



SESSION 4.7 SAFETY ASPECTS OF ROAD DESIGN

CONDUCTING ROAD SAFETY AUDITS & APPRAISALS

PRESENTED BY: RTS & AGTT

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Sight distance: fundamental requirement

Sight as primary input to driver

- Sight provides 99 % of input
- Hearing
- Motion detection (acceleration) and

Driving tasks

- Control (see ahead)
- Guide (see to sides)
- Navigate (see signs)



SOURCE: WHO

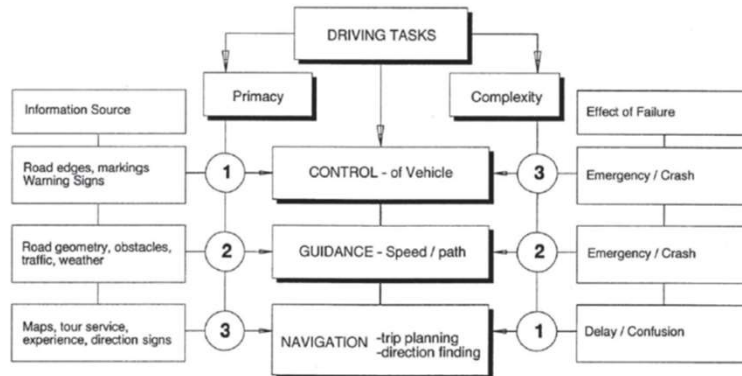


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Driving tasks SARTSM



Detail 1.20.3 Human Factors and the Driving Task



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Geometric design for safety: design speed

Horizontal alignment

- Tangents (length)
- Curves (radii)
- Transition
- S- curves
- Compound
- Broken back

Vertical alignment

- Gradient
- Length
- Crest curves
- Sag curves

Cross section

- Lane width
- Superelevation
- Number of basic lanes
- Auxiliary lanes
- Medians and shoulders
- Kerbs and gutters
- Side drains
- Slip lanes
- Street furniture
- Signage and marking
- Side slopes
- Vegetation
- NMT facilities

SOURCE: WHO



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Examples unsafe geometric features

<ul style="list-style-type: none"> Horizontal <ul style="list-style-type: none"> Too long tangents Bendiness Inadequate markings Vertical <ul style="list-style-type: none"> Too steep gradient Too flat gradient Sharp crest curves Sharp sag curves 	<ul style="list-style-type: none"> Cross section <ul style="list-style-type: none"> Inappropriate superelevation Narrow lanes Wide lanes Lack of shoulders Lack of recovery area Steep side slopes Trees Street furniture Kerbs on high speed roads
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Sight distances

- Stopping sight distance
- Passing sight distance
- Decision sight distance
- Intersection sight distance
- Shoulder sight distance
- Intervisibility
- Visibility of signs

SOURCE: RSM

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Safety issues resulting from capacity

High capacity

Driver expectations

Speeding

Severity of conflicts

Low capacity

Congestion

Intensity of conflicts



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Auxiliary lanes

Climbing lanes

Passing lanes

Acceleration lanes

Deceleration lanes

Turning lanes

Queuing lanes

Weaving lanes



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Public transport requirements

Modes of public transport

- Buses (normal and rapid transit)
- Minibus taxis
- Metered taxis / Uber

Facilities required: safety perspective

- *HOV lanes*
- *Stops and laybys*
- *Termini*
- *Holding areas*



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Design assumption: safety implications

Reaction times

Deceleration rates

Acceleration rates

Eye height

Object height

Design vehicles

Following distances



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Safety implications of maintenance

Maintenance of design assumptions

- sight distances

- skid resistance

Maintenance of road elements

- side slopes

- guardrails

- road surfaces

- road edges

- drainage



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END OF LECTURE

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