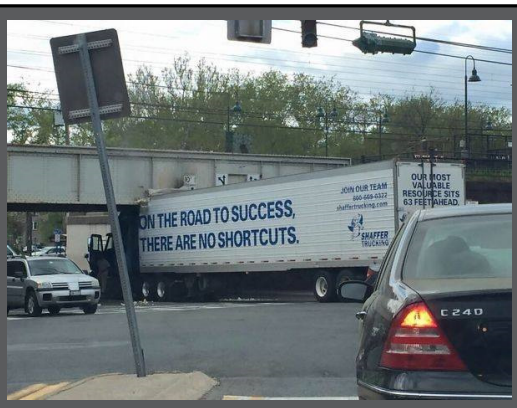

SESSION 2.2A ROAD SAFETY ENGINEERING CONCEPTS – PART 1

CONDUCTING ROAD SAFETY AUDITS & APPRAISALS

PRESENTED BY: RTS & AGTT

January 2022

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1

WHAT IS ROAD SAFETY ENGINEERING?

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What is Road Safety Engineering?

The road environment should assists the driver in making a series of correct decisions

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What is Road Safety Engineering?

When the driver makes a mistake, a forgiving road environment must help to reduce the severity of the crash

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What is Road Safety Engineering?

A safe road environment should provide no surprises to road users

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REMEMBER THE CONTEXT OF ROAD SAFETY ENGINEERING

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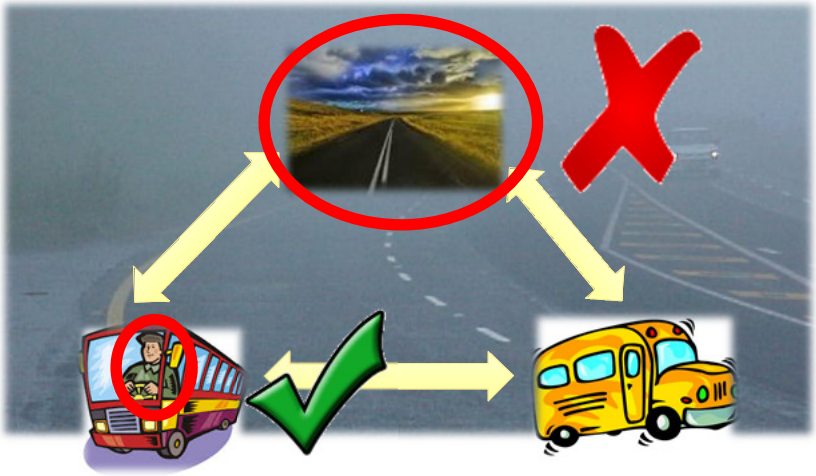
The context of road safety engineering



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The context of road safety engineering

Economy of location

Spatial distribution

Mobility

Modes

Congestion

Conflicts

Crashes

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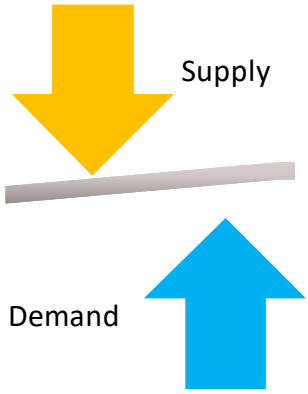
The context of road safety engineering



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SIGHT DISTANCE

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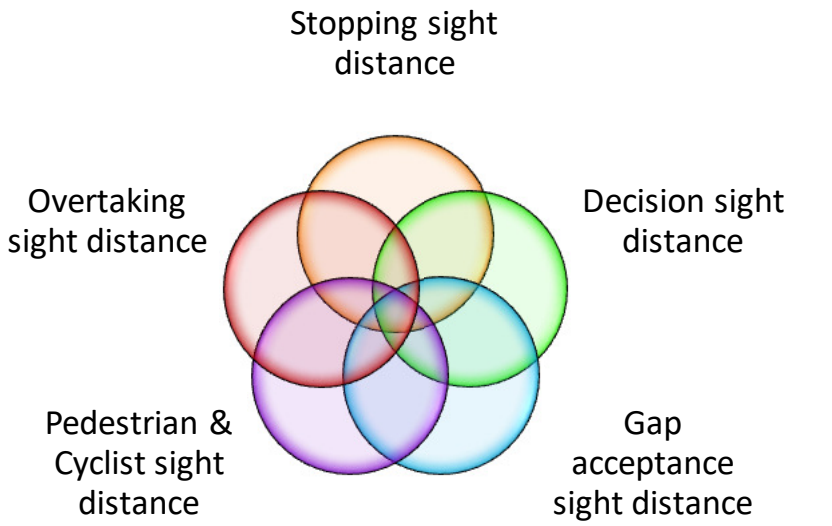
Road Geometry – Sight Distance



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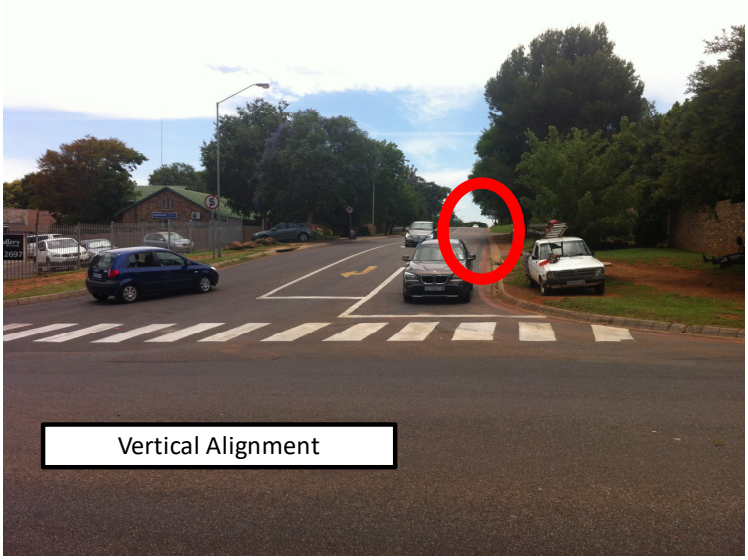
Road Geometry – Sight Distance



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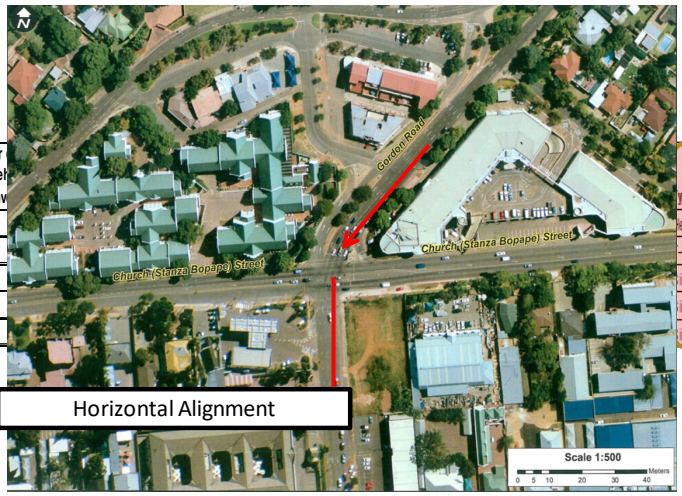
Road Geometry – Sight Distance

Crash No.	Nr of people involved	Nr veh inv
1	2	
2	2	
3	2	
4	2	
5	2	



Horizontal Alignment

ype
ead/Rear end
-Bone (back)
ideswipe
ideswipe
ideswipe

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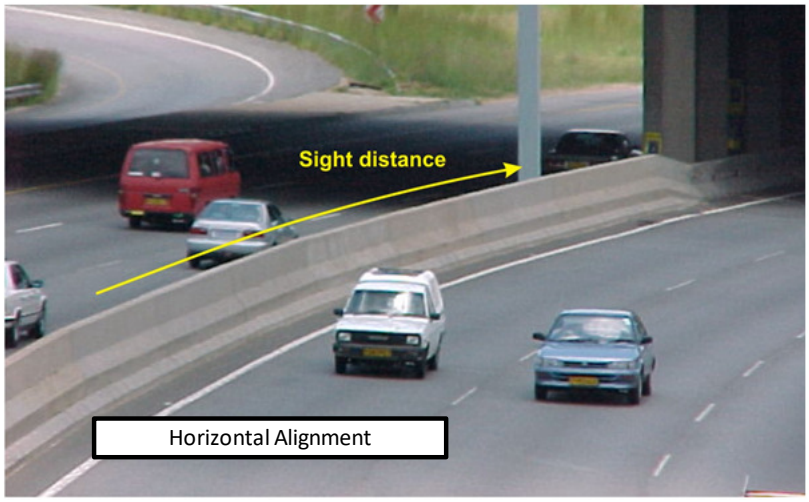
Road Geometry – Sight Distance



Horizontal Alignment

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Road Geometry – Sight Distance

Intersection Control

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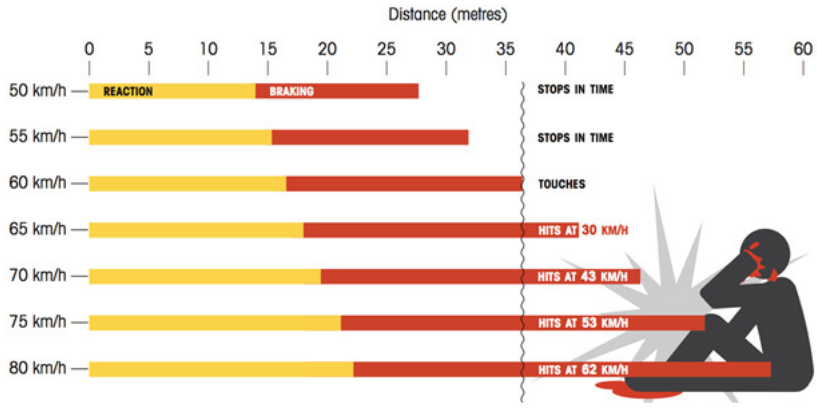
Road Geometry – Sight Distance

Stopping Sight Distance



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SPEED

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Speed - Safe Speed

Rural Roads: 80/100/120?

Urban Roads: 30/50/60/80?

Is there something like a “safe speed”???

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Speed – Understand the different kinds of speed

Important to understand the difference!

Speed Limit → Operating speed → Design speed → Appropriate speed

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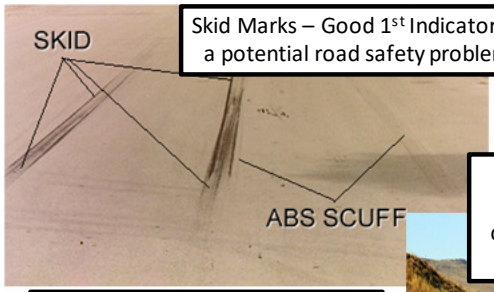
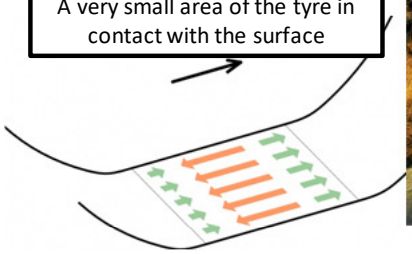
Speed – Contact with the road



Skid Marks – Good 1st Indicator of a potential road safety problem

The road surface and a combination of potential circumstances need to be taken into account

A very small area of the tyre in contact with the surface



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Speed – Managing Inappropriate Speed

- Speed limits
- Speed enforcement
- Traffic calming
- Speed reduction zones
- Other

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ROAD SIDE

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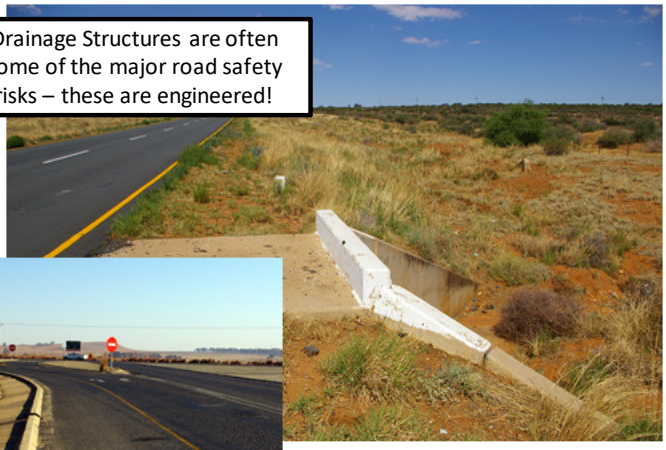
A forgiving roadside

Drainage Structures are often some of the major road safety risks – these are engineered!



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A forgiving roadside

Often, maintenance is the issue

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A forgiving roadside

We frequently get it wrong.

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A forgiving roadside

Very good.

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Traffic Signals

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Traffic Signals – Terminology

- Signal Warrants
- Legal Aspects
- Signal Faces / Placement
- Signal Timing / Phasing

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Traffic Signals – Appropriate Application is Important

Traffic signal applications

Common and widely accepted form of control

Caution to use indiscriminately

Incorrect application

Reduces traffic safety

Increases vehicular delay

Disproportionate benefit

Always benefit to side road (minor road)

Could be to detriment of main road
- Previously unimpeded movements
- Higher traffic volumes – greater delay

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Traffic Signals – Traffic Signal Warrants

Traffic signal warrants are used to indicate levels of delay above which signalisation is justified.

INSTALLATION of a traffic signal is deemed warranted at a junction or pedestrian or pedal cyclist crossing when **ANY** one of the following three queue length warrants are met.

Condition 1: The average length of ANY individual queue equals or exceeds four (4) over any one hour of a ***normal day***.

Condition 2: The SUM of the average lengths of all queues equals or exceeds six (6) over any one hour of a ***normal day***.

Condition 3: The SUM of the average lengths of all queues equals or exceeds four (4) over each of any eight hours of a ***normal day*** (the hours do not have to be consecutive, but they may not overlap)

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Traffic Signals – Caution!

A stop sign may NOT be used in conjunction with a traffic signal

Even if the signal is out of order

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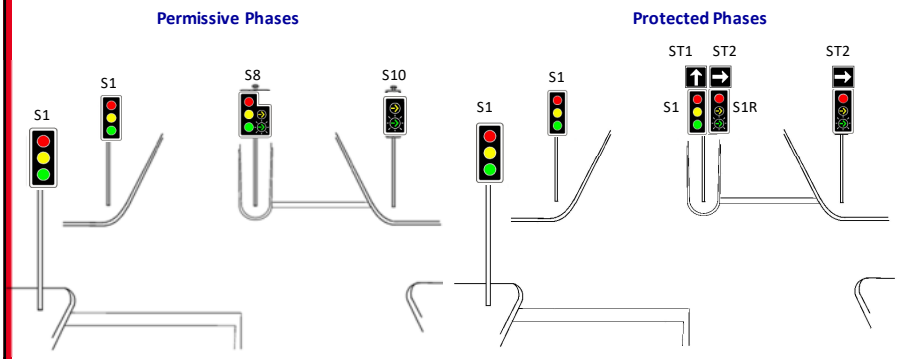
Traffic Signals – Caution!

Be aware of the difference between "Permissive" and "Protected" Phases and when+how it should be applied.



Be aware of the difference between "Leading" and "Lagging" Phases and when+how it should be applied.

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Traffic Signals – Caution!

Road Safety Engineering in Reverse!

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END OF LECTURE

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