

# VULNERABLE ROAD USERS

Training course  
for  
Youth workers and animators

The IMPACT project has been funded with support from the European Commission. This training course reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



## Acknowledgement

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This course has been prepared as part of the “Involvement and Motivation for Participation of Active young Citizens to stand for Traffic safety” (IMPACT) project, using best practice material from the “Road Safety in South East Europe” (ROSEE) and Responsible Young Drivers’ Formapack.



## What are we going to speak about?

- ↪ The IMPACT project
- ↪ Road safety fundamentals
- ↪ Vulnerable road users
- ↪ Pedestrian safety
- ↪ Bicyclists
- ↪ Powered two-wheeler drivers
- ↪ The YOUNG drivers:

- ↪ Rage on the road
- ↪ Before we sit behind the wheel
- ↪ Vision
- ↪ Influence of speed
- ↪ Driving under influence
- ↪ Safety on the road – the seatbelt
- ↪ SIMULATIONS – e.g. the influence of alcohol on the vision

# The IMPACT project



## The IMPACT project

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The IMPACT project aims at boosting international efforts to save young lives on the road by exchanging information and sharing good practices, providing a platform for long-term targeted impact through a list of exceptional players in the road safety and accident prevention field from Europe, Asia and Latin America. The project will foster improvements in awareness raising with focus on the most vulnerable road users (youth, cyclists, children, etc.) and will build better methodology through cross-fertilizing intercontinental experience.



## The IMPACT project: Partners

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Argentina	MINU Asociacion Civil
Austria	FACTUM Chaloupka & Risser OG
Belgium	Responsible Young Drivers Vlaanderen
Bulgaria	Open Youth Institute for Research, Education and Development
China	Shanghai ZhaBei Huatong Injury Prevention Consulting Center
Hungary	Hajdúsági Hallgatókért és Civilekért Egyesület
Romania	Association for Youth and Students in Partium



## The IMPACT project: Geographic coverage





## The IMPACT project: Expected results

1. choose and share good practices in road safety, involving modern technologies (e.g. driving simulators) for attracting the young people's attention and focusing on volunteer activities with large social impact; i.e. each project partner will implement a high quality local road safety campaign;
2. train 18 youth workers (3 people per partner country) and 30 animators (1 team of 5 people per partner country) to successfully plan and implement youth-led awareness-raising campaigns, targeting vulnerable road users. Those people will receive valuable professional skills which will help their personal and/or professional interests evolve on the basis of the newly acquired experience, improving their chances for better future carrier and/or education. Their learning outcomes will be recognized, using available European transparency and validation tools.
3. involve directly 1800 citizens (300 per partner country, 50% with less opportunities) in the six local field campaigns, organized by the animators and to reach at least 12 000 more through the paper materials distributed during them, 50 000 people through the partners' websites and 50 000 reached through media.





## The IMPACT project: Expected results (cont.)

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1. Road safety stakeholders seminar in Shanghai;
2. Road safety stakeholders conference in Buenos Aires;
3. High quality evaluation.



## The IMPACT project: Timetable

Project management	02/03/2015	01/03/2017
Kick-off meeting	02/03/2015	30/04/2015
Trainings	01/04/2015	30/08/2015
New campaign first implementation	01/09/2015	28/02/2016
Interim meeting / Stakeholders seminar	01/03/2016	30/04/2016
New campaign second implementation	01/05/2016	31/12/2016
Final meeting / Stakeholders conference	01/01/2017	01/03/2017
Evaluation	02/03/2015	01/03/2017

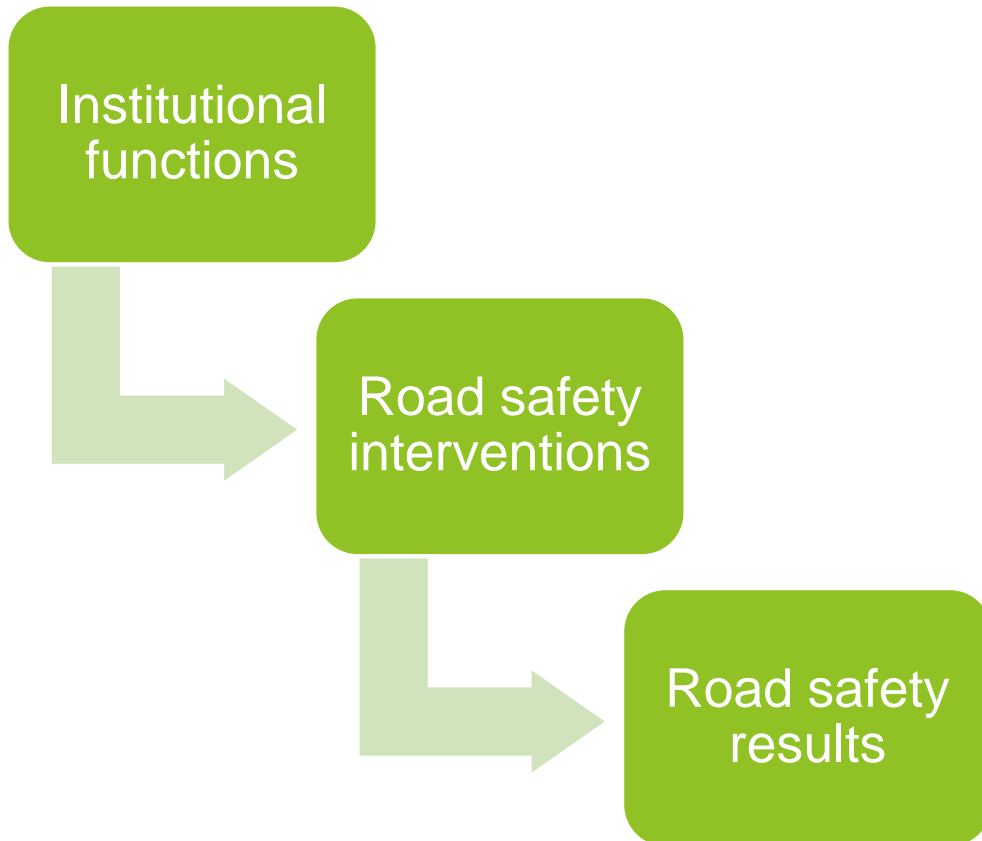


# ROAD SAFETY FUNDAMENTALS



## What is road safety management?

Road safety management focuses on the “production” of road safety with a three level management process.





## Why is road safety management important for protecting vulnerable road users?

- ▶ Road safety management is
  - ▶ is committed to reducing death and injury from road crashes
  - ▶ a long-term, continual process - it doesn't stop when individual projects end
  - ▶ Channels resources (human and financial) to the most critical safety issues based on evidence of the problem



## Why is road safety management important for protecting vulnerable road users?

- ▶ Research confirms a strong link between social deprivation and collisions
- ▶ Road safety management therefore contributes towards improving living standards
- ▶ This in turn can be reflected in a Safe Systems approach to road safety, which will be covered in session 2 of this workshop



**Interactive  
exercise**

# Road safety system





**Note:** Trainer to  
add local data  
and information  
here

# Road safety trends - graphs

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**Interactive  
exercise**

# Identification of problems

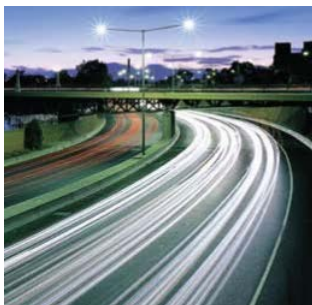




# Elements of the road safety system

A road crash and its severity is usually the result of the interplay of diverse factors including roads, the vehicle, road user behaviour and post crash care.

**Roads**



**Road User Behavior**



**Vehicles**



**Post Crash Care**





# The Haddon Matrix

There are many opportunity to prevent road crashes and injury

The Haddon matrix

PHASE		FACTORS		
		HUMAN	VEHICLES AND EQUIPMENT	ENVIRONMENT
Pre-crash	Crash prevention	Information Attitudes Impairment Police enforcement	Roadworthiness Lighting Braking Handling Speed management	Road design and road layout Speed limits Pedestrian facilities
Crash	Injury prevention during the crash	Use of restraints Impairment	Occupant restraints Other safety devices Crash protective design	Crash-protective roadside objects
Post-crash	Life sustaining	First-aid skill Access to medics	Ease of access Fire risk	Rescue facilities Congestion

Source: World Health Organization. World Report on Road Traffic Injury. 2004



# Catagories of interventions

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There are three major categories of interventions:

- reduction of road users' exposure to risk of an road traffic crashes or road traffic injuries
- preventing the occurrence of the crash
- reducing the likelihood of severe injury either during the collision or afterward, should a crash occur



# Identifying who should be involved

The Haddon Matrix helps to identify who should be involved in road safety. This includes, but is not limited to:

- ▶ vehicle design engineers;
- ▶ traffic planners;
- ▶ transport and road engineers;
- ▶ injury epidemiologists;
- ▶ trauma specialists;
- ▶ emergency response workers;
- ▶ police;
- ▶ policy makers;
- ▶ private and public sector advocates for road traffic safety.

These persons and their sectors, all need valid data to inform decisions and policies affecting road traffic safety.



# A systems approach

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A systems approach considers all factors contributing to road traffic injuries as well as the role of different agencies and actors in prevention efforts.



# Road crash and injury risk

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Risk arises as a result of various factors:

- ▶ Human error
- ▶ Force and nature of the impact
- ▶ Tolerance of the individual to this impact
- ▶ Quality and availability of emergency services and acute trauma care



# Risk factors

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The main risk factors influencing the occurrence of a road crash and severity of the outcome can be categorized into four groups:

- ▶ factors influencing exposure to risk
- ▶ factors influencing crash involvement
- ▶ factors influencing crash and injury severity
- ▶ factors influencing post-crash injury outcomes





# Risk factors

## Factors influencing exposure to risk

- economic factors
- demographic factors
- land-use planning practices
- traffic mix
- road function versus design and layout





# Risk factors

## Risk factors influencing crash involvement

- speed
- Impairment (alcohol or drugs)
- fatigue
- male
- vehicle defects
- youth driving together
- vulnerable road users





# Risk factors

## Risk factors influencing crash severity

- speed
- seat-belts, child restraints
- helmets
- Non-crash protective roadside objects
- insufficient vehicle crash protection
- Impairment (alcohol and drugs)





# Risk factors

## Risk factors influencing post-crash outcome of injuries

- delay in detecting crash
- delay in transport to a health facility
- fire resulting from collision
- leakage of hazardous materials
- alcohol and other drugs
- rescue, extraction, evacuation
- poor trauma care and rehabilitation

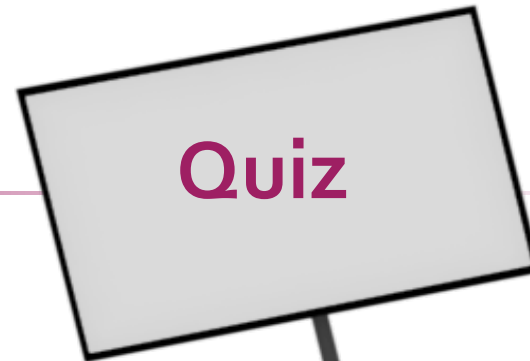




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and information  
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# Main risk factors in **xxx**

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# Risk factors & Haddon Matrix



# Global Decade of Action for Road Safety 2011 - 2020

The screenshot shows the website for the United Nations Road Safety Collaboration. The address bar displays <http://www.who.int/roadsafety/en/>. The page features a green header with the text "United Nations Road Safety Collaboration" and a search bar. Below the header, there is a navigation menu with options like "About", "Projects", "Publications", "Events", "Networks", "Funding opportunities", and "Ministerial Conference". The main content area includes a "HIGHLIGHTS" section with a link to "First Global Ministerial Conference" and a "Preparation" section with text about participants calling for an overall goal of road traffic deaths and safety activities. A large image of the United Nations building with flags is also visible.

The graphic titled "Global Plan for the Decade of Action for Road Safety 2011-2020" features a collage of four images: a person on a bicycle on a road, a group of children wearing helmets, a car crash test dummy in a vehicle, and a person walking on a road. Below the collage is the logo for the "DECADE OF ACTION FOR ROAD SAFETY 2011-2020", which includes a yellow diamond-shaped icon with a globe and the text "DECADE OF ACTION FOR ROAD SAFETY 2011-2020".



# Decade of Action Plan

The UN Decade of Action for Road Safety 2011-2020 Plan is based on the safe systems approach.

Pillar I	Pillar II	Pillar III	Pillar IV	Pillar V
Road safety management	Safer roads and mobility	Safer vehicles	Safer road users	Post crash management

[http://www.who.int/roadsafety/decade\\_of\\_action/plan/en/index.html](http://www.who.int/roadsafety/decade_of_action/plan/en/index.html)

Link to video on the Decade of Action Plan

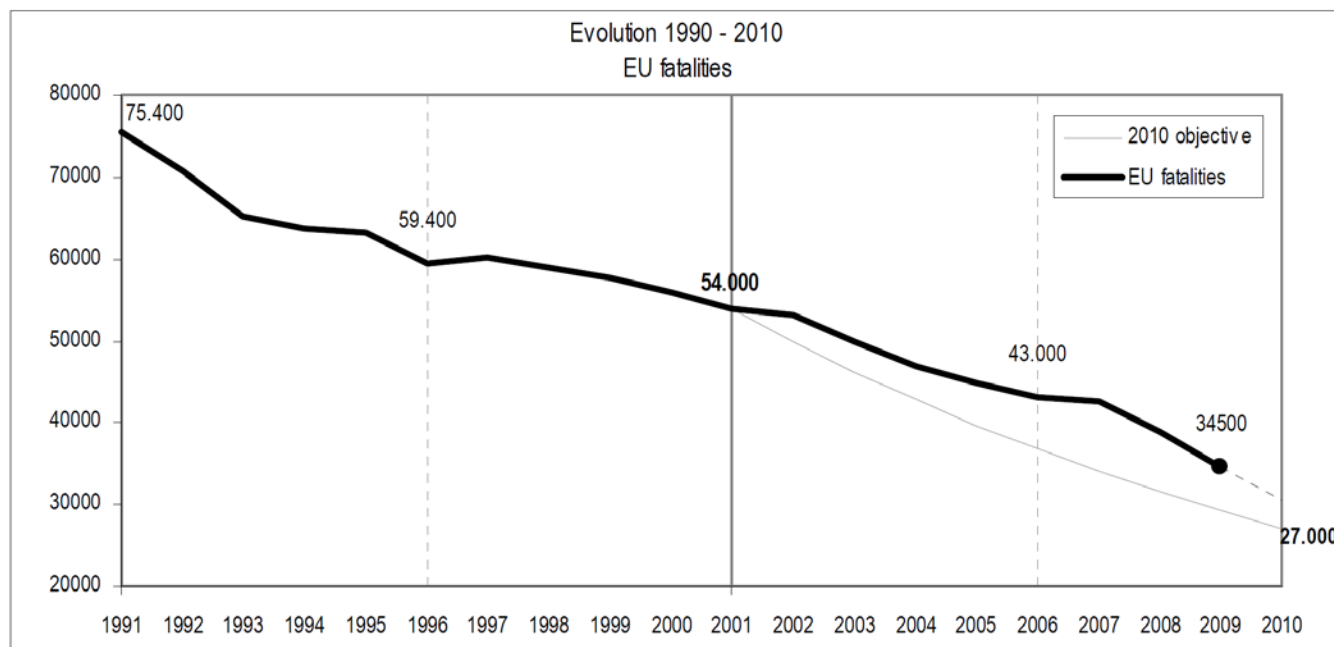
<http://www.roadsafetyfund.org/UnDecadeOfAction/Pages/default.aspx>





# EU policy orientations on road safety

Despite the success of previous EU programmes, European roads are still not safe. In 2012, more than 27,000 people died in traffic crashes on Europe's roads and more than 1.5 million were injured.





## EU's policy orientations

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The European road safety policy orientations 2011-20 aims to provide a general framework and challenging objectives to guide national and local strategies, in accordance with the principle of subsidiarity. Within the general framework, the Commission highlights the need to:

- ▶ create a cooperation framework based on the exchange of best practices across the EU;
- ▶ adopt a strategy for injuries and first aid to address the need to reduce the number of road injuries;
- ▶ improve the safety of vulnerable road users.



# EU's policy principles

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The Commission sets out three main principles:

1. striving for the highest road safety standards throughout Europe
2. an integrated approach to road safety
3. subsidiarity, proportionality and shared responsibility



## EU's policy target

- ▶ To continue with the target of halving the overall number of road deaths in the EU between 2010 and 2020:
  - to provide EU citizens with a more uniform level of road safety within the EU;
  - to encourage each EU country to contribute to the achievement of this common target through their own national road safety strategies.
  
- ▶ To reduce road traffic severe injuries:
  - once a common definition exists for 'severe injuries', the Commission will propose to add a common "injuries reduction target" to these European road safety policy orientations up to 2020.



# Strategic objectives

The Commission has identified seven objectives, for which actions will be proposed at both EU and national level:

1. To improve education and training of road users
2. To increase enforcement of road rules
3. Safer road infrastructure:
4. Safer vehicles:
5. To promote the use of modern technology to increase road safety
6. To improve emergency and post-injuries services
7. To protect vulnerable road users



## Interactive Discussion

# Decade of Action Plan & EU Policy Orientations on Road Safety 2011 - 2020





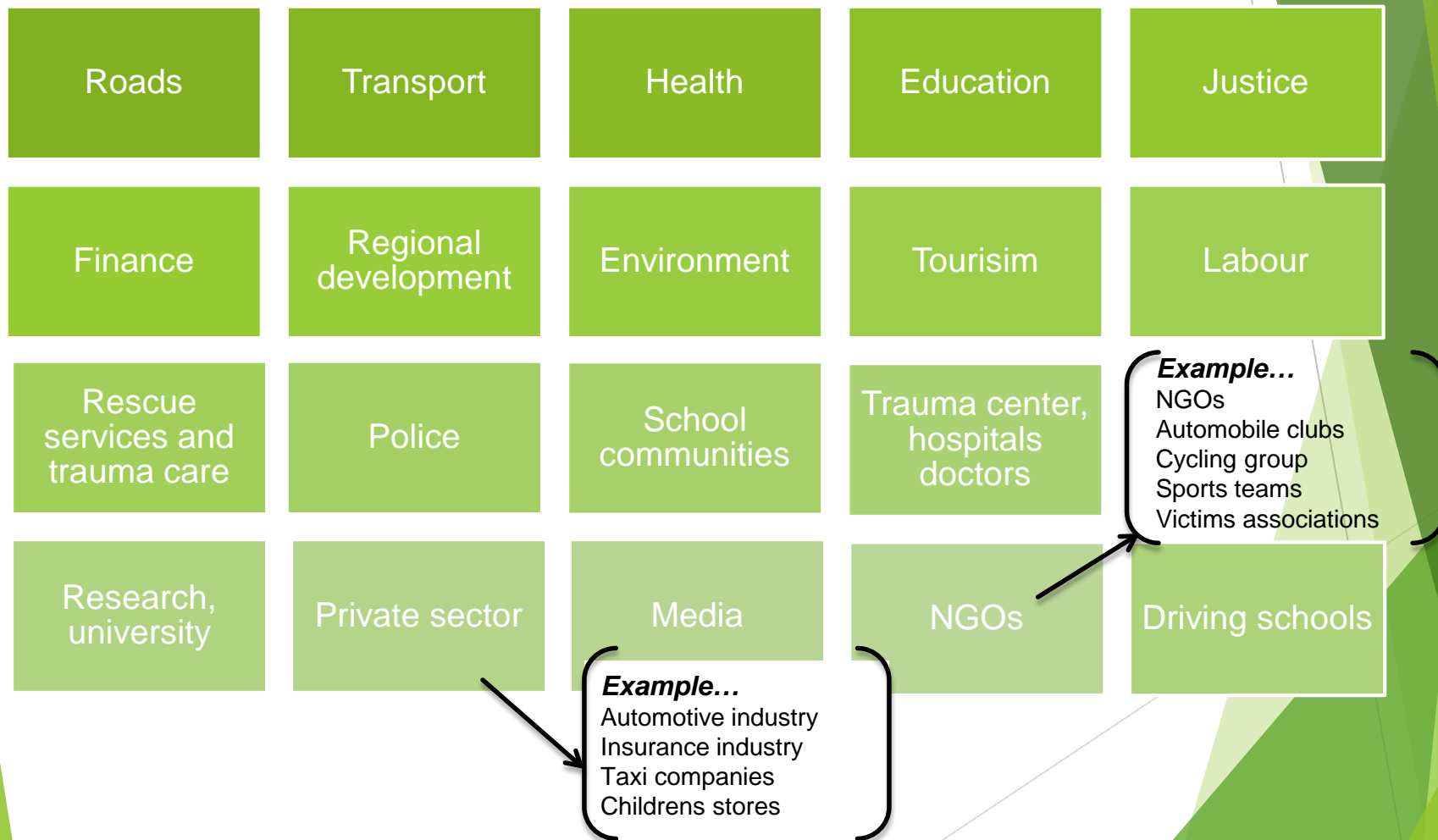
## Objectives and elements of the national road safety plan

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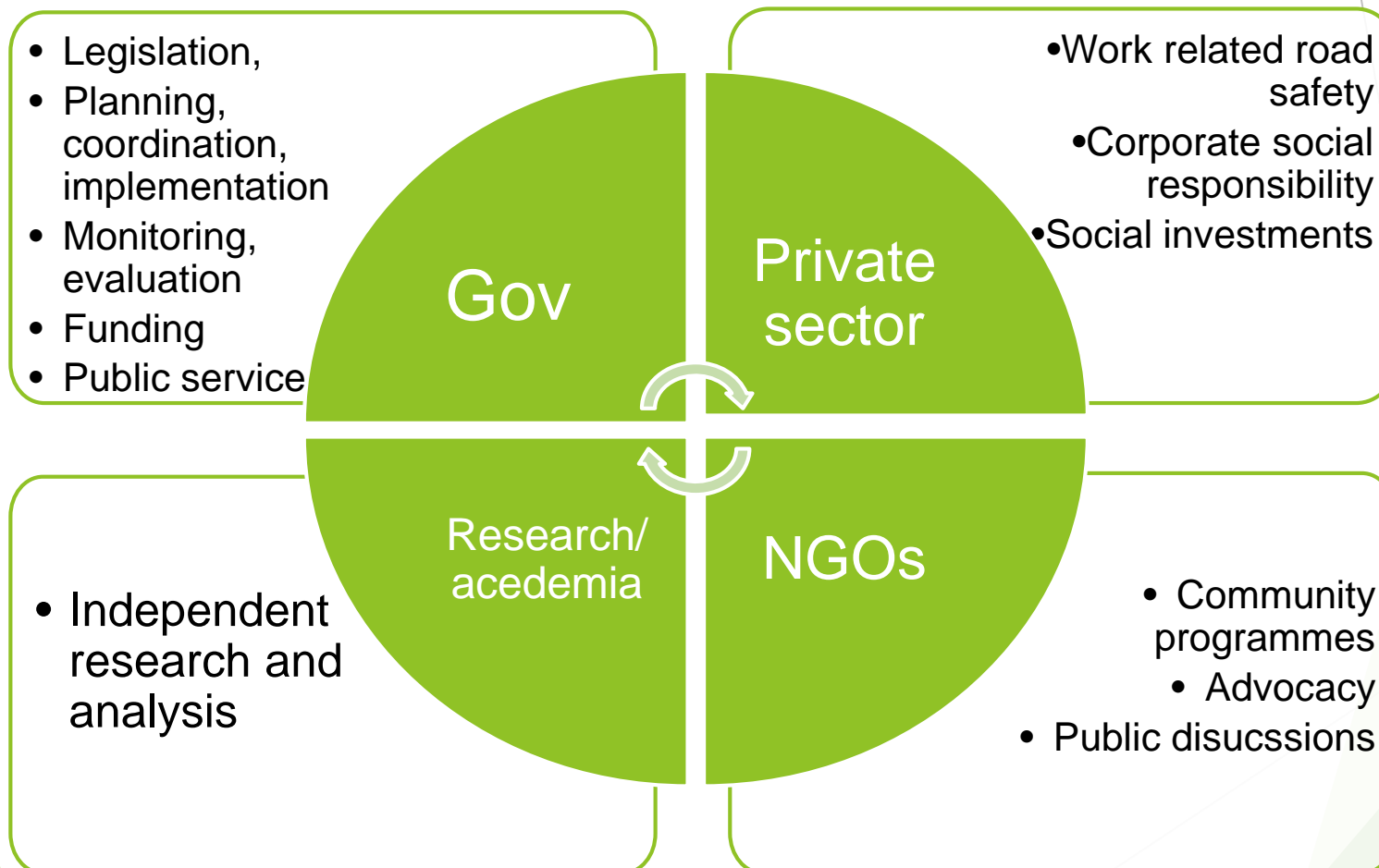
# Road safety stakeholders







# Road safety stakeholders - roles





**Interactive  
exercise**

**Road safety  
stakeholders**



# VULNERABLE ROAD USERS



Interactive  
discussion

Who are  
VRUs?





## Who is a vulnerable road user?

- ▶ Pedestrians and cyclists are referred to as vulnerable road users because of their unprotected state.
- ▶ Riders of motorized two-wheelers (motorcycles, mopeds and light mopeds) are also to a large extent unprotected.
  - ▶ there is also often a difference in speed with other road users - they travel at much higher speeds than pedestrians or cyclists.
- ▶ Children and the elderly are vulnerable road users when they are pedestrians or cyclists because of
  - ▶ inexperience of children
  - ▶ declining task capability (and physical vulnerability) of the elderly.
- ▶ Young and unexperienced drivers.



## Who are the most vulnerable?

- ▶ The vehicle can provide protection against external forces. In the case of protection by the vehicle, occupants of motorized vehicles (such as cars, vans, trucks and busses) have the advantage: they are the least sensitive to injury.
- ▶ Most vulnerable are the road users without a vehicle, and thus without a protective “shell”
  - ▶ pedestrians and
  - ▶ those using a vehicle without a shell (cyclists and light moped riders). Moped riders and motorcyclists are only protected from head injuries if they wear the crash helmet.
- ▶ In a crash with equal collision energy the elderly can be more severely injured than the young due to age related changes to the body



## A few facts..

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- ▶ 20-40% of journey are travelled by cycle or on foot, with the highest percentage in the Netherlands and the lowest in Finland.
- ▶ Trips on foot take place most frequently in Great Britain, whereas bicycle trips are most frequent in the Netherlands, Denmark and Sweden.
- ▶ Some groups of traffic participants walk or cycle more than others. These differences are also reflected in their crash involvement.
  - Walking is particularly important for children below the age of 12 and adults aged 75 and above.
  - The bicycle is used most frequently by adolescents (12-17 years of age) .



# Understanding the issues – facts in the EU

- on average in the EU almost two-thirds of road injury victims are vulnerable road users:
  - Pedestrians
  - Cyclists
  - Motorized two-wheelers
  - Children
  - Elderly
- Although road crash fatalities in the EU are declining, those involving vulnerable road users are not declining as fast as other road crash fatalities.

Injury data base (IDB): Injuries in the European Union, Summary of injury statistics for the years 2008-2010

Fact sheet: Prevention of Road Traffic Injuries among Elderly - Elderly Safety-Focus on Accidental Injuries

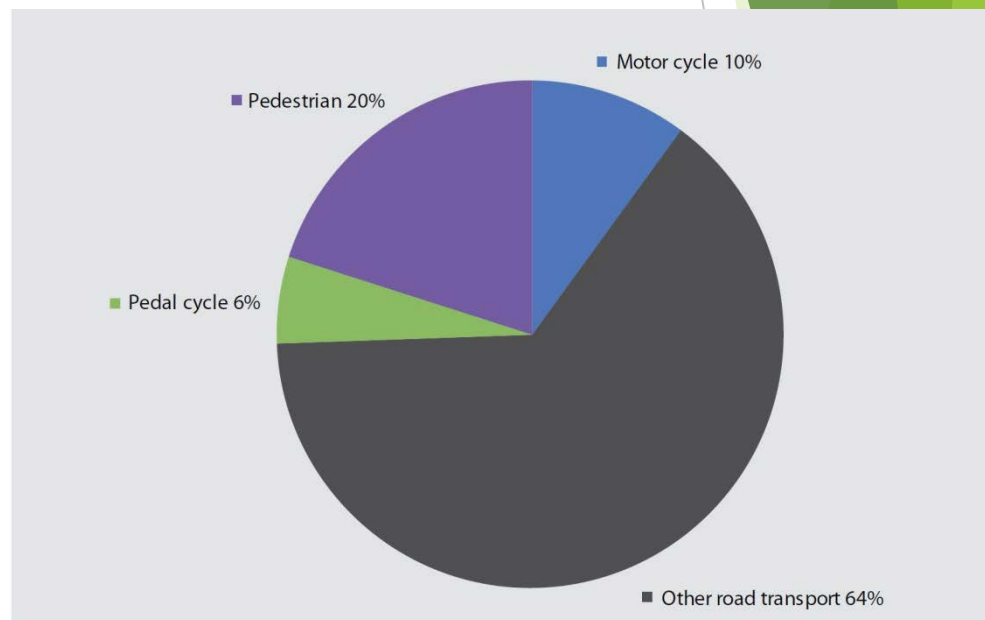




# Road crash fatalities in the EU

- ▶ 38,000 road crash fatalities in 2011 (17% of all injury fatalities in EU)
- ▶ one-third of these deaths are vulnerable road users (19% pedestrians, 9% motorcyclists and 6% cyclists)

Road fatalities by type of road user



Injury data base (IDB): Injuries in the European Union, Summary of injury statistics for the years 2008-2010

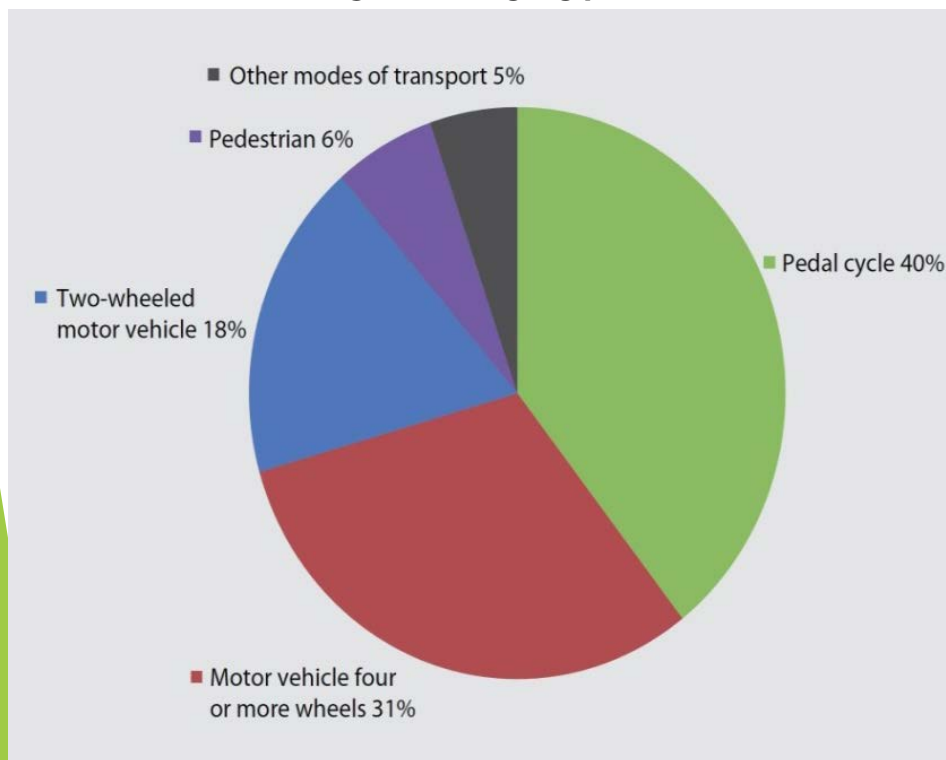
Source: WHO MDB

Fact sheet: Prevention of Road Traffic Injuries among Elderly - Elderly Safety-Focus on Accidental Injuries



# VRU – non-fatal injuries

## Road non-fatal injuries by type of road user

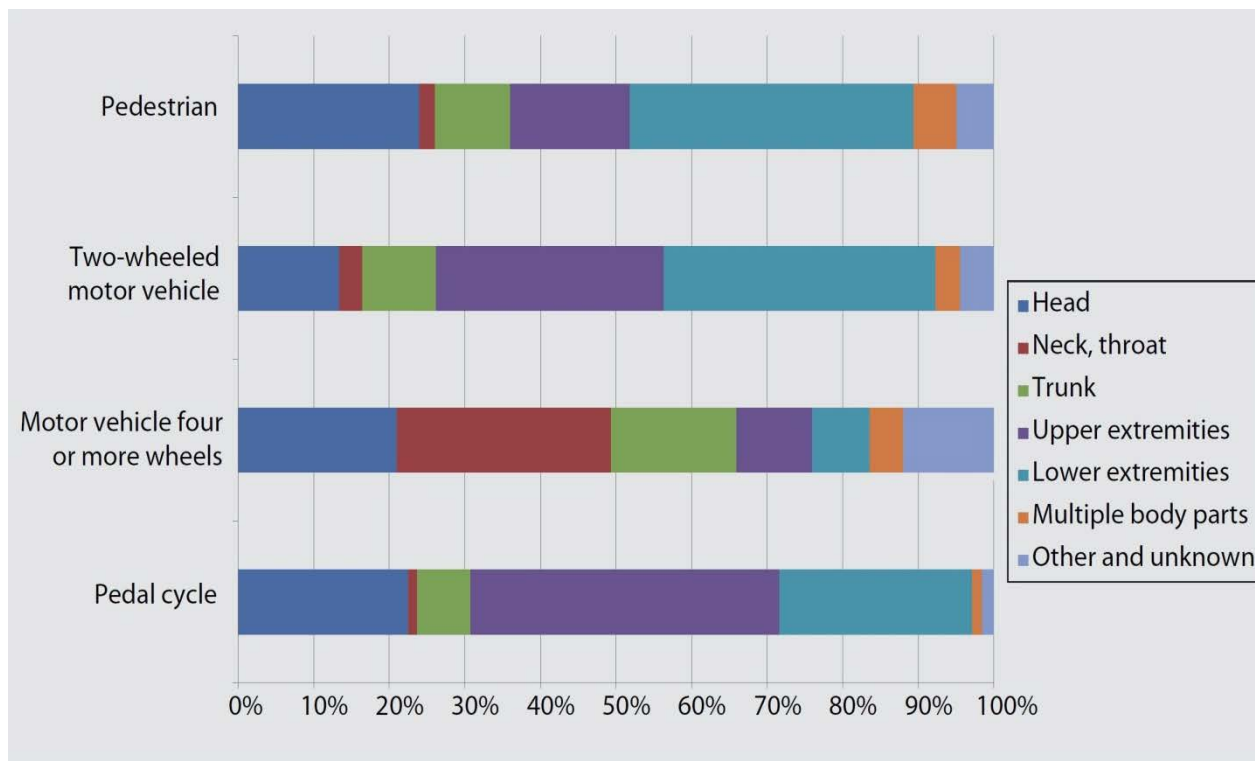


- ▶ Police records: 1.7 million injured road traffic users per year (1.4 million of which are slightly injured and 300 000 seriously injured);
- ▶ EU IDB - estimates that even 4.2 million road injuries per year have to be treated in EU hospitals;
- ▶ almost two-thirds of these road injury victims are vulnerable road users (hospital admissions and outpatients):
  - 6% pedestrians,
  - 18% motorized two-wheelers,
  - 40% pedal cyclists;

Source: EU IDB



# VRU - Non fatal injuries

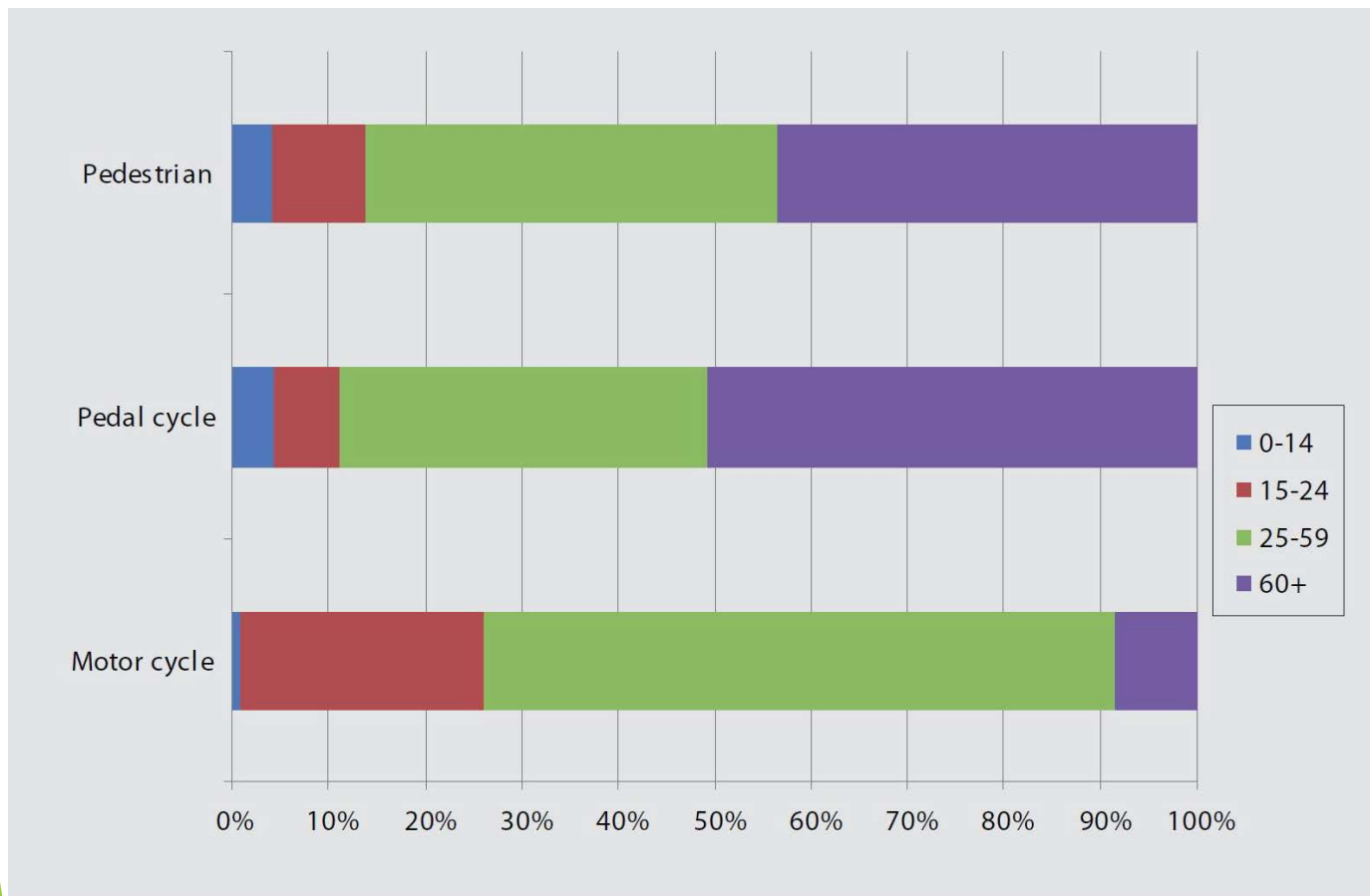


Non-fatal road injuries by type of road user and body part injured (only admissions).

Source: EU IDB



# Road fatalities by type of road users and age group



Injury data base (IDB): Injuries in the European Union, Summary of injury statistics for the years 2008-2010

Fact sheet: Prevention of Road Traffic Injuries among Elderly - Elderly Safety-Focus on Accidental Injuries

03.04.2015 "Vulnerable road users" training course / IMPACT project



## Road traffic injuries among elderly

- ▶ Road traffic injuries are the second leading cause of injury death among people of 65 and older, accounting for 20% of all types of injuries.
- ▶ There are nearly 11,000 deaths from road traffic injuries among elderly in the EU.
- ▶ Traffic injuries are more severe among elderly because senior citizens are more fragile.
- ▶ Most traffic fatalities involving older drivers occur more frequently during daytime and on weekdays.



## Road traffic Injuries among adolescents (Age 15 – 24)

- ▶ Around 16.000 young people between 15 and 24 years of age die from injuries every year - road injuries presents 46% off all fatal injuries among adolescents;
- ▶ non-fatal road injuries: aproximetly 36.000 adolescents per year are being injured;

Mode of transport of adolescents involved in road injuries (% of all injuries in this age group)

Four wheels motor vehicle	32%
Two wheels motor vehicle	28%
Pedal cycle	26%
Pedestrian	4%

Source: EU IDB



## Road Traffic Injuries among adolescents (Age 1 – 14)

- ▶ Around 3000 children die from injury each year in the EU - road injuries presents 32% off all fatal injuries among children;
- ▶ Public roads are the place of injury occurrence for about 11% of all child injuries, with more severe consequences compared to other injuries: head injuries were diagnosed in 23% of all transport related child injuries, which is the same dimension as for other child injuries (26%).
- ▶ The main role of children in traffic injuries is as riders (59%), passengers (29%), and pedestrians (10%); EU IDB estimates).

Injury data base (IDB): Injuries in the European Union, Summary of injury statistics for the years 2008-2010

Fact sheet: Prevention of Road Traffic Injuries among Elderly - Elderly Safety-Focus on Accidental Injuries



## Trends for pedestrians (in your jurisdiction)

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**Note:**  
Facilitator to adapt to local  
situation





## Trends for cyclists (in your jurisdiction)

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**Note:**  
Facilitator to adapt to local  
situation



# Trends for motorised two wheelers (in your jurisdiction)

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**Note:**  
Facilitator to adapt to local  
situation



## What can be done to protect vulnerable road user?

- ▶ In crashes involving only vulnerable road users and no other road users, it is mainly the infrastructure that is important for the prevention and limitation of injury.
- ▶ Vulnerable road users can be spared by limiting the driving speed of motorized vehicles and separating unequal road user types as much as possible.
- ▶ Adapting motor vehicles (e.g. by side-underrun-protection for trucks and collision friendly car fronts) can lessen the injury severity of vulnerable road users.



**Interactive  
discussion**

# **VRU challenges and solutions**





**Interactive  
exercise**

# Attitudes towards VRUs





# How to identify community perceptions

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- ▶ Information on community perceptions can you help to decide how much should be invested in raising public awareness about the risks of road crashes involving VRUs
- ▶ If community assessment data is not readily available it would be useful to conduct a public opinion survey



# How to identify community perceptions

Question	Yes	No	Comments
1. Is walking / cycling / riding a moped or motorcycle a safety problem in your community?			
2. Do you support the need for interventions to improve road safety for these road users?			
3. What type of measures do you think are needed to improve road safety for pedestrians, cyclists and motorised two-wheelers			
4. Who are the key stakeholders that you think need to be involved			



## Changing attitudes

### Activities to consider in changing attitudes to vulnerable road users

- ▶ Develop an advocacy campaign to raise awareness about VRU situation and needs (See ROSEE training on advocating for safer roads)
- ▶ Involve the local media in developing stories on VRU issues
- ▶ Involve key stakeholders and communities in developing approaches for improving safety for VRUs
- ▶ Approach celebrities, figureheads and politicians to become "Champions" of the cause





# Elements of a programme for improving the safety of vulnerable road users

- ▶ Leadership from a government agency
  - Good data on crashes and injuries involving VRUs
- ▶ Strategy and action plan to improve vulnerable road user safety including
  - ▶ Objectives and targets for improving the safety of VRUs
  - ▶ Legislation and standards that prioritize the safety of vulnerable road users
  - ▶ Enforcement of key laws affecting vulnerable road users (e.g. speed)
  - ▶ Interventions focused on achieving concrete outcomes for vulnerable road user safety
  - ▶ Monitoring of measurable performance indicators



# Tailoring the programme to the local context

- ▶ The local and national context needs to be understood
- ▶ In designing the programme
  - ▶ Collect and analyse the national and local crash injury data to understand the issues is any further data needed to help clarify the issues?
  - ▶ What do the long term trends indicate?
  - ▶ What has been done before and how effective was it?
  - ▶ What are the priorities to help improve safety?
  - ▶ Is relevant legislation in place? What are gaps in current legislation?



# Interventions for protecting vulnerable road users

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## Roads

- ▶ Land-use planning to reduce mixed traffic
- ▶ Better road design with facilities for vulnerable road users
- ▶ Road safety audits of schemes from the point of view of vulnerable road users and road safety
- ▶ Improved lighting facilities
- ▶ Traffic calming measures
- ▶ Road crossings with controlled facilities and island

## Vehicles

- ▶ Better vehicle design - pedestrian friendly front ends



# Interventions for protecting vulnerable road users

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## Enforcement

- ▶ Speed laws
- ▶ blood alcohol concentration limits

## Post crash response

- ▶ Improving post-crash care for victims of road crashes



# Interventions for protecting vulnerable road users

## Awareness raising and education

- ▶ Specific issue based education, publicity and training initiatives also targeting high risk populations such as the elderly and children
- ▶ Public awareness campaigns
- ▶ Promotion of high visibility clothing
- ▶ Pedestrian and cycle training for school children
- ▶ Education about VRUs in driver training courses



# Effective Interventions for Pedestrians and Cyclists

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## Legislation

- ▶ 30kph zones
- ▶ BAC limits
- ▶ Land use planning
- ▶ Helmet wearing



# Effective Interventions for Pedestrians

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- ▶ Footways and connections on preferred routes
- ▶ Dropped crossing for wheelchair users
- ▶ Tactile indicators for visually impaired road users



# Effective Interventions for Cyclists

- ▶ Cycle training
- ▶ Cycle facilities (lanes, routes, tracks, cycle friendly features at junctions etc.)
- ▶ Lower vehicle speeds - traffic calming with cycle friendly facilities (where appropriate)
- ▶ Helmet wearing





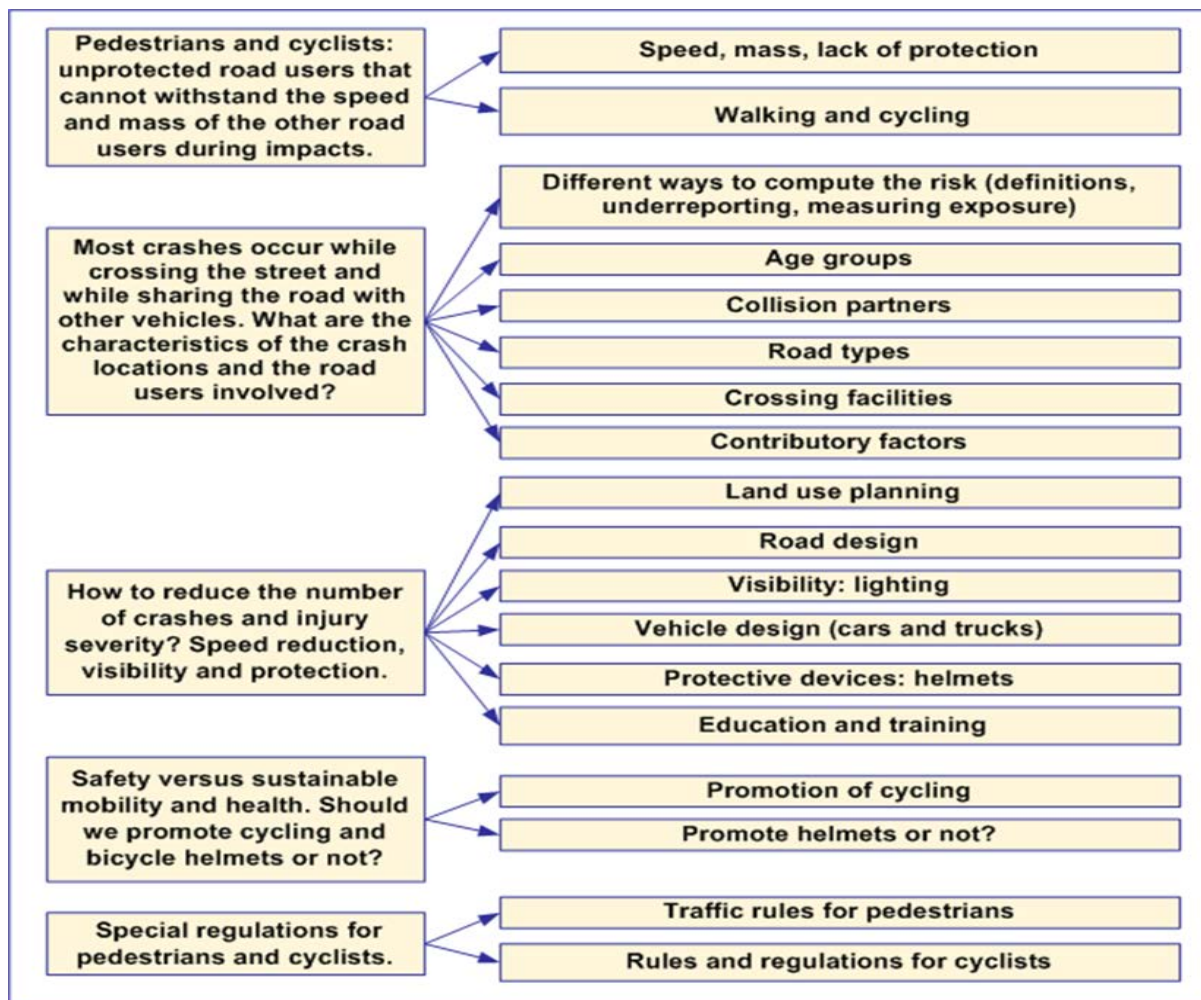
# Effective Interventions for Powered Two-Wheelers

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- ▶ Legislation (licensing, training)
- ▶ Safety equipment - Helmets and safer clothing
- ▶ Safer roadsides - removing road side hazards
- ▶ Safer roads - removing potholes, removing raised lines and slippery thermoplastic markings
- ▶ Visibility of motorised two-wheelers- daytime running lights
- ▶ Maintenance issues



# Elements of a programme to improve safety





**Interactive  
exercise**

# Interventions



# PEDESTRIAN SAFETY



## Road crashes involving pedestrians – situation globally

- ▶ Each year, more than 270 000 pedestrians lose their lives on the world's roads.
- ▶ Globally, pedestrians constitute 22% of all road deaths, and in some countries this proportion is as high as two thirds.
- ▶ Millions more people are injured in traffic-related crashes while walking, some of whom become permanently disabled.
- ▶ These incidents cause much suffering and grief as well as economic hardship for families and loved ones.
- ▶ The capacity to respond to pedestrian safety is an important component of road safety programmes
- ▶ Pedestrian collisions should not be accepted as inevitable because they are predictable and preventable



## Road crashes involving pedestrians – situation in your jurisdiction

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**Note:**  
Facilitator to  
adapt to local  
situation



# Walking as a mode of transport

- ▶ Walking is a basic and common mode of transport with benefits to health and the environment
- ▶ Virtually every trip begins with walking
- ▶ Unfortunately, in some situations increased walking can lead to increased risk of road traffic crashes and injury.
- ▶ Causes of road crashes involving pedestrians include
  - ▶ dramatic growth in the number of motor vehicles
  - ▶ neglect of pedestrian needs in roadway design and land-use planning
  - ▶ traffic laws are inadequately enforced

# Most accidents with pedestrians are due to frontal crash

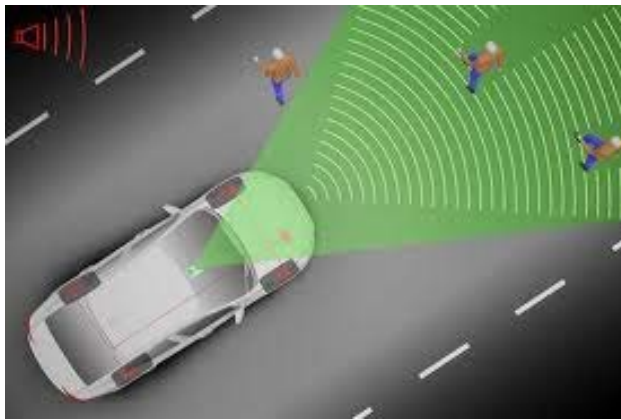
- ▶ In these cases the body bends around the front of the car.
- ▶ Elderly pedestrian is usually «taken» on the car and not fallen under it.
- ▶ The first contact is usually between the buffer and the knee area, the next - between the leg and the front.
- ▶ The bottom of the body is accelerated forwards while the top is twisted and hits the front.
- ▶ The head hits the windscreen.
- ▶ The victim falls on the road.







# Systems for active and passive safety



## Point of impact

The height and angle of a bullbar causes more damage on impact with unprotected pedestrians than vehicles without a bullbar.

Low point of initial contact



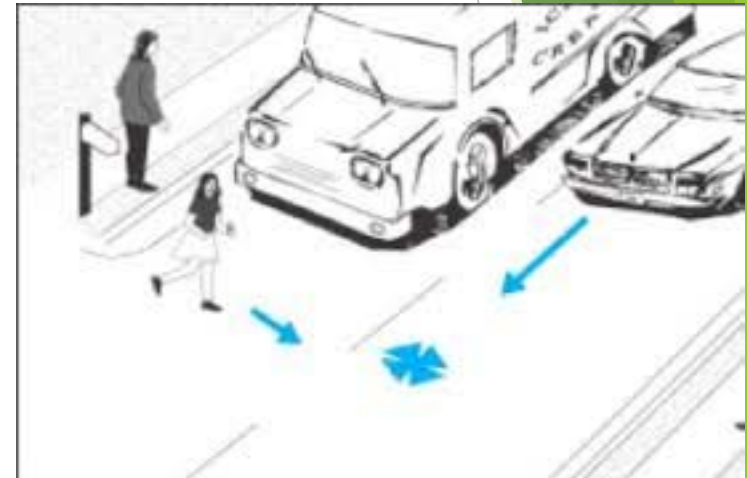
High point of initial contact





# Five main factors for pedestrian accidents

- ▶ The pedestrian does not look correctly around.
- ▶ The driver does not look correctly around.
- ▶ The pedestrian do not take proper consideration of the speed and direction of the vehicle.
- ▶ The pedestrian is under the influence of alcohol.
- ▶ The pedestrian has come out unexpectedly behind a parked vehicle.



# Pedestrian safety is shared responsibility

COMMUNITY - DRIVER - PEDESTIAN





# Visibility = Safety

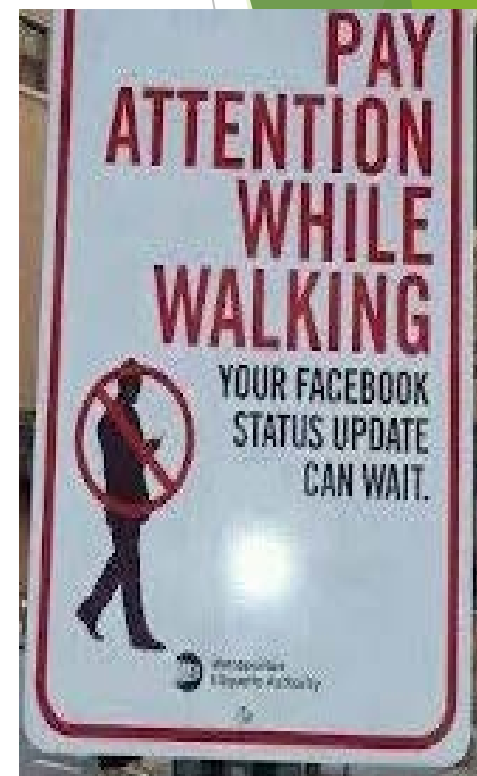
- ▶ Be visible, not invisible for the drivers.
- ▶ Cross on proper and properly lighted places. The drivers expect to see you there and pay more attention.
- ▶ Wear reflective clothes or reflective elements on the clothes.





# Be concentrated when crossing!

Worldwide for the last 10 years the accidents with pedestrians due to distractions with phones and smartphones has risen 7 fold.





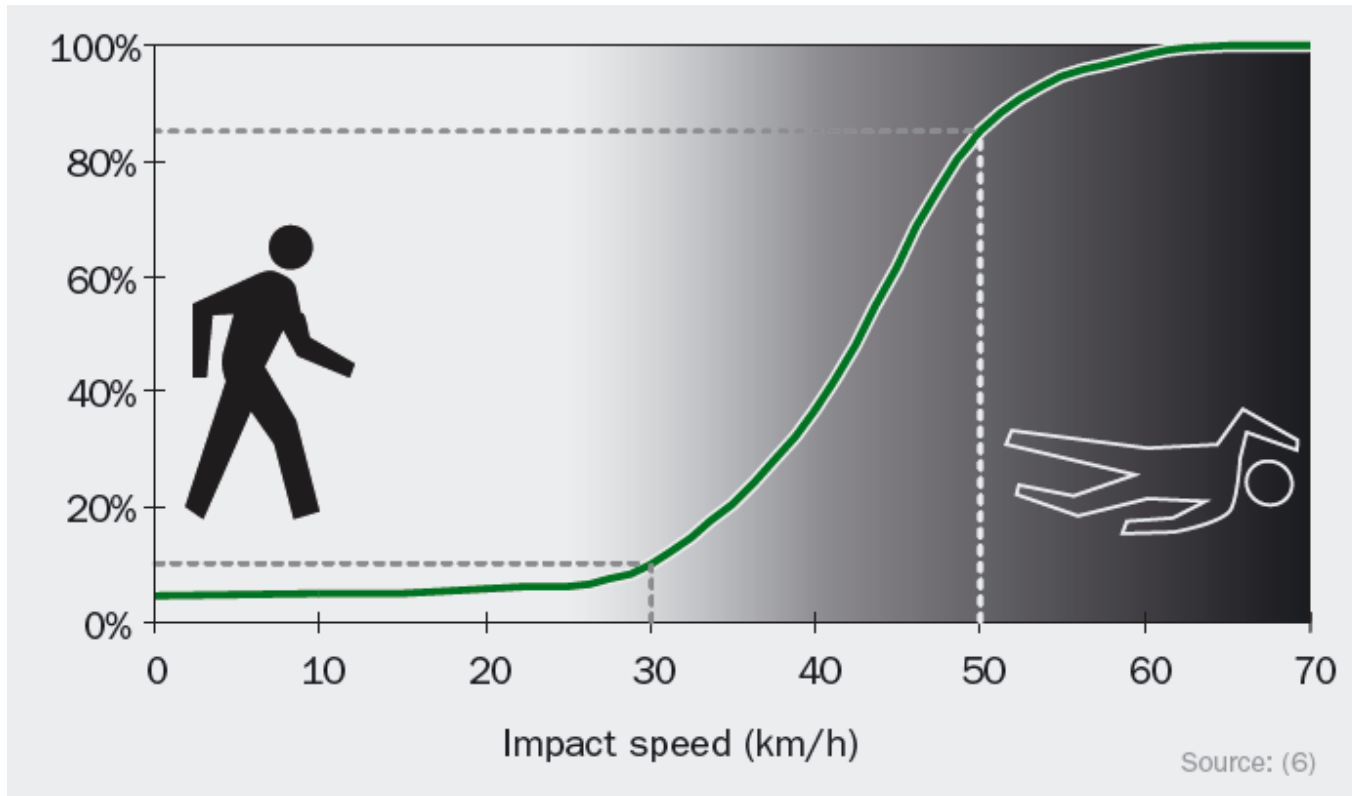
## Walking – main risks

The key risks to pedestrians are well documented, and include

- ▶ driver behaviour, particularly in relation to speeding as well as drinking and driving;
- ▶ infrastructure in terms of a lack of dedicated facilities for pedestrians such as sidewalks, crossings and raised medians;
- ▶ vehicle design in terms of solid vehicle fronts that are not forgiving to pedestrians should they be struck.
- ▶ Poor trauma care services in many settings also thwart efforts to provide the urgent
- ▶ treatment needed to save pedestrian lives in the event of a collision.



# Walking – speed





## Walking – who is at greatest risk

- Age groups with the highest percentage of pedestrian fatalities are:
  - Children under the age of 10
  - Adults over the age of 65
- Most pedestrian injuries occur in urban areas
- Crashes involving pedestrians frequently occur at facilities designed to aid them, such as pedestrian crossings





# Pedestrian safety in the EU

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- ▶ Pedestrian fatalities account for 20.4% of all road crash fatalities in the EU
- ▶ Pedestrian fatalities have reduced by 25% in the last decade in the EU23
- ▶ 64% of pedestrian fatalities are male
- ▶ 48% occur during the hours of darkness



## The Safe System approach and pedestrian safety

- ▶ Conventional analysis of road traffic injury risk has considered road users, vehicles and the road environment separately
- ▶ There is also a tendency among researchers and practitioners to focus on one or few factors, when in reality several interacting factors typically define any specific road traffic context
- ▶ The Safe System approach has several benefits as a framework for pedestrian safety:
  - ▶ Examination of a range of risk factors
  - ▶ Integration of comprehensive interventions
  - ▶ Assimilation of lessons learned
  - ▶ Collaboration with partners.



## Policy and planning reforms that support pedestrian safety

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- ▶ Land-use planning and roadway design should accommodate the specific needs of pedestrians not only to improve their safety, but also to increase pedestrian access to local services including shops, schools, hospitals, farms, neighbours, public transportation stops and social meetings
- ▶ A wide range of land-use planning and road design strategies to improve pedestrian safety have been developed and implemented in different countries



## Examples of effective land-use planning measures

- ▶ traffic-calming measures;
- ▶ restricting traffic in residential areas;
- ▶ building sidewalks;
- ▶ enforcing traffic laws;
- ▶ pedestrianizing city centres;
- ▶ installing pedestrian signals;
- ▶ constructing under- and over-passes;
- ▶ creating a road network that separates access roads from through-roads and ensures that traffic volume on access roads is as small as possible;
- ▶ reducing unnecessary travel;



## Examples of effective land-use planning measures

- ▶ designing pedestrian pathways for people with mobility impairments;
- ▶ locating roads, residential areas, workplaces and other industries in such a way that traffic volume and travel distances are minimized;
- ▶ redesigning public spaces to cater for pedestrian safety needs, and to encourage walking;
- ▶ integrating transportation planning with health issues, for example, active transport and design programmes;
- ▶ developing and implementing pedestrian safety policies



# Pedestrianisation

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- ▶ Pedestrianisation is the process of removing vehicular traffic from city streets or restricting vehicular access to streets for use by pedestrians
- ▶ Pedestrianisation improves the safety and accessibility for pedestrians, contributes to reducing noise and air pollution, creates more livable environments



# Pedestrianisation

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There are four main pedestrianisation schemes:

1. full-time pedestrian streets in which vehicular traffic is excluded or prohibited except for emergency vehicles;
2. part-time pedestrian streets in which vehicular traffic is eliminated for certain hours of the day or certain days of the week;
3. partial pedestrian streets that restrict vehicle access to slow public transport vehicles only;
4. partial pedestrian streets or traffic-calming measures



# Pedestrian safety policies and legislation in Europe

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- ▶ The European Charter of Pedestrians' Rights was adopted by the European Parliament in 1988
- ▶ This charter also outlines the rights of disabled pedestrians





## The European Charter of Pedestrians' Rights

- ▶ Under this charter pedestrians have the right to expect
  - ▶ the fixing of speed limits and modifications to the layout of roads to safeguard pedestrian and bicycle traffic
  - ▶ an effective system of road signs whose design also takes into account the needs of the blind and deaf
  - ▶ complete and unimpeded mobility, which can be achieved through the integrated use of the means of transport



## The European Charter of Pedestrians' Rights

- ▶ The disabled have the right to specific measures to maximise their independent mobility
  - ▶ including adjustments in public areas, transport systems and public transport (guidelines, warning signs, acoustic signals, accessible buses, trams and trains)



# EC traffic rules for pedestrians

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- ▶ The European Commission - has adopted traffic rules for pedestrians
- ▶ These are in addition to the rules which normally apply to all public highway users, according to the Vienna Convention
- ▶ Pedestrians are subject to specific rules defined in their national legislation in order to ensure that they can travel safely and easily



# EC traffic rules for pedestrians

- ▶ Traffic Rules for Pedestrians contain such issues as
  - ▶ If, at the side of the carriageway, there are pavements (sidewalks) or suitable verges for pedestrians, pedestrians shall use them.
  - ▶ Pedestrians wishing to cross a carriageway
    - ▶ Shall not step on to it without exercising care
    - ▶ they shall use a pedestrian crossing whenever there is one nearby
    - ▶ If the crossing is equipped with light signals for pedestrians, the latter shall obey the instructions given by such lights



## Pedestrian safety – relevant legislation in your jurisdiction

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**Note:**  
Facilitator to  
adapt to local  
situation



# Assessing the pedestrian safety situation

Accurate data on the extent of the pedestrian safety problem are essential to define the problem and develop appropriate measures.

Source:- Pedestrian safety A road safety manual for decision-makers and practitioners, WHO 2013

## Minimum data

*How big is the problem?*

- Number of crashes involving pedestrians.
- Number of pedestrians killed in road traffic crashes.
- Number of pedestrians injured in road traffic crashes.
- Total number of road traffic fatalities and injuries, preferably disaggregated by road user types.

*What type of traffic conflicts lead to pedestrian crashes?*

- Involvement of cars, trucks, motorcycles, bicycles and animal-drawn carts, etc.
- Vehicle manoeuvres (e.g. turning).

*On what day of the week and at what time do pedestrian collisions occur?*

- Date and time of injuries.

*How serious are the injuries?*

- Severity of pedestrian injuries.

*Which type of crashes lead to disability or life-threatening outcomes?*

- Outcome following collisions.

*Who is involved in pedestrian collisions?*

- Age and sex of those killed or injured as pedestrians.

*Where do pedestrian crashes occur?*

- Place of crash (specific location such as urban, rural and type of road).
- Dangerous road locations.

## Complementary data

*How many people live in the area being assessed?*

- Total number of people in the population under study (including disaggregation by urban and non-urban, by age and income).

*How and why do people typically travel around the area?*

- Origins and destinations of trips.
- Transport modes used.
- Trip distances.
- Trip purposes.

*What is the socioeconomic condition of the area under assessment?*

- Gross domestic product.
- Proportion of adults employed.
- Household income.



## Assessing other factors

- ▶ What are the available pedestrian facilities and general road transport infrastructure?
- ▶ What is the travel behaviour of pedestrians and other road users?
- ▶ What is the current enforcement of traffic regulations?
- ▶ Is there leadership and stakeholder engagement
- ▶ What are existing plans, policies and programmes



**Interactive  
exercise**

**Pedestrian  
safety  
knowledge  
and opinion**







## Pedestrian safety action plan

- ▶ The situational assessment provides an understanding of the local pedestrian safety situation - the extent and pattern of pedestrian traffic injuries, relevant risk factors, and the people, institutions, policies, programmes and resources that are currently (or could be) involved in pedestrian safety initiatives.
- ▶ The next step in improving pedestrian safety is to use this information, alongside the information to create a plan of action.
- ▶ A plan of action sets out a strategy for improving pedestrian safety in the setting under consideration. It provides a framework to organize interventions in a strategic manner that minimizes duplication of work and facilitates evaluation.



## Action plan components

- ▶ The action plan can include the following sections;
  - ▶ Problem identification
  - ▶ Clear objectives
  - ▶ Realistic targets
  - ▶ Performance indicators
  - ▶ Interventions (policy, land-use, engineering, education, enforcement)
  - ▶ Monitoring and evaluation framework
  - ▶ Budget
  - ▶ Timeline
  - ▶ Clear allocation of responsibilities (who does what)
  - ▶ Indication of how the programme will be sustainable/ next steps



## Target - example



- UK Target 2001-2010
- 50% reduction in Child KSI's
- 2010 achieved 64% reduction overall
- 60% reduction in Child pedestrian KSI's
- Compared to 94-98 baseline



# Stakeholder engagement

When developing a programme / action plan to improve pedestrian safety it is important to involve stakeholders such as:

- ▶ Political decision makers
- ▶ Road safety community - responsible agency
- ▶ Health service providers
- ▶ Education providers
- ▶ Police
- ▶ Interest groups (disabled etc.)
- ▶ Members of the public

“Stakeholder involvement is an essential element in creating publicly supported and trusted policies, programmes, and projects that reduce pedestrian crashes while creating liveable, walkable communities”.



## Pedestrian safety working group

The key stakeholders identified in the situational assessment should constitute a core working group. Activities of the working group could include:

- ▶ Setting the goals and objectives of the pedestrian action plan.
- ▶ Examining data or information available and prioritizing concerns.
- ▶ Coordinating the development and possibly implementation of the pedestrian safety action plan.
- ▶ Mobilizing support and resources for the pedestrian safety action plan.
- ▶ Coordinating and integrating the action plan into government road safety, transport and/or urban development programmes at the national and local levels.



# Key measures

- ▶ Key measures to improve pedestrian safety include

Key measures	Examples of interventions	Effectiveness		
		Proven	Promising	Insufficient evidence
<b>Reduce pedestrian exposure to vehicular traffic</b>	Provide sidewalks			
	Install and/or upgrade traffic and pedestrian signals			
	Construct pedestrian refuge islands and raised medians			
	Construct enhanced marked crossings			
	Provide vehicle restriction/diversion measures			
	Install overpasses/underpasses			
	Improve mass transit route design			
	Reduce traffic volumes by switching journeys from the car to public transport, walk and cycle for distances and purposes where these options work well			
<b>Reduce vehicle speeds</b>	Reduce speed limit			
	Implement area-wide lower speed limit programmes, for example, 30 km/h			
	Implement road-narrowing measures			
	Install speed management measures at road sections			
	Install speed management measures at intersections			
<b>Improve sight distance and/or visibility between motor vehicles and pedestrians</b>	Provide school route improvements			
	Provide crossing enhancements			
	Implement lighting/crossing illumination measures			
	Reduce or eliminate obstruction by physical objects including parked vehicles			
	Install signals to alert motorists that pedestrians are crossing			
	Improve visibility of pedestrians			

Source:- Pedestrian safety A road safety manual for decision-makers and practitioners, WHO 2013



## Reducing pedestrian exposure to vehicular traffic

There are a number of specific engineering measures that reduce pedestrian exposure to vehicular traffic.

Most of these measures involve separating pedestrians from vehicles or reducing traffic volume.

- ▶ Sidewalks/ footpaths
- ▶ Marked crossings
- ▶ Overpasses and underpasses
- ▶ Mass transport routes



## Reducing vehicle speeds

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- One of the most effective ways to improve pedestrian safety is to reduce the speed of vehicles
- Speed management is much more than setting and enforcing appropriate speed limits.
- Speed management employs a range of measures in engineering, enforcement and education with the aim of balancing safety and efficient vehicle speeds on the road network.





## Visibility

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- ▶ Intervisibility between pedestrians and motorists to ensure pedestrians can see and be seen
- ▶ Good quality lighting to ensure that pedestrians are visible at night



# Visibility

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- Providing crossing enhancements such as raised crossing islands and traffic signals.
- Implementing lighting and/or crossing illumination measures.
- Increasing intensity of roadway lighting increases visibility of pedestrians at night, especially at pedestrian crossings..
- Removing or repositioning physical objects that affect visibility, such as trees and billboards that make it difficult for drivers to see pedestrians.
- Installing signals to alert motorists that pedestrians might be crossing
- Improving conspicuity of pedestrians



# Improving pedestrian and motorist safety awareness and behaviour

- Changing the attitudes and behaviour of drivers and pedestrians is a complex, long-term undertaking that requires a variety of interventions to be implemented.
- These measures are most effective when implemented alongside other measures described in this module such as speed management and reducing pedestrian exposure to vehicular traffic.
  - ▶ Mass media campaigns
  - ▶ School based programmes
  - ▶ Traffic law enforcement



**Interactive  
exercise**

**Elderly road  
users**





# Monitoring and evaluation

Evaluation is a critical component of pedestrian safety interventions.

## ► Evaluation

- measures the effectiveness of the programme
- assesses whether the desired outcomes are being achieved.
- Can help identify success as well as constraints
- Can provide insights on how to adjust programmes so that objectives and targets are achieved.

The results of evaluation are key inputs for decision-makers involved in pedestrian safety programmes.

They also provide the content for dissemination and improvement of ideas and initiatives



## Tips for evaluation

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- ▶ Plan the evaluation
- ▶ Identify existing monitoring and evaluation activities in your setting,
- ▶ Identify suitable indicators to monitor processes, outputs and outcomes.
- ▶ Conduct the evaluation consistently, as planned
- ▶ Use evaluation results to improve the programme, and inform the public and other stakeholders about successes or failures



## Monitoring and evaluation

- ▶ Targets and performance indicators aimed at improving road safety for pedestrians need to be both realistic and achievable.
- ▶ Monitoring against such targets is important to ensure that programmes / action plans are achieving their intended aims.
- ▶ Wherever possible monitoring should be carried out at a local level and results compared against both local and national targets.



# Performance indicators

- ▶ Performance indicators are used to measure progress towards the objectives.
- ▶ They indicate changes and improvements in the baseline conditions being addressed,
  - ▶ the number of pedestrian fatalities and injuries
  - ▶ the amount of funding allocated to pedestrian safety.
- ▶ Performance indicators help to define key activities, deliverables and outcomes for the action plan.
- ▶ Each performance indicator should have specific targets, either quantitative or qualitative.





# Example indicators for evaluating a pedestrian safety programme

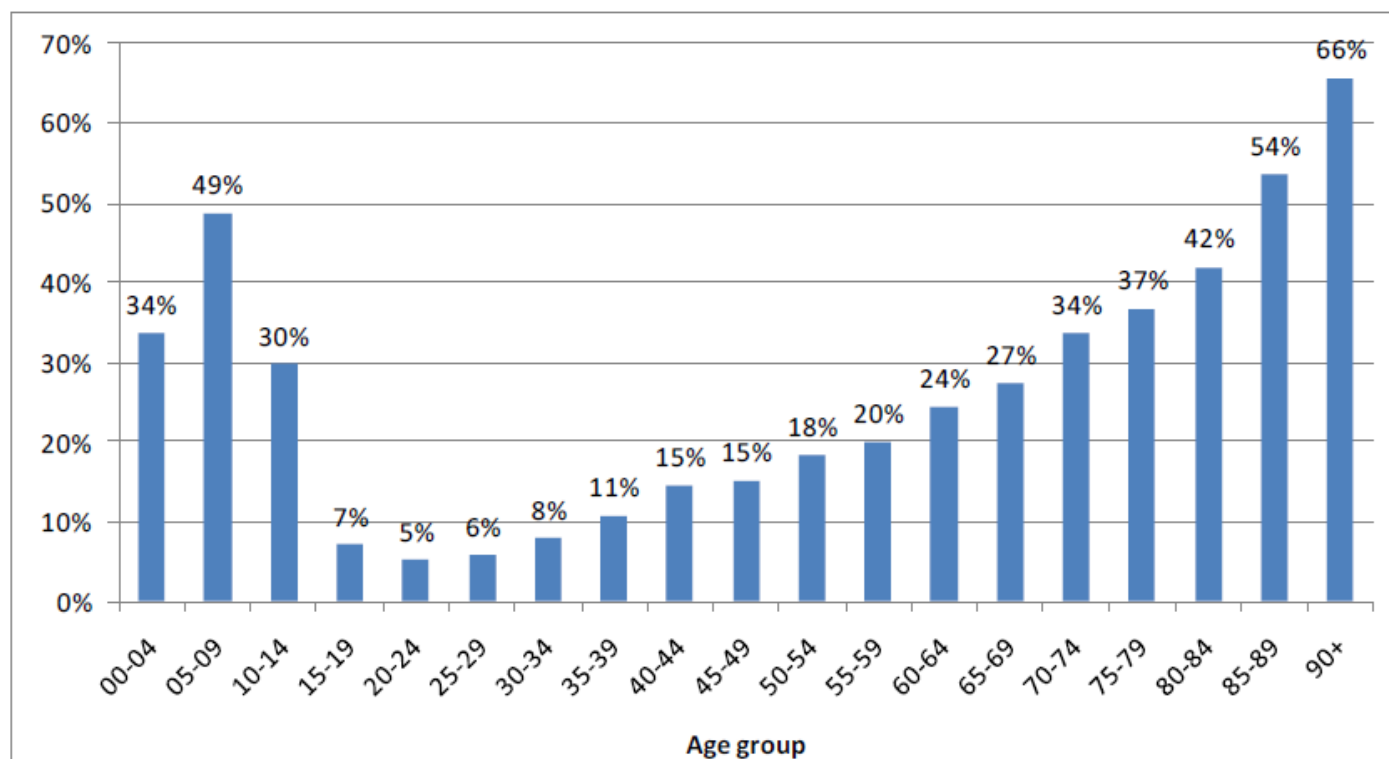
Type of indicator	Purpose	Examples
Process	To assess progress in the process of change, in order to show how the programme or activity has been implemented or executed	<ul style="list-style-type: none"> <li>• Setting up a working group</li> <li>• Conducting a situational assessment</li> <li>• Preparing a pedestrian safety plan</li> <li>• Prioritizing pedestrian safety in national and local policies and programmes</li> <li>• Implementing a plan of action</li> </ul>
Output	To measure outputs or products that are attributable to the programme processes	<ul style="list-style-type: none"> <li>• Publishing and disseminating a pedestrian safety plan</li> <li>• Officially launching a pedestrian safety plan</li> <li>• Endorsement of a pedestrian safety plan by national or local government</li> <li>• Allocating human and financial resources to a pedestrian safety plan</li> <li>• Securing space for sidewalks</li> </ul>
Outcome	To measure the ultimate outcomes of implementing various activities	<ul style="list-style-type: none"> <li>• Increase in knowledge and awareness about risk factors for pedestrian injury</li> <li>• Change in behaviour: speed, drinking and driving, street crossing and yielding at pedestrian priority points</li> <li>• Reduction in pedestrian fatalities and injuries</li> </ul>

Source:- Pedestrian safety A road safety manual for decision-makers and practitioners, WHO 2013



# Data

Figure 6: Pedestrian fatalities as a percentage of all fatalities by age group, EU-16, 2008



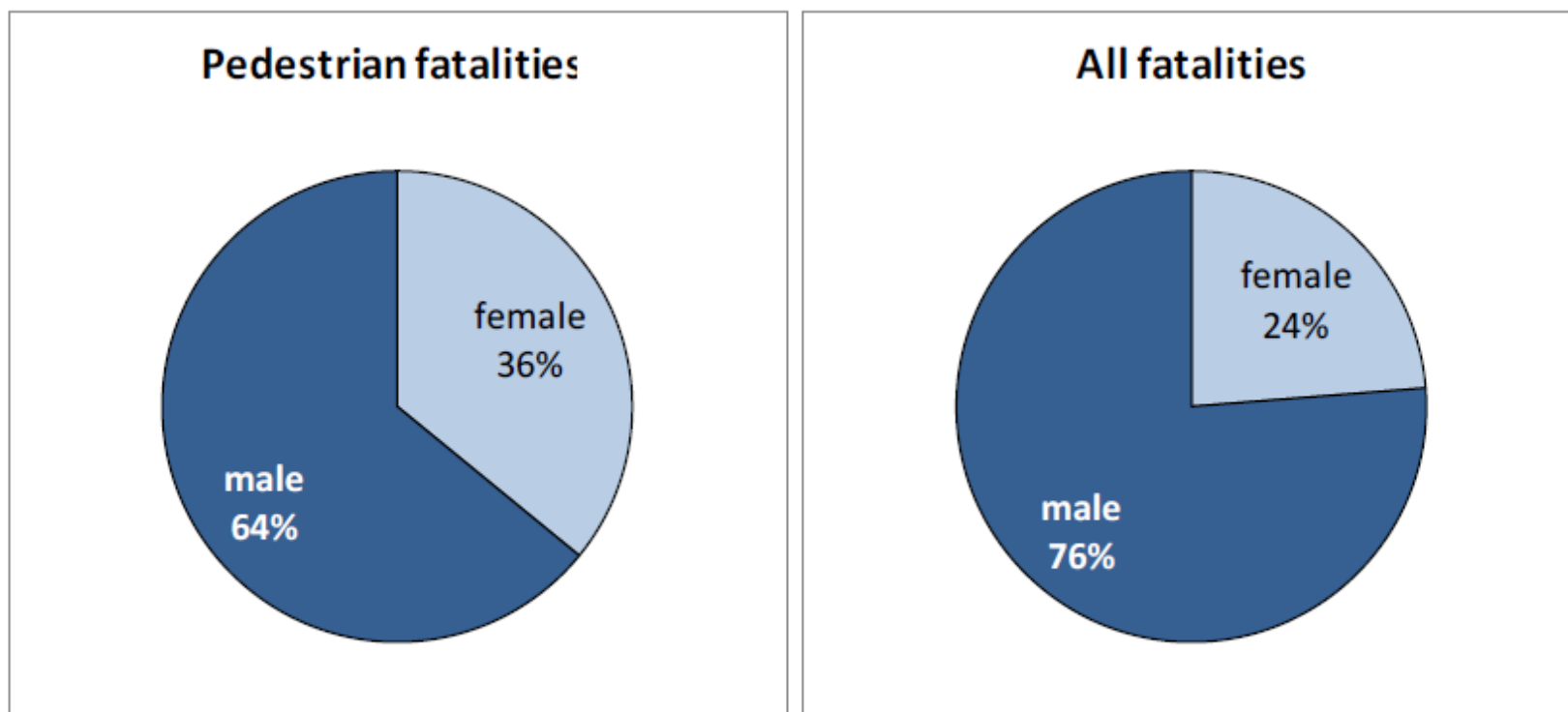
Countries included: FR, AT, BE, CZ, DK, ES, FI, EL, IE, IT, LU,  
NL, PT, RO, SE, UK

Source: CARE Database  
Date of Query: November 2010



# Data

Figure 10: Share of pedestrian and all fatalities by gender, EU-23, 2008



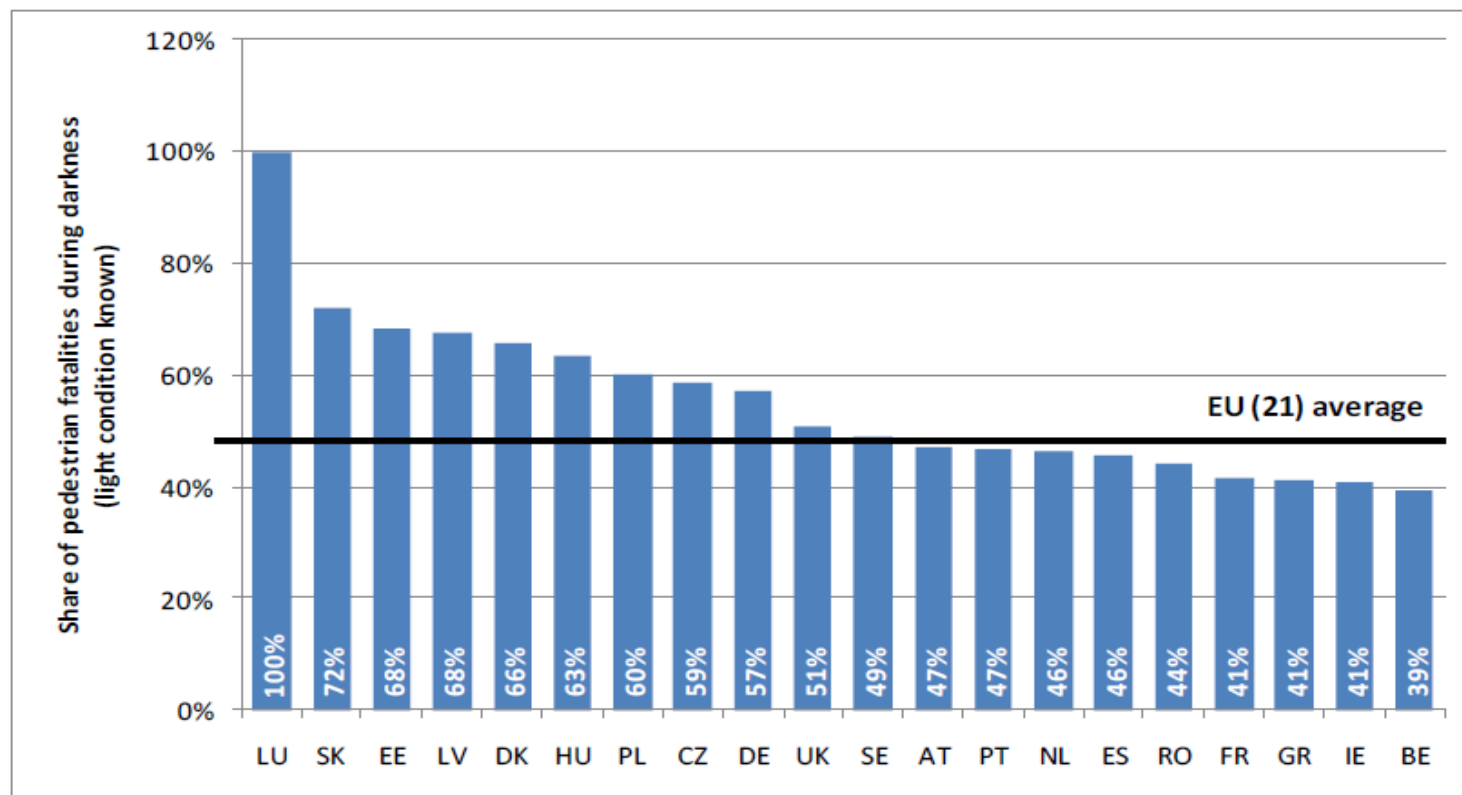
Countries included: BE, CZ, DK, DE, EE, IE, EL, ES, FR, IT, LV, LU, HU, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK

Source: CARE Database  
Date of Query: November 2010



# Data

Figure 12: Pedestrian fatalities during darkness as a proportion of all pedestrian fatalities by country 2008 (excluding Italy and Slovenia)

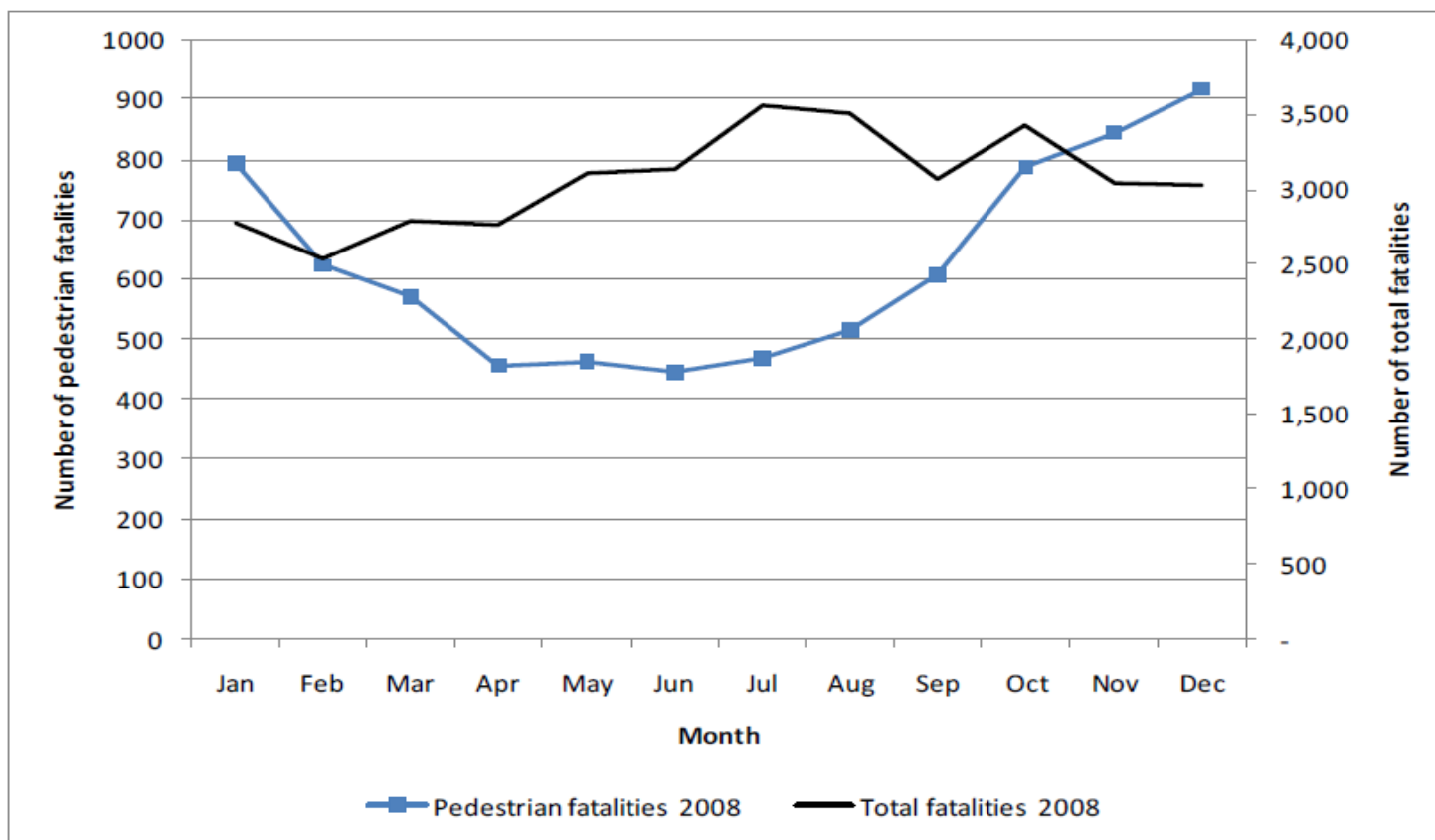


Source: CARE Database  
Date of Query: November 2010



# Data

Figure 13: Pedestrian fatalities and total fatalities by month in EU (23), 2008



Source: CARE Database  
Date of Query: November 2010

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the left and right sides of the frame, creating a dynamic, modern aesthetic. The central area is a plain white space where the text is located.

**BICYCLISTS**



## Cycling as a transport mode

- ▶ Bicycles are part of the urban mobility mix in many European countries
- ▶ Bicycles use no fossil energy, deliver important health benefits, and improve the livability of cities.
- ▶ The bicycle offers an affordable way of getting to work, to earn income and to access basic living needs.



## Cycling as a mode of transport

- ▶ Cycling is also a common way for travelling to work.
- ▶ Between about 30 and 40% of the person kilometers by bicycle is travelled on home-work trips.
- ▶ For young people in secondary school (12 to 17 years of age), the bicycle is by far the most important vehicle.
- ▶ They use their bicycle for no less than 52% of all trips.





## Cycling as a transport mode

Many cities are introducing advanced public bike systems and making bicycling a central part of the mobility solution in many urban settings.

### Advantages of cycling

- ▶ An affordable and seamless door to-door mobility service - it is as versatile as walking but can cover greater distances at faster speeds.
- ▶ alternative to cars and allows for greater freedom of movement than scheduled public transport services.
- ▶ Bicycles are well suited to respond to the great number of short trips that are typical for urban mobility.



## Cyclist Safety in the EU

- ▶ Cycling is a transport mode where relatively unprotected road users interact with traffic of high speed and mass.
- ▶ The bicycle is used most frequently by adolescents (12-17 years of age)
- ▶ Denmark & the Netherlands have the highest percentages of cyclist fatalities in the total number of road accident fatalities
- ▶ 2,440 (6.5%) fatalities in EU23 in 2008
- ▶ 60% occur in urban areas
- ▶ Nearly 40% occur at intersections
- ▶ Around 70% of those killed are male



## Road crashes involving cyclists– situation in your jurisdiction

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**Note:**  
Facilitator to  
adapt to local  
situation



## The transport system is not designed for cyclists

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- ▶ The road system has not been designed for mixing well-protected, heavy and high velocity vehicles with unprotected, lightweight and slower road users such as cyclist
- ▶ Though cycling is an important component of urban mobility, cyclists are often seen as intruders in the road system.



# The road system is not designed for cyclists

Furthermore, the traffic system does not typically account for the specific characteristics of cyclists and bicycles.

- ▶ Cyclists are highly flexible and sometimes unpredictable road users,
- ▶ riders display very different abilities,
- ▶ cyclists seek to minimise energy expenditure,
- ▶ bicycles can be easily de-stabilised and are relatively difficult to see because of their size (in daytime) and their poor or lack of night-time lighting.



# Cyclists in transport policies

Do policies that increase the number of cyclists contribute to more unsafety/crashes?

- ▶ Not necessarily if attention is paid to good policy design.
- ▶ Where it does not reduce the quality of cycling networks, bicycle facilities should be located away from road traffic when feasible - especially for sections where cars are accelerating (hills, long straightaways).



## Legislation – Vienna convention

EU vehicle regulations set out in the Vienna Convention state bicycles must:

- ▶ have an efficient brake
- ▶ be equipped with a bell
- ▶ be equipped with a red reflecting device at the rear
- ▶ show a white or yellow light at the front and a red light at the rear during the hours of darkness



## Legislation – Vienna convention

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- ▶ must not ride without holding the handlebars with at least one hand
- ▶ must not allow themselves to be towed by another vehicle
- ▶ must not carry, tow, or push objects which hamper their cycling or endanger other road users
- ▶ must keep to the right of the carriageway (to the left in the United Kingdom and Ireland)





## Legislation – Vienna convention

- ▶ must give an appropriate arm signal when they wish to turn
- ▶ may not ride more than one abreast except
- ▶ where the carriageway is wide enough
- ▶ where cycle traffic is heavy
- ▶ on cycle tracks, etc.
- ▶ are required to use cycle lanes and tracks
- ▶ may not use motorways and similar roads.



## Legislation - example Germany and Netherlands

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Germany and the Netherlands have supplementary regulations regarding mandatory equipment to ensure cyclists' visibility:

- ▶ One white reflecting device visible from the front.
- ▶ Orange pedal reflectors visible from the front and rear.



## Legislation - example Germany and Netherlands

- ▶ Two wheel-mounted orange spoke reflectors on each wheel, arranged at an angle of  $180^\circ$  and visible from the side, or continuous white circular retro-reflector strips on the tires or on the spokes of the front and rear wheels.
- ▶ One additional red large-surface reflector on the rear.
- ▶ Mudguards to prevent mud from reducing the visibility of lights and reflectors.



## National legislation

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In addition to the rules which normally apply to all public highway users and in accordance with the Vienna Convention, cyclists are subject to specific rules defined in their national legislation in order to ensure that they can travel safely



## Cyclist safety – relevant legislation in your jurisdiction

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**Note:**  
Facilitator to  
adapt to local  
situation



## Safety helmets

In some European countries, cycle helmets have become mandatory in the last few years

- ▶ Malta, cycle helmets are mandatory for all cyclists
- ▶ Sweden, Slovenia, Czech Republic, cycle helmets are mandatory for all cyclists up to the age of 15
- ▶ Spain, cycle helmets are mandatory for all cyclists outside urban areas (except when going uphill?)



**Interactive  
exercise**

# Attitudes towards cyclists





## Cyclist safety action plan

- ▶ The situational assessment provides an understanding of the local cyclist safety situation - the extent and pattern of cyclist traffic injuries, relevant risk factors, and the people, institutions, policies, programmes and resources that are currently (or could be) involved in pedestrian safety initiatives.
- ▶ The next step in improving cyclist safety is to use this information, alongside the information to create a plan of action.
- ▶ A plan of action sets out a strategy for improving pedestrian safety in the setting under consideration. It provides a framework to organize interventions in a strategic manner that minimizes duplication of work and facilitates evaluation





## Action plan components

- ▶ The action plan can include the following sections;
  - ▶ Problem identification
  - ▶ Clear objectives
  - ▶ Realistic targets
  - ▶ Performance indicators
  - ▶ Interventions (policy, land-use, engineering, education, enforcement)
  - ▶ Monitoring and evaluation framework
  - ▶ Budget
  - ▶ Timeline
  - ▶ Clear allocation of responsibilities (who does what)
  - ▶ Indication of how the programme will be sustainable/ next steps



# Stakeholder engagement

When developing a programme / action plan to improve cyclist safety it is important to involve stakeholders such as;

- ▶ Political decision makers
- ▶ Road safety community - responsible agency
- ▶ Health and education service providers
- ▶ Police
- ▶ NGOs or sports groups involved in cycling
- ▶ Interest groups (disabled etc.)
- ▶ Members of the public
- ▶ Motoring groups



## Cyclist safety working group

The key stakeholders identified in the situational assessment should constitute a core working group.

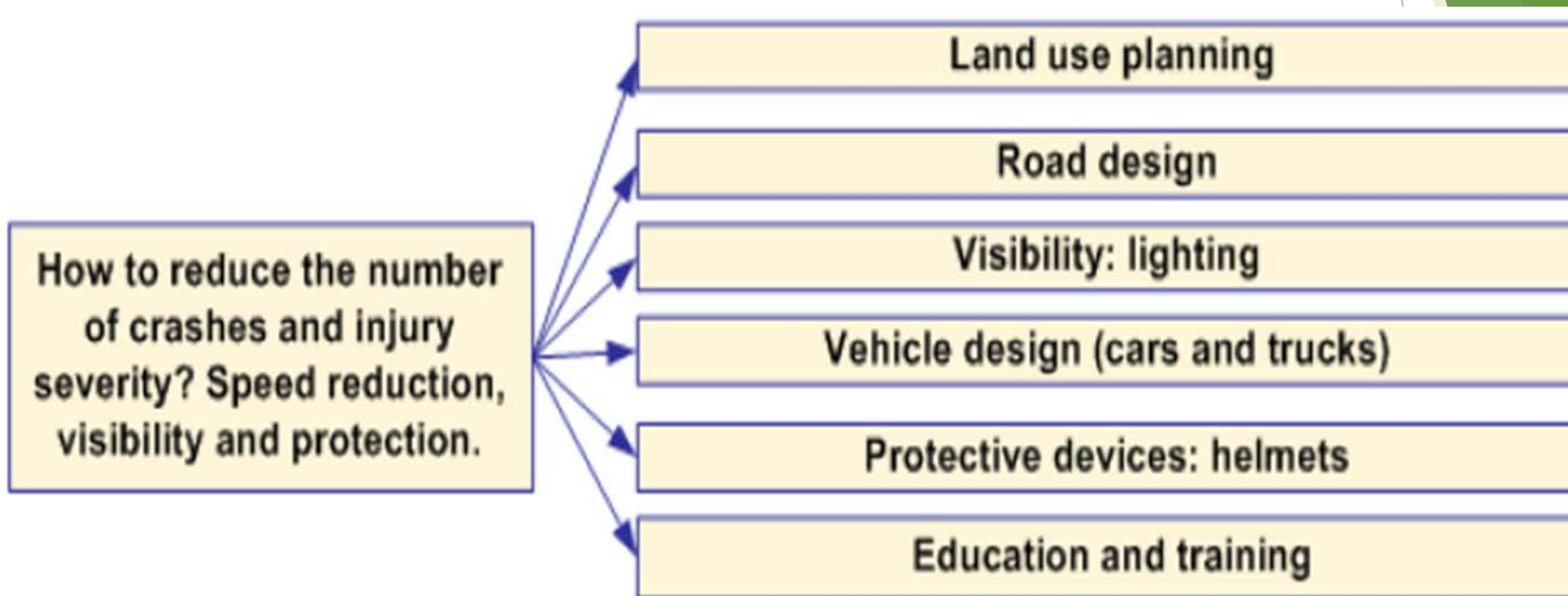
Activities of the working group could include:

- ▶ Setting the goals and objectives of the pedestrian action plan.
- ▶ Examining data or information available and prioritizing concerns.
- ▶ Coordinating the development and possibly implementation of the pedestrian safety action plan.
- ▶ Mobilizing support and resources for the cyclist safety action plan.
- ▶ Coordinating and integrating the action plan into government road safety, transport and/or urban development programmes at the national and local levels.



# Cyclist safety working group

The programme / action plan can include using such measures as:





# Key measures to improve cyclist safety

Source: Cycling Safety: Key Messages, OECD/ ITF (2012)

1. Where it does not reduce the quality of cycling networks, bicycle facilities should be located away from road traffic when feasible - especially for sections where cars are accelerating (hills, long straightaways).
2. Insufficient evidence supports causality for the “safety in numbers” phenomenon - policies increasing the number of cyclists should be accompanied by risk-reduction actions.
3. Efforts must be made to harmonize definitions of bicycle accident terminology so as to be able to make reliable international comparisons on cyclist safety.



# Key measures to improve cyclist safety

Source: Cycling Safety: Key Messages, OECD/ ITF (2012)

5. National authorities should set standards for, collect or otherwise facilitate the collection of data on non-fatal cycling crashes based on police reports and, in either a systematic or periodic way, on hospital records.
6. National authorities should set standards for, collect or otherwise facilitate the collection of accurate, frequent and comparable data on bicycle usage.
7. Speed management acts as “hidden infrastructure” protecting cyclists and should be included as an integral part of cycle safety strategies.
8. Cyclists should not be the only target of cycling safety policies – motorists are at least as important to target.



# Key measures to improve cyclist safety

Source: Cycling Safety: Key Messages, OECD/ ITF (2012)

9. Authorities seeking to improve cyclists' safety should adopt the Safe System approach - policy should focus on improving the inherent safety of the traffic system, not simply securing cyclists in an inherently unsafe system.
10. Authorities should match investments in cycle safety to local contexts, including levels of bicycle usage and account for cyclist heterogeneity.
11. Cycle safety plans should address safety improvement and the improvement of *perceived* safety.



# Land use planning

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Cyclist safety measures that are the most comprehensive and most closely associated with urban planning and policy philosophies are:

- ▶ Area-wide speed reduction or traffic calming schemes
- ▶ Provision of an integrated cycle network





# Road design measures

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Assure a cyclist-friendly infrastructure by the introduction of measures such as:

- ▶ Area-wide speed reduction
- ▶ Safe cycling routes
- ▶ On-carriageway facilities
- ▶ Off-carriageway facilities
- ▶ Contra-flow facilities
- ▶ Crossing facilities



# Visibility

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- ▶ Good quality lighting to ensure that cyclists are visible to other road users at night
- ▶ EU vehicle regulations require pedal cycles to be fitted with lights during the hours of darkness
- ▶ Are the lights for the cyclists to see with or are they to indicate the presence of the cyclist to other road users? - discussion



## Vehicle design

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- ▶ Policies and programmes for improving cycling for cyclists can have little influence the design of crash friendly car fronts as this rests primarily with vehicle manufacturers.
- ▶ Partnership working with logistics companies to encourage retro fitting of under-run bars to their goods vehicle fleet can result in increased safety for cyclists
- ▶ In 35-50% of the crashes between heavy goods vehicles and two-wheelers, injury severity can be limited by side under run protection



# Protective devices

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- ▶ Policies and programmes can be used to promote the use of protective devices for improving road safety for cyclists through partnership working with cycle retailers and product manufactures
- ✓ Cycle helmets
- ✓ Reflective or brightly colored clothing
- ✓ Retro-fit reflectors
- ✓ Cycle lights etc.



# Education

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- ▶ Road safety education for cyclists should be planned and progressive.
- ▶ Education should be directed at other types of road users, such as motorists as well as cyclists.
- ▶ Car driver instruction should cover characteristics of cyclists' behaviour and the necessary anticipation required by drivers to avoid conflicts with them.
- ▶ Education goes together with a comprehensive approach to road safety and mobility.



# Monitoring and evaluation

Evaluation is a critical component of cyclist safety interventions.

- ▶ Evaluation
  - ▶ measures the effectiveness of the programme
  - ▶ assesses whether the desired outcomes are being achieved.
  - ▶ Can help identify success as well as constraints
  - ▶ Can provide insights on how to adjust programmes so that objectives and targets are achieved.

The results of evaluation are key inputs for decision-makers involved in cyclist safety programmes.

They also provide the content for dissemination and improvement of ideas and initiatives



# Tips for evaluation

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- ▶ Plan the evaluation
- ▶ Identify existing monitoring and evaluation activities in your setting,
- ▶ Identify suitable indicators to monitor processes, outputs and outcomes.
- ▶ Conduct the evaluation consistently, as planned
- ▶ Use evaluation results to improve the programme, and inform the public and other stakeholders about successes or failures



# Targets and performance indicators

- ▶ Targets and performance indicators aimed at improving road safety for cyclists need to be both realistic and achievable.
- ▶ Monitoring against such targets is important to ensure that programmes / action plans are achieving their intended aims.
- ▶ Wherever possible monitoring should be carried out at a local level and results compared against both local and national targets.





# Target

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- ▶ A typical target could be to double the number of children cycling to school
- ▶ The performance indicator could be the percentage of children between the age of 5 and 16 who cycle to school
- ▶ The performance indicator would then be measured against the chosen baseline figure to see if the target had been met
- ▶ Baseline - Ages 7-11: 2%; Ages 11-16: 1%. (2006)  
Source - Sport Council for Wales Children and Young People Survey

## A good example



- ▶ UK Target 2001-2010
- ▶ 40% reduction in all KSi's
- ▶ 2010 achieved 49% reduction overall
- ▶ 26% reduction in all cyclist KSi's
- ▶ 65% reduction in child cyclist KSi's
- ▶ Compared to 94-98 baseline

# Example – TfL Cycle Safety Action Plan



# TfL Cycle Safety Action Plan objectives

- ▶ To ensure the future growth in cycling in London is accompanied by a reduced rate of cycling casualties;
- ▶ To increase the perception that cycling is a safe and attractive transport option;
- ▶ To make progress towards achieving the existing and future targets for reducing cyclists killed or seriously injured;
- ▶ To ensure London continues to be a world leader in developing effective cycling safety improvements underpinned by analysis and a sound understanding of the cause of collisions.





# TfL Cycle Safety Action Plan evidence review

- ▶ Cycle trends
- ▶ Casualty trends
- ▶ Gender
- ▶ Age
- ▶ Location
- ▶ Speed
- ▶ Time of day / year
- ▶ Collision factors



# TfL identified 8 common collision types following data analysis

- ▶ Fatal collision between bicycle and goods vehicle
- ▶ Close proximity collision between cyclist and vehicle
- ▶ Other vehicle disobeys junction control
- ▶ Other vehicle turns right across path of cycle
- ▶ Cyclist hits or swerves to avoid an open door of other vehicle
- ▶ Other vehicle runs into the rear of cycle
- ▶ Cyclist disobeys junction control
- ▶ Cyclist rides off the footway into the path of vehicle on the carriageway

03.04.20  
15



## TfL Cycle Safety Action Plan

- ▶ The eight conflict types (i.e. types of collisions) described above lead to the greatest number of casualties and have therefore been prioritised for action.
- ▶ The causes of casualties will be addressed by nine action areas.
- ▶ These action areas have been informed by the collision factors of age, gender and location.





# TfL Cycle Safety Action Plan

- ▶ The action areas include interventions that will address more than one of the conflicts which commonly occur







## The nine action areas are:

- ▶ Safer infrastructure
- ▶ Training and information
- ▶ Communication
- ▶ Enforcement
- ▶ Regulation
- ▶ Technology
- ▶ Commercial driving & working practices
- ▶ Research & monitoring
- ▶ Partnership working





## TfL Cycle Safety Action Plan

TfL also identified the next steps required for continued improvement of safety for cyclists:

- ▶ London Boroughs will be encouraged to prioritise action to improve cycle safety as part of their Local Improvement Plans for transport
- ▶ Developing enforcement activities to better integrate cycling into the enforcement regime and promote cycle safety

# POWERED TWO- WHEELER DRIVERS



# What is a powered two wheeler?

---

There are two quite different types of powered two wheelers (PWT's):

- ▶ mopeds with 50cc and restricted top speed;
- ▶ motorcycles



**Interactive  
exercise**

**Data needs**





# Powered two wheelers introduction

- ▶ With two wheels in line, minimal bodywork and high power to weight ratio, PTW's are an economical means of transport.
- ▶ Riding a PTW gives a special sensation which is attractive to some groups of riders.
- ▶ Riding a PTW is also much more dangerous than using another motor vehicle.
- ▶ In the EU the minimum age in most countries for riding a moped is 16 and for riding a motorcycle is 18
- ▶ Two main issues in regards to powered two wheelers as a mode of transport include
  - ▶ Vulnerability
  - ▶ Popularity



## Vulnerability

- ▶ Compared to cars, powered two wheelers are less stable, less visible and offer less protection to the driver.
- ▶ They are involved in a disproportionately high percentage of fatal and serious road crash incidents.
- ▶ In the EU, powered two-wheelers account for some 17% of all road fatalities but only 2% of road users.
- ▶ 1 in 3 victims among powered two wheelers is under 25.



# Popularity

- ▶ Compared to cars, powered two wheelers are less expensive to buy and run.
- ▶ They are less expensive to insure than cars particularly for younger people and are often seen as a fun practical alternative in towns and cities.
- ▶ In recent years many older riders have returned to motorcycling often on high powered machines without sufficient skills to control them properly.







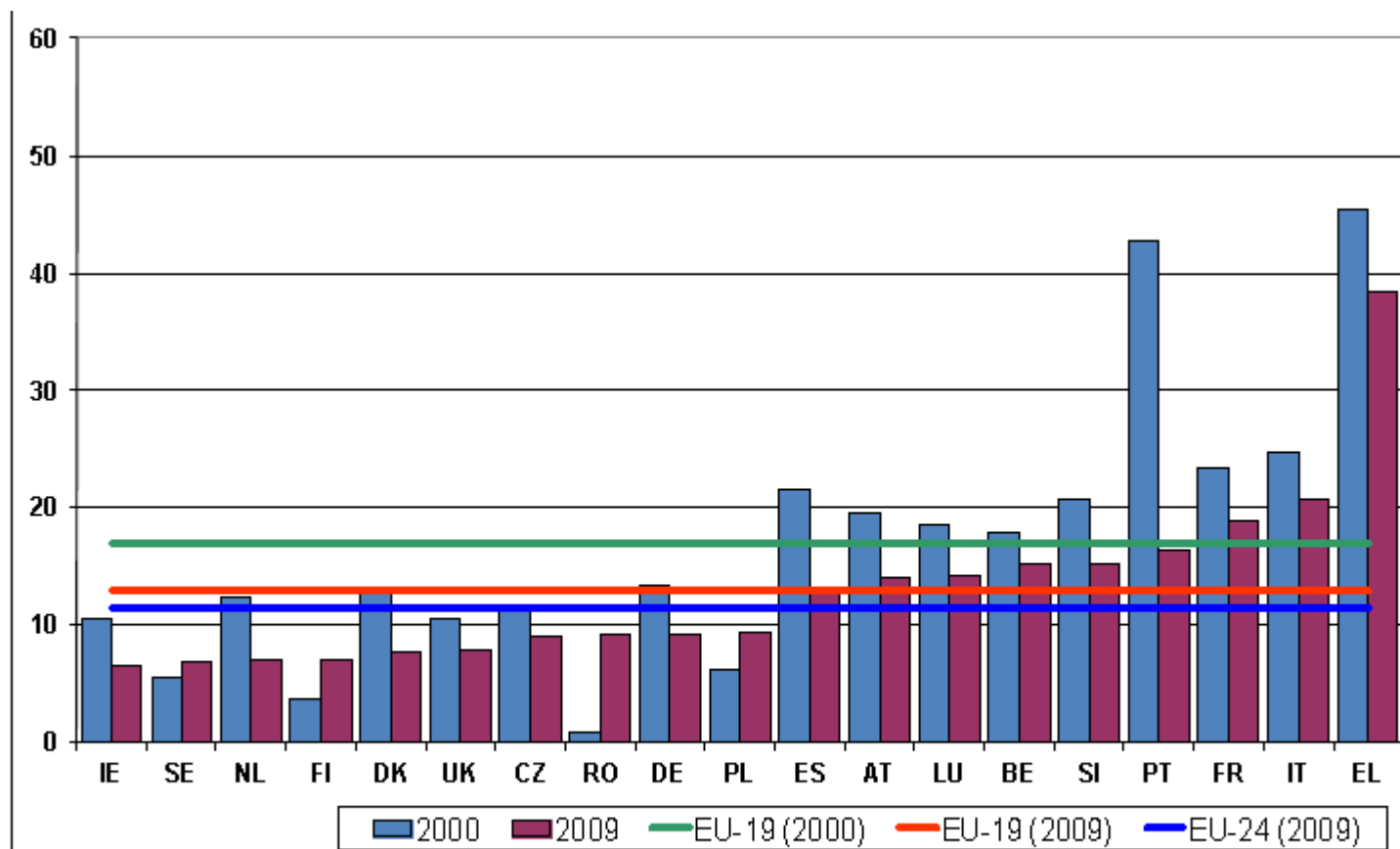
# Transport policy issues

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- ▶ Collisions between the front of the powered two-wheeler and the side of a car are frequent, with many riders falling before the collision as well as many riders departing from the powered two-wheeler during the collision
- ▶ Braking a powered two-wheeler is difficult and loss of control in an emergency situation is often found in accident studies



# Motorycle and moped rider fatalities per million inhabitants in the EU, 2000 vs 2009



Source: CARE Database / EC  
 Date of query: November 2011  
 Source of population data: Eurostat



## Road crashes involving PTW– situation in your jurisdiction

---

**Note:**  
Facilitator to  
adapt to local  
situation



## Powered Two-Wheelers in transport policy and programmes

- ▶ Despite the high number and severity of motorcycle crashes this road user group is not prioritised in transport planning.
- ▶ Improving safety for powered two-wheelers is traditionally seen as being led by legal, education, training and testing measures.
- ▶ Few countries provide specific highway facilities for powered two-wheelers.
- ▶ In some countries they are allowed to use bus lanes.



## Powered Two-Wheelers in transport policy and programmes

- ▶ Poor condition of the road surface or small objects on the road are likely to cause loss of control of a two-wheeled vehicle.
- ▶ The European Motorcycle Industry has prepared "Guidelines for PTW safe road design in Europe".
- ▶ This is an inventory of aspects that are relevant for (the safety of) powered two-wheelers with attention to road design, road maintenance, traffic engineering and traffic management.



## Powered Two-Wheelers in transport policy and programmes

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Particular problems in powered two-wheeled vehicle safety identified were:

- ▶ Speed inhibitors in urban areas with different types of road surface, speed humps, lane narrowing's etc.
- ▶ Use of raised lane markings and lane dividers.
- ▶ Poor maintenance and temporary road repairs.



## Legislation – licensing and training

- ▶ In most (but not all) EU countries legislation provides for both a theoretical and practical test for powered two-wheelers
- ▶ The use of a helmet is also required in most countries
- ▶ The minimum age for mopeds varies between 14 and 16 years old
- ▶ The minimum age for engine sizes up to 125cc or power up to 11kw (A1) is 16 to 18 years old
- ▶ Larger engine sizes are allowed after 2 years of experience



## Legislation – licensing systems

- ▶ Little evidence exists of the effect of current licensing systems in improving safety. One future option is to introduce a more graduated system.
- ▶ Such a system of graduated licensing is expected to reduce the number of motorcycle crashes because:
  - ▶ Young riders are not allowed to ride a motorcycle
  - ▶ Learning and gaining experience is restricted to low risk conditions
  - ▶ Licensed riders are more competent (as compared with other systems)
  - ▶ Some potential riders are discouraged to obtain a motorcycle license





## Legislation – violations and enforcement

- ▶ Certain types of violations by powered two-wheeler riders (speeding, drinking, tampering with the engine, not wearing a helmet) contribute to incidents/injuries
- ▶ Depending on the proportion of riders violating the law, increased enforcement effort may be needed.



# PTW safety – relevant legislation in your jurisdiction

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**Note:**  
Facilitator to  
adapt to local  
situation



**Interactive  
exercise**

# **Attitudes towards PTW**





# Powered two-wheeler safety action plan

- ▶ The situational assessment provides an understanding of the local powered two-wheeler safety situation - the extent and pattern of powered two-wheeler traffic injuries, relevant risk factors, and the people, institutions, policies, programmes and resources that are currently (or could be) involved in pedestrian safety initiatives.
- ▶ The next step in improving powered two-wheeler safety is to use this information, alongside the information to create a plan of action.
- ▶ A plan of action sets out a strategy for improving pedestrian safety in the setting under consideration. It provides a framework to organise interventions in a strategic manner that minimizes duplication of work and facilitates evaluation



## Action plan components

- ▶ The action plan can include the following sections;
  - ▶ Problem identification
  - ▶ Clear objectives
  - ▶ Realistic targets
  - ▶ Performance indicators
  - ▶ Interventions (policy, land-use, engineering, education, enforcement)
  - ▶ Monitoring and evaluation framework
  - ▶ Budget
  - ▶ Timeline
  - ▶ Clear allocation of responsibilities (who does what)
  - ▶ Indication of how the programme will be sustainable/ next steps



# Stakeholder engagement

When developing a programme / action plan to improve powered two-wheeler safety it is important to involve stakeholders such as;

- ▶ Political decision makers
- ▶ Road safety community - responsible agency
- ▶ Health and education service providers
- ▶ Police
- ▶ Powered two-wheeler groups/clubs of Interest groups (disabled etc.)
- ▶ Companies selling PTW
- ▶ Members of the public
- ▶ Motoring groups



## Plan of Action

- ▶ Once the data has been collected from stakeholders and analysed a programme / action plan can be developed / agreed to improve powered two-wheelers
- ▶ The data analysis can be used to target selected groups of powered two-wheelers in the action plan:
  - ▶ Young riders
  - ▶ 'Returning' riders on high powered motorcycles
  - ▶ Professional riders such as couriers
  - ▶ Commuters and leisure riders



## Cyclist safety working group

The key stakeholders identified in the situational assessment should constitute a core working group.

Activities of the working group could include

- ▶ Setting the goals and objectives of the PTW action plan.
- ▶ Examining data or information available and prioritizing concerns.
- ▶ Coordinating the development and possibly implementation of the pedestrian safety action plan.
- ▶ Mobilizing support and resources for the PTW safety action plan.
- ▶ Coordinating and integrating the action plan into government road safety, transport and/or urban development programmes at the national and local levels.





# Prevention measures

- ▶ Measures to prevent powered two-wheeler incidents and injury are based on knowledge of the crash characteristics and of factors contributing to accidents.
- ▶ Measures to prevent incidents and injuries are directly or indirectly aimed at
  - ▶ the riders,
  - ▶ the vehicles,
  - ▶ other road users,
  - ▶ the road environment or
  - ▶ a combination of these



# Prevention measures

Measures that have been shown to be effective in preventing injuries and incidents include:

## Injury prevention

- ▶ Helmets
- ▶ Protective clothing
- ▶ Leg protection and air bags
- ▶ Guard rails

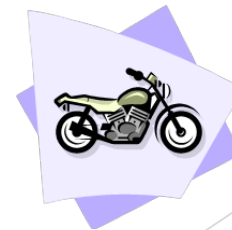
## Crash prevention

- Learning, testing and licensing
- Conspiquity
- Daytime running lights
- Educational campaigns
- Enforcement of traffic laws
- Road surface
- Road design
- E-safety



## Effective interventions – roads, vehicle, environment

- ▶ Road design with facilities for unprotected road users
- ▶ Speed management
  - ▶ by police
  - ▶ traffic calming measures that are powered two-wheeler friendly
- ▶ Better vehicle design:
  - ▶ pedestrian friendly front ends will also be better for collisions with motorised two-wheelers
  - ▶ leg guards





## Effective Interventions for powered two wheelers

- ▶ Injuries from single vehicle crashes are more severe when hitting a fixed object like a guard rail at the roadside
- ▶ Devices have been designed to be retrofitted to existing guard rails to prevent injuries to motorcyclists.





# Effective interventions – awareness raising

- ▶ Public awareness campaigns can play an important role in supporting enforcement of legislative measures, by increasing awareness of risks and of the penalties associated with breaking the law
  
- ▶ Specific issue based Education and Publicity initiatives such as
  - ▶ Wearing helmets and protective clothing
  - ▶ Daytime running lights on and wearing fluorescent/ retroreflective clothing
  - ▶ Avoiding risky behaviour and situations
  - ▶ Attention from car drivers to the presence and behaviour of riders



# Effective Interventions – road surface

- ▶ Maintenance issues
  - ▶ Skid resistance of road repairs and service chamber covers
  - ▶ Pot holes and repairs
  - ▶ Surface deformation - ride quality
  - ▶ Raised lines and slippery thermoplastic markings
- ▶ Safer roadsides – removing road side hazards



# Targets, monitoring and evaluation

- ▶ Casualty rates involving powered two-wheelers is obviously one of the key targets with percentage achievement of the target being the performance indicator.
- ▶ The EU target was to deliver a 50% reduction in all fatalities (including pedestrians) between 2000 and 2010. (20,000 deaths / year).
- ▶ This target has been extended to deliver a 50% reduction in fatalities between 2010 and 2020.



# Targets, monitoring and evaluation

- ▶ A typical target could be to increase by 50% the number of riders
  - ▶ wearing helmets
  - ▶ wearing protective clothing
  - ▶ using daytime running lights
  
- ▶ The performance indicator (to help monitor progress towards achieving the target) could be the percentage increase actually achieved





# Targets, monitoring and evaluation

- ▶ Other targets could be to audit to all highway improvement schemes from a powered two-wheelers' safety point of view or to remove roadside hazards are key areas of the road where serious crashes are likely to occur
- ▶ The performance indicator could be the percentage of schemes where this has been carried out



**Interactive  
exercise**

# Data analysis and review



# Example powered two wheeler intervention





# Someonesson

- ▶ Joint initiative by 3 adjoining safer roads partnerships in Yorkshire and Humberside
- ▶ £30,000 budget
- ▶ Carried out in 2010
- ▶ Evaluated using RoSPA E-valu-it tool





## Aims

- ▶ To make drivers more aware of the risks that motorcyclists face
- ▶ To encourage drivers to look out more for motorcyclists.
- ▶ To make motorcyclists more aware of the risks they face
- ▶ To encourage motorcyclists to make themselves more visible to other road users





## The objectives were:

- ▶ To get as many drivers in the Yorkshire and Humber region to hear our radio messages for our budget
- ▶ To get 2000 unique visits on the Someone's Son website in the first 12 months
- ▶ To distribute 200 printed high visibility vests to motorcyclists





## Learning point - objectives

The project was put together before E-valu-it came into existence. Whilst we had a very clear idea that we wanted to achieve casualty reduction and understood our target audiences, we didn't start off with clearly define objectives and outcome measures. This came later.





## The "Someone's Son" campaign included:

- ▶ Radio advertising
- ▶ Bespoke website
- ▶ Facebook page
- ▶ Poster campaign
- ▶ Engagement of the riding community
- ▶ Giving out of high visibility vests printed with a campaign message
- ▶ Campaign launch







## Costs

The total financial cost of the intervention was £30,000 which was divided equally between the three partnerships

Breakdown of costs	Initial Allocations
Radio adverts on Galaxy – airtime	£15,218
Advert production	£1,995
Advan	£1,950
Artwork and print	£2,000
Micro-site	£3,500
Promotion items (1,500 tabards)	£5,337
<b>Grand Total</b>	<b>£30,000</b>





## Results

- ▶ Reached 1.2m people 2% of target audience
- ▶ 1,620 unique hits on website ([www.someones-son.co.uk](http://www.someones-son.co.uk))
- ▶ Hand out over 1,100 printed high visibility vests (originally 200 expected)
- ▶ 40 facebook fans





## Results

The Someone's Son campaign was developed before the E-valu-it tool kit was launched but this report is a result of running the campaign through the tool kit retrospectively.

The tool kit has been very useful and has enabled us to identify a number of improvements and learning points. These have been considered and have been implemented into the second phase of the campaign.

Recommendations:-

- Clearly defined outcome measures to be set before any activities
- Measure press coverage as well if possible
- The campaign suffered from a cut in funding during the year – it never really set its roots. Therefore need to look at the campaign over a longer time period.
- More developments in the website and Facebook page to keep interest

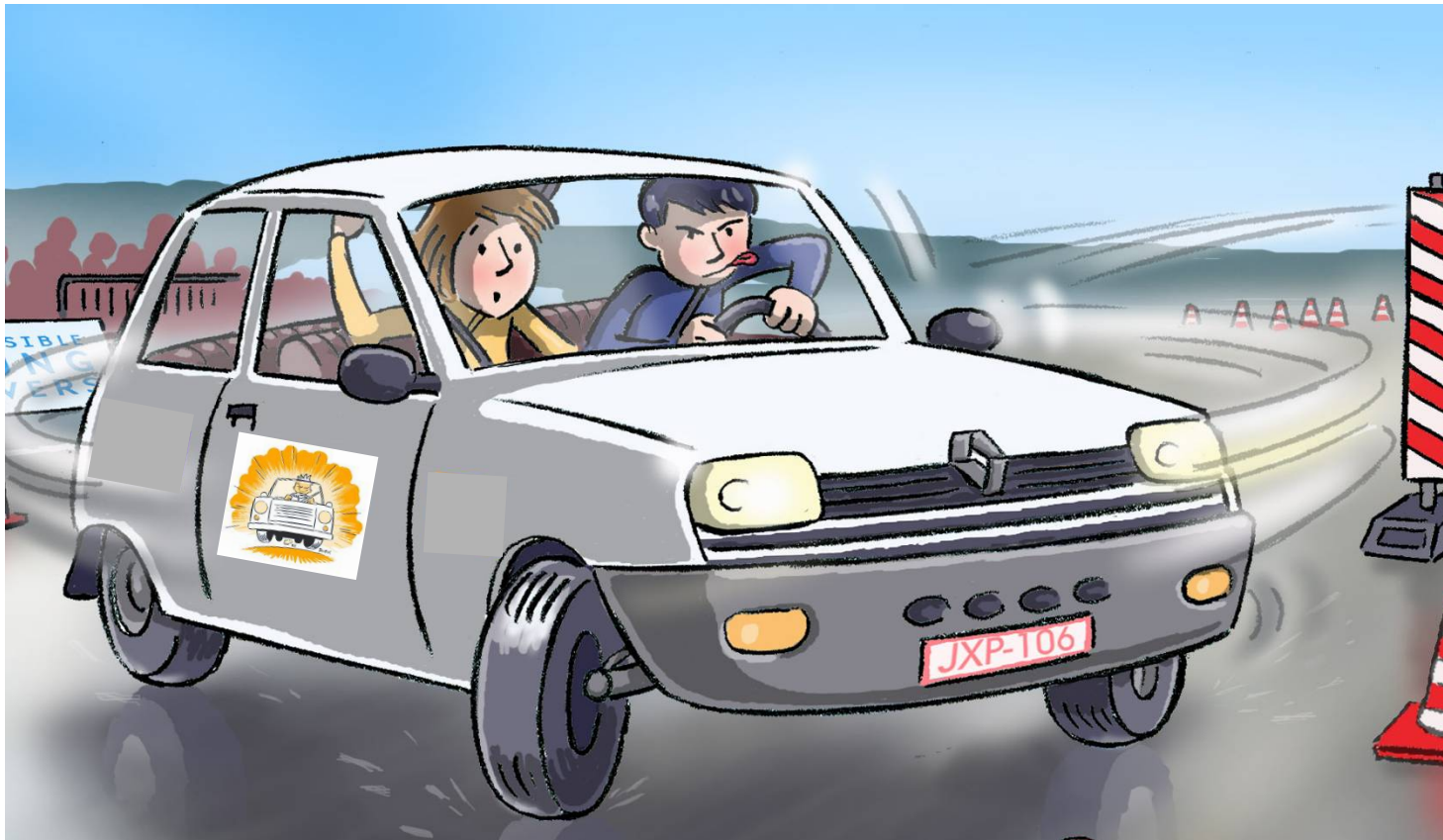


The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the left and right sides of the frame, creating a modern, dynamic feel. The central area is a clean white space where the text is placed.

# THE YOUNG DRIVERS



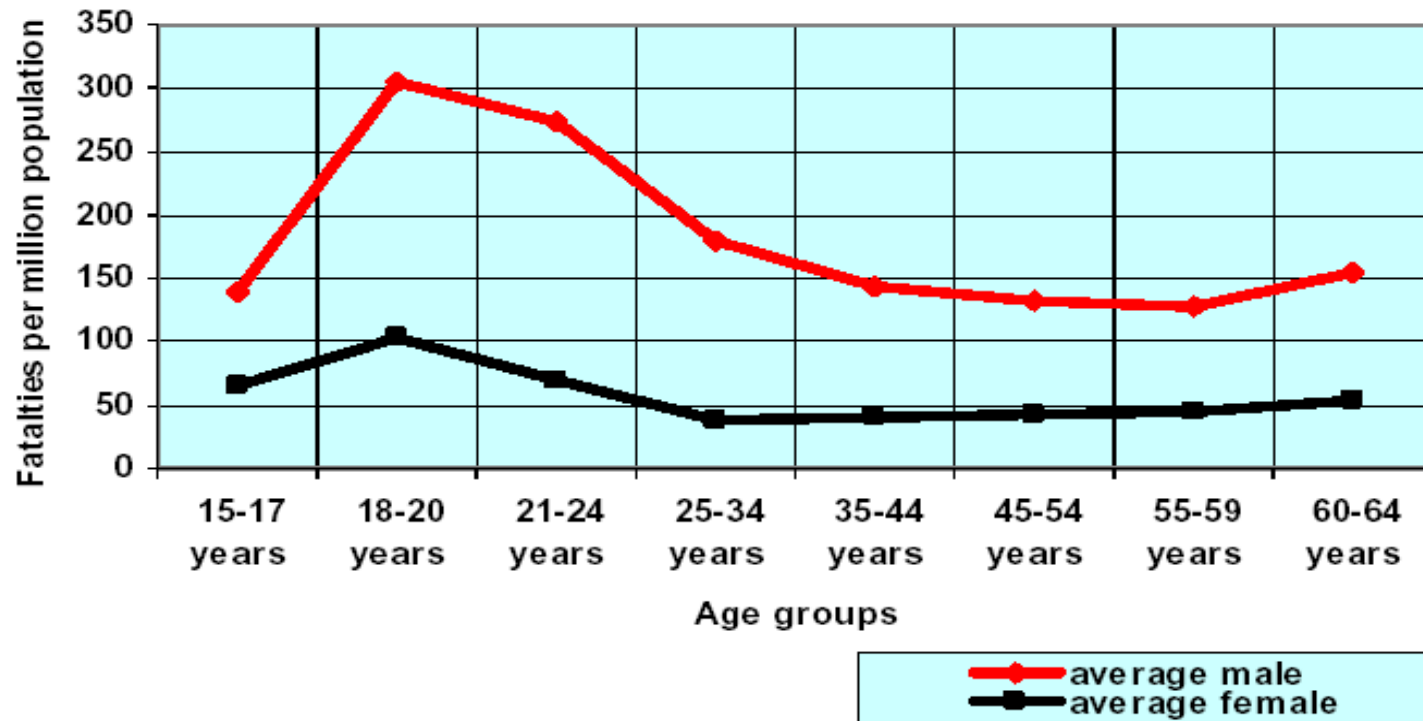
# Driving is not a game





## A fact

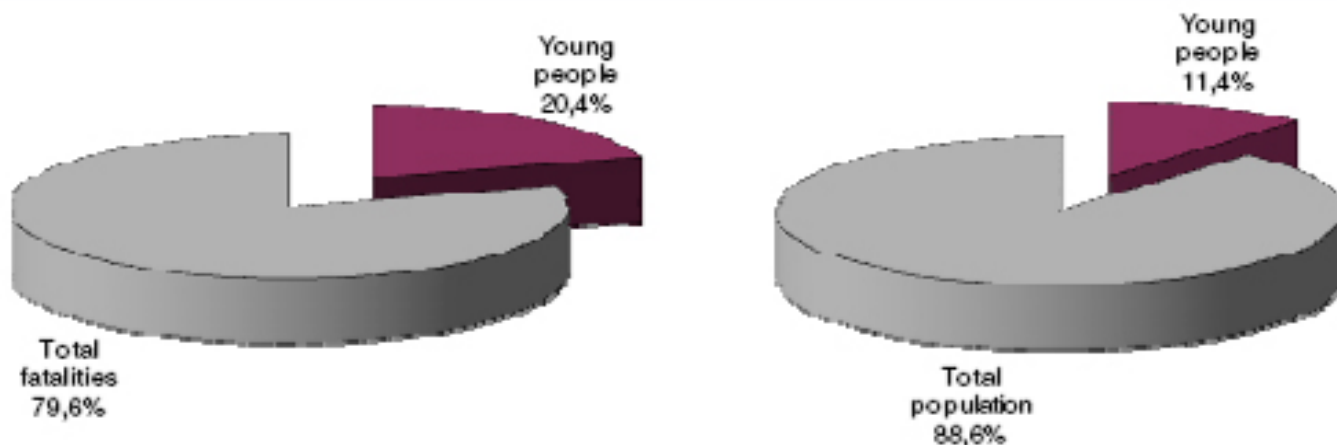
**Road user fatalities per million population  
by gender and age**  
Various OECD Countries, 2003





## A fact

Figure 1: Proportion of young people in population and in traffic fatalities in the EU-19, 2006



Source: CARE Database / EC  
Date of query: September 2008  
Source of population data: EUROSTAT

- ❑ **90% Accidents = Human behaviour**
- ❑ **10% Accidents = Technical issues**



# Young people – relevant statistics in your jurisdiction

---

**Note:**  
Facilitator to  
adapt to local  
situation





# Factors contributing to unsafe behavior

- ▶ LIMITED ABILITY to recognize dangers
- ▶ High risk ACCEPTANCE
- ▶ OVERESTIMATION of own skills
- ▶ UNDERESTIMATION of traffic
- ▶ Lack of AUTOMATISM
- ▶ AT NIGHT in the weekend
- ▶ STRESS
- ▶ LIFE STYLE (try new things/bragging/conforming)
- ▶ ALCOHOL / DRUGS consumption



Why?

---

**INEXPERIENCE**

**IGNORANCE**

**CONFORMISM**



# Comparison: General mass vs. youth perception

**GENERAL:**

Perception of reality

**YOUTH:**



10 Years of Meth Use



Drug use





## Road rage

- ▶ Aggression is usually caused by irritation.
- ▶ The give&take aspect: The victim becomes the aggressor.
- ▶ The culture (7/10 drivers admit it):
  - ▶ Aggressive gestures
  - ▶ Not keeping distance
  - ▶ Verbal insults
- ▶ The irritating behavior:
  - ▶ Head tailing
  - ▶ Congested crossroads
  - ▶ Double parking
  - ▶ Not turning lights when dark
  - ▶ ...



## Tips

Car drivers that have been involved in an accident during the last three years are more inclined to behave aggressively.

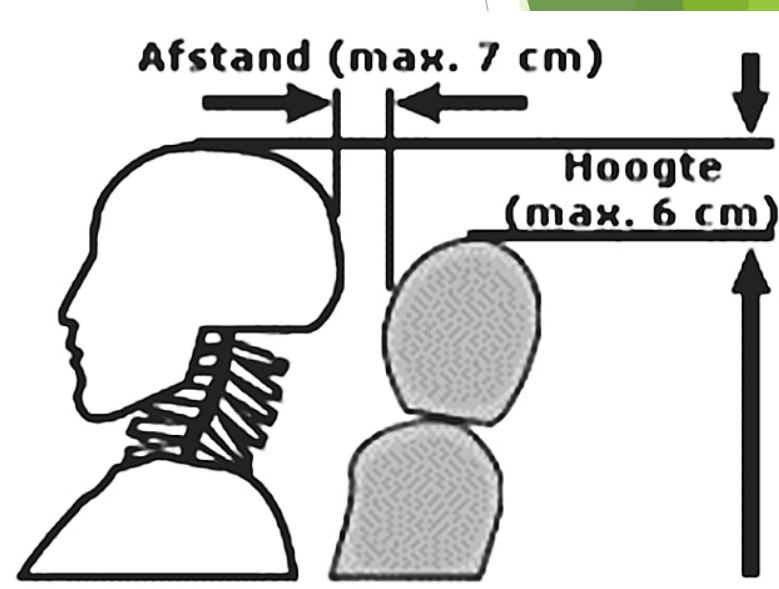
What can you do?

- ▶ The culture (7/10 drivers admit it):
  - ▶ Listen to calm music
  - ▶ Sing
  - ▶ Put the heating off
  - ▶ Relax
  - ▶ Stop the car and take a short walk
  - ▶ Think positively
  - ▶ Use your imagination...



## Before we sit behind the wheel

- ▶ Adjust the seat to your needs
- ▶ Adjust the rearview mirrors and make sure you see everywhere around you
- ▶ Put your seatbelt on
- ▶ Have both hands on the steering wheel
- ▶ Turn the lights on





## Vision = limitations

Physical condition: myopic, astigmatic,  
fatigue, etcv.

External factors:

- ▶ Fog
- ▶ Rain
- ▶ Dirty windscreen
- ▶ Sunlight
- ▶ Stickers
- ▶ Objects
- ▶ ...





## Why vision is so important?

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90% of our decisions and acts depend on what our eyes have seen.

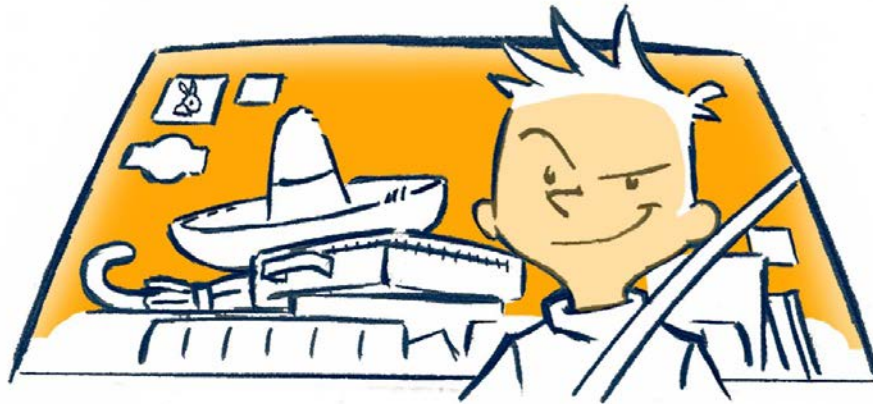
Looking around and seeing what is going on allows us to:

- ▶ Find our way (by looking into the direction we are going)
- ▶ Observe obstacles (and avoid them)
- ▶ Anticipate (and avoid critical situations)



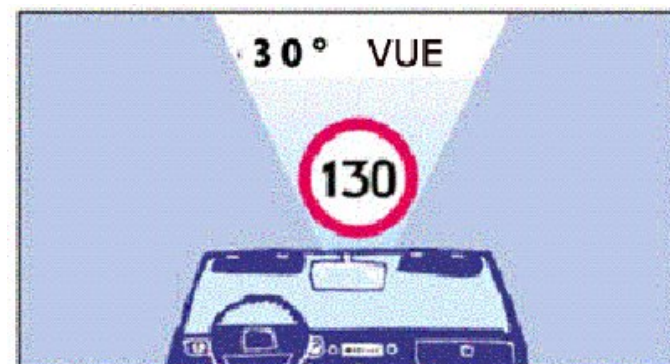
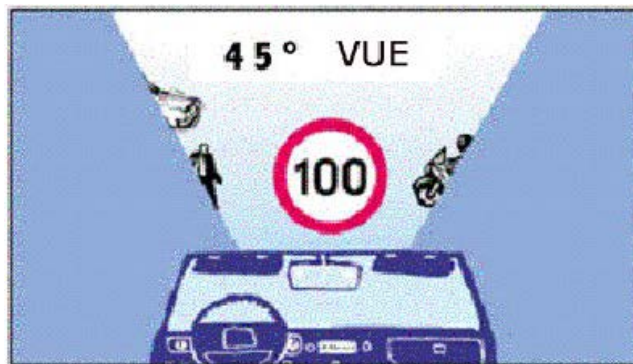
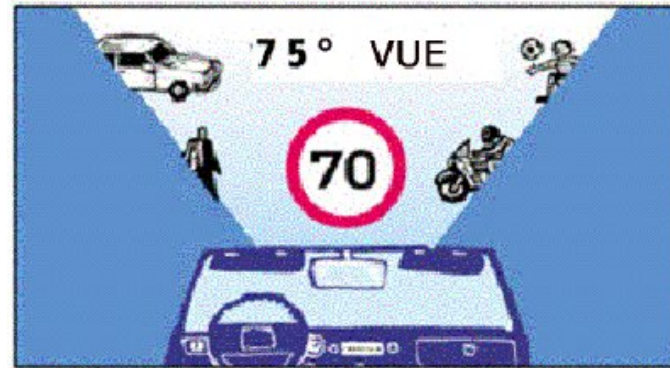
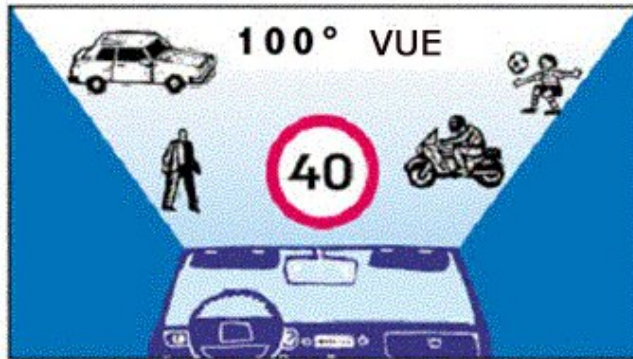


## What is wrong here?





## Vision&speed: The tunnel effect



## Why speeding up at all?



One can gain several minutes!

BUT...



120 KM/H → 22'30"



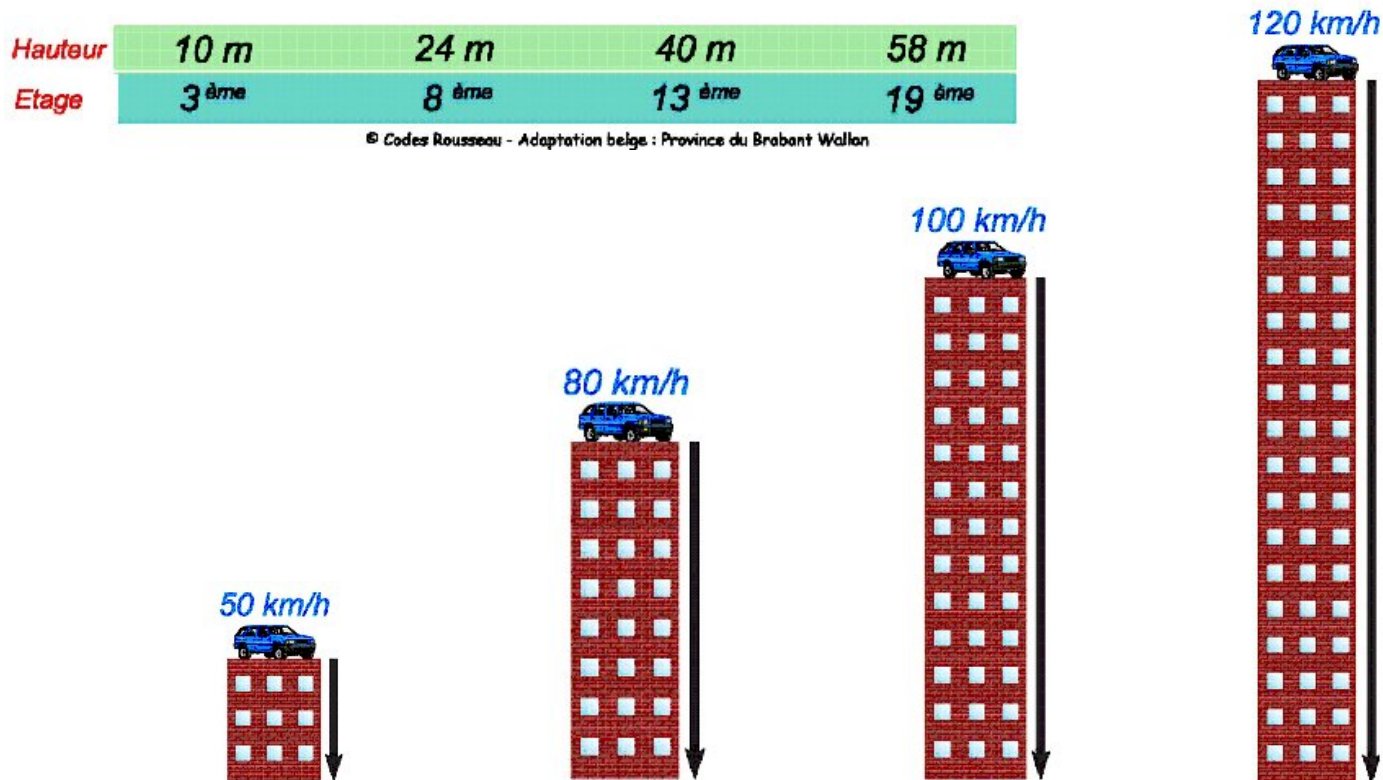
145 KM/H → 18'36"

↓  
3'54"

- ▶ Takes unnecessary risks
- ▶ Endangers other people's lives
- ▶ Uses much more fuel



# Frontal car accident = free fall from a building





## Time to reaction

4 stages from the moment of surprise to taking a decision

- |                                      |   |            |   |                |
|--------------------------------------|---|------------|---|----------------|
| 1. Monitoring                        | } | = ½ second | } | = <u>1 sek</u> |
| 2. Surprising event                  |   |            |   |                |
| 3. Possibility for reaction / reflex |   |            |   |                |
| 4. Decision                          |   |            |   |                |
| - Break                              | } | = ½ second |   |                |
| - Go around the obstacle             |   |            |   |                |
| - Accelerate                         |   |            |   |                |

Do the maths!

50 km/h

= 50 000 meters/ 3600 (seconds)

= 13,88 meters, travelled for 1 second before you start braking.



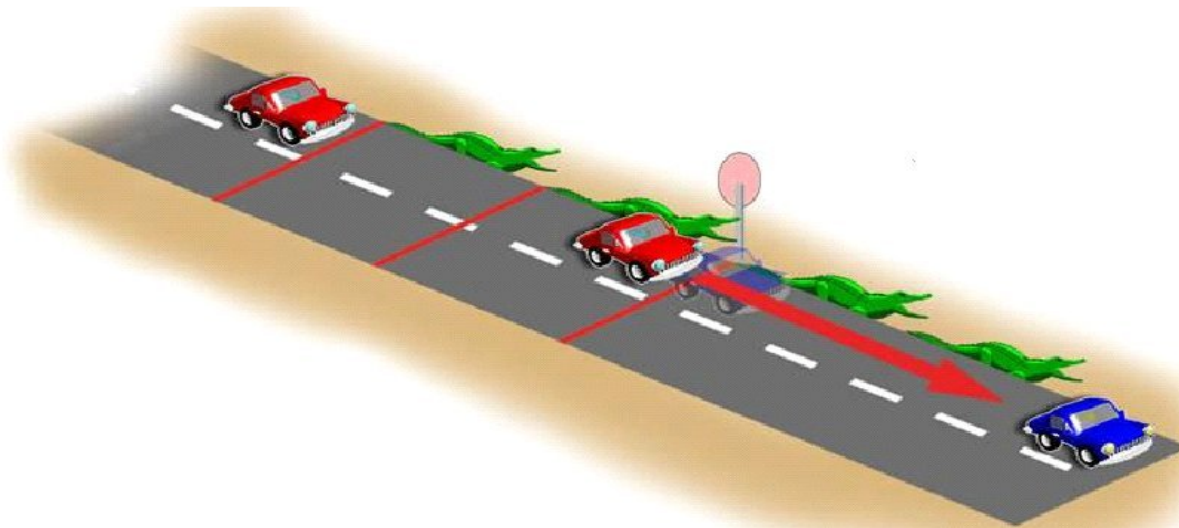
# The driving simulator.





# Keeping enough distance.

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© Codes Rousseau - Adaptation belge : Province du Brabant Wallon

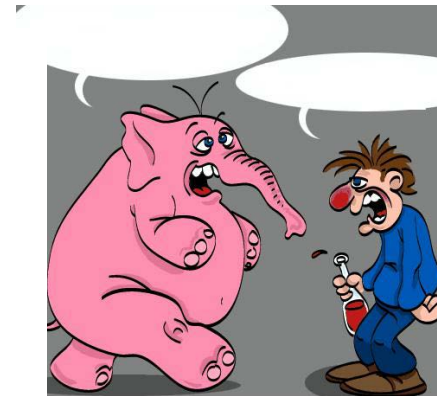


# The effect of using alcohol/drugs/medicines

Advice 1: Do not even use before or during you drive!



Common drugs of abuse studied  
at the Dept. of Pharmacology







## The alcohol and the feeling

Two glasses of alcohol do not have the same effect on everyone!!!

Consider!

- ▶ Gender
- ▶ Height
- ▶ Weight
- ▶ Habits/frequency
- ▶ Environment
- ▶ Food
- ▶ Fatigue
- ▶ Drugs/medicines
- ▶ ...



<http://roadsafety.open-youth.org>



## Effects of alcohol on your body

- ▶ Alteration of:
  - ▶ Vision
  - ▶ Movements
  - ▶ Reflexes
  - ▶ Behaviour
- ▶ Difficulty to recognize
- ▶ Bad estimation of elements, such as speed, distance, etc. which is necessary for careful and responsible driving
- ▶ Feeling invulnerable, bragging and then taking useless risks
- ▶ ...





## How long does alcohol stay in your blood?

- ▶ There is no tip to recover from a drunken state.
- ▶ You lose 0,15‰ per hour.





# Drugs

3 types of drugs:

- ▶ Stimulating (amphetamines, ecstasy, caffeine, cocaine, tobacco, etc.)
- ▶ Sedative (opium, painrelievers, medicines, etc.)
- ▶ Hallucinates (LSD, cannabis, magic mushrooms, etc.)





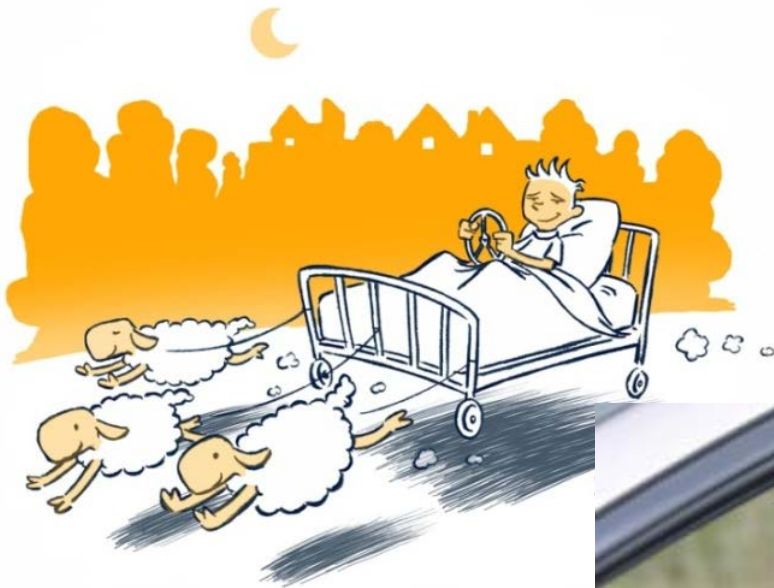
## Effects of drugs on your body

- ▶ Alteration of vision
- ▶ Alteration of movements (slow motion)
- ▶ Losing all reference points
- ▶ Underestimation of speed and distance
- ▶ Day dreaming
- ▶ Brain damage
- ▶ ...





## What else you should avoid while driving?





# Distraction game





## SIMULATION: The alcovision goggles

To prove the effect of the alcohol, let's try it!



But first, let's explore a last crucial point!





# Protecting yourself is your own responsibility!





# Always BUCKLE-UP!



## Why buckle-up?

- ▶ The risk of head injury decreases by 75%.
- ▶ The risk of chest wound decreases by 61%.
- ▶ Backseat passengers survive twice more often.
- ▶ There is less chance to be thrown out of the car, which increases the death possibility 5 times.



## Do you know how strong is the seatbelt?

If you drive with 50 km/h...  
Your body mass will be 35 times  
more than your weight.

I.e. if you weight 60 kg, at the  
moment of impact with static object  
your mass will be 2100 kg.

If there is a passenger on the back  
seat without a seatbelt, your  
chances of survival as driver are  
drastically lowered. It is your task to  
make sure everyone is safe in the  
vehicle.



# MONITORING AND EVALUATION



# Why do we need to evaluate the programme?

- ▶ Monitoring and evaluation allows us to determine
  - ▶ Whether or not it works, and why
  - ▶ Helps to refine the programme by learning from experience
  - ▶ Provides evidence for continued support



# How to evaluate the programme

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- ▶ Planning the evaluation
- ▶ Choosing the evaluation methods
- ▶ Dissemination and feedback



# Planning the evaluation

- ▶ The evaluation framework must be developed and implemented alongside the proposed programme
- ▶ This work should be carried out by the working group as they develop the action plan for the programme (see sessions 5, 6, 7)
- ▶ Baseline data should be collected prior to the implementation of the programme so that changes can be measured





# Planning the evaluation

---

- ▶ The type of evaluation will depend on a number of factors including
  - ▶ Aims of the evaluation
  - ▶ Objectives of the programme
  - ▶ Resource constraints



## Aims of the evaluation

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- ▶ Assessing the extent to which the programme objectives have been met
- ▶ For example
  - ▶ An evaluation of a pedestrian road safety improvement programme may primarily be aimed at determining whether pedestrian fatality and serious injury rates per million population have reduced as a result of the programme
  - ▶ However secondary aims may include determining whether the pedestrian awareness and driver awareness of safety issues has increased and whether the programme is acceptable to stakeholders



# Types of evaluation

---

- ▶ Three types of evaluation
  - ▶ Process evaluation
  - ▶ Impact assessment
  - ▶ Outcome evaluation



# Process Evaluation

---

- ▶ Examines whether the programme was carried out as planned rather than the outcomes of the programme
- ▶ Create a list of indicators to be measured that reflect the programme aims
- ▶ The results will help to identify the strengths and weaknesses of the programme



## Example of Process Evaluation

- ▶ In a media campaign designed to improve vulnerable road user safety this may involve
  - ▶ Have the campaign products (posters, billboards, radio and television spots) been pre-tested?
  - ▶ How often are the campaign advertisements run?
  - ▶ How many people saw them?
  - ▶ Was the target group being reached?



# Example of Process Evaluation

- ▶ If the intervention involves enforcement of legislation
  - ▶ Is there noticeable enforcement by police?
  - ▶ Are the police supportive of the campaign?
  - ▶ Is the penalty sufficient to change behaviour?
  - ▶ Are people able to circumvent the process (for example with bribes)?



# Impact Assessment

---

- ▶ Determines changes brought about by the programme
- ▶ Impact or programme effect refers to a change in a target population
- ▶ For example if TV adverts were shown, do people who saw them believe that the measures will improve their safety?



# Outcome Evaluation

Outcomes are measured to see if the programme was successful, for example

- ▶ Are there fewer fatalities and serious injuries per million population for the each of the unprotected road user groups?
- ▶ Are there more controlled crossings?
- ▶ Are there more facilities for cyclists?
- ▶ Do people think that measures improve safety?
- ▶ This is the most common type of evaluation as it measures the differences made by the programme





# Choosing the Evaluation Methods

Evaluations fit into one of two broad categories

- ▶ **Qualitative** - often used for formative and process evaluations e.g. focus groups, open-ended questions in interviews or questionnaires
- ▶ **Quantitative** - often used for Impact and outcome evaluations e.g. surveys of views, before and after studies, closed question in interviews or questionnaires



## Qualitative Studies

- ▶ Trying to understand changes in behaviour through detailed descriptions of characteristics or behaviour patterns
- ▶ Use open ended questions requiring short answers in focus groups or interviews
- ▶ For example
  - ▶ Do the facilities make it safer for unprotected road users?
  - ▶ Is there sufficient priority for unprotected road users in your community?
- ▶ Can help to enhance the development of the programme



# Randomised control trials (RCT)

- ▶ Highest quality of evidence
- ▶ Random allocation of sites / routes / areas for inclusion within intervention programme
- ▶ Compare effects of intervention against 'control' sites
- ▶ Significant resources required
- ▶ Ethical considerations



## Controlled before-after study

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- ▶ Takes into account other influences on outcomes
- ▶ Observe and measure the outcomes before and after the intervention for both the 'sample' and the 'control'
- ▶ 'Control' should be as similar as possible to 'sample'



# Interrupted time series design

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- ▶ Uses multiple measures of the outcome of interest before and after the programme
- ▶ Variations include the use of control groups
- ▶ Use mainly routinely collected data such as death rates



# Uncontrolled before-after study

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- ▶ Weakest evidence
- ▶ No 'control' - no account of outside influences
- ▶ Measures the intended outcomes before and after the period of intervention



# Choosing Performance Indicators

- ▶ Performance indicators or outcome measures are a way of measuring the success of a programme
- ▶ They should relate directly to the objectives of the programme and their choice will be determined by
  - ▶ Aims of the evaluation
  - ▶ Study type used
  - ▶ Resources available



# Choosing Performance Indicators

- ▶ Injury and death outcomes
  - ▶ Extent to which vulnerable road users are fatally or seriously injured in road crashes (per million population)
  - ▶ The proportion of vulnerable road users compared to other road users in all fatal and serious injuries
- ▶ Calculating rates
  - ▶ Injury and death rates are a better measure
  - ▶ Per 1,000 riders, per registered vehicle (motorised two-wheelers), per kilometre of travel





# Choosing Performance Indicators

- ▶ Other possible indicators
  - ▶ Number of drivers yielding to pedestrians at controlled crossings
  - ▶ Number of cyclists and motorised two-wheelers wearing helmets and or high visibility clothing
  - ▶ For motorcyclists the number of riders using daytime running lights can be a useful indicator
  - ▶ For children the number of school children receiving pedestrian or cycle training
  - ▶ Trends observed from such tests are a good basis for tracking changes



# Economic evaluation

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- ▶ To demonstrate 'value for money'
- ▶ To identify cost effective interventions
- ▶ Comparison of intervention with a 'do nothing' alternative
- ▶ Measurement of intervention costs, e.g.
  - ▶ Equipment
  - ▶ Staff
  - ▶ Consumables



## Economic evaluation methods

- ▶ Cost-effectiveness analysis (CEA), e.g.
  - ▶ Proposed intervention costs €2m and would save 100 lives
  - ▶ Existing practice costs €1m and saves 20 lives
  - ▶ Proposal would cost an additional €1m and save an additional 80 lives
  - ▶ Cost per additional life saved = €12,500
  - ▶ Is this value for money? - compare with other possible interventions and budgetary restraints



# Economic evaluation methods

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- ▶ Cost-benefit analysis (CBA)
  - ▶ Total monetary cost vs total monetary benefit
  - ▶ Project funded if benefits exceed costs
  - ▶ Difficult to ascribe monetary value to some benefits, e.g. health, quality of life, productivity (what would be the value of the benefits in an open market?)



# Sample size

- ▶ For *quantitative* evaluation, the sample size must be large enough for the outcomes to be detectable
- ▶ Sample size / time period will depend on:
  - ▶ Frequency of event to be quantified
  - ▶ Inherent variability of the event
  - ▶ Expected size of effect of intervention
  - ▶ Advice available on the internet but the help of a statistician would help



## Dissemination and feedback

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- ▶ Feedback on the evaluation to stakeholders is vital
- ▶ Dissemination of the results of a will help to gain further support for a successful programme
- ▶ Publicity about this may add to the impact of the programme



# Questions?

*Thank you  
for your attention!*

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