Module 11. Traffic safety pillars: management

Introduction

The success of some countries when it comes to road safety records can, to a considerable extent, be attributed to a road safety management system, which is based on the *Safe System* approach. Traffic safety management plays a crucial role in improving overall traffic safety, and recent research studies shows that improvements in management lead to improvements in traffic safety.

Learning outcomes

After completing this module, the students should be able to:

- know the key elements of traffic safety management
- identify the relevant stakeholders and their roles in traffic safety management
- explain the role of the *lead agency* in traffic safety management
- explain the role of crash data and Safety Performance Indicators (SPIs) in road safety management
- understand the key elements of the continuous improvement in policy making
- suggest improvements of national road safety policies, in accordance with Safe System road safety management principles.

Key messages to learners

- Success of countries that are the current global leaders in traffic safety is to a considerable extent attributed to the way their work in traffic safety is organized. Traffic safety management based on the Safe System approach is considered to be the current state-of-the-art, and its effectiveness has been proven both in high-income- and low- and middle-income contexts.
- Continuous improvement in management is an approach based on cycles of iterations in which incremental progress is made. Often it is presented as the steps Plan–Do–Study–Adjust (and then repeat again). In public policymaking, which includes traffic safety management, the steps could be further specified as agenda setting–formulating policy–adopting policy–implementing policy–evaluating policy.
- The essential components of traffic safety management can be summarized as: (*i*) defining burden and nature of road casualties; (*ii*) gaining commitment and support from decision makers; (*iii*) establishing road safety policy or vision; (*iv*) defining institutional roles and responsibilities; (*v*) identifying key road safety problems; (*vi*) setting road safety targets; (*vii*) formulating strategy and developing action plans; (*viii*) allocating responsibilities for plan implementation; (*ix*) ensuring funding; (*x*) applying measures with known effectiveness; (*xi*) performance monitoring; (*xii*) stimulation of research and capacity building. The components should be seen as elements of one system, and failure in building any of them greatly affects the others and the effectiveness of the traffic safety management in general.
- Data on crashes and safety performance indicators is crucial for ensuring continuous improvement in traffic safety. Public road administrations need data to identify high-risk areas (be it geographical areas, specific road segments, road user categories, or vehicle types) and choosing which measures to implement. One of the central aspects of the *Safe System* is reliance

on evidence-based measures. Without collection and analysis of the data, even if some measures are implemented, one cannot assess whether they were effective, thus no lessons are learn from that experience.

- Traffic safety management is complex, and it involves many different actors—national authorities, regional and local authorities (related to roads, police, healthcare, education, labour, finances, etc.), non-governmental organization (NGOs), private organizations (insurance, vehicle manufacturers), research institutes and so on. It is therefore necessary to have a *lead agency* that sees to the four management processes going on: (*i*) inter-sectoral coordination, (*ii*) consultation of non-governmental stakeholders, (*iii*) knowledge production and use, and (*iv*) capacity building.
- Research on traffic safety management systems in low- and middle income countries often highlights deficiencies in the following aspects: (*i*) absence of or lack of formal power by the lead agency; (*ii*) unsustainable practices in collection of road crash statistics and other relevant data; (*iii*) absence of routines for in-depth crash investigations and communication of the findings to the relevant stakeholders; (*iv*) inconsistent collection and reporting of safety performance indicators (SPIs), their insufficient coverage of all Safe System pillars; (*v*) absence or inconsistency of quantified targets related to crashes and SPIs; (*vi*) lack of realistic strategies and action plans for reaching the targets; (*vii*) unclear definition of responsibilities for implementing the plans; (*viii*) irregular safety performance monitoring and consequently lack of timely adjustments if things are not going 'according to the plan'; (*ix*) spending already limited resources on safety measures with doubtful effectiveness, often chosen based on personal opinions and political preferences, not the scientific knowledge.

Learning activities

Exercise 1. Country case analysis

Objective. Apply all twelve elements of traffic safety management (Varhelyi, 2016) to assess a real-world system for a given country.

Instructions:

- assign each student (or small group) a country
- provide guidelines to collect information using WHO Global Status reports, government road safety strategies, and academic literature
- instruct students to evaluate (in theory) how well the country addresses each of the twelve elements
- conclude with a written report and in-class presentation.

Learning outcomes:

- ability to critically evaluate and benchmark national road safety systems
- practice using real data and policy documents.

Exercise 2. Simulation of a National Road Safety Council

Objective. A role game to experience decision-making process for complex problems.

Instructions:

- Prepare some data (for your or any 'case country') reflecting the situation in various aspects of traffic safety—accident trends, related costs, in-depth analyses (if available), etc.

- Assign students specific roles: parliament member, transport minister, police, public health, NGOs, insurance sector, car dealer, environment officer, concerned parent, news reporter, etc.
- Provide each role with concise arguments, highlighting both their presumed professional knowledge, and possible 'other motives'. For example, a politician might be more interested in getting votes and thus endorse only 'popular measures' rather than in evidence-based yet unpopular measures (reducing speeds). Transport minister might be mostly interested in promoting car-based mobility (car symbol of freedom, personal achievement, masculinity) and be less interested in providing for pedestrians. Car dealers want to earn money, if less safe cars sell better he does not mind. Suggest the news reporter to highlight this conflicts of interest.
- The purpose of the meeting is to agree on road safety targets, formulate a strategy, allocate responsibilities and budgets, and prioritize measures.

Learning outcomes:

- Experience complexities in multi-stakeholder policymaking.
- Develop soft skills in argumentation, teamwork, and compromise.

Exercise 4. Safety Performance indicator monitoring

Objective. Practical experience of working with safety performance indicators.

Instructions:

- Provide a dashboard of simulated or real SPIs over the ten-year period (e.g. speed compliance, seatbelt usage, share of vehicles with highest safety rating, etc.), as well as targets set for each indicator.
- Students identify which indicators are off-track and propose remedial actions.

Learning outcomes:

- Learn to interpret performance metrics.
- Understand how monitoring connects to policy response.

Assessment quiz

Question 1

Why is traffic safety management important?

- because it helps reduce traffic congestion (incorrect)
- because it ensures only professional drivers are allowed on the roads (incorrect)
- because it provides a structured framework for implementing, monitoring, and improving road safety (correct)
- because it promotes the use of electric vehicles (incorrect)

Comment (shown after the answer has been given):

Numerous research studies demonstrated that systematic approach to traffic safety management (particularly if based on Safe System) results in better safety performance over time.

Question 2

Why is continuous improvement important in road safety management?

- because it ensures that strategies are updated based on new knowledge, data, and evaluation of past measures (correct)

- because road users regularly demand new traffic rules (incorrect)
- because traffic safety problems change and require regular re-training of drivers (incorrect)
- because traffic authorities must use their budgets each year or lose them (incorrect)

Comment (shown after the answer has been given):

Continuous improvement (based on the Plan– Do–Study–Adjust cycle) ensures that road safety strategies evolve based on changes in the current situation, as well as on the lessons learnt (what works and what does not) from previous cycles, leading to more effective and adaptive safety systems.

Question 3

What is the role of the lead agency in traffic safety management?

- to enforce traffic fines and collect revenue (incorrect)
- to coordinate all actors and ensure responsibility, continuity, and monitoring of road safety work (correct)
- to organize public transport schedules (incorrect)
- to replace the roles of all other stakeholders in road safety (incorrect)

Comment (shown after the answer has been given):

A lead agency is essential to coordinate efforts across sectors, assign responsibilities, monitor performance, and maintain a structured and continuous road safety management system.

Question 4

Why is it important to have a vision in traffic safety management?

- because it simplifies traffic laws for drivers and therefore, there are less violations and road crashes (incorrect)
- because it helps traffic police set quotas for fines and clarity for drivers about the consequences of violations (incorrect)
- because it makes it easier to apply for international funding (incorrect)
- because a clear vision provides direction, ambition, and long-term commitment to reducing fatalities and serious injuries (correct)

Comment (shown after the answer has been given):

A vision such as *Vision Zero* sets a clear and ambitious goal that unites stakeholders, guides strategy, and motivates long-term and systemic improvements in road safety.

Question 5

Why is it important to establish clear responsibilities in traffic safety management?

- because it helps assign blame after accidents and clarify who should take responsibility (incorrect)
- because it ensures one agency controls the entire traffic system and responsible for all elements of the road safety management system (incorrect)
- because clear allocation of responsibilities ensures that actions are implemented, monitored, and continuously improved (correct)
- because it reduces the need for data collection and analysis (incorrect)

Comment (shown after the answer has been given):

Traffic safety involves many stakeholders. Defining who is responsible for what (data collection, enforcement, driver training, etc.) ensures accountability, effective coordination, and progress toward safety goals.

Recommended reading and resources for students

- Elvik, R. (2023). Vision Zero in Norway. In K. Edvardsson Björnberg, S. O. Hansson, M.-Å. Belin, & C. Tingvall (Eds.), *The Vision Zero handbook: theory, technology and management for a zero casualty policy*. Springer. https://doi.org/10.1007/978-3-030-23176-7_6-2
- Nævestad, T.-O., Sam, E. F., Farah, H., Mwamba, D., Masaki, J., Laureshyn, A., Magnusson, M., Varhelyi, A., Elvik, R., Blom, J., Egner, L. E., Miyoba, T., & Bisht, L. S. (2025). Safe system implementation in three African and three European countries: Preliminary results from a comparison of six countries. *Transportation Research Procedia*, *89*, 243–254. https://doi.org/10.1016/j.trpro.2025.05.059
- Nævestad, T.-O., Sam, E. F., Farah, H., Mwamba, D., Masaki, J., Laureshyn, A., Magnusson, M., Varhelyi, A., Elvik, R., Blom, J., Miyoba, T., & Bisht, L. S. (2024). *State of road safety management in selected African countries—review and recommendations* (Deliverable D2.1). Horizon Europe project AfroSAFE. https://www.ictct.net/wp-content/uploads/AfroSAFE/D2.1.pdf
- Várhelyi, A. (2016). Road safety management—the need for a systematic approach. *The Open Transportation Journal*, 10, 137–155. https://doi.org/10.2174/1874447801610010137

Recommended (additional) reading for teacher

- Elvik, R. (2008). Road safety management by objectives: A critical analysis of the Norwegian approach. *Accident Analysis & Prevention*, 40(3), 1115–1122. https://doi.org/10.1016/j.aap.2007.12.002
- Elvik, R. (2023). What would a road safety policy fully consistent with safe system principles mean for road safety? *Accident Analysis & Prevention*, 193, 107336. https://doi.org/10.1016/j.aap.2023.107336
- Wegman, F., Aarts, L., & van der Knaap, P. (2023). Sustainable Safety: a short history of a Safe System approach in the Netherlands. In K. Edvardsson Björnberg, S. O. Hansson, M.-Å. Belin, & C. Tingvall (Eds.), The Vision Zero handbook: theory, technology and management for a zero casualty policy. Springer. https://doi.org/10.1007/978-3-030-76505-7_2
- Gitelman, V., & Doveh, E. (2016). Investigating road safety management systems in the European countries: patterns and particularities. *Journal of Transportation Technologies*, 6, 378–404. https://doi.org/10.4236/jtts.2016.65032
- Green, M., Muir, C., Oxley, J., & Sobhani, A. (2022). Safe System in road safety public policy: a case study from Victoria, Australia. *IATSS Research*, 46(2), 171–180. https://doi.org/10.1016/j.iatssr.2021.11.006
- ITF. (2022). *Road-safety management and capacity building in Cameroon*. International Transport Forum. https://www.itf-oecd.org/sites/default/files/itf-safe-system-case-study-cameroon.pdf
- Muhlrad, N., Valleta, G., Butler, I., Gitelman, V., Doveh, E., Dupont, E., Thomas, P., Talbot, R., Papadimitriou, E., Yannis, G., Persia, L., Giustiniani, G., Machata, K., & Bax, C. (2014). Analysis of road safety management systems in Europe. *Transport Research Arena*, Paris, France.

https://www.researchgate.net/publication/270645439_Analysis_of_road_safety_management_systems_in_Europe

Prepared by expert

In case you have specific questions, need a discussion partner, or just want feedback on your lecture materials, you may reach out the author(s) of this module. Please, put 'AfroSAFE curriculum' in the email subject.

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