

## Crash data systems: Himachal Pradesh Case study

July 2021



# About TRL

## Vision

World leader in creating the future of transport and mobility, using evidence-based solutions and innovative thinking

300

engineers, scientists, psychologists, IT experts and statisticians



Providing world-leading technology and software solutions for surface transport modes and the related markets of automotive, motorsport, insurance and energy

## Mission

Challenge and influence our chosen markets, driving sustained reductions (ultimately to zero) in:

- Fatalities and serious injuries
- Harmful emissions
- Barriers to inclusive mobility
- Unforeseen delays
- Cost inefficiencies



1000 clients in

**145** countries

# About Transport Research Laboratory

Over 80 years' experience in road safety

- Established in 1933 by the UK Government
- Privatised in 1996
  - Research organisation status
- Owned by the Transport Research Foundation (TRF), a Non-profit Distributing Foundation



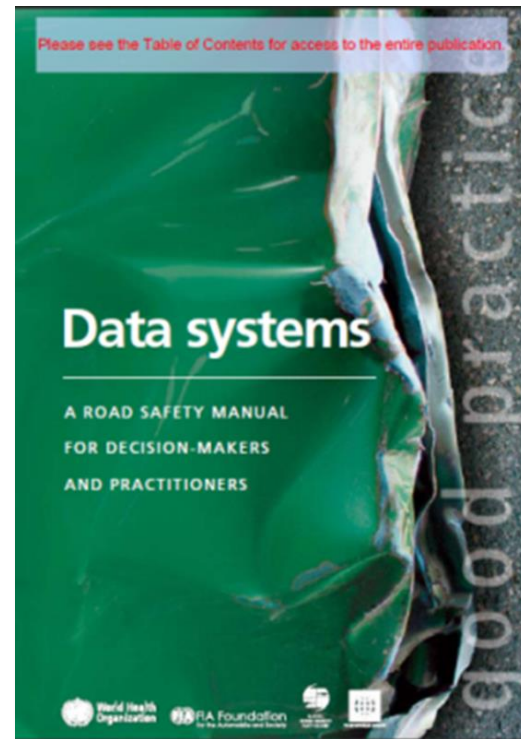
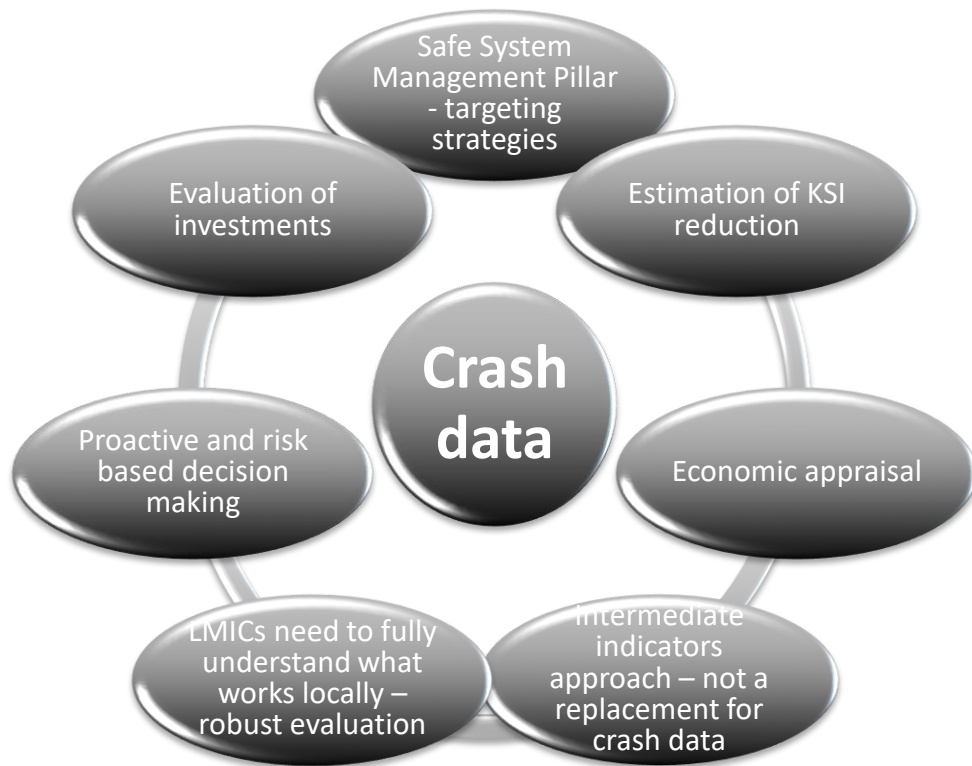
The Zebra Crossing was officially introduced to the UK in 1951

(and it was designed by TRL)



# Crash data systems

Crash data is essential to good Safe Systems strategy development



# Why data is essential

## Safe Systems framework for improved road safety

- Access to crash data means Safe System project development can be properly focussed
- Lack of robust evaluations that prove pilot corridor activities have really been successful

### Numbers of casualties

and economic values – to calculate societal costs



**Crash Data System** used to give national numbers injured



**Data system** includes SPI Information

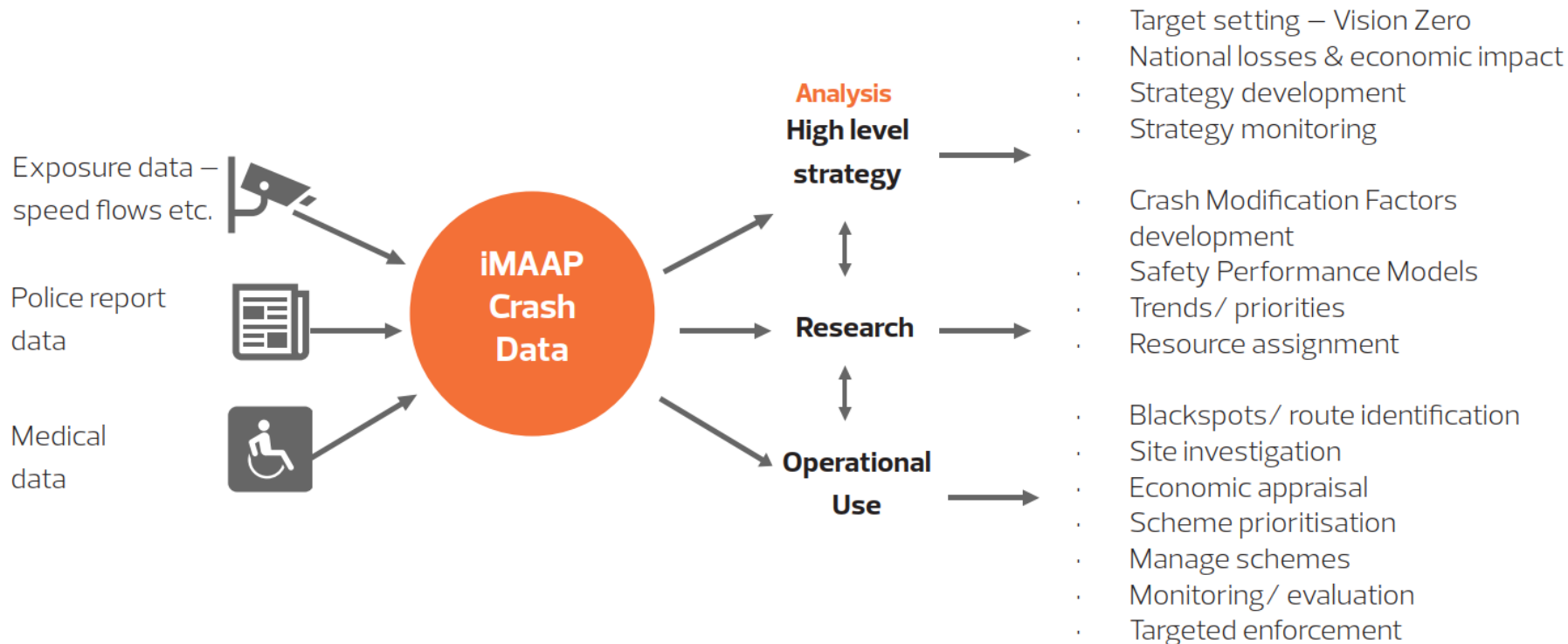


Analysis of **Crash data** Formulates **Policy** And **Strategy**



# iMAAP is a tool for crash data management

Effective modern crash data system has a central role in safety management



# Practical management of crash data

Data collection and storage have changed through time – rapidly at present

The image illustrates the practical management of crash data through a combination of field data collection and a centralized software interface.

**Field Data Collection:** A police officer in a uniform is shown interacting with a motorcycle, likely using a handheld device to record accident details.

**Software Interface:** The interface displays a map of an area including Summerhill, Chaura Maidan, Shimla, Tutikandi, and Khalini. A red pin marks a specific location on the map. The interface also shows a list of accident records on the left, with columns for Accident Date, District, Junction Type, and Weather Condition. The records include details such as HP 33 C5120 and various accident IDs.

**Accident Images:** A section on the right shows a photograph of a severely damaged white car involved in an accident.

**Summary Statistics:** The interface provides summary statistics for Full Records, showing 2187 records for one category, 3488 for another, and 3100 for a third.

# Himachal Pradesh

## State in the Western Himalayas

- Western Himalayas – beautiful, cool, hilly
- Population approx. 700 million
- Tourism, Agriculture (apples)
- 13 Districts
- Good development, but high rate of crash fatalities





# Himachal Pradesh: RADMS project 2014/15

## Road Accident Data Management System (RADMS)

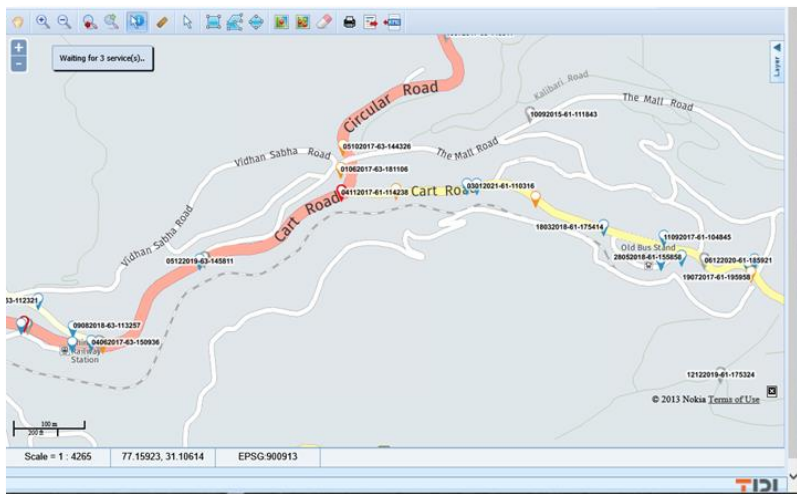
- Crash data systems review
- IT systems review
  - Vehicle registrations
  - Medical systems
- iMAAP Implementation
- Training – Police, Road Agency Staff
- Mobile devices (around +300 police stations)
- Set up Accident Data Management Cell
  - Standard Operating Procedures (SOPs)



# Rapid capture of crash data

Mobile devices – fast systematic web-based system

Accurate crash locations:

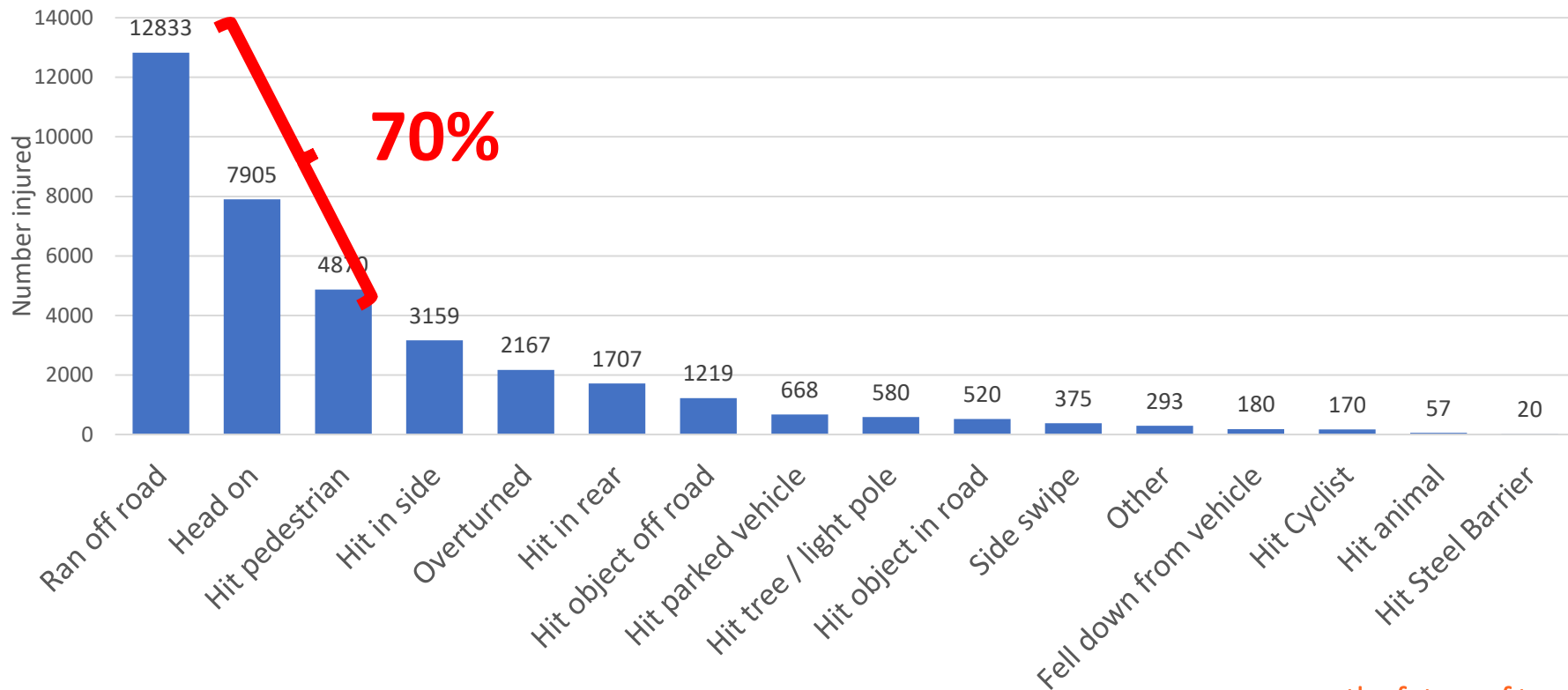


Scene photos:



# Injury numbers by crash types (5 years data – mid 2015-2020)

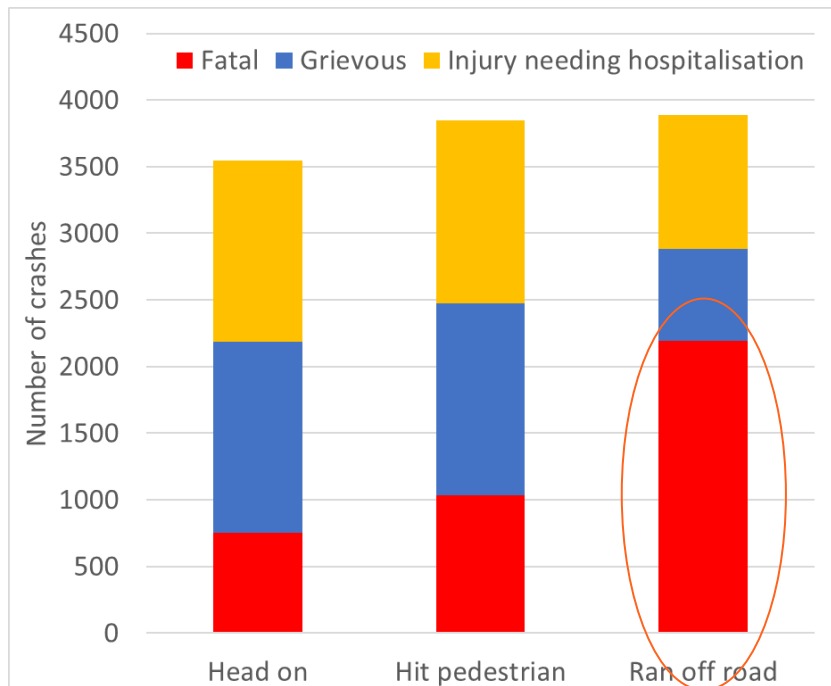
Understanding the crash type helps to determine which safety measures are relevant



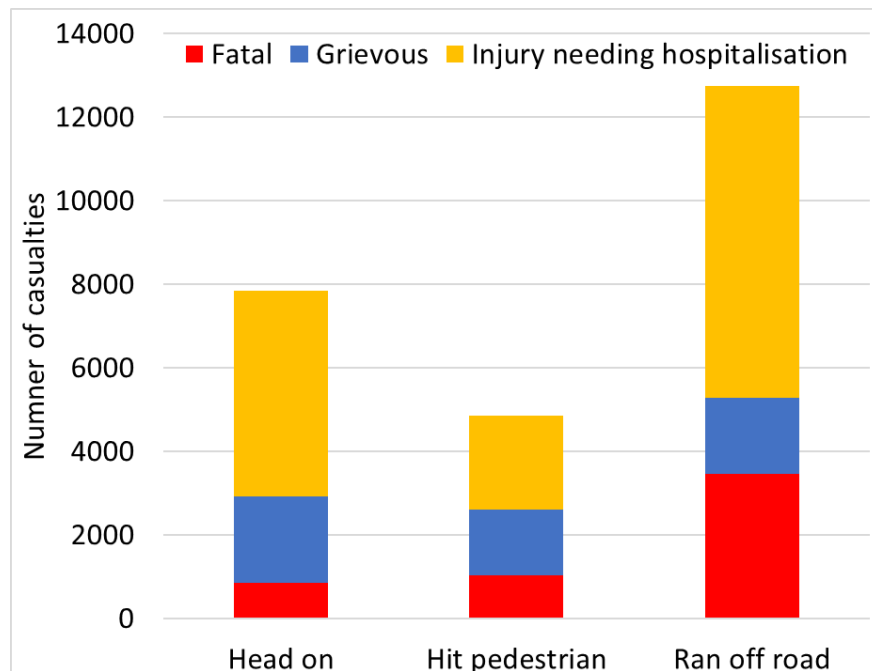
# In-depth patterns – top 3 – fatalities and serious injuries

Understanding severity of injury outcome help to prioritise

## Crash numbers:

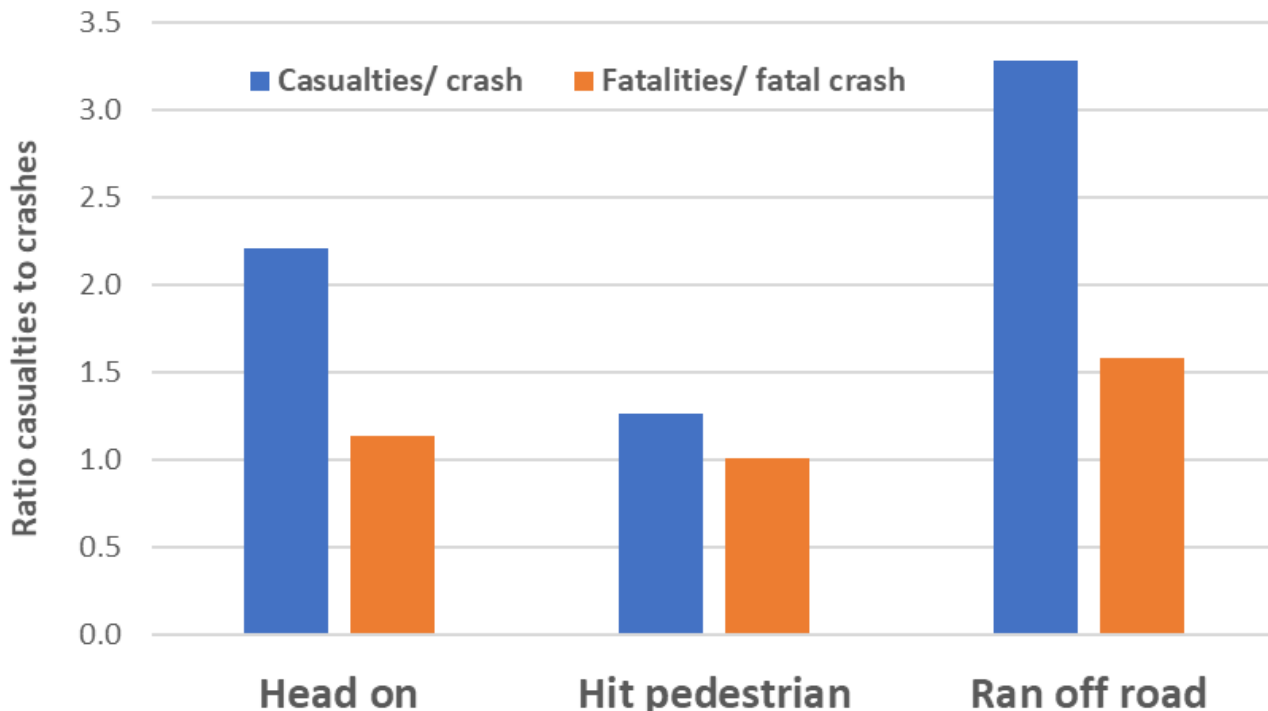


## Casualty numbers:



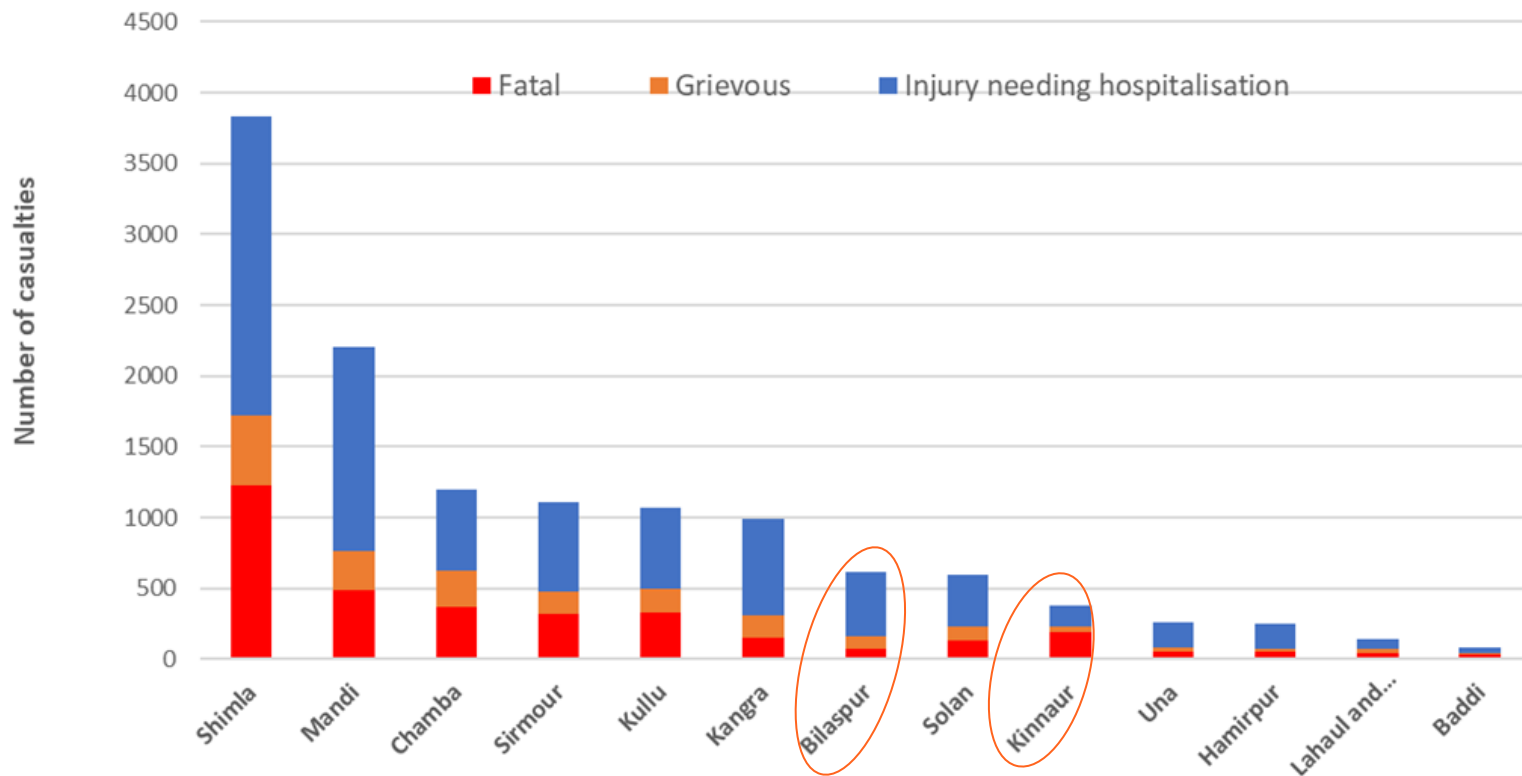
# Serious/ fatal casualties per crash type

Using rates or % allows a better comparison to help make prioritisations



# Run off road focus: district

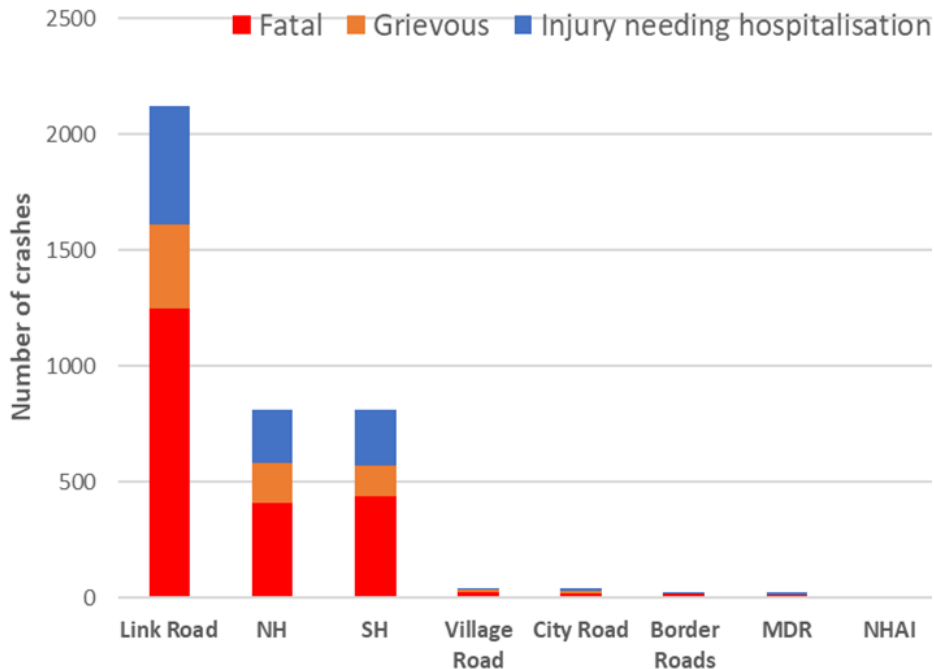
Looking at the proportions can help identify contrasting areas



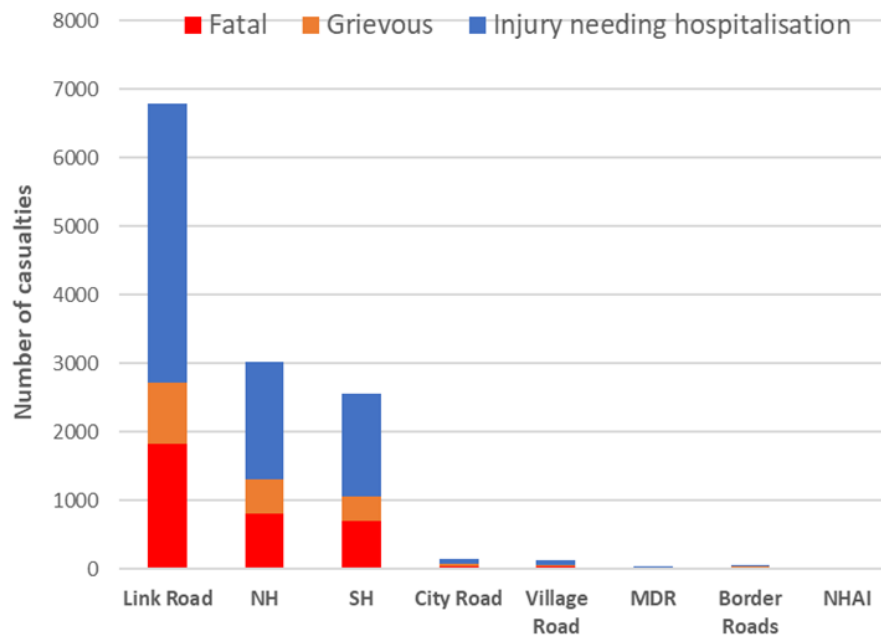
# In-depth patterns – road types

Link roads are the biggest crash and casualty problem

## Crash numbers:



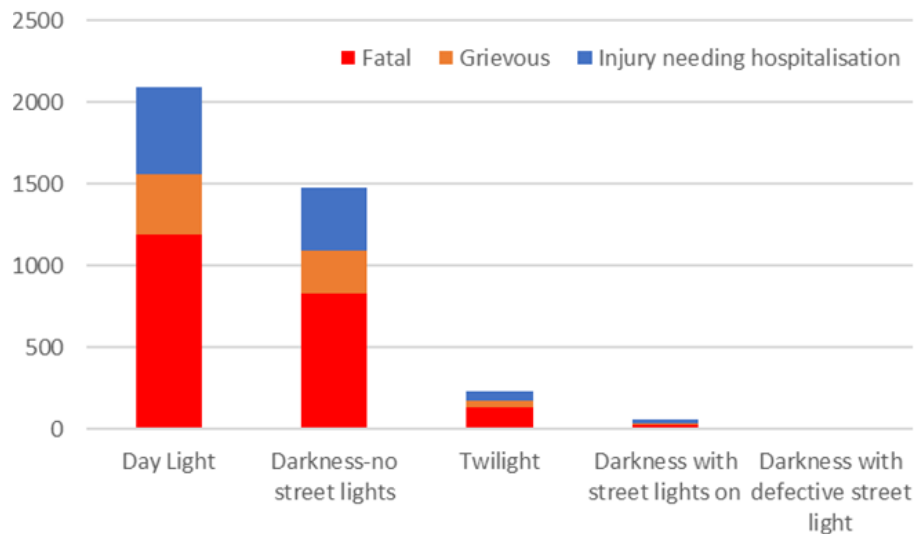
## Casualty numbers:



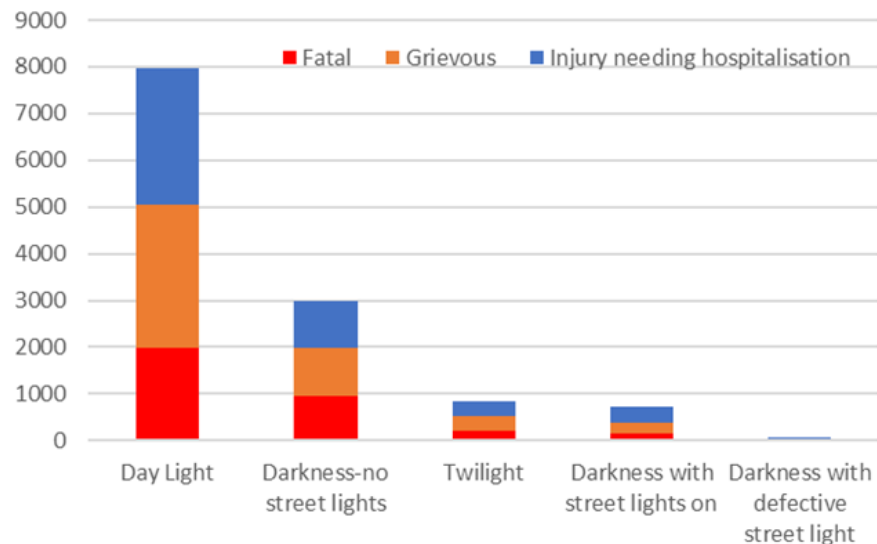
# Light conditions

Run off road greater proportion darkness

## Run off road crashes



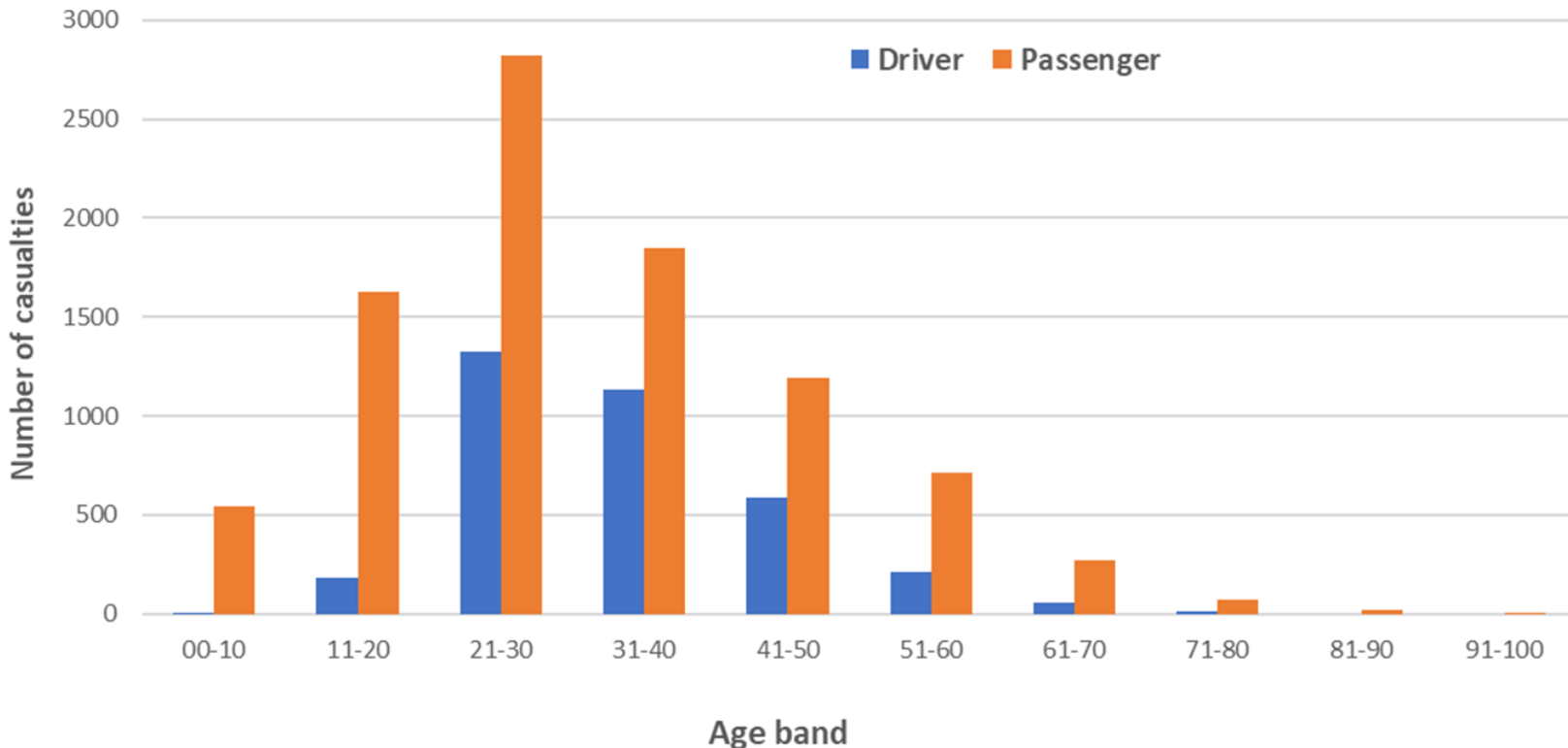
## Other crashes





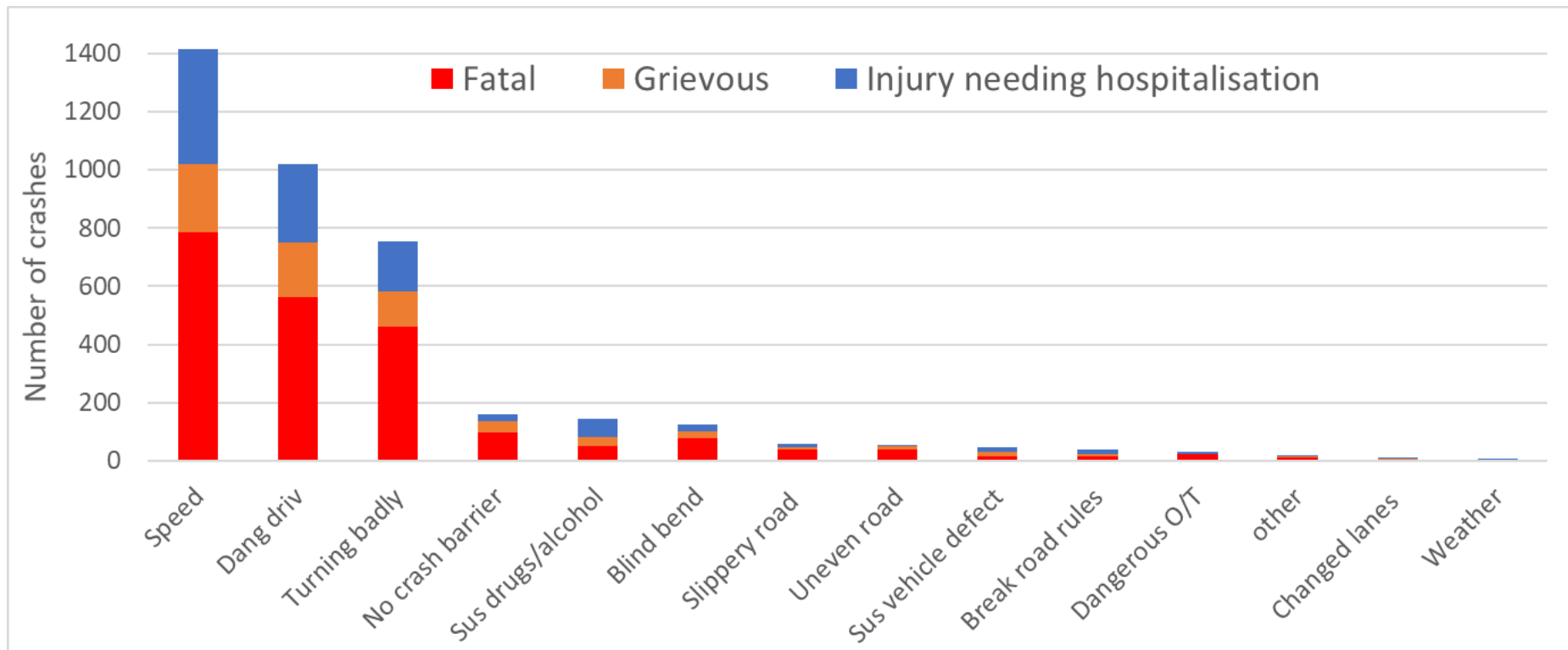
# Run-off road - driver and passenger casualty age bands

Young and novice drivers are the biggest casualty problem



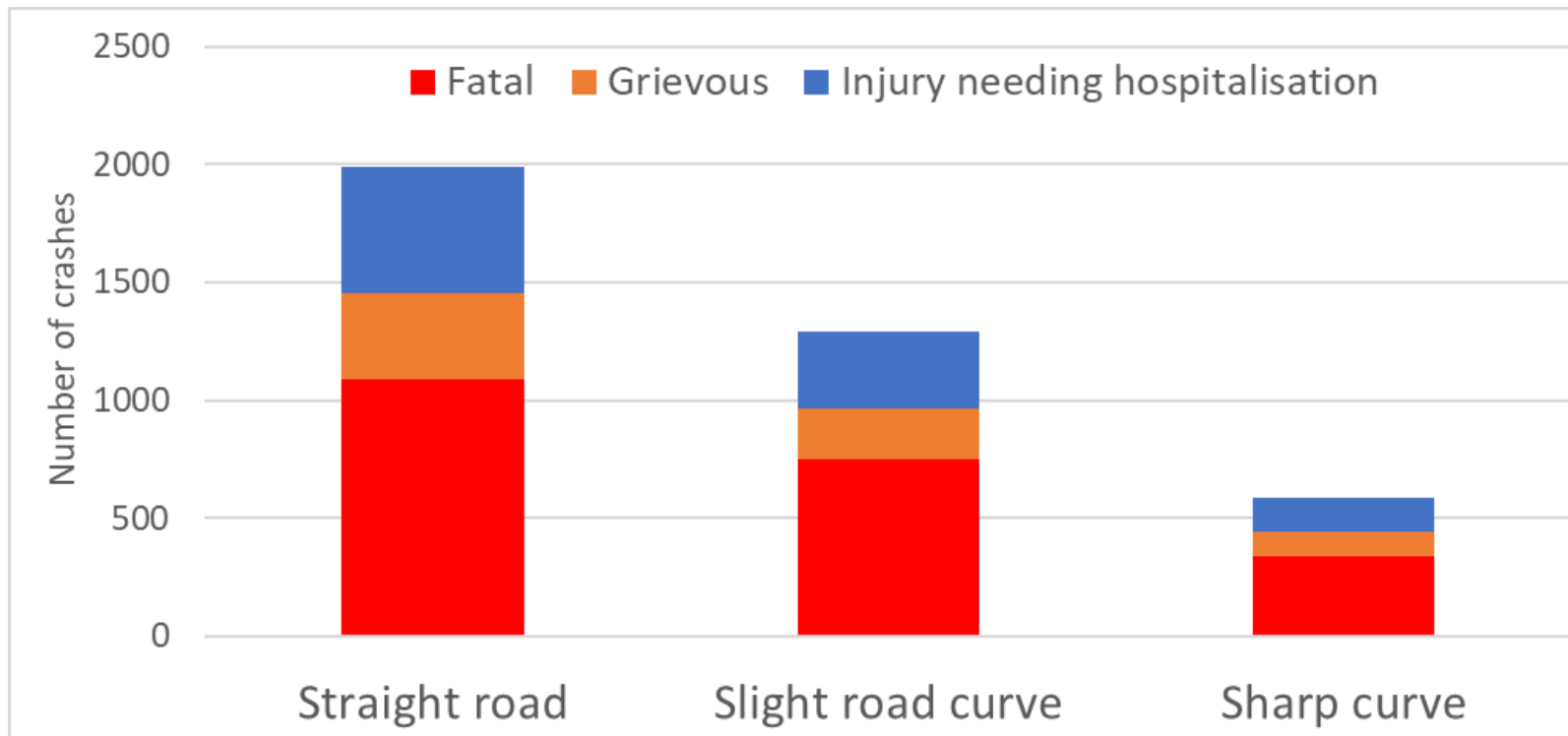
# Police assigned factors

Understanding of contributory factors can help to select safety measures



# Horizontal road features

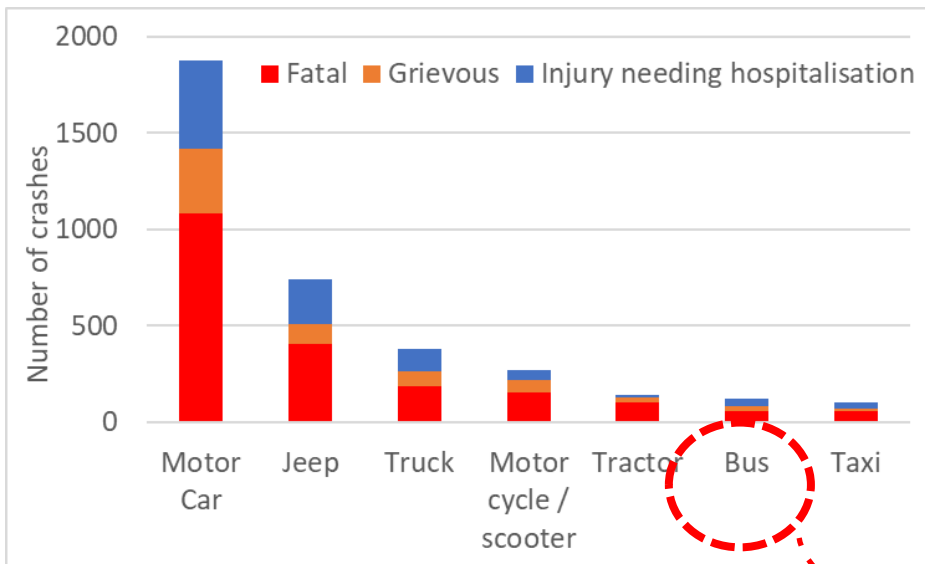
Road geometry can influence injury risk



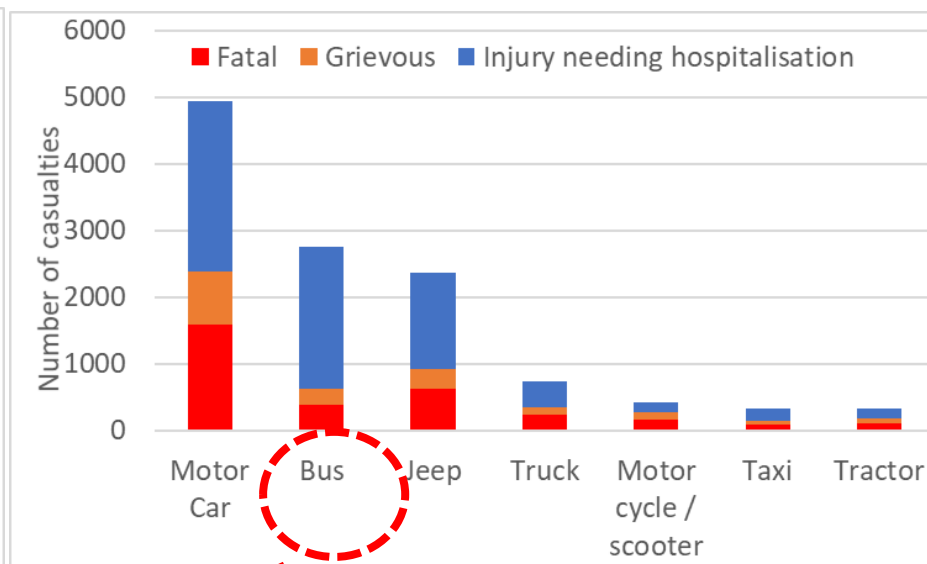
# Vehicles per crash and casualty

Buses are in comparatively smaller number of crashes, but have a larger number of casualties

## Number of crashes



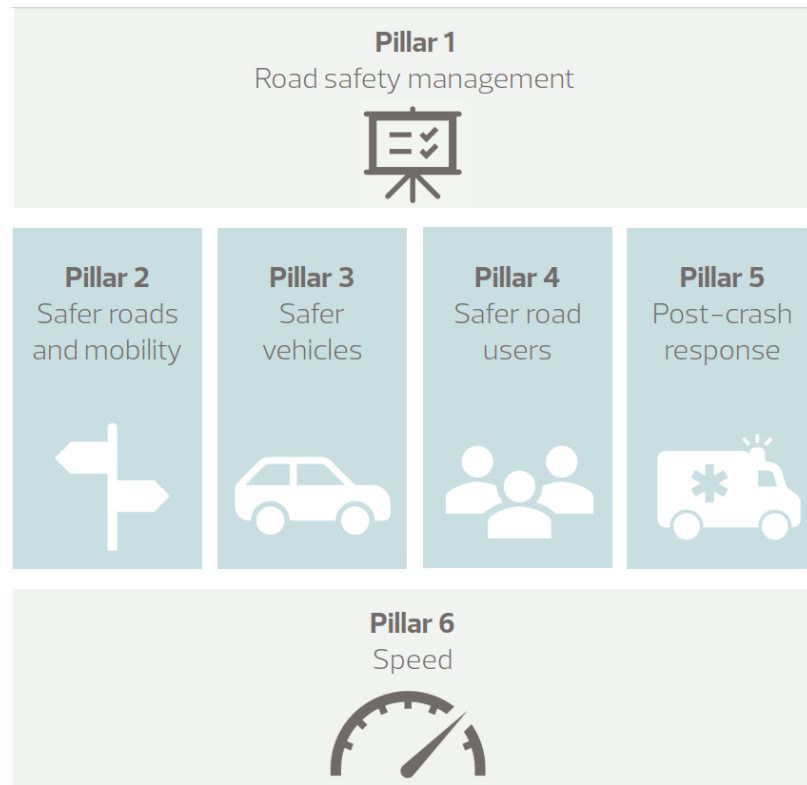
## Number of casualties



# Safe systems Road Safety Management

## What Safe Systems really means

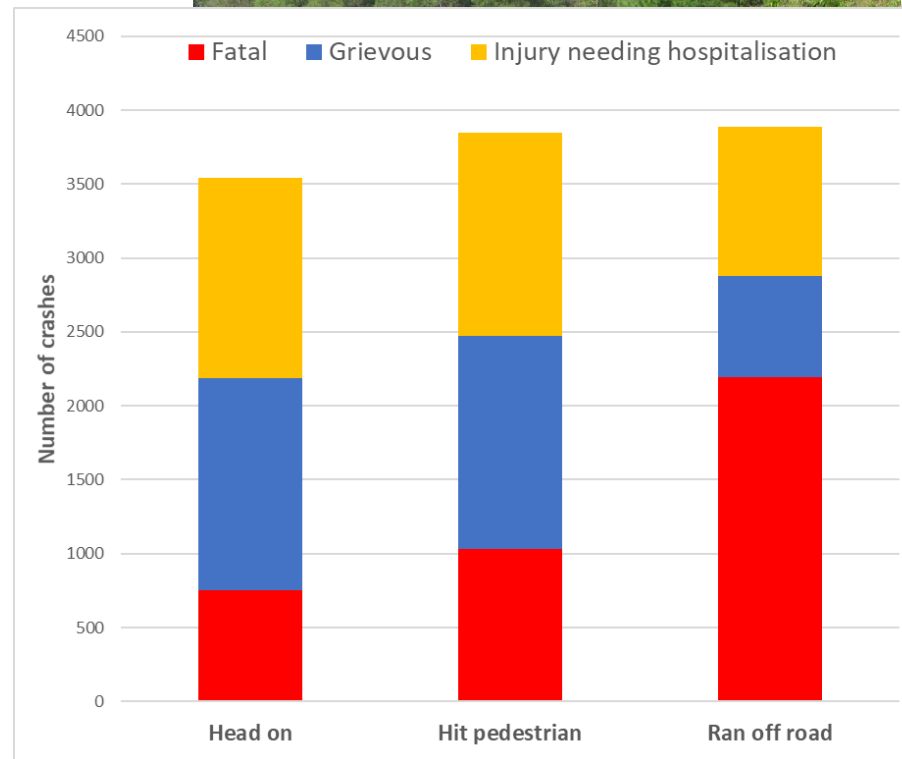
- Do more approaches to tackle single road safety issues and risks
  - Multiple sectors or 'Pillars' applied
- Prioritise issues where best scope to reduce fatal/serious casualties
  - Avoid crashes occurring if possible
  - Reduce severity when crash is unavoidable
- Use data to plan strategies targeted at the real risks/problems
- Use data to monitor and evaluate



# Evidence based strategies

## Following approaches linked to the evidence

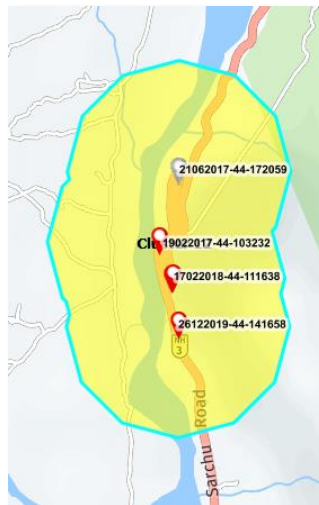
- Based primarily on rapid crash data analysis above but also familiarity with Himachal Pradesh
- Far more analysis would need to be done to develop the ideas fully – which TRL will be doing
- Run off road problem focus here:
  - Repeat for pedestrian and head-on crash types



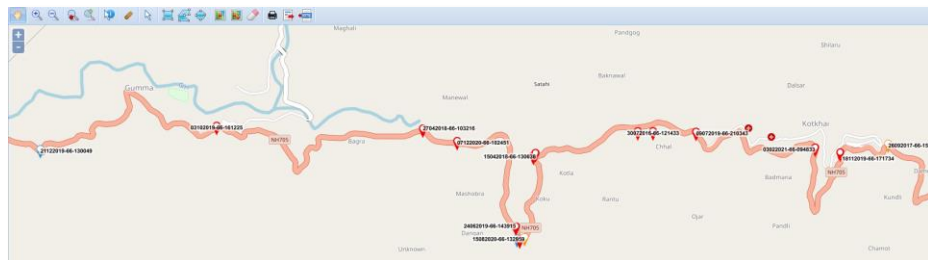
# Roads Pillar

## Defining a road strategy

- Systematically put barriers on Link roads
- Prioritise crash prone sections using cluster/ route analysis:
  - Barrier improvements
  - Lighting at some locations?
  - Parapets at bridges
- Apply iRAP - area wide treatment at high risk locations



Accident Reference Number	19022017-44-103232	21062017-44-172059	14012018-44-175233	17022018-44-111638	26122019-44-141658
Accident Time	20:00	22:00	18:30	19:00	19:45
No. of Injuries	3	0	12	3	5
Light Condition	Darkness -no street lights	Darkness -no street lights	Darkness -no street lights	Darkness -no street lights	Darkness -no street lights
Weather Condition					
Vehicle Type 1	Motor Car	Truck	Motor Car	Motor Car	Motor Car
Accident Factor	Dangerous driving	Turning without care	Turning without care	Blind bend	Speed
Horizontal Features	Slight road curve	Sharp curve	Sharp curve	Sharp curve	Straight road



# Vehicle pillar

## Defining a vehicles strategy

- Vehicle technical testing improved
- Focus on bus technical standards:
  - Tyres
  - Brakes
  - Head lights
- Focus on jeeps – they seem safe but are highly unstable
  - Awareness campaign?





# People pillar

## Defining a behaviour strategy

- General driver training improvement
- Higher standards for bus driver training
- Awareness campaigns linked to police action on speed and dangerous driving focus
- Review and enforce seat belt laws



# Speed pillar / Post-crash pillar

## Defining a speed strategy / post-crash strategy

- Speed limit reviews
- Targeted speed enforcement based on crash data and where people speed

## Post crash Pillar

- Review resources distribution
- Optimise and invest
- Improve time to attendance and to EMR



20/09/2014 15:15

# Crash Data Systems & Processes - Sustainability

## Key success factors

Need local commitment	Collaboration/ responsibility Police buy-in essential for country wide/ region adoption
Clear responsibility to collect data	BAU – Business as Unusual activity OPs – Standard Operating procedures
Training	Should be a continuous process – long term
Support & quality checks on-going	safety unit
Systems & IT	Cloud based; 'GPS' Location; Scene photos Mobile app capability Other data held/ links

# Long term successes – MAAP/ iMAAP

Mix of development stages

Himachal Pradesh (India)	Dubai
Jamaica	Abu Dhabi
Sri Lanka	Qatar
Ghana	Kuwait
Botswana	Papua New Guinea
Mauritius	Fiji
UK - Extensively	Malaysia (PLUS)

# Building on RADMS/ iMAAP success

Successful work continues with a road safety corridor project

Safe Systems based - review and strengthening management pillar/ capacity

Extensive use of the crash data – further development

USD 1.3M road safety project with Himachal Pradesh

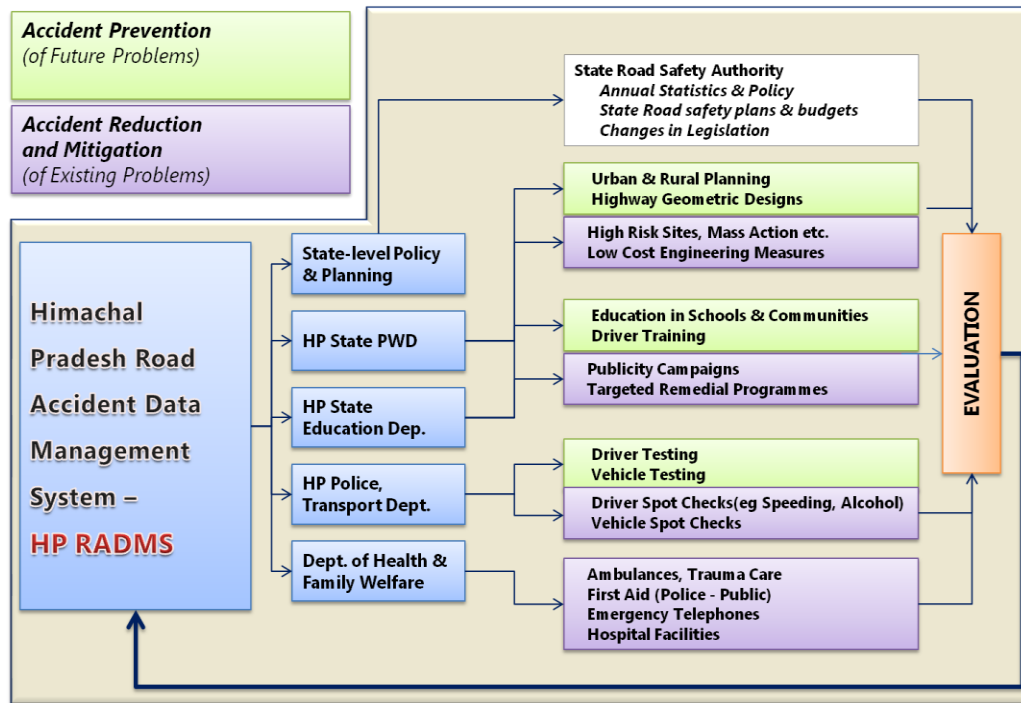
iRAP - Engineering measures on a pilot corridor

Strengthening police capacity - enforcement activities

# Conclusions

Crash data management is at the heart of a good road safety strategy

- Collect crash data of sufficient quality and volume
  - Provides insights to crashes that enable selection of safety measures
  - Helps to define safe systems pillar strategies
- Intermediate Indicators / Safety Performance Indicators challenging
  - Speed targeted – measure before and after activities
  - Ensure investment is impacting KSIs
- Link strategies to targets for KSI reduction – **need crash data**
  - Longer term Vision Zero





## Questions?

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