

Safe System Approach

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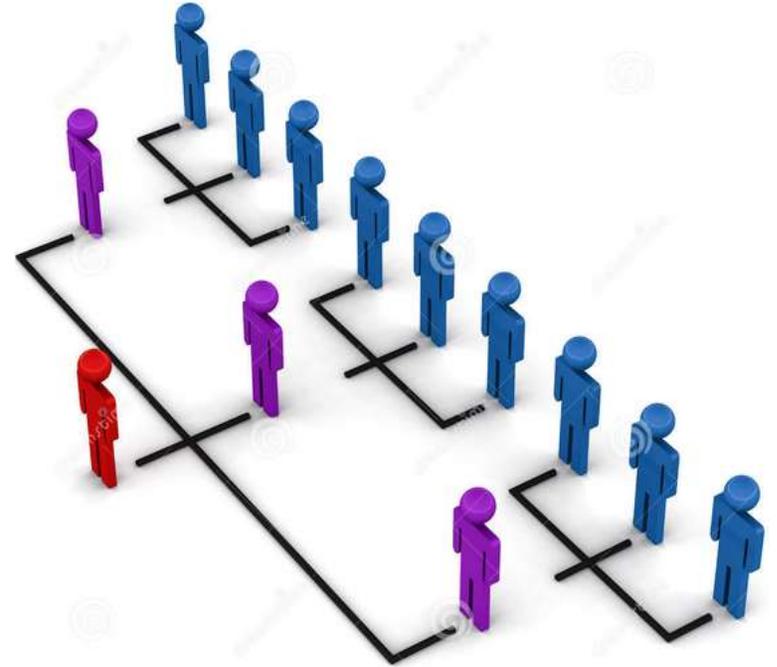
Safe System Concept

- Aims to develop a road transport system more able to **accommodate human error**
 - Efficient management of crash energy
- **Incorporates many strategies** for better management of crash forces, with key strategy
 - road network improvements
 - posted speed limits



Safe System Concept

- Is reinforced by broad management and communication structures incorporating **all government agencies involved in transport safety**



Safe System Concept

- Aligns safety management decision making **with broader societal decision making** as to
 - **Meet** economic goals and human and environmental health goals
 - **Create** a commercial environment that generates demand for, and benefits the providers of, safe road transport products and services



Safe System Concept

- Embraces the philosophy of **“shared responsibility”** for road safety among the various actors of the road transport system
 - Introducing more and more intensive countermeasures is insufficient
- Expands
 - Swedish **“Vision Zero”**
 - Dutch **“Sustainable Safety”**



Safe System Approach and Societal Values

- Road transport touches all parts of **economic and social life**
- Safe system approach must connect with, incorporate, and contribute to changing **overarching societal values**
- Values in certain areas require **particular consideration** when implementing a safe system approach



Safe System Approach and Societal Values

- In cases of economic development without the necessary transport infrastructure to support production and service sectors in the economy, safety is regarded as **subsidiary to mobility**, rather than the other way round
- The Safe System task is to
 - Reverse the safety/mobility balance
 - Turn mobility into a safety function, by bringing system designers to accept responsibility for road users safety



Safe System Approach and Societal Values

- There is a **growing tension** between the rights of individuals and a growing consumerist value (e.g. motorist lobbies exercise pressure to improve the safety of roads used by their members)
- The safe system task is to
 - **Recognize** the limits to which individual behaviors can be regulated
 - **Accelerate** communities' reactions



Safe System Approach and Safety Culture

- **Strong safety culture**
 - The number and rate of serious injuries and deaths are constantly dropping
- **Weak safety culture**
 - Fatalities and serious injuries are maintained or increased over time
 - No publicly accepted push exists to remedy this situation
 - Tolerance on the misconception that road casualties are unavoidable



The Ambition of Safe System Approach

- Any level of serious trauma arising from the road transport system is **ultimately unacceptable**, and the system should be designed to expect and accommodate human error
 - Despite other transport systems, road transport is an almost entirely open system where everyone participates with an extraordinarily large numbers of human interactions
- The goal is to achieve **a state of balance between mobility and safety of the system**



The Ambition of Safe System Approach

- **Achieve ambitious road safety targets**
 - Define the desired level of ambition (highest level is that which applies to other infrastructural services)
- Apply ethical, public health, responsibility and integration perspectives to **achieve a transport system that is safe** (in terms of avoiding deaths and disabling serious injuries)



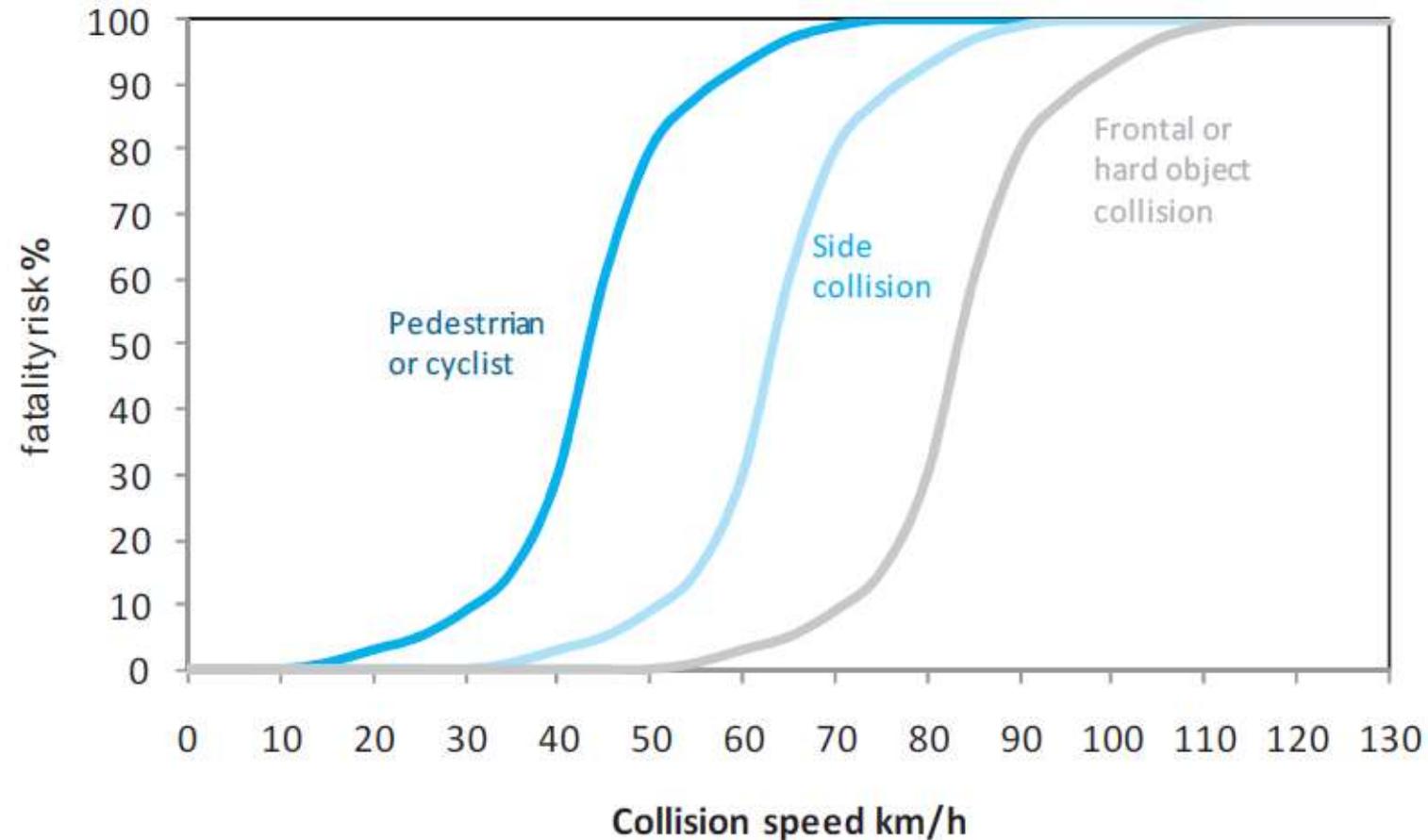
Changing the Context for Developing Interventions

- The long term goal of no road deaths or serious injuries will necessarily require a fundamental change in **how different organizations and communities are encouraged to take action to improve safety**
- It will also necessarily require a fundamental change in **how the interaction between the road environment, travel speeds and vehicles is managed**



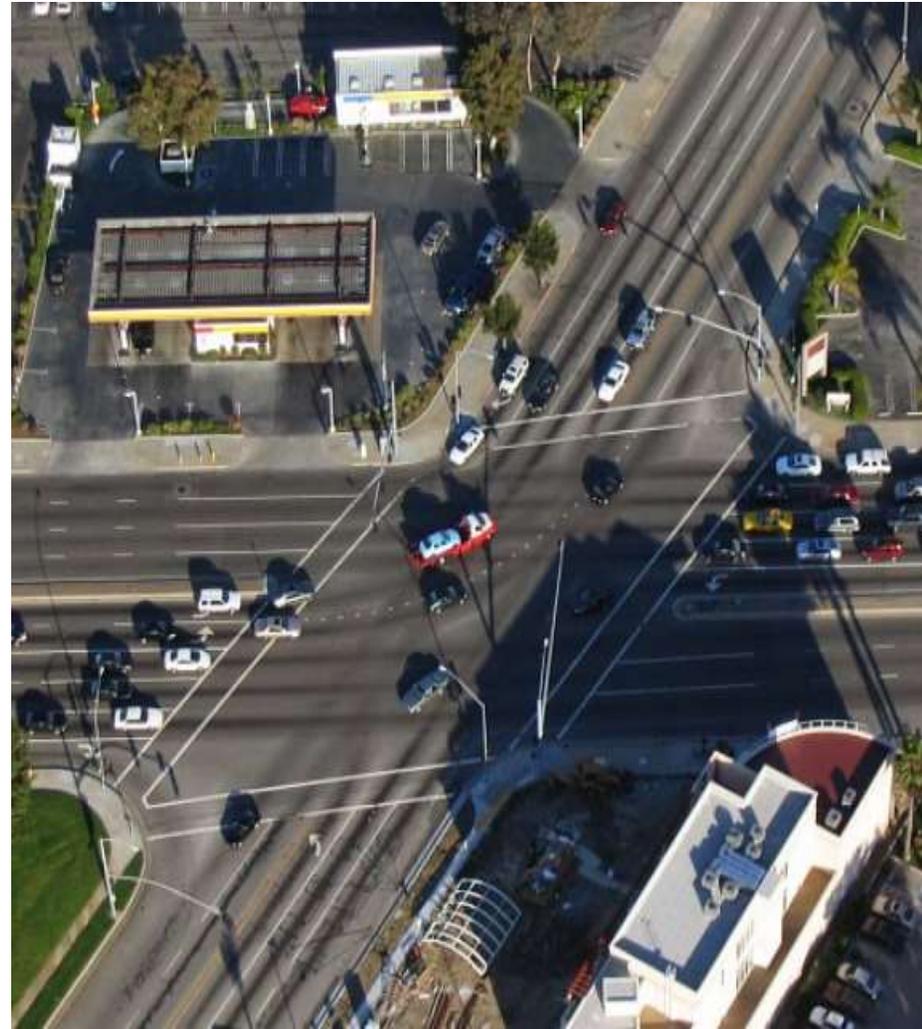
Interaction between Infrastructure, Speed and Physical Vulnerability

- Human body's tolerance to physical force is at the center of the Safe System approach



Interaction between Infrastructure, Speed and Physical Vulnerability

- **Safe System approach vs intersection safety**
 - reduce the speed limits on the intersecting roads
 - and/or re-engineer the intersection to encourage the driver to reduce speed
 - or improve the interaction between vehicles



Interaction between Infrastructure, Speed and Physical Vulnerability

- **Australia's Safe System approach**
 - Safer roads and roadsides based on risk analysis of risk and crash-related safety performance of the road network
 - Safer speeds, where speed management is seen as a complementary measure to road-based improvements
 - Safer vehicles, especially through improved marketing of vehicles with high safety ratings



The Safe System Approach to Responsibility

- The traditional designers of transport systems have primary responsibility for **ensuring safe conditions** for all road users by addressing
 - the road and roadside
 - the travel speed as influenced by speed limits
 - the primary and secondary safety features of vehicles



The Safe System Approach to Responsibility

How the performance of the system designers is to be improved over time?

- **If new target groups are to change their attitudes, values and behaviors in making the road transport system safer, a change is also required in engaging and communicating with these groups**



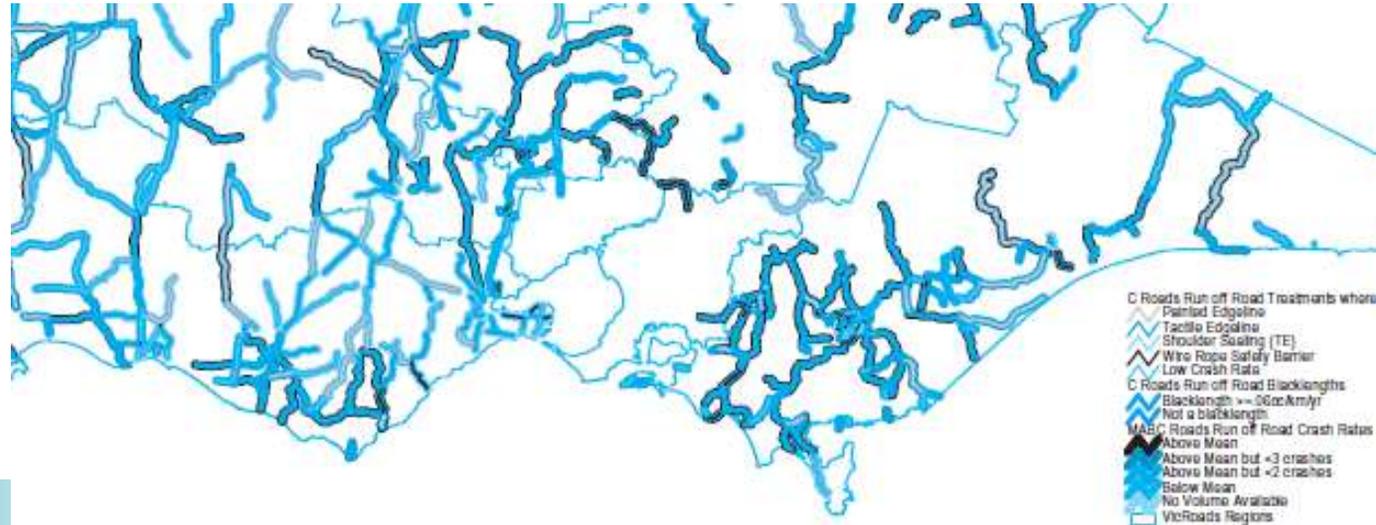
The Safe System Approach to the Road Environment

- A Safe System approach places particular importance on the interaction between **the road environment and permissible travel speeds**
- While the specific steps vary from system to system, the Netherlands' ***Sustainable Safety*** represents one of the most comprehensive approaches to improving the safety of the road environment



The Safe System Approach to the Road Environment

- Forward thinking road authorities (e.g. Victoria, Australia) develop **quite detailed risk assessment mapping**, using approaches such as those applied in iRAP for specific crash types across their network
- They can use this as a **basis for calculating and mapping various treatment options** known to be cost effective in reducing the risk of injury for those crash types



The Increasing Importance of Vehicle Safety Technologies

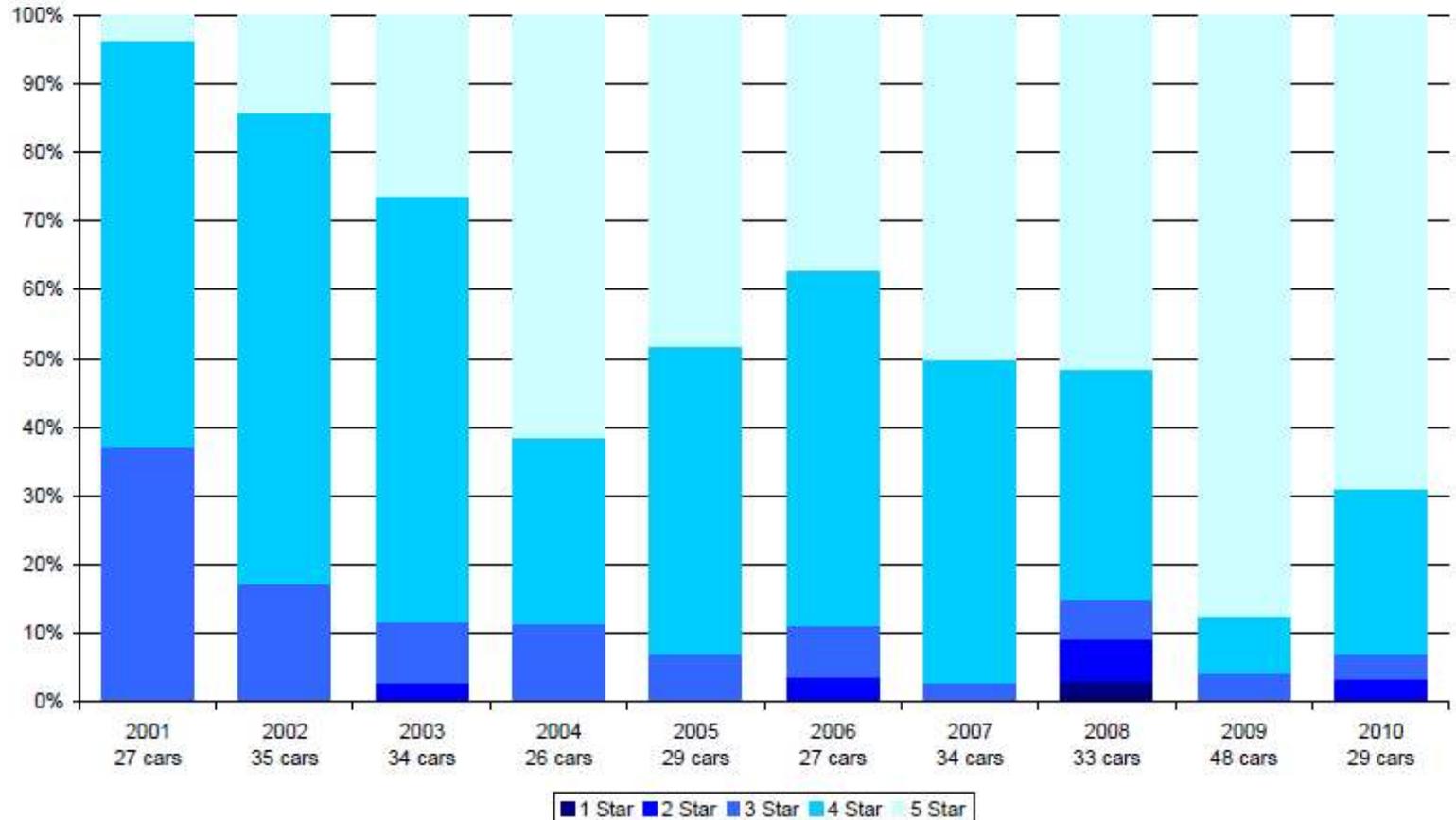
- Over the last decade, remarkable developments have been seen in vehicle safety, particularly in **passive**
- However, rollout of these technologies (e.g. stability control, head protecting curtain air bags, etc.) is **unevenly distributed in the vehicle fleet**
- As a matter of international corporate policy, manufacturers and importers need to be encouraged to give **greater priority** to the provision of available and emerging safety features



The Increasing Importance of Vehicle Safety Technologies

- Safer vehicles

EuroNCAP ratings: percentage of cars falling into each category, 2001-2010



The Increasing Importance of Vehicle Safety Technologies

- An extensive range of active safety features that reduce the risk of a crash occurring are **already onto the market**
 - Vehicle to vehicle communications
 - Vehicle to driver interactions (to assist behavioral compliance for example, drink driving, speeding and drug use)
 - Vehicle to road and roadside infrastructure technologies
- Most effective features are those addressing **crash prevention and safety** (Road geometry warning systems, etc.)



Implementing a Safe System Approach

- **Develop a co-ordinated response among functions **inevitably dispersed** across a range of transport, justice and health agencies**
 - Strategy/policy, analysis, and monitoring
 - Education, information and promotion
 - Road funding and highway management
 - Vehicle regulation and management
 - Transport management
 - User licensing and general traffic enforcement
 - Injury treatment and rehabilitation



Implementing a Safe System Approach

- While road safety leadership needs to be assumed by one agency, responsibility for road safety **needs to be widely shared**
- Extending basic coordination mechanisms to a more widespread engagement of profit and **not-for-profit organizations is critical**



Implementing a Safe System Approach

- **Practical steps** to generate greater community support for a safety culture
 - Identify the group of critical issues that need to be addressed
 - Develop compelling information relating to the scale and significance of the issue
 - Bring a wide range of private and public interest groups and citizens together to discuss, verify, modify and develop contributions
 - Develop options for interventions



Implementing a Safe System Approach

- Integrate road safety with other transport and wider societal goals
 - Rather than focusing solely on road safety, the safety manager needs to **look more broadly** at improving the quality of people's interaction with the transport system
 - **Meet the need for people** and goods to move (destination reached at scheduled time)
 - Economic costs for firms **can be reduced**
 - **Long term improvements** in safety are essentially aligned with better organized urban environments (land use vs transport)
 - **Recognize the synergy** with other public health issues (cycling)
 - Promote synergies between **road safety objectives and environmental protection** (low speeds in urban areas)

Implementing a Safe System Approach

- **Measure and project performance improvement**
 - Considerable attention to be paid to the development and management of performance indicators, and the re-orientation of these indicators to the systems and interventions that are going to create the greatest safety value



Implementing a Safe System Approach

- Measure performance
 - Need to switch from injury based data (final outcomes) to **performance data** (intermediate outcomes)
 - Considerable effort has been made in different countries and through different international collaborations (IRTAD, ERSO, etc.) to establish and report **meaningful indicators that can be used to monitor overall system performance**



Implementing a Safe System Approach

- **Monitoring road safety performance indicators**

- **Road User Behavior**

- speeding, comparison to mean speed, speed variance, speed limit violations
- percentage of seat belts , “child restraints” and helmets’ use
- incidence of drinking and driving
- incidence of mobile phone use
- failure to stop - yield at junctions or at pedestrian crossings
- inadequate headways - close following
- use of reflective devices for cyclists and pedestrians
- use of pedestrian crossing facilities by pedestrians



Implementing a Safe System Approach

- **Monitoring road safety performance indicators**
 - **Road and Vehicle**
 - percentage of road network not satisfying safety design standards
 - pavement friction mostly in winter and on wet road surfaces
 - percentage of new cars with the top star rating according to EuroNCAP
 - percentage of technically defective vehicles
 - **Quality of the post-crash care**



Implementing a Safe System Approach

- **Projecting improvement from the Safe System approach**
 - Usually feasible to estimate the likely benefits arising from changes in key behaviors and in individual aspects of the road environment
 - More difficult to make a firm quantitative estimate of reductions in serious injuries and fatalities arising from a Safe System approach



Taking Safe System Strategy Further

- Eliminate all fatalities and serious trauma arising from road crashes in the long term
- Recognize that prevention efforts notwithstanding, road users will remain fallible and crashes will occur
- Those involved in the design of the system need to accept responsibility for ensuring that no deaths or serious injuries occur as a result of using the road transport system



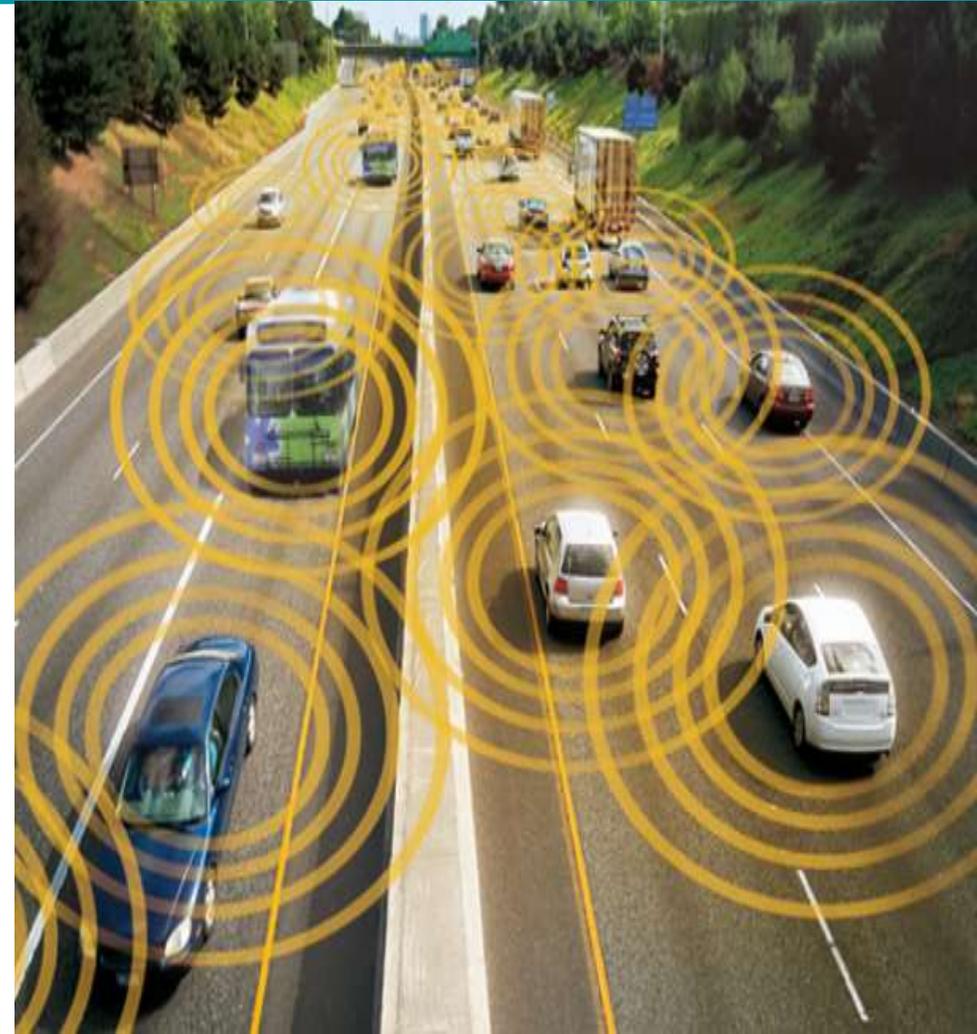
Taking Safe System Strategy Further

- Those that use the system need to **accept responsibility** for complying with the rules and constraints of the system
- Aim to develop a transport system better able to accommodate human error by **reducing crash energy** through managing the interaction of all components of the transport system



Taking Safe System Strategy Further

- **Re-Orient interventions** to focus on the inherent safety quality of the road infrastructure, and align travel speed to the safety thresholds implied by that infrastructure
- **Place greater priority** on the use of technology to improve the safety of the road transport system
- Address road safety at an **organizational or corporate level**



THANK YOU!

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