighting
  - Signs
  - Speed limit
  - Enforcement
- **Driver**
  - Age
  - Gender
  - Reaction time
  - Attitudes
  - Thrill-seeking
  - Risk acceptance
  - Hazard perception
  - Alcohol level
  - Ownership of vehicle
  - Circumstances of the journey
  - Occupancy of the vehicle

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Likely Frequency of the Problem to Lead to a Crash

Likelihood	
Frequent	Once or more per week
Probable	Once or more per year (but less than once a week)
Occasional	Once every five to ten years
Improbable	Less often

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Likely Severity of the Resulting Crash

Severity of Resulting Crash	
Catastrophic	Likely **multiple deaths** such as: • High-speed, multi-vehicle crash on a freeway • Car runs into crowded bus stop • Bus and petrol tanker collide • Collapse of a bridge or tunnel
Serious	Likely **death or serious injury** such as: • High or medium-speed vehicle/vehicle collision • High or medium-speed collision with a fixed roadside object • Pedestrian or cyclist struck by a car
Minor	Likely **minor injury** such as: • Some low-speed vehicle collisions • Cyclist falls from bicycle at low speed • Left-turn rear-end crash in a slip lane
Limited	Likely **trivial injury to property damage** only such as: • Some low-speed vehicle collisions • Pedestrian walks into object (no head injury) • Car reverses into post

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Risk and Suggested Treatment Action

Risk	Suggested Treatment Action
Intolerable	The safety concern "must" be corrected, even if the cost is high
High	The safety concern "should" be corrected or the risk significantly reduced, even if the treatment cost is high
Medium	The safety concern "should" be corrected or the risk significantly reduced if the treatment cost is moderate, but not necessarily high
Low	The safety concern "should" be corrected or the risk reduced if the treatment cost is low

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Focus of risk identification

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The fallacy of auditing against standards

Road Standard

- Is measure of level of quality.
- Ensures a uniform driving experience.
- Implies that safety has been taken into consideration.

If standards makes roads safe, then why does crashes occur?

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Key questions which the auditor has to ask

Correct application of a standards must be checked.
However, in the context of the standard/ design/ solution ask:

- "Who can be hurt in a crash on this part of the road/ project and how might that happen?"
- "Does the road environment communicate the correct message to the road users?"
- "What can be done to reduce the potential for that crash, or to limit its consequences?"

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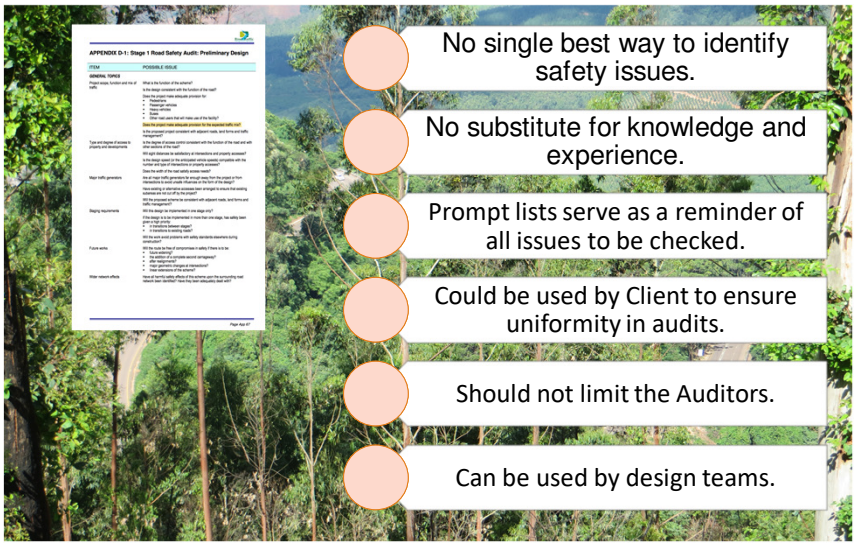
The Role of Prompt Lists



- No single best way to identify safety issues.
- No substitute for knowledge and experience.
- Prompt lists serve as a reminder of all issues to be checked.
- Could be used by Client to ensure uniformity in audits.
- Should not limit the Auditors.
- Can be used by design teams.

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END OF LECTURE

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