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Enhancing Policy and Action for Safe Mobility



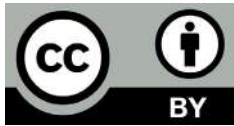
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Enhancing Policy and Action for Safe Mobility



INTERNATIONAL ROAD FEDERATION
FEDERATION ROUTIERRE INTERNATIONALE



WORLD BANK GROUP





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LIST OF ABBREVIATIONS AND ACRONYMS

ABC	Awareness and Behavior Change
ABS	Anti-lock Braking System
ACRS	Australasian College of Road Safety
ADB	Asian Development Bank
AfDB	African Development Bank
ASEAN	Association of Southeast Asian Nations
CBD	Central Business District
CBA	Cost-Benefit Analysis
CPM	Catalogue of Policy Measures
CSO	Civil Society Organization
DOT	Department of Transportation
DRIVER	Data for Road Incident Visualization, Evaluation, and Reporting
EASST	Eastern Alliance for Safe and Sustainable Transport
EIGE	European Institute for Gender Equality
FCDO	Foreign, Commonwealth and Development Office
FIR	First Information Report
FSI	Fatal and Serious Injury
GBV	Gender-based Violence
GDCI	Global Designing Cities Initiative
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GRA	Global Roadmap of Action Toward Sustainable Mobility
GRS	Grievance Redressal System
GRSF	Global Road Safety Facility
GRSP	Global Road Safety Partnership
gTKP	Global Transport Knowledge Practice
HVT	High Volume Transport
IEA	International Energy Agency
IISD	International Institute for Sustainable Development
iRAP	International Road Assessment Programme
IRF	International Road Federation
IRTAD	The International Traffic Safety Data and Analysis
ITDP	Institute for Transportation and Development Policy
ITF	International Transport Forum
ITS	Intelligent Transportation System
JRS	Journal of Road Safety

KMRCL	Kochi Metro-rail Corporation Limited
LMIC	Low- and Middle-Income Countries
HIC	High-Income Countries
MDB	Multilateral Development Bank
MoRTH	Ministry of Road Transport and Highways
MSI	Multistakeholder Initiatives
NACTO	National Association of City Transportation Officials
NCAP	New Car Assessment Programme
NGO	Nongovernmental Organization
NMT	Nonmotorized Transport
ODOT	Oregon Department of Transportation
OECD	Organization for Economic Co-operation and Development
OGP	Open Government Partnership
PACTS	The Parliamentary Advisory Council for Transport Safety
PMAP	Parking Management Area Plan
RoSPA	The Royal Society for the Prevention of Accidents
RSA	Road Safety Audit
RSO	Road Safety Observatories
SDG	Sustainable Development Goals
SPI	Safety Performance Indices
SSATP	Africa Transport Policy Program
SSD	Safe Stopping Distance
SuM4All	Sustainable Mobility for All
SUMPs	Sustainable Urban Mobility Plans
SWOV	Institute for Road Safety Research (Dutch)
TfL	Transport for London
TOD	Transit Oriented Development
TUMI	Transformative Urban Mobility Initiative
UNEP	United Nations Environment Programme
UNECE	United Nations Economic Commission for Europe
UNDP	United Nations Development Programme
VKT	Vehicle Kilometer Traveled
VRU	Vulnerable Road Users
WIM	Women in Motion
WRI	World Resources Institute



FOREWORD

The SuM4All consortium consists of 56 member organizations that have pledged to a shared vision on sustainable mobility anchored on the four goals of universal access, efficiency, safety, and green mobility and have agreed to work together toward its implementation.

The launch of the Decade of Action for Road Safety 2021–2030 sets the ambitious target of preventing at least 50 percent of road traffic deaths and injuries by 2030. Against this background and leveraging its members and network, the SuM4All Partnership engaged in an incredible opportunity to contribute and deliver value in a relatively abbreviated time frame under the “Global Roadmap of Action (GRA) in Action Series” in 2022. The “GRA in Action” series detailed, concrete, and actionable guidance on “How to” implement high level policies included in the Global Roadmap of Action’s (GRA) Catalogue of Policy Measures (CPM)¹ and turn them into impactful actions in the field—by deep diving into selected measures, reflecting on country examples and global experiences. This series covers some of the most cutting-edge topics and policy issues countries’ decision makers face in transport: e-mobility, transport–energy nexus, data sharing, safety, public transport, gender, and freight and logistics.

As part of that effort, we are pleased to share the report on safe mobility that provides practical and actionable policy guidance along with case examples and resources on how the Safe System approach can be mainstreamed in road safety, sustainable mobility, and urban development. The report offers thought leadership on how countries can implement a systemic and integrated approach to road safety to synergize and positively affect the other three policy goals of sustainable mobility. It also provides enhanced knowledge and best practices for road safety in the wider context of the SDGs, to increase awareness and improve the skills of national, subnational, and local authority stakeholders to implement and scale up the Safe System approach to road safety.

We thank the International Road Federation (IRF) and Michelin for leading the engagement with our Members under the safety working group on this important topic. They have contributed to raising its visibility in policy making, and collaboratively leading the production of this paper.

Sustainable Mobility for All Steering Committee

(On behalf of our 56 Member organizations)

May 2023, Washington, D.C.

Note:

<https://www.sum4all.org/key-products/catalogue-policy-measures-cpm>

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Working group members provided their input: David Shelton (ADB), Ingrid Johnston (ACRS), Per Mathiasen (EIB), Malaya Zumel (EIB), Anne Joslin (FCDO), Geert van Waeg (IFP), Luca Pascotto (FIA), Lotte Brondum (Global Alliance of NGOs for Road Safety), Valeria Motta (Global Alliance of NGOs for Road Safety), Chika Sakashita (Global Alliance of NGOs for Road Safety), Alina Burlacu (World Bank, GRSF), Véronique Feypell (ITF-OECD), James Bradford (iRAP), Nora Guitet (Michelin), Pedro Homem de Gouveia (POLIS), Yarob Badr (UN ESCWA), Bronwen Thornton (Walk 21), Nhan Tran (WHO), Claudia Adriazola (WRI), Nikita Luke (WRI) and Vineet John (WRI). Additionally, presentations were made by Iman Abubaker (WRI) and Michael King (Traffic Calmer).

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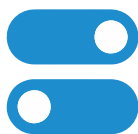
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EXECUTIVE SUMMARY



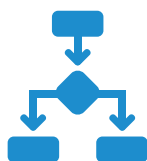
1. A paradigm shift is essential from the traditional approach to road safety



Road safety is a serious, hard-to-abate global health and development concern, with more than 1.35 million people killed and 50 million people injured on roads every year. Low- and middle-income countries (LMICs) account for the majority (93 percent) of road crash fatalities while accounting for 60 percent of global vehicle traffic.

Road crash deaths are not an inevitable cost of growth or mobility and are not isolated from the environment and road system that they occur in. The traditional approach to road safety focuses on changing road user behavior through education and enforcement and on actions that protect car occupants, with less attention to pedestrians, cyclists, and public transport and paratransit users. The Safe System approach is a paradigm shift from this traditional approach.

2. The Safe System approach to road safety has yielded tangible and measurable results



The Safe System approach is underpinned by the recognition that road transport is a complex system. People, vehicles, and infrastructure must interact in a way that ensures a high level of safety, anticipate, and accommodate human errors and prevent road crashes. Therefore, all transport system stakeholders—the ones who plan, design, and maintain roads, manufacture vehicles, and administer safety programs—must be accountable and share the responsibility for safety with road users. The focus should be on taking a proactive, upstream, and integrated approach to make the mobility system safe, rather than wait for events to occur and then react.

An analysis of traffic fatalities in 53 countries between 1994 and 2015 revealed that countries that had adopted the Safe System approach had the lowest rates of fatalities per 100,000 inhabitants and the fastest rate of change in fatality levels, especially its pioneers, Sweden and the Netherlands. The UN Global Plan for the Decade of Action on Road Safety (2021–2030)

aims to reduce road crash fatalities and injuries by at least 50 percent.

How can the Safe System approach deliver on a large scale for LMICs, which account for 93 percent of road crash fatalities?

3. This report provides actionable guidance and case examples and proves that resources for effectively implementing the Safe System approach exist for LMICs



It focuses on the “how” – how to provide pragmatic, action-oriented guidance and recommendations based on emerging and successful proof cases, and how to turn policies and high-level commitments into concrete steps and measures in practice. We primarily target senior decision makers at the national, subnational, and local levels, and development financing organizations. However, guidance is also relevant to the private sector, road safety practitioners, and civil society organizations (CSOs) that advocate for evidence-based interventions to create safer road environments.

The Safe System approach for LMICs is not only about safe mobility, but it also can deliver economic benefits on more global issues: climate action, public health, sustainable development, and urban life. In fact, applying this knowledge requires a paradigm shift, a change in the way problems are defined and solutions are implemented and evaluated.

Our collaborative work provides two main entry points to succeed in this paradigm shift and leverage policy or project opportunities based on the country and city context:

A. Embed the Safe System approach in transport strategies, policies, and programs.

B. Build support for the Safe System approach: capacity development, awareness strategies.

A. Embed the Safe System approach in national, subnational, and local or urban transport strategies, policies, and programs.

To succeed in this paradigm shift and ensure effective delivery requires a bold rethinking of the way problems are addressed, decisions are made, and solutions are implemented.

A.1. Incorporate the Safe System approach in transport and road safety policies and institutional framework

- Embody the Safe System approach in governance, in the form of an empowered nodal agency at national and subnational levels, and steer and coordinate action with all involved stakeholders.
- Build a dedicated, open-access national data repository for road safety, covering all facets from crash data, victim details, vehicle, infrastructure, and speed data to ensure evidence-based strategies.
- Articulate a clear, evidence-based vision toward the Safe System approach, with bold achievable targets and intermediate implementation milestones.
- Reform legislations, standards, and regulations to ensure accountability among all stakeholders involved in safe road infrastructures, safe vehicles, and safe road use.
- Allocate funds for road safety activities in annual state budget by respective ministries or departments for road safety actions in consultation with the nodal agency.
- Adopt gender transformative approaches in road safety and foster a security culture for women in public spaces and transport.

A.2. Safe system approach for cities: a specific business case

Cities will be home to 70 percent of the global population by 2030. Cities need appropriate land use systems and safe, integrated, multimodal transport.

- Flip the traditional hierarchy to prioritize active and sustainable modes of transport while making the system safer for all users.
- Reorient spatial development and urban mobility plans toward integrated transport and land use systems along with demand management measures to reduce vehicle kilometers traveled.
- Adopt citywide speed limits and low speed zones in places with high demand for walking, cycling and other activities and implement these through traffic calming and enforcement.

A.3. Prioritize safety in street and nonurban road design

Safety should be considered the primary component for planning, designing, and engineering all road categories: urban and peri-urban streets, rural access roads, district or province roads, highways, and motorways or freeways. Therefore, in all projects:

- Incorporate a dedicated road safety team from the initiation stage and allocate ear-marked funds in budgets for road safety activities—stagewise assessments, road safety trials, safety clearance, audits, inspections, and monitoring.
- Set safe speeds and speed management measures, supported by effective enforcement, along road stretches and at intersections to provide safe walking and cycling facilities.

B. Build consistent support for the Safe System through capacity development and awareness strategies.

Once established, the Safe System approach will deliver expected benefits provided it is sustained by multiple layers of support and wide range of advocacy—not only among decision makers and experts but within communities. It is an additional challenge for LMICs, but programs and tools exist.

B.1. Build capacity development on the Safe System approach

- Basic learning open to all—introducing the paradigm shift to the Safe System approach.
- Advanced learning for specific agencies and departments—deep diving in methods and tools to implement the Safe System approach.
- Certification courses for experts—practitioners with specialized roles in road safety management.
- Include courses on the Safe System in professional programs—undergraduate or graduate programs in transportation planning, traffic engineering, urban planning, and urban design.
- Upskill knowledge for journalists and NGOs to make them become powerful allies in advocating for the Safe System approach.

B.2. Increase awareness for buy-in

- Shift away from traditional road safety awareness campaigns aiming only at inducing behavior change in road users—they are proven to be ineffective.

- Safe System approach strategies to raise awareness include linking climate action and public health with road safety, adopting a children-first approach, highlighting the economic and social costs of road crashes and fatalities, involving active road users, and emphasizing gender safety, security, and universal accessibility.
- Build broad-based consensus and buy-in from communities impacted by transport and road safety plans through information, public participation, and engagement during different stages of a project.

B.3. Produce and share knowledge on good practices

- Create and disseminate knowledge on emerging and good practices of the Safe System approach implementation in LMICs.
- Benefit from peer learning to better understand the resistance, negotiations, and implementation of the Safe System approach.

The Safe System approach to road safety requires political will, horizontal and vertical coordinated action within government and with civil society, private sector, and other organizations. Partnerships to deliver are needed and possible, and multiple entry points are available to leverage existing initiatives while planning for longer term change.

It is time to act with urgency toward a future without road crash fatalities and serious injuries



INTRODUCTION



Road safety is a serious global health and development concern. Global road fatalities reached 1.35 million in 2016, a 15 percent increase from 2000¹ (WHO 2018). Children and poor people are the most impacted groups in road crashes and injuries globally (Silverman 2016). In fact, road crashes are the primary cause of fatalities among children and young people between the ages of 5 and 29 (WHO 2018).

Road crashes can cost up to 6 percent of a country's GDP (World Bank 2022^a). The world economy would lose US\$1.8 trillion, in 2010 prices, as a result of fatal and serious injuries (FSI) owing to road crashes between 2015 and 2030 (Chen, Kuhn, Prettner, and Bloom 2019).

Regionally, most of the human lives lost on roads, nearly 93 percent are from low- and middle-income countries (LMICs), even though they contribute to 60 percent of the global road traffic (WHO 2018). LMICs account for 84 percent of the 68 countries where road crash fatalities have increased since 2010 (WHO 2015^b).

Most of research on road crashes and injuries has focused on the effectiveness of interventions in high-income countries (HICs). Decision makers in LMICs have limited resources, which are often expended on ineffective interventions (Turner, Job, and Mitra 2021). This is due to limited awareness, individual and institutional capacity

amongst decision makers and professionals alike. It is imperative to improve decision-making processes, implement evidence-based road safety interventions (Turner, Job, and Mitra 2021), and identify and scale up successful interventions in creating safe road environments (Perel, Ker, Ivers, and Blackhall 2007).

The importance and relevance of the Safe System approach

Road crash deaths are not an unavoidable outcome of development (ITF, 2022) or mobility, and are not isolated from the environment and road system that they occur in. The road system comprising street design, institutions, laws, enforcement, regulation, land use, infrastructure, and road users continuously interact with each other to create streets and cities that can be safe or unsafe for their residents (WRI 2018).

The traditional approach to road safety pins responsibility on road users while underemphasizing the safety of the road system and accountability of system designers.² It focuses on education and enforcement of road users' behavior and on actions that protect car occupants, with less attention to active pedestrians and cyclists, public transport, and paratransit users (WRI 2018). The Safe System presents a paradigm shift from this traditional approach (Table I.1).

Table I.1: The Safe System and traditional approaches to road safety.

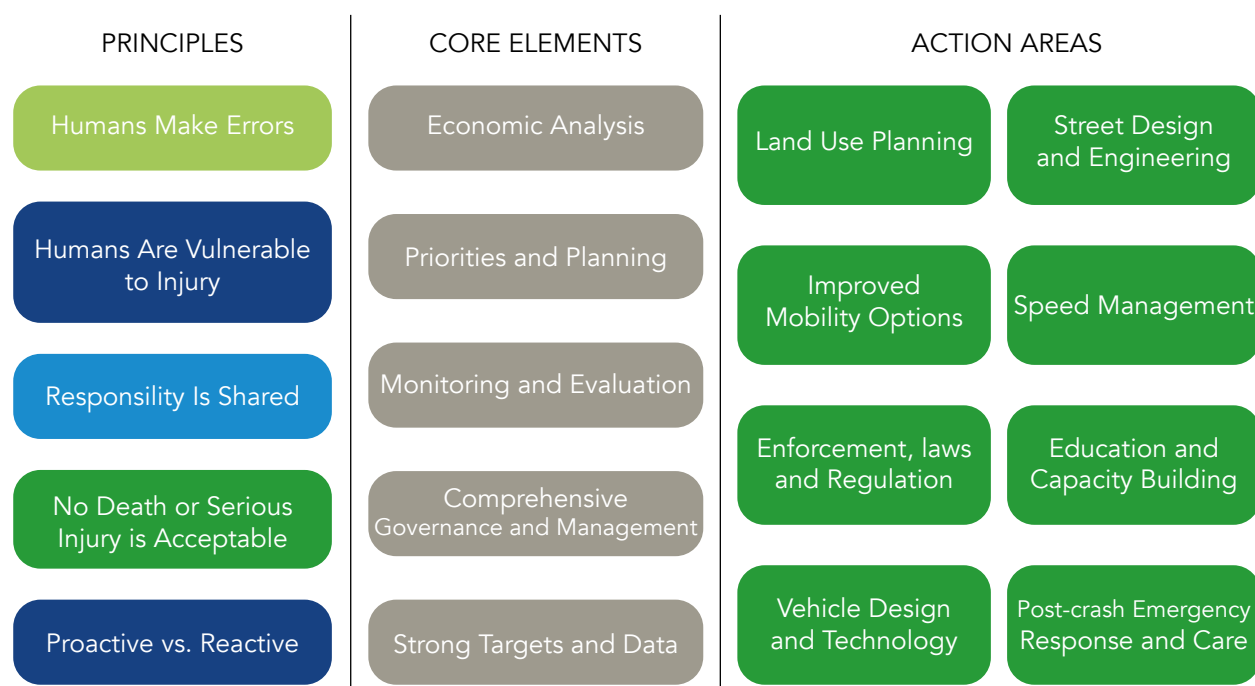
Item	Traditional Approach	Safe System / Vision Zero
What is the problem?	Accident risk	Fatalities and serious injuries
What causes the problem?	Human factors	Humans make mistakes Humans are fragile
Who is primarily responsible?	Individual road users	System designers
Is there public demand for road safety?	People do not want safety	People want safety
What is the appropriate goal?	Optimize the number of fatalities and serious injuries	Zero fatalities and serious injuries

Source: Adapted from Belin, Tillgren, and Vedung, 2012.

The Safe System approach starts from the following principles (ITF 2016; WRI 2018; ITF 2022) (Figure I.1):

1. People make mistakes that can lead to road crashes.
2. The human body has a limited ability to tolerate crash forces before harm occurs. Therefore, the focus should be on creating infrastructure that is tolerant of human fallibility, including roads, cars, and any new mobility technology.
3. System designers must share the responsibility to prevent road crashes that result in death or serious injuries.
4. A proactive approach should be taken to make the mobility system safe, rather than waiting for events to occur and reacting. All parts of the system must be strengthened to multiply their effects so that if one part fails, road users are still protected.
5. No death or serious injury should be accepted in the mobility system. Lack of safety should not be a trade-off for faster mobility. Rather, the mobility system should be both safe and efficient.

Figure I.1: Principles, core elements, and action areas of the Safe System approach.



Source: WRI, 2018



A study of road crash fatalities in 53 countries between 1994 and 2015 revealed that countries that adopted the Safe System approach recorded the lowest rates of fatalities per 100,000 inhabitants and the fastest rate of change in fatality levels, especially its pioneers, Sweden and the Netherlands (WRI 2018). These countries focused on implementing policies such as lower urban speed limits; roundabouts on rural roads; segregated zones for pedestrians, bicyclists, and motorized vehicles (Eurostat 2017). In Sweden, the fatality rate fell by 55 percent between 1994 and 2015 with fewer than three deaths per 100,000 people. The Netherlands had fewer than four fatalities per 100,000 residents, and the rate fell by more than 50 percent. The adopted measures saved an estimated 1,700 lives between 1998 and 2007 in the Netherlands (Weijermars and Wegman 2011). Other places are also seeing rapid results such as Spain and New York in the first three years of adopting Vision Zero (WRI 2018).

There is acceptance of the Safe System approach in some developed countries, but there is limited awareness in LMICs (Heydari, Hickford, McIlroy, Turner, and Bachani 2019). Among LMICs, Mexico (ITDP and FIA Foundation 2019) and Colombia (Cuevas 2016) have aimed for and are working toward Vision Zero—zero road crash deaths and serious injuries.

The UN Global Plan, 2021–2030, focuses on a modal shift toward walking, cycling, and shared mobility system (WHO 2021). The Safe System action areas (figure I.1) focus on safe, integrated land use and transport systems that reduce vehicle kilometers traveled, speed management, complete streets and safe nonurban roads, improved vehicle technology, enforcement, postcrash care, and reformed licensing systems (table I.2).

Table I.2: Recommended actions for the Safe System approach.

In 2021, the UN Decade of Action for Road Safety (2021–2030) revised the approach to include the following:	
Multimodal transport and land use planning	Build a multimodal transport system with a focus on sustainability and safety
Safe road infrastructure	Create a safe environment to accommodate human mistakes and injury tolerances to reduce the severity of crashes and injuries
Safe vehicles	Design vehicles to protect humans and to avoid severity of crashes and injuries using state-of-the-art technology
Safe road use	Address safety of all road users equitably—pedestrians, cyclists, transit users and others
Postcrash response	Provide emergency response to stabilize the injuries and conduct forensic investigation of the crash

Objective and target audience

The Sustainable Mobility for All (SuM4All) partnership³ developed a Global Roadmap of Action (GRA) toward Sustainable Mobility⁴ in 2019. The partnership created a Catalogue of Policy Measures (CPM),⁵ across four pillars—safety, green mobility, efficiency, and universal access—to transition toward sustainable mobility. The GRA Safety paper focused on the Safe System approach as the means to reduce and zero down global crash deaths and serious injuries (SuM4All, 2019).

The SuM4ALL partnership aimed to provide detailed, concrete, and actionable guidance on “How to” implement high level policies included in the Catalogue of Policy Measures (CPM) (SuM4All 2022) in 2022. The Working Group on Road Safety—co-led by the International Road Federation (IRF) and Michelin—has developed this report on how the Safe System approach can be mainstreamed in road safety, sustainable mobility, and urban development. It aims to increase awareness, accountability, and demand for the Safe System approach and bridge the gap between vision and action in the field. The research process is in Appendix A and the relevant compendium of policy measures, which served as a starting point for this document and are in Appendix B.

The primary target audience is senior decision makers at the national, subnational, and local

levels as well as development finance institutions. It will also be useful for the private sector,⁶ road safety professionals, and civil society organizations (CSOs) to advocate with policy makers on the Safe System approach.

Structure and scope

The report provides multiple entry points to embed the Safe System approach to road safety along with a capacity development framework focusing on decision makers and road safety specialists. Additionally, strategies are outlined to increase awareness and build support to implement the Safe System approach. The report culminates with a synthesis of evidence-based case examples and resources included throughout the document. Two-thirds of case examples are from LMICs, along with resources to guide implementation. The case studies are distributed in various regions with Africa at 27 percent, America at 22 percent, Europe at 18 percent, Western Pacific at 18 percent, Southeast Asia at 12 percent, and Eastern Mediterranean at 3 percent.

The Safe System approach recognizes postcrash care as an essential function. However, it is less emphasized in this report owing to a focus on prevention of fatal and serious road crashes (table I.3). Similarly, while the guidance is relevant for metropolitan and rural areas, cities are emphasized to a greater extent on account of their density and potential impact.

Table I.3: Structure of the report.

Chapters	Title	Objective
1	Embed the Safe System approach to road safety in national, subnational, and urban transport planning	Provide entry points for embedding the Safe System in policies, legislation, street design, and nonurban design guidelines and projects.
2	Build capacity on the Safe System approach	Identify themes and areas of capacity development for different government agencies and experts.
3	Increase awareness to build support for implementing the Safe System approach	Identify strategies to build public support for implementing the Safe System approach.
4	Produce and share knowledge on good practices	Summarize emerging and good practice examples and resources are summarized.

Notes

1. This is despite a slight decline (3.2 percent) in the fatality rate.
2. System designers include decision makers, policy makers, regulators, legislators, planners, designers, and engineers of streets, nonurban roads and multimodal transport and land use systems.
3. The SuM4All consortium consists of 56 member organizations that have pledged to a shared vision of sustainable mobility anchored on the 4 goals of universal access, efficiency, safety, and green mobility and have agreed to work together toward its implementation. Member organizations fall into five broad categories: (i) Multilateral Development Banks; (ii) UN/Intergovernmental Organizations; (iii) Bilateral Partners; (iv) Private Sector/ Business Associations; and (v) Global Civil Society Organizations: <https://www.sum4all.org/consortium-members>.
4. <https://www.sum4all.org/gra>
5. <https://www.sum4all.org/key-products/catalogue-policy-measures-cpm>
6. Especially vehicle manufacturers and insurance companies.

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1. EMBED THE SAFE SYSTEM APPROACH IN NATIONAL, SUBNATIONAL, AND URBAN TRANSPORT PLANNING



The Safe System approach should be embedded in a long-term policy framework to ensure alignment in design, regulatory and legislative instruments, and projects. Decision makers in LMICs should increase financing for multisectoral road safety investments and complement these by creating and transferring road safety knowledge, expertise, and innovation. This report provides multiple entry points such as national, subnational, or urban transport or road safety policies,

strategies, programs, plans, legislation, guidelines, and projects (table 1.1). The foundation, however, is that no street, intersection, or nonurban project is implemented without incorporating the Safe System approach to road safety. Their effectiveness needs to be assessed by evidence-based demonstration of intermediate and eventual outcomes toward zero road crash fatalities and serious injuries.

Table 1.1: Entry points for the Safe System approach in transport planning.

Entry points	Examples	Performance monitoring
Policy	<ul style="list-style-type: none"> National transport policy National urban transport policy Road safety policy 	
Strategy	<ul style="list-style-type: none"> Sustainable Transport Strategy Nonmotorized transport and public transport strategy Road safety strategy/ action plan Speed management strategy or action plan 	
Program	<ul style="list-style-type: none"> Road safety programs such as SARSAI (Tanzania), SSK-RS (Vietnam) 	
Plan	<ul style="list-style-type: none"> Urban development plans Sustainable urban mobility plans 	
Legislation	<ul style="list-style-type: none"> National Road Safety Act Motor Vehicle Act / Road Traffic Act Statutory urban development plans 	
Guidelines	<ul style="list-style-type: none"> Street and nonurban road design guidelines 	
Projects	<ul style="list-style-type: none"> Street and nonurban road projects and intersections 	

Assess effectiveness by evidence-based demonstration of intermediate and eventual outcomes toward zero road crash fatalities and serious injuries.

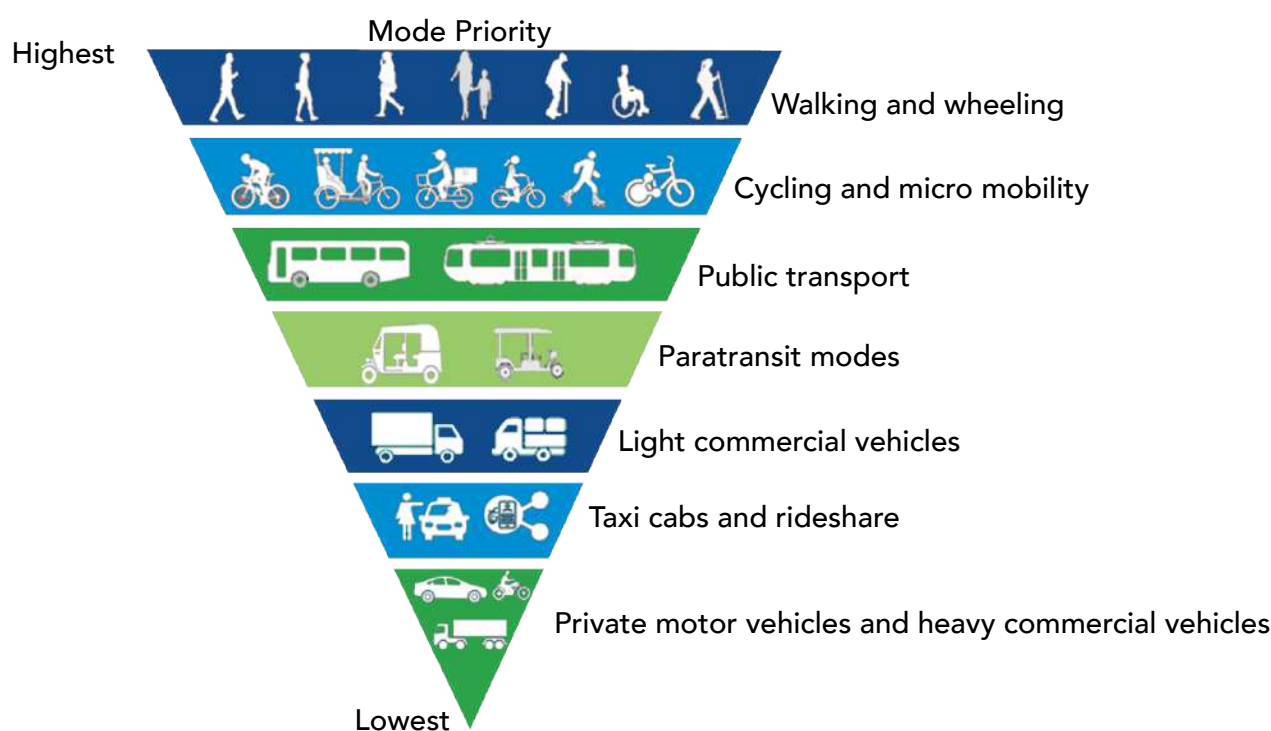


1.1 Flip the hierarchy to prioritize integrated transport systems that encourage active modes and public transport

Cities will be home to 70 percent of the world's population by 2030. Systems that predominantly depend on personal motor vehicles will be unable to cater to this increased demand for urban mobility. Investments in active modes and public transport systems will be central to facilitating

safe and efficient mobility for large groups of people. Implementing the Safe System approach should begin with safe, integrated multimodal transportation, and land use planning. This will require flipping the mode hierarchy and priority on streets to provide safe and sustainable journeys for all (figure 1.1) along with interventions that explicitly minimize or mitigate potential road safety risks and demand minimum safety performance for all expected modes, abilities, and journeys (WHO 2021a).

Figure 1.1: Mode priority on streets.



Source: Adapted from Bicycle Innovation Lab, The Urban Catalysts, SHARE-North, TUMI

We need to flip the mode hierarchy and priority on streets to provide safe and sustainable journeys for all.

1.2 Incorporate the Safe System approach in road safety and transport policies, strategies, and programs

The Global Plan 2021–2030 aims to decrease road crash deaths and injuries by at least 50 percent. These and vision zero road safety targets encourage prioritizing to implement results-based interventions (Elvik 1993). Road safety targets should be incorporated—overall, intermediate, and where possible, by mode—within national, subnational, and urban transport policy and planning instruments. These can provide the driving force to allocate annual budgets to collect and update the road crash database, incorporate the Safe System approach within transport projects, build a road safety team, and for regular capacity development.

Institute an effective nodal agency at national and subnational levels through legislative measures

Road safety management is a crosscutting function¹ that facilitates efficient implementation of the Safe System approach. A nodal agency is necessary to coordinate road safety management with other government and nongovernment stakeholders (World Bank 2015). Countries with larger populations may also require nodal agencies at the subnational levels. The role of the nodal agency is to ensure coordinated road safety actions and programs across levels of government and other nongovernment stakeholders (GRSF 2013; Mitullah, Small, and Azzouzi 2022). Depending on the available resources, this could be a single department, a dedicated standalone road safety agency, a separate road safety division within a department, or a road safety council or standing committee coordinated by a lead agency (table 1.2).

Table 1.2: Recommended coordination structure at the national and subnational levels.

Levels	Coordination structure
Basic	The transport ministry/ department could serve as a nodal agency and coordinate with the urban development, finance, and health counterparts.
Desirable	Road safety department under the transport ministry could serve as a nodal agency and coordinate with home affairs, justice, finance, health and social care, education, women, family affairs, and urban development.



Case examples

- The National Road Safety Agency (ANSV), established in 2008 under the then Ministry of Interior and Transport (now Ministry of Transport), is responsible for coordinating road safety in Argentina. It coordinates with different government agencies toward safe infrastructure, traffic law enforcement, safer vehicles, postcrash response, education, and campaigns. The agency developed a National Road Safety Observatory, instituted a national licensing system, education strategy, and monitoring plan (ITF–OECD 2019). Although reduction in road fatalities is not significant, the establishment of ANSV helped overcome institutional barriers to effective road safety initiatives in the country (Bhalla and Shotten 2019).
- Morocco’s National Road Safety Agency (NARSA) is responsible for development, implementation, and monitoring of national road safety policies, strategies, plans, and performance targets through horizontal governance, vertical integration—at the central, regional, and local levels—and delivery partnerships with NGOs. In effect, NARSA receives funding from national treasuries and responsible ministries with which it coordinates with (Mitullah, Small, and Azzouzi 2022).
- The Federal Road Safety Corps (FRSC) in Nigeria is a lead agency that functions based on five action areas of the previous Safe System approach (Global Plan 2011–20) and African Road Safety Action Plan with effective inter agency governance and a significant taskforce of approximately 65,000 staff. It prepares national road safety strategies, manages, and monitors road safety performance of all stakeholders at national and state levels (Cardoso et al. 2019). See also: Table 1.3.

Table 1.3: Case examples of road safety agencies at the national levels.

No.	Example	Organization, Year	Link
1	National Road Safety Agency (ANSV)	Ministry of Transport, Argentina, 2008	https://www.argentina.gob.ar/seguridadvial
2	National Road Safety Agency (NARSA)	Ministry of Transport and Logistics, Morocco, 2018	https://www.narsa.ma/
3	The Federal Road Safety Corps (FRSC)	Office of the Secretary, Federation of Nigeria, 1988–2007	https://frsc.gov.ng/

Prepare an open-access national data repository for road safety

Reliable traffic and road safety data are important to identify road safety problems and implement effective interventions. A road safety database must cover crash data—deaths, minor and major injuries—victim details such as type of road user,

age, gender, vehicle data such as mode, year of registration, brand, and other information such as geolocation, time, speed, and potential causes (UK Department for Transport 2022).

Resources

- Fédération Internationale de l'Automobile (FIA) partnered with the World Bank, OECD–ITF and WHO to improve road safety data collection processes in LMICs. They have supported the creation of regional road safety observatories (RSOs)—a network of countries to exchange experience and share road safety data to reduce road crash deaths and injuries in the regions (GRSF 2022).
- The International Traffic Safety Data and Analysis (IRTAD) database has safety and traffic data collected directly from relevant national data providers in 32 countries. IRTAD has encouraged twinning between countries who are among the best performers and those that are working to improve their record for road safety by increasing their road crash data since 2008 (IRTAD 2022).
- The Data for Road Incident Visualization, Evaluation and Reporting (DRIVER) developed by the World Bank and the Global Road Safety Facility (GRSF) is an example of an open-source software platform to record and manage road safety data. It can predict blackspots, estimate the economic costs of road crashes, and track the effectiveness of road safety interventions. It has been piloted or implemented in several countries or cities, such as Fortaleza in Brazil, Lao People's Democratic Republic and the Philippines (World Bank and GRSF 2017). See also: Table 1.4.

Table 1.4: Some data repositories as resources.

No.	Resource	Organization, Year	Link
1	Regional road safety observatories	FIA, World Bank, OECD–ITF and WHO, 2011–to date	https://www.roadsafetyfacility.org/programs/road-safety-observatories
2	IRTAD database	OECD, 1988–to date	https://www.itf-oecd.org/irtad-road-safety-database
3	Open-source software programs (Example: DRIVER)	World Bank and GRSF, 2017	https://www.roadsafetyfacility.org/programs/DRIVER

Articulate a clear vision

The Safe System approach to road safety envisions a mobility system free from deaths and injuries, recognizing that humans make mistakes, the human body has a limited ability to tolerate crash forces, and that system designers share responsibility. Decision makers have a disproportionate influence on the planning, design, and regulation of road systems and bear responsibility for road crashes. Such a vision should be reflected in the planning, outreach, implementation, and expected outcomes.

Set bold, achievable targets

Defining clear road safety targets enables prioritizing and implementing effective interventions (Elvik 1993). Targets must be realistic numbers and set at intermediate as well as long-term periods. Multiple countries have adopted programs toward zero fatalities and serious injuries at national and subnational levels. Some of them include the Vision Zero program (Sweden), Sustainable Safety (Netherlands), Toward Zero Deaths (US states), Mexico, and Colombia.

The adoption of road safety targets by key government ministries at the national level such as transport, urban development, health, and road-owning agencies could ensure better stakeholder coordination and alignment. Simultaneously, mode specific targets focusing on pedestrians, cyclists, or public transport can also be used effectively to create safer street environments.

Case examples

- Vietnam aims to reduce annual road crash fatalities and injuries by 5 to 10 percent in their national strategy for ensuring road traffic safety for the period 2021–2030 and a vision of zero fatalities for 2045 (Govt. of Vietnam 2020).
- Ethiopia's Non-Motorized Transport (NMT) Strategy 2020–29 plans to reduce pedestrian and cyclist fatalities by 80 percent below 2019 levels (Ministry of Transport Ethiopia 2020) in addition to targets related to modal shift and emissions.
- Colombia and Mexico passed new laws in road safety that incorporate targets and recommendations from the UN Global Plan of 2021–2030. Both legislations direct the implementation and assessment of public road safety policy using the Safe System approach. (Government of Colombia 2021; Federal Government of Mexico 2022).
- Tanzania envisaged a new 10-step plan for safe road infrastructure with tools to design and build safer (existing and new) roads (UNECE, IRF, and iRAP 2020). See also: Table 1.5.

Table 1.5: Case examples of road safety targets.

No.	Example	Organization, Year	Link
1	Vietnam's National Strategy for Road Safety during 2021–2030 with a vision toward 2045	Ministry of Transport, 2020	https://irap.org/2021/05/vietnams-2030-strategy-targets-3-star-or-better/
2	Ethiopia Non-motorized Transport Strategy 2020–29	Ministry of Transport, Ethiopia, 2020	http://airqualityandmobility.org/STR/Ethiopia_NMTStrategy_EN200529.pdf
3	Colombia Julián Estaban's Law	Government of Colombia, 2021	https://www.who.int/news/item/20-06-2022-colombia-s-landmark-road-safety-law-could-save-countless-lives
4	Mexico National Law of Mobility and Road Safety	Federal Government, Mexico, 2022	http://www.dof.gob.mx/nota_detalle.php?codigo=5652187&fecha=17/05/2022
5	Tanzania The Ten Step Plan for Safer Road Infrastructure	UNECA, IRF and iRAP, PIARC, TARA, 2020–2022	https://unece.org/projects-2

Adopt gender transformative approaches in transport and road safety

Multimodal transport and active mobility can be encouraged when infrastructural investments and policies improve safety and security, and address gender safety concerns (WHO 2021b). Gender transformative action in transport entails reflecting women's—and gender and sexual minorities—access to safe and affordable public transport (ITF 2018) and working toward increasing the share of women and gender and sexual minorities in leadership and decision-making roles in transport (Singhai and Singhai 2021), and in road safety.

The availability and accessibility of gendered data in transport (Montes et al. 2022; Women Mobilize Women 2022) and road safety is a significant step in this regard. Specifically, collecting and analyzing gender and age disaggregated data on road crashes, fatalities, serious injuries in gender differences in travel can help understand and frame strategies.

The City of Vienna introduced gender mainstreaming strategy as a practical step to implement gender equality in public spaces. The strategy laid out design of roads, paths, squares, and parks tailored to the needs of women, men, older people, young people, and persons with disabilities (City of Vienna 2008).

Globally, women remain underrepresented in the transport sector with a share of 22 percent (European Commission 2017). This is also the case when it comes to gender minorities and persons with disabilities. More women can be attracted and retained in the industry through workplace policies, leadership programs, networking, encouraging professional organization participation, effective cultural diversity, and harassment-free culture among many practices (Godfrey and Bertini 2019). More needs to be done to include women and gender minorities as road safety experts and in management and decision-making positions in the sector.

Case examples

- The Kochi Metro Rail Limited (KMRL) in India has partnered with Kudumbashree² to recruit women and transgender persons. Their services include train operation, customer relations, crowd management, housekeeping, and catering services (Kochi Metro 2017).
- FIA Foundation conducted a study on women's personal safety in public transport in three Latin American countries —Argentina, Chile, and Colombia. Buenos Aires in Argentina increased the share of women in city traffic agents to 54 percent, bus drivers for dedicated services and subway drivers to 20 percent (and guards to 33 percent) At present, women's share of metro bus ridership stands at 54–60 percent in various services. The City of Santiago (Chile) was able to increase women's participation in cycling from 10 to 30 percent by collaborating with a women's group Macaleta and developing more than 200 kilometers of cycle tracks. A safety and security audit was conducted in one of the districts that provided data to improve policies and solutions to help women feel safer and less vulnerable (Allen et al. 2018). See also: Table 1.6.

Table 1.6: Case examples of incorporating a gender perspective in transportation.

No.	Example	Organization, Year	Link
1	Recruit women and trans persons	Kochi Metro Rail Limited, 2017	https://kochimetro.org/social-inclusion/
2	Increase female traffic agents, bus and subway drivers and guards	City Government, Buenos Aires, Argentina	https://scioteca.caf.com/handle/123456789/1405
3	Safety audits, increase women's share in cycling, employment of women in Red Metropolitana de Movilidad (formerly Transantiago)	Ministry of Transport and Telecommunications and other agencies, Chile	https://scioteca.caf.com/handle/123456789/1405

Resources

- The World Bank's handbook for gender-inclusive urban planning and design addresses six areas of concern in using public spaces by women, girls, and gender minorities. The publication highlights the benefits of integrating gender inclusion in urban planning and design to bridge the obvious gap between policy and practice and intention and action through best practices (World Bank 2020).
- The ITF Gender Analysis Toolkit for Transport provides a methodology for gender-inclusive perspective in transport projects, plans, and policies. It includes three tools for conducting gender studies for governments, organizations, contractors, and other practitioners (ITF 2022). See also: Table 1.7.

Table 1.7: Resources for incorporating a gender perspective in transportation.

No.	Resource	Organization, Year	Link
1	Handbook for Gender-Inclusive Urban Planning and Design	World Bank, 2020	https://www.worldbank.org/en/topic/urbandevelopment/publication/handbook-for-gender-inclusive-urban-planning-and-design
2	Gender Analysis Toolkit for Transport	ITF, 2022	https://www.itf-oecd.org/itf-gender-analysis-toolkit-transport-policies-0
3	Sustainable Mobility for All. 2023. Gender Imbalance in the Transport Sector: A Toolkit for Change.	SuM4All, 2023	https://www.sum4all.org/data/files/gender_imbalance_in_the_transport_sector_a_toolkit_for_change.pdf

Allocate funds for road safety activities in transport budgets

Although a majority of the costs for financing road safety are in the transport sector, the benefits are economy wide and in the health sector. The nodal agency should allocate a budget to coordinate, maintain road safety databases, analyze data, manage knowledge, and develop capacity. Sufficient funds should be allocated as a line item in annual budgets by respective ministries or departments for road safety actions (table 1.8) in consultation with the nodal agency.

Additional funding requests are to be communicated to the finance ministry/ department after approved by the nodal/ transport agency. The Africa Transport Policy Program (SSATP) recommends that governments should allocate 10 percent of road development funds and 5 percent of road maintenance funds toward road safety assessments, inspections, audits, and speed management measures (SSATP 2014).

Table 1.8: Government agencies and their role in road safety.

Government agencies	Budget allocations for road safety actions.
Nodal agency	Prepare national or subnational policies, strategies, and action plans, steer and coordinate, maintain road safety databases, analyze data, manage knowledge, and develop capacity.
Road owning agency	Allocate 10 percent of street and nonurban road development funds and 5 percent of road maintenance funds toward road safety assessments, inspections, audits, and speed management measures.
Traffic Police	Record road crashes scientifically, conduct crash investigations, traffic management, and enforcement.



Case examples

- The Government of Ethiopia has allocated funds, for projects to improve footpath, cycle tracks, bike sharing, and parking as part of its NMT strategy, through its own budget or the Ethiopian Road Fund. It will also support local authorities in establishing local transport funds (LTF). A number of conditions are tied to receive these funds and include an approved sustainable mobility plan (SMP). At least 33 percent of the local government's capital expenditure is on transport projects that focus on footpaths or sidewalks, cycle tracks, cycle sharing systems and cycle parking, and funding for urban projects that focus on complete streets (Ministry of Transport, Ethiopia 2020).
- The Government of the Philippines amended legislation in 2022 to reallocate motor vehicle user charges (MVUC) into road development, maintenance, road safety, and pollution control. The amended legislation includes allocation of 85 percent of the funds for national and local road development and maintenance, 7.5 percent to a Special Road Safety Fund and 7.5 percent to and placed in the Special Vehicle Pollution Control Fund (Senate of the Republic of the Philippines 2022). A proactive approach lends opportunity to mainstream road safety in the national and local road development, in addition to a dedicated road safety fund to be used for road safety management.
- Ghana introduced legislation for allocation of road safety funds. It comprises 2.5 percent of all revenues accrued to the Road Fund, 2.5 percent of Driver and Vehicle Licensing Authority, one percent of National Insurance Commission, loans and grants for the National Road Safety Authority and other internally generated funds (Parliament of Republic of Ghana 2019). Between 2018–19 and 2020–21, the share of Ghana Road Fund increased by 85 percent and the total road safety budget increased by 50 percent. See also: Table 1.9.

Table 1.9: Case examples of budget allocations for road safety.

No.	Example	Country, Year	Link
1	Ethiopian Road Fund and Local Transport Funds (LTF)	Ethiopia, 2020	http://roadfund.gov.et/display
2	Legislation for Special Road Safety Fund	Philippines, 2017	https://legacy.senate.gov.ph/lisdata/26922231321.pdf
3	Legislation for allocation of road safety funds from various sources	Ghana, 2019	http://ir.parliament.gh/handle/123456789/2006



1.3 Reorient spatial development and urban mobility plans

Cities can plan for safe, integrated, multimodal transport systems and introduce demand management measures to reduce vehicle kilometers traveled (VKT) and encourage a mode shift to sustainable modes of transport.

Plan for safe multimodal transport, public transport, walking, and cycling in urban areas

Total VKT is associated with the degree of risk for both vehicle occupants and other road users (Sharpin et al. 2018). Lowering VKT by switching to active modes and public transportation and shifting from a four-degree scenario (4DS) to two-degree scenario (2DS) would result in an annual reduction of 200,000 road fatalities and greenhouse gas emissions (Hidalgo and Duduta

2014). In Guadalajara in Mexico, road crashes on the Macrobús BRT corridor reduced by 46 percent after its implementation. In contrast, crashes remained relatively constant citywide, with a slight decrease of nearly 8 percent over a five-year period (Duduta, Adriaola-Steil, and Hidalgo 2013). Sustainable urban mobility plans (SUMP) ensure balanced and integrated development of safe sustainable transport modes in cities. Safety and the environment coexist in land use planning and development (Duduta, Adriaola-Steil, and Hidalgo 2013). Cities with higher urban densities and street connectivity in the United States have recorded lowest fatality rates per capita. Cities like New Delhi and Beijing have the potential to reduce road crash fatalities with integrated land use and transport policies that prioritize space for walking, cycling, and public transportation while minimizing reliance on private motorized vehicles (McClure, et al. 2015). These can be achieved through lower speed limits, traffic calming measures, and 30 kilometers per hour speed zones.

Resources

- The SUMP toolkit supports national and regional governments in the preparation and implementation of SUMP (GIZ 2019).
- The transit-oriented development (TOD) standard 3.0 provides a framework to assess the extent to which the street network and urban development around mass transit is oriented to support active modes and encourage public transport use (ITDP 2017a).
- The TOD toolkit 2020 focuses on road safety interventions in a TOD zone (WRI India and World Bank 2020).
- The BRT Planning Guide aims to support planning and engineering professionals, policymakers, NGOs, and business groups to implement high-quality and cost-effective mass transit solutions for cities within their budgets (ITDP 2017b). See also: Table 1.10

Table 1.10. Resources that support safe, integrated multimodal transport.

No.	Resource	Organization, Year	Link
1	SUMP Toolkit	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2019	https://changing-transport.org/toolkits/sump
2	TOD Standard 3.0	ITDP, 2017	https://www.itdp.org/library/standards-and-guides/tod3-0/
3	Integration of Road Safety Considerations in TOD projects	World Bank and WRI India, 2020	https://documents1.worldbank.org/curated/en/721181605154745472/pdf/Integration-of-Road-Safety-Considerations-in-Transit-Oriented-Development-projects-Good-Practice-Note.pdf
4	The BRT Planning Guide	ITDP, 2017	https://www.itdp.org/2017/11/16/the-brt-planning-guide/

Implement demand management measures

Demand management measures such as on-street parking management complement and support investments in safe sustainable transport. They should focus on disincentivizing private vehicles (Barter 2016) through parking management area plans (PMAP), demand-based pricing and effective enforcement (Shah, Rajiv, and Jose 2022).

PMAPs can be prioritized around frequent public transport nodes and the revenues reinvested into the neighborhoods. Other measures include caps on off-street parking requirements around transit nodes or low parking minimums.³

Resources

On-street parking management is a toolkit for managing street space efficiently (Barter 2016). See also: Table 1.11.

Table 1.11: On-street parking management toolkit.

No.	Resource	Organization, Year	Link
1	On-Street Parking Management: An International Toolkit	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2017	https://sutp.org/publications/on-street-parking-managment/

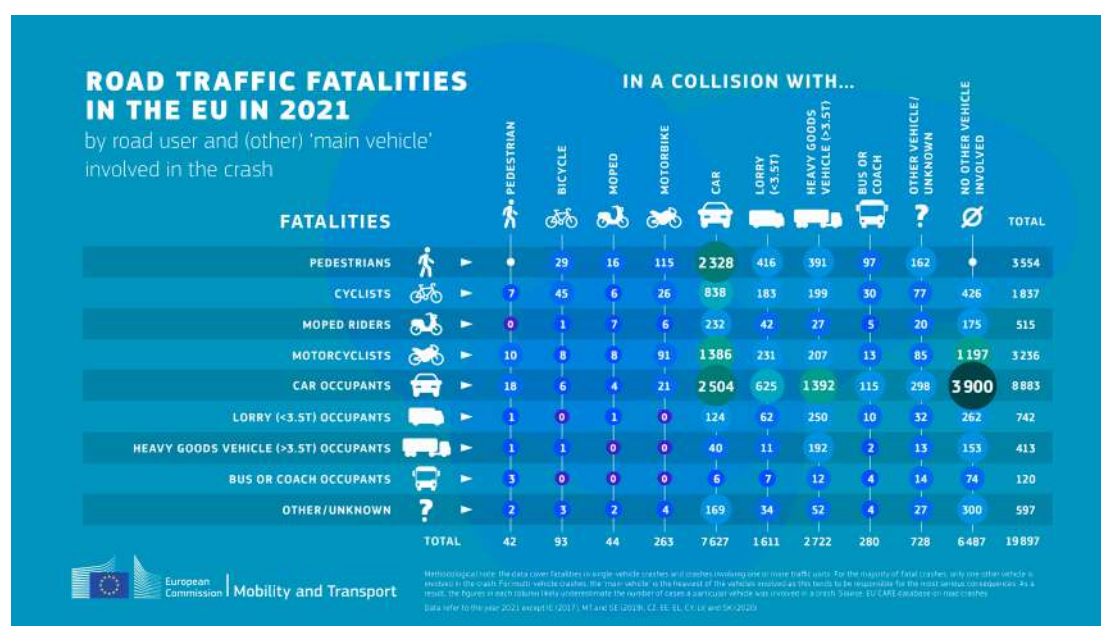


1.4 Prioritize safety in street and nonurban road design guidelines

In the Safe System approach, mobility is a function of safety (PACTS 2022). Speeds have a direct impact on fatality rate and serious injuries, particularly for pedestrians and cyclists.

The European Union's (EU) collision matrix indicates that more than 99 percent of pedestrian deaths are caused by motor vehicles and two-thirds of them are by cars (figure 1.2) (European Commission 2022).

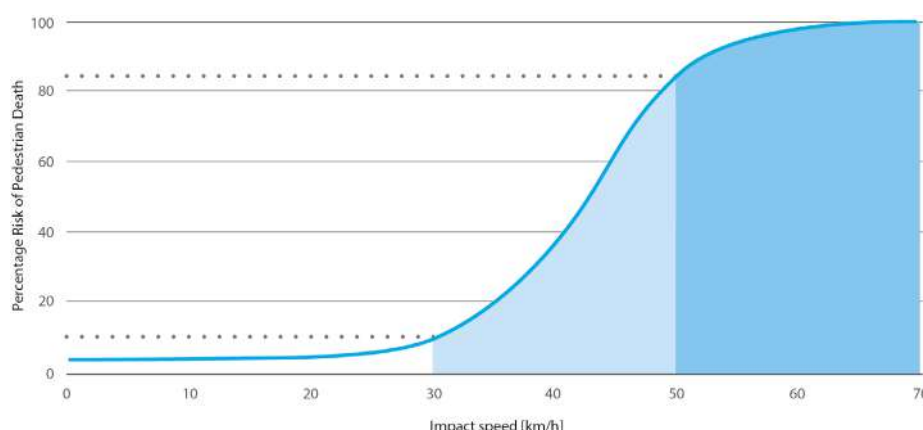
Figure 1.2: Collision matrix: road traffic fatalities in the EU (2021).



Source: (European Commission, 2022).

Cities need to lower speeds. At 50 kilometers-per-hour speeds, pedestrians are likely to have more than 80 percent fatality risk on roads. This reduces to 10–12 percent when speeds are limited to 30 kilometers per hour (figure 1.3) (GRSP 2008; WRI 2015).

Figure 1.3: Impact of speeds on fatality risks for pedestrians.



Source: Adapted from WHO (2008), WRI (2015).

Set citywide 30 kilometers-per-hour speed limits

Street design guidelines must emphasize safe streets for all (ITDP India 2016) with citywide speed limits at 30 kilometers per hour.⁴ A safe posted speed should translate to a safe design speed (Road Safety Observatory 2017). Urban street design guidelines should prioritize complete streets through an equitable allocation of road space and universal access (ITDP India 2016). Cities can also include low speed zones in street

design guidelines, implement and progressively scale them up from evidence and additional benefits. A low-speed zone is an area where speeds are reduced by design to less than 30 kilometers per hour to increase the mobility and safety of pedestrians and cyclists. Low-speed zones—or livable speed zones—in urban areas and cities benefit economy, public health, and quality of life, in addition to reducing fatality (WRI, 2021).

Case examples

- Brussels introduced a 30 kilometers-per-hour speed limit on most of its roads from 2021. The number of fatal and serious injuries (FSIs) reduced from 46 to 30 in the city, when compared to the first quarters of 2020 and 2021. This also resulted in a consistent impact on average speed reduction on all roads. While streets that adopted new speed limits witnessed a higher drop in speeds, average speed fell by 7 percent on streets with 50 kilometers-per-hour limit (Eurocities 2021). A study in London revealed that lowering speeds from 48 kilometers per hour to 32.2 kilometers per hour accounted for 46 percent reduction in FSIs (Grundy, Edwards, and Armstrong 2009).
- In 2018, the government of Zambia reduced speed limits near schools and locations with high pedestrian traffic. It was piloted in two schools in Lusaka by engaging the ministries of education and transport. After its successful implementation, in 2019, the government introduced 30 kilometers-per-hour speed restrictions on all urban roads in the country⁵ (WHO 2021a). Daxue Road in Shanghai, China attracted more than 400 small businesses and 200 start-ups with the implementation of lower speeds as part of an urban road revitalization in 2012 (WRI 2021). See also: Table 1.12.

Table 1.12: Case examples of city speed limits and low-speed zones.

No.	Example	Organization, Year	Link
1	Low-speed school zones Lusaka, Zambia (and expanded city-wide)	City Government, Amend, Zambia Road Safety Trust, 2019	https://www.childhealthinitiative.org/blog/2020/zambia-legislates-for-low-speed-school-zones-following-foundation-backed-campaign
2	30 kmph speed limit: Brussels	Federal government, 2021	https://eurocities.eu/latest/road-safety-fewer-accidents-in-brussels-30-km-h-city/
3	Low-speed zone: London and its impact (1986-2006)	BMJ, 2009	https://www.bmj.com/content/bmj/339/bmj.b4469.full.pdf
4	Low-speed zone: Shanghai	City Government, 2012	https://www.wri.org/research/low-speed-zone-guide

Resources

The Low-Speed Zone Guide (example 1.10) aims to provide strategies and resources to decision makers and local governments to develop low-speed zones specific to their context (WRI 2021). See also: Table 1.13.

Table 1.13: Resource for implementing low-speed zones.

No.	Resource	Organization, Year	Link
1	Low-speed zone	WRI, 2021	https://www.wri.org/research/low-speed-zone-guide

Set safe speeds on nonurban roads

The Safe System approach puts safety over mobility on highways and other roads (Austroads 2017). Nonurban road design guidelines should focus on safety as the primary component of planning and engineering. The nonurban road categories are rural roads, district/province roads, highways, and motorways or freeways (table 1.14).

Access control is required on all motorways or freeways irrespective of areas. However, access-controlled roads should not be permitted inside villages. Speed limits on nonurban roads with a 30 kilometers-per-hour limit when it passes through a village with pedestrian and cycling activity. Speeds are also capped at 70-, 40-, 30- and 20-kilometers per hour in the order of hierarchy in hilly terrains (Road Safety Observatory 2017).

Table 1.14: Recommended speed limits on nonurban roads (in kmph).

Areas	Rural access roads	District/provincial roads	Highways	Motorways/freeways
Nonurban roads	30	50	80	100
Passing through a village with pedestrian and cycling activity	20	30	30	-
Hilly terrain	20	30	40	70



Resources

- The Royal Society for the Prevention of Accidents' (RoSPA) research provides guidance how to set speed limits on streets and nonurban roads using design elements and interventions with relevant examples (Road Safety Observatory 2017).
- The Global Road Safety Partnership (GRSP) has developed good practice guides for decision makers and practitioners in road safety that includes speed management (GRSP 2020). See also: Table 1.15.

Table 1.15: Resources for managing speeds on nonurban roads.

No.	Resource	Organization, Year	Link
1	Speed Limits	Road Safety Observatory, 2017	https://www.rosipa.com/media/documents/road-safety/road-observatory/Roads-Speed-limits.pdf
2	Good Practice Manuals	Global Road Safety Partnership: 2008-2022	https://www.grsproadsafety.org/resources/good-practice-manuals/

Adopt speed management measures and provide safe walking and cycling facilities

Setting speed limits on streets and nonurban roads is a key intervention for safe streets (Road Safety Observatory 2017). However, roads do not become safer just by setting speed limits. Speed management is a tool that makes the road system safe by not allowing higher speeds. This can be achieved through traffic calming and design measures along road stretches and at intersections, supported by effective enforcement where possible.

In urban areas, expressways should be redesigned as urban arterial roads (NACTO 2012). Pedestrians require dedicated facilities on all streets along with safe crossings (ITDP, 2018). Traffic calming is required at regular intervals, where design speeds are much higher than the posted speeds, or speed limits, of 30 kilometers per hour (GRSP 2008).

However, where vehicular speeds exceed 30 kilometers per hour, cycle tracks⁶ are mandatory. In addition, sight distance must be in accordance with the traffic calmed design speed. Safe stopping distance (SSD) is an essential check for estimating sight distance for the corresponding speed (ODOT 2003; NSW Government 2022). Pedestrians and cyclists require wide shoulders and safe crossing facilities on nonurban roads. Shoulders should provide a safe halting area for other vehicles, if required. Signalized intersections and roundabouts are recommended for nonurban roads with speed limits of up to 50 kilometers per hour at locations where pedestrians and cyclists cross. An accessible facility for pedestrians and cyclists is mandatory on roads if speed limits are above 50 kilometers per hour (GRSP 2008).

Resources

- Streets for Walking and Cycling is a guide to create safe and accessible environments for pedestrians and cyclists with successful examples from local and international contexts (Kost et al. 2018).
- The purpose of Austroads Guide to Road Design is to support designers with a framework that supports design efficiency, consistency, and road user safety (Austroads 2017).
- The Guide to Integrating Safety into Road Design focuses on safe road and roadside design elements, and complementary changes to road networks to improve speeds, vehicle safety, road user behavior, and postcrash care (Mitra et al. 2021). See also: Table 1.16.

Table 1.16: Resources for street and nonurban road design.

No.	Resource	Organization, Year	Link
1	Streets for Walking and Cycling	ITDP Africa and UN Habitat, 2018	https://unhabitat.org/sites/default/files/2020/06/streets-for-walking-and-cycling.pdf
2	Guide to Road Design	Austroads, 2021	https://austroads.com.au/safety-and-design/road-design/guide-to-road-design
3	Guide to Integrating Safety into Road Design	World Bank, 2021	https://www.roadsafetyfacility.org/publications/integrating-safety-road-design



1.5 Reform legislation, standards, and regulations

Legislation, standards, and regulations are required for effective road safety management, safe road infrastructure, safe vehicles, and safe road use. The section focuses on regulations for Integrated multimodal transport and land use systems, safe road infrastructure, vehicles, and road use.

Integrated multimodal transport and land use systems

Orient spatial development plans and codes to encourage safe, sustainable modes of transport

Spatial development plans, codes⁷ must be oriented to encourage the use of active modes and integrated public transport. This can be done by planning for walkable urban blocks, mixed-income and mixed-use development with amenities and public open spaces in addition to reliable and efficient first and last mile connectivity.

The provision of off-street parking is to be linked to public transport frequency. In LMICs, equitable transit-oriented development can be encouraged through upgrading services and traffic calming in informal settlements located around frequent transit and augmenting amenities (ITDP 2022).

Safe road infrastructure

Institute accountability for road construction and maintenance

Road owning agencies must be held responsible for crashes due to poor design, construction and maintenance of footpaths, cycle tracks, roads, and related infrastructure. Governments must introduce or amend transport or road safety acts that institute accountability to the road owning agency, concessionaire or the contractor and sub-contractor responsible for the design, construction, and maintenance of the safety standards of roads, through penalties (WHO 2013).

Create and implement on-street parking management rules to regulate street space

Demand management measures such as on-street parking management can disincentivize private vehicles (Barter 2016). Cities should create PMAPs along with demand-based pricing and effective enforcement (Shah, Rajiv, and Jose 2022). These can be prioritized around frequent public transport nodes and the revenues reinvested into the neighborhoods.

Safe vehicles

Create and maintain a national register for vehicles

Through legislative measures, governments must set up a single-window national portal for motor vehicle registration and permits at the national, subnational, and local levels. Subnational governments must support the portal management with data related to vehicles, owner or user information, applicable permits. Certificates of fitness or roadworthiness, pollution, insurance, and permits, if required, can be linked to vehicle registration. This will help enforcement agencies in assessing unsafe and polluting vehicles.

Adopt vehicle safety standards

Governments should adopt general safety regulations for all motor vehicles, such as European Union that include buses and heavy commercial vehicles (European Union 2019). The global or national new car assessment program (NCAP) is mandatory for safety certification of cars. The norms include adult and child occupant protection, minimum testing speed at 64 kilometers per hour, and front offset as well as side impact crash requirements (Figure 1.4). The Global NCAP recommends a satisfactory safety rating for all vehicles irrespective of the models and makes (Global NCAP 2022).

Motorbike assessment protocols for bike motorcyclists/ two-wheelers are recommended, which include an antilock braking system (ABS), and improved helmets and gears for rider protection (ASEAN NCAP 2019). Helmets and gears may be subject to country-based standards or Department of Transport (DOT) in the US or Economic Commission for Europe (ECE) in

Europe. UNECE recommends countries and regions with snow and icy conditions to adopt UN Regulation of using studded tires for enhanced safety (UNECE 2022). Regulators should also

consider speed limits or alerts in commercial vehicles using safety devices (Bliss and Breen 2013).

Case examples

- General safety regulations include type-approval of all new vehicles, systems, components, high level safety of technology, and environmental performance (European Union 2019).
- Global NCAP covers adult and child occupant protection, minimum testing speed at 64 kilometers per hour, and front offset and side impact crash requirements (Global NCAP 2022). See also: Table 1.17.

Figure 1.4: Adult and child occupant protection rating.

ADULT OCCUPANT PROTECTION			CHILD OCCUPANT PROTECTION		
★ ★ ★ ★ ★ MAX. 17.00 Points			★ ★ ★ ★ ★ MAX. 49.00 Points		
STARS	SCORE	PROTECTION LEVEL	STARS	SCORE	PROTECTION LEVEL
★ ★ ★ ★ ★	14.00 - 17.00	Good Protection	★ ★ ★ ★ ★	46.00 - 49.00	Good Protection
★ ★ ★ ★	11.00 - 13.00	Adequate Protection	★ ★ ★ ★	37.00 - 45.99	Adequate Protection
★ ★ ★	8.00 - 10.99	Marginal Protection	★ ★ ★	25.00 - 36.99	Marginal Protection
★ ★	5.00 - 7.99	Weak Protection	★ ★	13.00 - 24.99	Weak Protection
★	2.00 - 4.99	Poor Protection	★	13.00 - 12.99	Poor Protection
	0.00 - 1.99			0 - 0.01	

Source: Global NCAP.

Table 1.17: Case examples of vehicle safety standards.

No.	Example	Organization, Year	Link
1	General Safety Regulations	European Union, 2022	https://ec.europa.eu/commission/presscorner/detail/en/IP_22_4312
2	Global NCAP	Towards Zero Foundation, 2022	https://www.globalncap.org/

Conduct regular maintenance and scrapping of vehicles

All motor vehicles are subject to renewal of fitness or roadworthiness certificates regularly and after

being involved in a minor or major road crash. Regulatory bodies must ensure mandatory scrapping for all motorized vehicles in case of expired registration or fitness certificate or roadworthiness.

Case example

The "Used Vehicles Programme" by United Nations Environment Programme (UNEP)

regulations should be considered (UNEP 2022) for used imported vehicles, especially in LMICs. See also: Table 1.18.

Table 1.18: Case example of maintenance for used vehicles.

No.	Example	Organization, Year	Link
1	Used Vehicles Programme	UNEP, 2022	https://www.unep.org/explore-topics/transport/what-we-do/regulating-used-vehicles

Create and maintain a national register of driving licenses

Governments should set up a national driver licensing portal and recommend linking it to the vehicle owner. It can effectively remove duplication of driving licenses in various states or provinces. Regulating agencies shall use unique driver identification numbers on driving licenses to register traffic offences and penalties.

In case of offenses leading to road crashes, the driving license of the offender —verified through digital evidence—must be linked to respective first information reports (FIRs). This will help enforcement agencies in identifying repeated offenders, introducing graduated penalties, and stringent punishments such as suspension or cancellation of license.

Reform the licensing procedure and renewal system

The driver licensing procedure must include a computer-based theory test, logged, and supervised driving lessons from an authorized driving school or practitioner, and standardized practical tests in addition to age and medical requirements. The theory should instill respect for all road users, especially pedestrians and cyclists, inform the potential driver of traffic laws and rules, penalties, and postcrash care.

A completion certificate of the theory test is mandatory to proceed to the practical test. On-road practical tests must incorporate knowledge of traffic rules and driving empathy for all road users. Agencies must suspend or revoke licenses of regular offenders—three or more in a year—in addition to progressive penalties.

Case example

A graduated licensing system is recommended for new drivers and those below 21 years (VicRoads 2017). Victoria, Australia introduced graduated licensing system in 2007–2008. This program consists of a mandatory 120 hours of supervised practice and one year probation extended up to four years. Between 2002 and 2014—including pre and post implementation—road crashes reduced 42.5 percent involving fatalities and

serious injuries of drivers aged 18 to 23 years (VicRoads 2017). It has also been implemented in several other countries such as Hong Kong, Sweden, and New Zealand. For other applicants, driving lessons may be limited up to 50 hours,⁸ which includes five driving hours at night (House of Commons 1988; Ministry of Justice 1993; South Africa Department of Transport 2012). See also: Table 1.19.

Table 1.19: Case example for graduated licensing system.

No.	Example	Organization, Year	Link
1	Graduated Licensing System	VicRoads, Victoria, Australia, 2008-09	https://www.vicroads.vic.gov.au/safety-and-road-rules/driver-safety/young-and-new-drivers/victorias-graduated-licensing-system

Promote and enforce the use of safety devices and in abiding traffic laws

The use of safety devices (seat belts, helmets) and following the traffic rules comes under a shared responsibility of the enforcement agency, rider or driver, and co-passengers. Vehicles should have inbuilt technology to alert users through repeated warnings for not using the safety devices. Additionally, two helmets could be provided at the time of the purchase of a two-wheeler—for the driver and pillion rider. Penalties related to registration of vehicles, traffic and parking violations, including driving or parking on footpaths or sidewalks and cycle

tracks, should be indexed to inflation, with progressive penalties for repeat offenders. Regulatory agencies must adopt digital systems for traffic management, detection of violations and penalty system; and ensure follow-up on fine collections. Effectiveness of enforcement measures is strongly related to the perceived chance of being fined. Authorities should adopt frequent and credible regulatory measures, while safeguarding equitable distribution of enforcement measures — such as disproportionate enforcement in low-income neighborhoods or two-wheelers and paratransit drivers, no racial or income profiling.

Case example

The motor vehicle rules in India, consist of traffic penalties that are indexed to inflation, accountability for road maintenance, and a good Samaritan law (MoRTH 2019). See also: Table 1.20.

Table 1.20: Case example of motor vehicle rule amendments for road safety.

No.	Example	Organization, Year	Link
1	The Motor Vehicles (Amendment) Act (No 32 of 2019)	Govt. of India, 2019	https://morth.nic.in/sites/default/files/notifications_document/MVpercent20Actpercent20English.pdf

Resource

“Strengthening road safety legislation: a practice resource manual for countries” provides guidance for decision makers and practitioners in road safety to adopt or modify transport or road safety legislation at national or subnational levels (WHO 2013). See also: Table 1.21.

Table 1.21: Resource to legislate road safety.

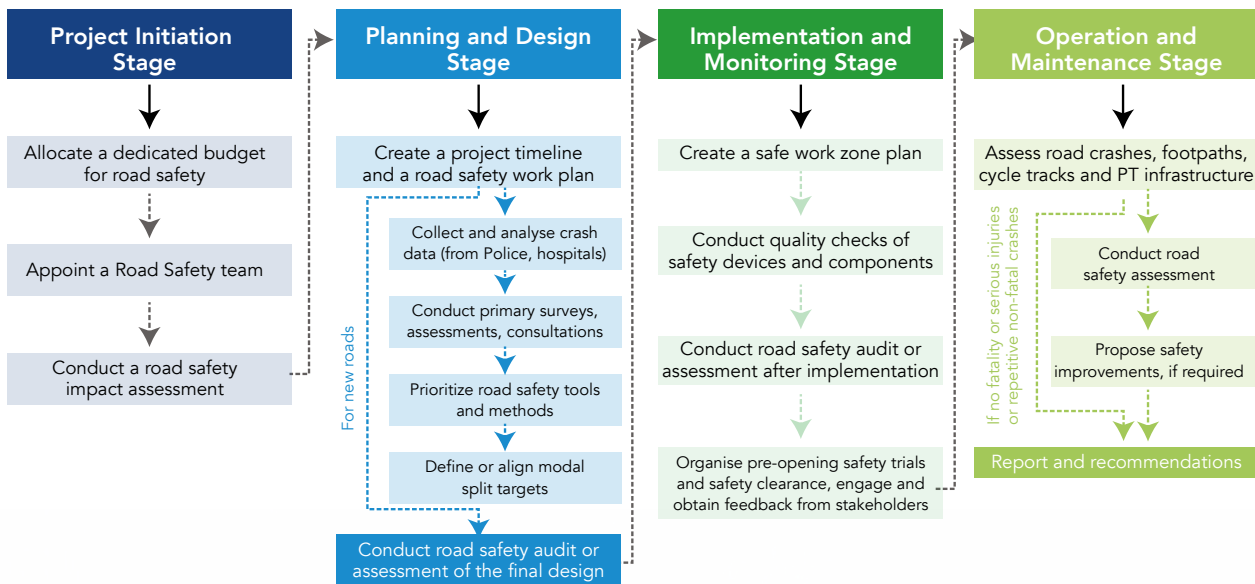
No.	Resource	Organization, Year	Link
1	Strengthening road safety legislation: a practice and resource manual for countries	WHO, 2013	https://www.who.int/publications/i/item/strengthening-road-safety-legislation

1.6 Incorporate the Safe System approach in street and nonurban road projects

Street and nonurban road projects—redesigned or new—undertaken by the road owning agency must include a process that incorporates the Safe System approach at various stages. It includes appointing a road safety team, stagewise assessments, trials, safety clearance, and long-term recommendations.

This section briefly describes activities during project initiation, planning and design, implementation and monitoring and operation and maintenance stages (figure 1.5; Appendix C). The project should ensure that sufficient time and resources are dedicated to stakeholder engagement throughout the process, and time must be set aside to obtain regular input from stakeholders, explain the rationale for the proposed changes, and manage expectations to build trust and support.

Figure 1.5: Process for mainstreaming road safety in road projects (streets and nonurban roads).



Resources

- Organizations and professionals can use the process and road safety tools recommended by gTKP (gTKP 2019), Directive (EU) 2019/1936 of the European Parliament, and star rating for designs.
- The African Development Bank (AfDB) has created road safety manuals (proactive approaches, reactive approaches and road safety audits) adapted to African conditions to assist road infrastructure safety practices in the continent based on the Safe System approach (AfDB 2015).
- Work zone safety guidelines are a collection of good practice solutions from various countries and contexts to ensure a safe environment for road workers, road users, and equipment. It also defines roles and responsibilities of each contributor in terms of safety tests, risk evaluation and traffic management (Eichinger-Vill, 2021). See also: Table 1.22.

Table 1.22: Resources to integrate road safety in street, and nonurban road projects.

No.	Resource	Organization, Year	Link
1	Road Safety Tools and Methods	gTKP (World Bank), 2019	https://www.gtkp.com/
2	Star Rating for Designs (SR4D)	iRAP, 2021	https://irap.org/star-rating-for-designs/
3	Directive (EU) 2019/1936 of the European Parliament and of the Council of 23 October 2019 amending Directive 2008/96/EC on road infrastructure safety management	European Parliament, 2019	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019L1936
4	Road safety manuals for Africa – proactive approaches	AfDB, 2015 (gTKP)	http://www.afdb.org/en/documents/document/road-safety-manuals-for-africa-existing-roads-proactive-approaches-51935/
5	Road safety manuals for Africa – reactive approaches	AfDB, 2015 (gTKP)	https://www.afdb.org/en/documents/document/road-safety-manuals-for-africa-existing-roads-reactive-approaches-51936
6	Road safety manuals for Africa – road safety audits	AfDB, 2015 (gTKP)	http://www.afdb.org/en/documents/document/road-safety-manuals-for-africa-new-roads-and-schemes-road-safety-audit-51937/
7	TEM Guidelines on Work Zone Safety	UNECE, 2021	https://unece.org/sites/default/files/2022-02/reduced_2118906E_web.pdf

Case examples

Under the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS), GRSF assessed 371 kilometers of roads in Brazil in Fortaleza and Sao Paulo using iRAP—which since 2019 is called BrazilRAP. Fifty-one kilometers of roads were redesigned after they were star rated. The project is estimated to prevent more than 15,900 potential deaths and serious injuries in the next 20 years (GRSF–BIGRS 2019).

Addis Ababa introduced the Safe Intersections Program in 2017, which focuses on infrastructure investments in crash hotspots around the city, with assistance from Global Designing Cities Initiative (GDCI). Through this plan, the city reclaimed more than 7,400 square meters of pedestrian space permanently through street transformation projects (GDCI 2022). See also: Table 1.23.

Table 1.23: Case examples of road integrated into street and intersection design.

No.	Example	Organization, Year	Link
1	BIGRS in Brazil (Fortaleza and São Paulo)	GRSF–BIGRS, 2015-19	https://www.roadsafetyfacility.org/success-stories/sustainable-road-safety-outcomes-brazil
2	Safe Intersection Program, Addis Ababa, Ethiopia	Addis Ababa City Administration and GDCI, 2017-2020	https://globaldesigningcities.org/wp-content/uploads/2022/03/Designing-Safe-and-Sustainable-Streets_GDCI_2022.pdf



1.7 Foster a security culture in public spaces and transport

Governments must focus on an inclusive approach (OECD 2015) to increase the effectiveness and acceptability of public transport modes. The safety of a transport system plays a significant role in women's mobility choices and behavior. Research from several countries suggests that women experience lesser safety and security in public places and on public transport (ITF, 2018).

Communication strategies to improve safety for women and gender minorities involves a survivor- centric grievance redressal system, encourage bystander intervention, reporting of sexual abuse and harassment, increasing women, gender minorities' share as service providers and communication systems for positive gender socialization.

Create a victim and survivor-centric grievance redressal system

Research indicates that 86 percent of women in Brazil face harassment in public places while 44 percent in public transport. However, less than 5 percent of women reported the harassment (ITF 2018).

There is a need to address gender-based violence (GBV) in public spaces and transport systems. A survivor or victim-centric grievance redressal system (GRS) is recommended (OECD 2021).

Case example

The local administration of Quito, Ecuador, created a platform called "Stop Harassment" in 2017 that allows people to report cases of sexual harassment in public transportation through short messaging service (SMS). It works on a feedback mechanism that alerts the driver, who then sets off an alarm within the bus before police intervention.

Survivors and victims receive support from psychologists, whereas offenders are convicted through the prosecutor's office (UN Women 2017). Sexual harassment on public transportation has decreased because of the regulation (UN Women 2022). See also: Table 1.24.

Table 1.24: Case example for preventing and addressing sexual abuse and harassment in public transport.

No.	Examples	Organization, Year	Link
1	Stop Harassment	City of Quito, 2017	https://unwomenusa.org/videos/quito-city-committed-preventing-sexual-harassment-public-spaces

Encourage bystander intervention in public spaces and in public transport

Bystanders are unlikely to intervene in crimes and harassment, or non-dangerous incidents, on public transportation (Fischer et al. 2011). Bystander intervention includes reporting an

incidence of sexual harassment, calling for emergency assistance, taking the survivor for medical help, nonconfrontational interventions, or providing support to the person facing sexual harassment.

Case example

- The call-it-out campaign in Victoria, Australia encourages bystanders to intervene safely and report harassment (State Government of Victoria 2019).
- The World Bank recommends driver and conductor training on nonconfrontational strategies (Gonzalez and Alves 2016).
- The Dakhal Do (Intervene) campaign by Breakthrough in India, encourages bystander action to reduce violence against women and girls in both public and private spaces (Breakthrough 2021). See also: Table 1.25 through the prosecutor's office (UN Women 2017). Sexual harassment on public transportation has decreased because of the regulation (UN Women 2022). See also: Table 1.24.

Table 1.25: Case examples of for encouraging bystander intervention.

No.	Examples	Organization, Year	Link
1	The call-it-out campaign	State Government of Victoria, 2019	https://blogs.worldbank.org/transport/no-one-helps-nadie-me-hace-el-paro-preventing-violence-against-women-public-transport
2	Dakhal Do campaign	Breakthrough, 2021	https://inbreakthrough.org/dakhal-do/

Encourage women, youth, gender minorities, and persons with disability to report harassment

In addition to bystander interventions, it is equally important to encourage victims facing harassment in public spaces to report it (Valan 2020).

Communicating cases of successful reporting and timely redressal is an effective way to convince the potential petitioners and encourage them to use grievance redressal systems.

Case example

The Report it to Stop it Campaign in London uses communication tools such as magazine and newspaper advertising, editorial partnerships in

buses and trains to educate the passengers on how to report harassment (TfL, 2021). See also: Table 1.26.

Table 1.26: Case example for encouraging reporting of sexual abuse and harassment.

No.	Examples	Organization, Year	Link
1	Report it to Stop it Campaign	TfL, 2021	https://tfl.gov.uk/info-for/media/press-releases/2021/october/new-campaign-launches-to-stamp-out-sexual-harassment-on-public-transport

Adopt a communication system for positive gender socialization

Communications in public transport and spaces must promote positive gender socialization messages as a part of creating an inclusive mobility system.

This includes questioning stereotypes and avoiding trivialization (EIGE 2019).

Case example

The City of Vienna introduced gender-sensitive language and branding in government forms, documents, telephone directories, texts on the intranet and the internet, advertising for events, folders, posters, films, and images used for public relations (City of Vienna 2008).

For example, their posters on the underground rail network, which aim to increase awareness on vulnerable passengers, represents men and women equally. See also: Table 1.27.

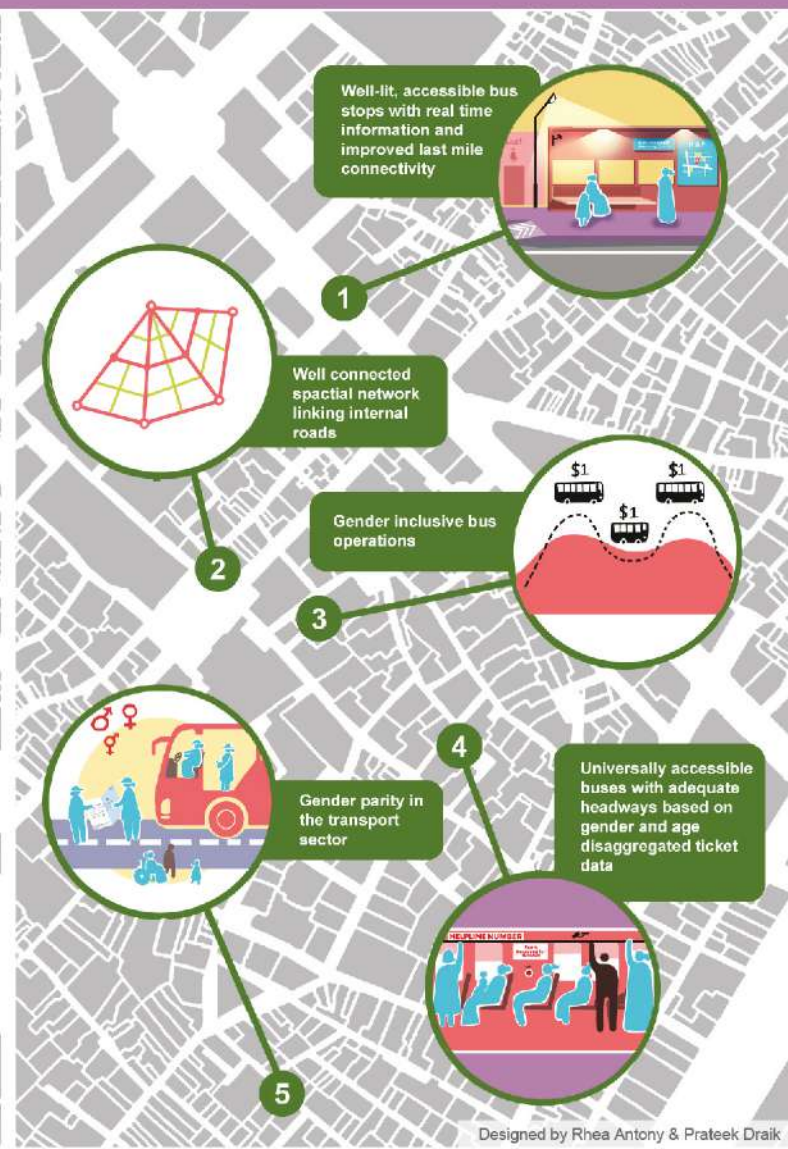
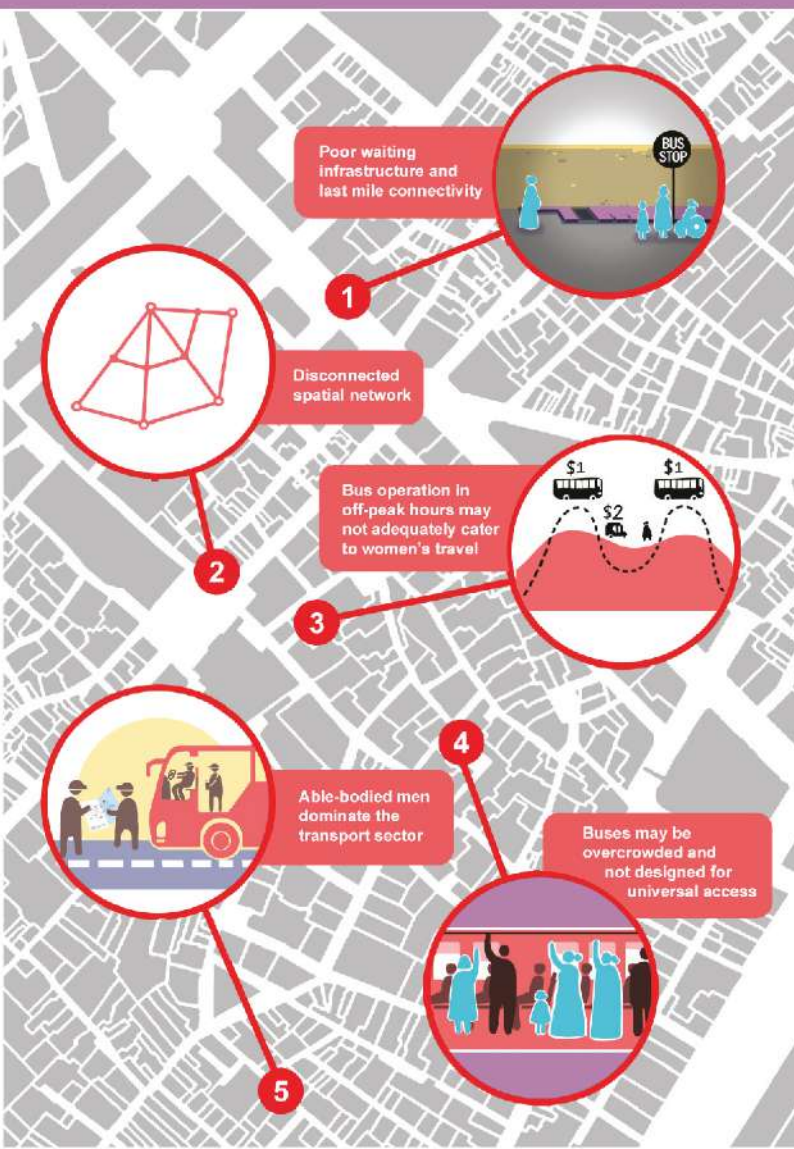
Table 1.27: Case example for positive gender socialization in mobility systems.

No.	Examples	Organization, Year	Link
1	Gender sensitive language	City of Vienna, 2008	https://www.wien.gv.at/english/administration/gendermainstreaming/

Notes

1. Per the Global Plan 2011–2020, five action areas included management, safe user, safe vehicle, safe road, and effective postcrash response. Road safety management is categorized as a crosscutting function that includes safe road infrastructure, safe vehicles, safe road use and postcrash response.
2. A government initiative (Kerala subnational government) to eradicate poverty and promote women's empowerment.
3. Congestion pricing has been implemented in cities such as Stockholm, Singapore, and London. It has been implemented in city centers or CBDs to ease traffic congestion by providing consumers with incentives to prioritize travel, avoid trips of low value, or use other modes of transportation (GIZ and ADB, 2015). It is recommended that low- and middle-income countries institute effective on-street parking management systems in place and regulate street use as a priority.
4. Speed limits above 30 kmph are considered an exception and urban local bodies must justify the need for higher speed limits.
5. This needs to be evaluated based on the impact and degree of enforcement.
6. These are segregated from the carriageway with curbs or barriers.
7. And where relevant other urban planning legislation, such as town planning acts.
8. Some states in Australia and the US – 50 hours, Brazil – 45 hours, most LMICs - none.

GENDER AND BUS TRANSPORT: KEY ISSUES AND RECOMMENDATIONS



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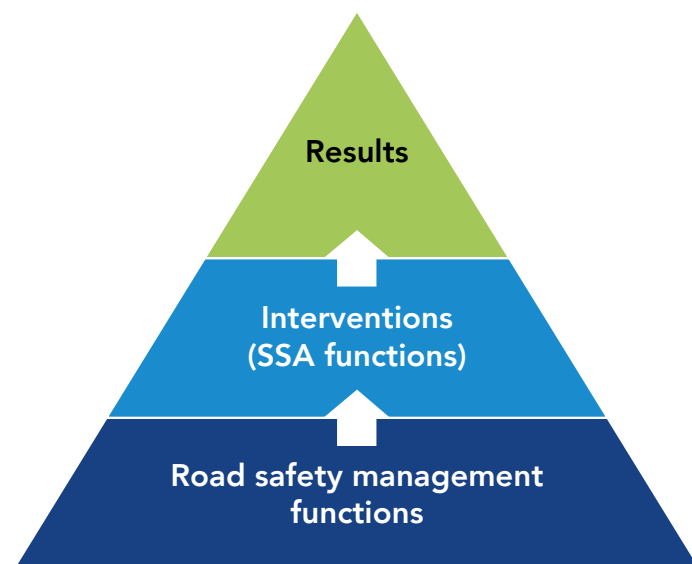
2. BUILD CAPACITY ON THE SAFE SYSTEM APPROACH



A shortage of dedicated road safety research institutions, qualified road safety experts, funding, and training programs plagues LMICs (WHO 2015a; Bhalla and Shotten 2019). Road safety is addressed in isolation and not explicitly embedded in transport planning, urban planning, and design (McIlroy et al. 2019). The availability of reliable and disaggregated road safety data remains a challenge in LMICs. Road safety policies, programs, and interventions do not acknowledge a gender perspective (ADB 2013), and universal accessibility (Handicap International 2016). This can be attributed to road safety management gaps, which is unable to develop the required institutional capacity and interventions at the national, subnational (Bliss and Breen 2013), and local levels.

Additionally, the expertise required to implement the Safe System approach in road projects is insufficient at various levels in government and nongovernment organizations. Countries need to establish or strengthen a robust road safety management system at various levels to enable planning, designing, and implementing evidence-based interventions that bring about systemwide results (Assessing the Maturity of National Road Safety Management Systems 2023). Since road safety management varies across countries, a capacity development approach must be based on the starting point of a country, province, or city and include an assessment at three levels: institutional management functions, interventions, and results (figure 2.1).

Figure 2.1: Framework for road safety management.



Source: Adapted from Bliss and Breen, 2013; ADB, 2023.

Note: SSA refers to the Safe System approach.

2.1 Develop capacity amongst decision makers on the Safe System approach

Capacity development programs should assess existing capabilities and outline the expected learning outcomes, measurement indicators, and source of evidence (table 2.1).

Such programs are to be conducted on a regular basis. The learning outcomes range from an increased awareness of the Safe System approach to its implementation. The proposed capacity development framework is based on the Global Plan 2021–2030.

Table 2.1: Expected learning outcomes, measurement indicators, and sources of evidence.

Capacity Development	Areas	Measurement indicators ^a	Evidence
Increased awareness	Safe System approach and its difference from previous approaches to road safety	Number and share of participants reporting increased awareness of the Safe System approach	Feedback from participants
Enhanced skills	Technical ^b Project management Consensus building and collaboration	Share of trained staff	Data from the respective agencies Certification for specialists
Improved coordination and consensus	Improved coordination between different stakeholder agencies and departments	Regular interagency meetings are conducted Share of respondent stakeholders who agree and are in alignment with the decisions undertaken	Minutes of coordination meetings Interviews with stakeholders
Fostered partnerships with nongovernment actors	Inform, consult, and partner with nongovernment organizations to leverage their strengths in implementing the Safe System approach.	Share of non-government participants in decision-making, and events Information and consultation meetings organized with nongovernment actors and follow-up actions	List of members in the decision-making forums and events Minutes of meetings
Formulated policies, strategies, plans, and projects	Includes road safety, transportation, and urban development	Official documents	Official document available on the website or obtained from the respective agency
Implemented policies, strategies, plans, and projects	Outcomes assessed by age, gender, ability, and moving toward Zero road crash fatalities and serious injuries. Improved perception of safety and security for pedestrians and public transport users, retained and increased mode shares in walking, cycling, and integrated public transport	Regular monitoring of the progress of implementation toward the outcomes	Information from the nodal agency

Notes:

a. These should be disaggregated by gender, where relevant.

b. These include skills required by specialists (Section 3.4).

Source: Adapted from Otoo, Agapitova, and Behrens, 2009.

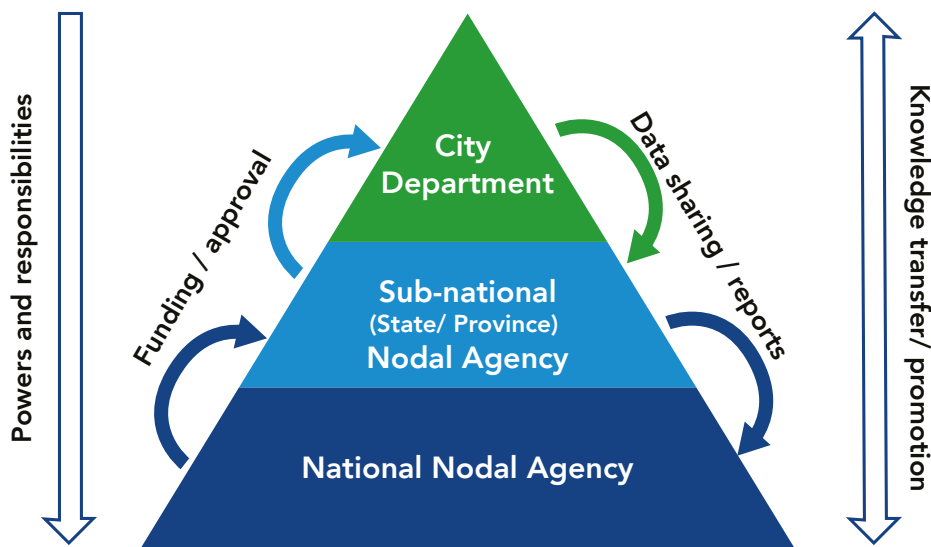
The capacity development framework outlines level of expertise required for each function of the Safe System approach, depending on primary responsibilities of agencies¹ (table 2.2), with a detailed description of roles (Appendix D).

The key agencies in road safety are the transportation ministry or department, urban planning and development, police,² nonurban roads, vehicle registration, and safety standards, health and social care, and education.

- **A nodal agency**—the transport ministry or department—is a prerequisite for efficient road safety management. It must also possess necessary control and influence over other government institutions to deliver timely outputs (World Bank 2015). Its role is to foster leadership and set goals toward the Global Plan 2021–2030 for road safety, align government agencies horizontally and vertically and collaborate with nongovernment partners to achieve these, mobilize financial and human resources, reform legislative

instruments, develop evidence-based performance monitoring systems, encourage research and development and knowledge transfer. It also anchors capacity development requirements at national, subnational, and city levels (figure 2.2) (Bliss and Breen 2013; Small, Jordan, Anyala, and Shelton 2023). The nodal agency requires an advanced understanding of all the action areas along with managing and coordinating road safety actions amongst government and nongovernment stakeholders.

Figure 2.2: Nodal agencies at different scales of government.



Source: Adapted from Bliss and Breen, 2013; ADB, 2023.

- **The urban planning and development ministry** is responsible to prepare or guide the preparation of urban mobility plans and statutory land use plans. Therefore, it requires an advanced understanding of how to plan, finance, and manage multimodal transport systems, connected with city planning, and designing complete streets.
- **The police department** may hold responsibility to manage intersections in some instances, enforcing traffic rules, and approve street design and nonurban road projects. They are trained in maintaining law and order and may not have received prior training on road safety. Hence, their capacity development should cover designing for safer roads, vehicles, and effective enforcement.
- **The health and social care department or ministry** plays a significant role to plan and enable access to emergency care, affordable health care, and insurance, addressing the

socioeconomic burdens imposed on lower-income groups, and women as caregivers of road crash victims.

- **The education department** or ministry plays a role in increasing awareness among teachers, parents, children, and youth on road safety, and should include awareness of the Safe System approach and how youth can become advocates for change.
- **Road-owning agencies** require advanced knowledge on designing safer roads, prioritizing active travel and accessibility, the role of safe speeds, and traffic calming measures.
- **Metropolitan authorities** are responsible for formulating transport and urban development policies and plans within the larger purview of national or subnational frameworks and implementation. This requires an advanced understanding of all the action areas.³

- The report provides an outline for basic and advanced understanding of the Safe System approach. A basic program aims to inform and increase awareness of the Safe System approach concepts and relevance in the specific country or city, and the shift required from traditional approaches to road safety. Additionally, it provides a preliminary understanding of the technical, project management skills, coordination,

and collaboration required to achieve it. An advanced program will need to build on a capacity assessment to equip practitioners with the methods and tools required to translate concepts into contextual recommendations (tables 2.2 and 2.3). Interactive lectures, workshops and games, and field visits can be explored to engage participants.

Table 2.2: Capacity development framework for decision makers (system designers).

Target audience	Primary responsibility	Road safety management ^a	Multimodal transport and land-use planning	Safe road infrastructure	Safe vehicles	Safe road use	Postcrash response
Decision makers at the national and subnational levels							
Nodal or Lead Agency ^b	Coordination and road safety management						
Urban Planning and Development	Urban mobility and city planning						
Police	Enforcement, approval, traffic management						
Road Owning Agencies	Design of streets and nonurban roads						
Health and Social Care	Emergency care, affordable access to health care, insurance						
Education Department	Education						
Decision makers at the local level							
Decision makers	Policy formulation, implementation						
Legend: Advanced							
Basic							

Notes:

- a. Road safety management is a cross-cutting function of the Safe System approach.
b. This may be under the purview of the transport ministry or department.

Table 2.3: Proposed themes to be covered in basic and advanced programs.

Themes covered in a basic program	
Introduction to the Safe System approach	<ul style="list-style-type: none"> • How has the Safe System approach evolved—accidents, crashes, and shared responsibility? • What are national and international commitments and agreements? • Why is the Safe System approach important and relevant to achieving vision zero? What is the shift from the traditional approach to road safety? And what are the underlying principles and action areas of the Safe System transport and land use planning? • What are emerging and good practices in the implementation of the Safe System approach in high-income countries, upper- and middle-income countries, and LMICs at the national, subnational, and local levels?
Road safety management in the Safe System approach	<ul style="list-style-type: none"> • What are the elements of an effective road safety management system? How can it be strengthened at national, subnational, and local levels? • Who are the key stakeholders or partners in the efficient management of the Safe System approach and how do we ensure coordination among them? • What is the road safety context in the country in road safety management? • What are the challenges and gaps in the existing system under each function? How can these be addressed?
Themes covered in an advanced program	
Road safety management	<ul style="list-style-type: none"> • How should an effective road safety management system be developed around the Safe System approach? What are emerging and good practice case studies? • How can legislative mechanisms establish an effective road safety management system and other recommendations of the Safe System approach? • What institutional structures can ensure effective coordination, implementation, and accountability? • How can existing transport and urban development funds be leveraged proactively for road safety? What dedicated safety funding mechanisms are required and how can they be allocated for institutional management and interventions? • How can progress be monitored and evaluated through outputs and outcomes? • How should research, development, and knowledge transfer be encouraged? • What individual and institutional capacity development is required at national, subnational, and city levels? • How can a national database be created and maintained effectively, such that it collects and monitors demographic data by age, gender, ability, and mode?

Multimodal transport and land use planning	<ul style="list-style-type: none"> • How can cities plan for multimodal transport and land use planning using the Safe System approach, and what are emerging and good practice case studies? • How can development and mobility plans encourage safe, multimodal transport, and what are the amendments required in statutory frameworks and development codes? • What are low speed zones important in urban areas and how can they be integrated in mobility and spatial development plans?
Safe road infrastructure	<ul style="list-style-type: none"> • How should safe road infrastructure be designed and managed, within the Safe System approach, and what are emerging and good practice case studies? • How can street networks and right of way be planned and designed to manage speeds below 30 kmph? What are evidence-based speed calming measures for streets and nonurban roads? • How can streets and nonurban roads be designed to create safe environments for those most vulnerable to road crash fatalities and serious injuries, especially pedestrians and cyclists? What are forgiving roads? • How do streets and nonurban roads become secure and universally accessible for children, elderly, women, girls, gender minorities, and persons with disabilities? • How can pedestrian, cycling, public, and paratransit infrastructure be maintained and managed effectively? • How can demand management measures, especially on-street parking, be implemented?
Safe vehicles	<ul style="list-style-type: none"> • How should countries adopt a safe vehicle approach and what are emerging and good practice case studies? • How can legislation and standards ensure safe speeds and vehicles—buses, cars, light and heavy commercial vehicles, and three-wheelers and two-wheelers? • What are general safety regulations and how can they make vehicles safer for all road users and other vehicles? What are the state-of-the-art safety devices and technology in various vehicles? • What are new car assessment programs (NCAP) and how can cars be made safer over the years through NCAP? How can used or old vehicles be monitored, regulated, and scrapped? • How can adult, child and gender safety be incorporated into vehicle design and technology?
Safe road use	<ul style="list-style-type: none"> • How can licensing systems and enforcement ensure safe road users, and what are emerging and good practice case studies? • How should the existing licensing process (driving) be regulated to ensure safe drivers and how can a graduated licensing system be implemented at a national or subnational level? • What are evidence-based road safety interventions to enhance safe road use and how can they improve road user behavior? • How can traffic management and enforcement be strengthened to create safe environments for pedestrians and cyclists on streets and nonurban roads? • How can technology-based enforcement regulate curb use and encourage safe road use?

Postcrash response	<ul style="list-style-type: none"> • How should the postcrash response be a part of the Safe System approach, and what are emerging and good practice case studies? • What are the standard protocols for post-crash response in cities, rural areas. And remote locations? How can rapid medical response and transport; trauma centers and rehabilitation programs be ensured in such locations? • How can accredited postcrash care networks—basic and advanced emergency care, police—be established, and what kind of formal training is required for first responders? • How can the police and health departments coordinate in the pre- and post-crash period? • How can road users be encouraged to become good Samaritans and first responders?
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Resources

- GRSF has proposed a road safety management capacity framework that focuses on institutional management functions, interventions, and results, managing outcomes and improvement in the functioning of the lead road safety agency (Bliss and Breen 2013).
- ADB has proposed a framework to assess the maturity of the country in addressing road safety to tailor its capacity development program (Small, Jordan, Anyala, and Shelton 2023). <https://www.adb.org/publications/assessing-national-road-safety-management-systems>

Numerous successful programs deliver road safety knowledge, some of which are highlighted here.

- iRAP provides training for road safety practitioners for Road Assessment Program (RAP) and develops knowledge and abilities necessary to plan projects, manage, and assess them. It includes one-to-five-hour modules with assignments on programs and projects, star rating essentials, star ratings for designs and star ratings for schools (iRAP 2022).
- IRF provides training and certification schemes on road safety management and audits, road safety engineering, and road safety auditors and supports countries in setting-up their national training and accreditation scheme (IRF 2023).
- GRSP's Road Policing Capacity Building increases awareness and capacity of traffic police authorities to enforce legislation pertaining to major road safety risk factors in LMICs. The training modules are tailored to the participants' local context and address themes like speeding, drunk-driving, non-use or improper use of helmets, and non-use or improper use of seatbelts and child restraint systems (GRSP 2022).
- The John Hopkins International Injury Research Unit (JH-IIRU) and the Global Road Safety Partnership (GRSP) have trained more than 400 road safety professionals from 60 LMICs through the Global Road Safety Leadership Course, since 2016, supported by Bloomberg Philanthropies.
- Since 2012, the Monash University Accident Research Centre (MUARC) has developed and delivered a five-day Road Safety Management Leadership Program. Additionally, Delft University offers an annual hybrid road safety course, which includes six weeks of online modules followed by a five-day in-person interaction in Delft, Netherlands.

Table 2.4: Resources for successful capacity development programs on the safe system approach.

No.	Resource	Organization, Year	Link
1	Road Safety Management Capacity Reviews and Capacity System Projects	GRSF, 2013	https://www.worldbank.org/en/topic/transport/publication/road-safety-management-capacity-review-guidelines
2	Assessing the Maturity of National Road Safety Management Systems	ADB, 2023	https://www.adb.org/publications/assessing-national-road-safety-management-systems
3	Road safety training	iRAP, 2022	https://irap.org/training/
4.	Road Safety Management, Engineering and Audits Certification	IRF, 2023	https://irfnet.ch/event/regional-seminar-on-road-safety-audits-for-decision-makers-international-course-on-road-safety-engineering-and-audits-2/
5.	Road Policing Capacity Building	GRSP, 2022	https://www.grsproadsafety.org/programmes/road-policing-capacity-building/
6.	Global Road Safety Leadership Course	JH-IIRU and GRSP, 2016-to date	https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-international-injury-research-unit/education/capacity-development/training-programs/global-road-safety-leadership-course/
7.	Road Safety Management Leadership Program	Monash University Accident Research Centre (MUARC), 2012-to date	https://www.monash.edu/muarc/news-and-events/events/muarc-road-safety-management-leadership-program
8.	Annual Delft Road Safety Course	Delft University, ongoing	https://delftroadsafetycourses.org/annual-delft-road-safety-course/



2.2 Reorient certification courses for experts and specialists in road safety

Capacity building is also required to create a pool of experts to support decision makers at the national, subnational, and local levels (gTKP 2019),

- **A road safety coordinator** aims to coordinate between different members in road safety cells and be a nodal person for road safety management. Such a position may not be recognized as a specialized role, which would involve technical, project management, and negotiation skills.
- **A road safety specialist**—trained in the Safe System approach—leads planning and design of road networks, corridors, and addresses black spots. They will supervise road safety auditors, analysts, designers, and other specialists. Specialists may have a background in engineering with limited exposure. The Safe System approach would include an in-depth understanding of complete streets, forgiving roads, vulnerable road users, speed management and multimodal transport planning to create a safe environment.
- **A road safety auditor**—trained in the Safe System approach—coordinates and conducts road safety audits at various stages of the development stages of streets and nonurban roads in addition to supervising the road safety inspections. Road safety auditors are engineers trained in road safety audits, however, do not consider road use behavior. The Safe System approach would include understanding principles of complete streets, forgiving roads, vulnerable road users, and speed management while incorporating these into road safety audits to create a safer environment.
- **A road safety analyst**—trained in the Safe System approach—conducts multidimensional road safety assessments through data and research in road safety. Analysts also organize, disaggregate, and update the repository for crash data for research and public use. In LMICs, engineers and planners with analytical

development banks, international organizations, and the private sector. Table 2.3 provides the capacity development framework for specialists.

It is recommended that the courses on the Safe System approach be certified to ensure a consistent level of exposure and expertise, while prioritizing training on the most important parts. This includes forgiving roads, managing speeds, and creating safe environments with a priority toward pedestrians and cyclists.

skills perform the role of road safety analysts. They may not have expertise in assessing transport or road safety data and portal management. The Safe System approach would include a comprehensive knowledge of user centric, spatial data analytical tools, expertise in handling disaggregated crash data, and analytical skills based on age, gender, mode, and universal access.

- **A crash investigator**—trained in the Safe System approach—analyzes a crash that involves serious injuries or deaths and assesses the human and social costs of crashes, using evidence-based methods. Crash investigators may have engineering backgrounds in civil works, mechanical, or automobile engineering in many countries. Their understanding of driving behavior and street or road design is limited. The Safe System approach would incorporate an understanding of human psychology in terms of pedestrian and cyclist behavior, extensive knowledge of driving behavior in urban, rural, and hilly regions, vehicle safety from the perspective of adult and child occupants, and expertise in the interpretation of road and street design and principles.
- **A road design expert**—trained in the Safe System approach—designs safe and sustainable streets and nonurban roads for all users. They tend to be road or traffic engineers, or transport planners with an orientation toward designing roads for speeds and personal motor vehicles. The Safe System approach would entail designing complete streets, understanding countermeasures to maintain operational speeds at 30 kilometers per hour, and designing child-friendly streets and forgiving roads.

In addition to the basic and advanced learning, the certification courses for experts could focus on the tools and methodologies for implementing

the Safe System approach (tables 2.4 and 2.5). See also: Table 2.6.

Table 2.5: Capacity development framework for professionals and specialists focusing on the Safe System approach.

Target audience	Primary responsibility	Roadsafety management	Multimodal transport and land use planning	Safe road infrastructure	Safe vehicles	Safe road use	Postcrash response
EXPERTS							
Road Safety Coordinator	Coordination						
Road Safety Specialist	Management						
Road Safety Auditor	Safety audits						
Road Safety Analyst	Database and analysis						
Crash Investigator	Crash study						
Road Design Expert	Design and planning						
PROFESSIONALS							
Professional Courses							
Expert		Advanced		Basic			



Table 2.6: Additional skills required for experts.

Themes covered for specialization in each action area (for experts only)	
Road safety management	Design road safety programs at the national, subnational, and city levels, create a data repository, institutional framework for coordination, transparency, and accountability; budget sources and allocation; monitoring and evaluation (targets and performance indicators); research and knowledge transfer; institutional capacity development.
Multimodal transport and land use planning	Address the technical, regulatory, financial, and institutional aspects to plan, design, and maintain safe, integrated, and multimodal transport and land use systems; link the goals and targets of climate action, public and individual health with sustainable transport modes and system; concepts and practical knowledge of low-speed zones, 30 kmph speed limits, healthy and livable streets, and forgiving road system.
Safe road infrastructure	Exposure to and apply tools to design safe roads such as blackspot analysis and treatment, maintenance inspections, network or area analysis and treatment, road safety assessment, road safety audit, road safety impact assessment, road safety inspection, route or corridor analysis and treatment, work zone safety guidelines and star rating for designs (SR4D).
Safe vehicles	Learnings from general safety regulations, vehicle safety programs such as Global-NCAP or other NCAPs, used vehicles program, policies and regulations for vehicle scrapping, the role of state-of-the-art and future technology in vehicle safety, and the impact of safety system in vehicles.
Safe road use	Understand and implement intelligent transport systems for safe speeds, traffic signals and management, graduated licensing system, evidence-based safe road use behavior, signals for pedestrians and cyclists, technology led enforcement and follow-up.
Postcrash response	Implement good Samaritans law; establish coordinated mechanisms for postcrash response interventions and programs in cities, rural areas and remote locations; operationalize rapid medical response and transport; establish trauma centers and rehabilitation programs; encourage first-responder interventions and conduct trainings; and introduce insurance policies that alleviate the burden on lower-income groups and caregivers.



Resources

- The global Transport Knowledge Practice (gTKP) provides a range of infrastructure safety management methods. Approaches have been created to assess, prioritize, and keep track of the performance of road infrastructure safety for road safety professionals (gTKP 2019).
- The Road Safety Capacity Building Programme by GRSP and iRAP provides technical knowledge into the development of the Safe System approach for road safety professionals. The program covered four modules in the training—road safety leadership and management, safer road users, safer roads and mobility, and safer vehicles, each covering up to five hours (GRSP and iRAP 2021).
- The World Bank and ADB—as part of a Bloomberg Philanthropies Initiative—conduct Road Safety Capacity Building Programme for Asia and the Pacific that is focused on safe road infrastructure (World Bank and ADB 2022).
- The Asia Pacific Road Safety Observatory, through its Road Safety Capacity Building Programme engages developing Asian country road safety staff and managers and technical practitioners with targeted initiative to build capacity and understanding in the application of the Safe System approach to road safety interventions (APRSO 2021).
- The Guidelines on Work Zone Safety, by the Trans-European North–South Motorway (TEM) Project and UNECE, provides good practice solutions and recommends work zone safety principles and measures (UNECE 2021). See also: Table 2.7.

Table 2.7: Resources to build capacity in road safety.

No.	Resource	Organization, Year	Link
1	Road Safety Tools and Methods	gTKP, 2019	https://www.gtkp.com/themepage.php?themepgid=375
2	Road Safety Capacity Building Programme	GRSP and iRAP, 2020-21	https://www.grsproadsafety.org/road-safety-capacity-building-programme/
3	Road Safety Capacity Building Programme for Asia and the Pacific (Webinar series)	World Bank and ADB, 2022	https://www.roadsafetyfacility.org/events/helping-save-lives-road-crashes-asia-pacific-webinar-series-safer-road-infrastructure-asia
4	Road Safety Capacity Building Programme	Asia Pacific Road Safety Observatory, 2021	https://www.aprso.org/event/road-safety-capacity-building-program
5	Guidelines on Work Zone Safety	UNECE, 2021	https://unece.org/sites/default/files/2022-02/reduced_2118906E_web.pdf



2.3 Introduce the Safe System approach in professional courses and for nongovernment audiences

Courses on the Safe System approach can be introduced in professional diplomas, and undergraduate or graduate programs in transportation planning, traffic engineering, road design, urban planning, and urban design. Additionally, journalists and nongovernment organizations (NGOs) can become powerful allies in advocating for the Safe System approach.

Resources

- GDCI trains journalists to focus on the media's role in changing the dialogues around creating safe streets and mobility in Indian cities and towns. The course is delivered in four parts that include an introduction to safer streets, safer streets for safer cities, safer streets for a safer India, and roles and resources (GDCI 2020). The guide to journalists and media professionals on how to report road safety is recommended for practice (WHO 2015b).
- Global Alliance of NGOs for Road Safety conducts capacity-building sessions for member NGOs in various road safety areas—safer streets, speed management and Safe System approach, NGO meaningful participation—to effectively plan and execute targeted advocacy activities.
- Australasian College of Road Safety has partnered with the Journal of Road Safety (JRS) to launch a new mentorship program, which offers support for road safety experts in LMICs to build their capacity (ACRS 2022). See also: Table 2.8ures (UNECE 2021). See also: Table 2.7.

Table 2.8: Resources for capacity development of journalists and NGOs.

No.	Resource	Organization, Year	Link
1	Capacity development program for journalists	GDCI, 2020	https://globaldesigningcities.org/2020/10/29/bigrs-journalist-training-program/
2	Guidance for Journalists	WHO, 2015	https://apps.who.int/iris/bitstream/handle/10665/179826/9789241508933_eng.pdf?sequence=1&isAllowed=y
3	Capacity-building sessions for NGOs	Global Alliance of NGOs for Road Safety, 2015	https://www.roadsafetyngos.org/what-we-do/areas-of-work/capacity-building/

Notes

1. Agency refers to a government department or ministry.
2. And in some cases, the judiciary if feasible.
3. Except safer vehicles, the regulations for which are usually established at the national level.

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3. INCREASE AWARENESS TO BUILD SUPPORT TO IMPLEMENT THE SAFE SYSTEM APPROACH



Road crash fatalities are the major cause of death among children (WHO 2018; WHO 2021), young people of ages 5 to 29 years, and ranks eighth as the leading cause of death overall. In LMICs, a large share of child crashes and injuries are experienced when walking on roads with fast and mixed traffic (Turner, Job, and Mitra 2021). School children are often forced to walk in these unsafe environments as other modes become unaffordable (Global Alliance of NGOs for Road Safety 2020).

The traditional approach to road safety holds road users accountable for traffic collisions owing to their risk-taking behavior, and places responsibility on road users to protect themselves to avoid crashes. As a result, decision makers continue to focus on advertising campaigns, education, and raising awareness amongst road users. However, evidence has indicated that these have not yielded results in reducing road crashes, fatalities, and injuries. Such an approach ignores how the built environment influences users' travel behavior and choices (WRI 2018). Additionally, women and gender minorities' security in public spaces and transport has not received adequate attention, even though women may be a majority of public transport users in many countries. Women are also five times more likely than men to get trauma injuries and have a 47 percent higher chance of

having serious injuries in crashes (Burlacu and Carvajal 2021).

The Safe System approach presents a paradigm shift from the traditional approach to road safety. It is based on the principle that humans make mistakes that may lead to crashes and that humans have a limited ability to bear harm. The most effective way to prevent traffic deaths is a systemic approach whereby system designers share the responsibility to create safe road environments, rather than address issues separately.

Road safety strategies and interventions, therefore, should not be treated in isolation (McIlroy et al. 2019). Behavior change can be achieved by implementing the Safe System approach. The Global Plan, 2021–2030, underscores the importance of safe, integrated land use and transport systems that reduce vehicle kilometers traveled, speed management, complete streets and safe nonurban roads, enhanced vehicle technology, improved enforcement, reformed licensing systems, and upgraded emergency interventions. It also emphasizes addressing gender differences in the design and construction of transport infrastructure and universal accessibility (WHO 2021).

3.1 Raise road safety awareness

Decision makers must raise awareness and build broad-based support among nongovernment stakeholders and communities to implement the Safe System approach. Some strategies include

linking climate action and public health with road safety, a children-first approach, humanizing road safety, highlighting the economic and social costs of road crashes and fatalities, and involving active and vulnerable road users and emphasis on gender safety and universal accessibility. These can also be used by nongovernment organizations to build political will for road safety (EASST 2022; Brondum et al. 2022; Global Alliance of NGOs for Road Safety 2021) as outlined in Section 3.2.

Connect and communicate the importance of road safety in climate action, individual and public health

By nudging active mode use and moderating motorized traffic speed, implementing the Safe System approach can support achieving climate targets and improving individual and public health.

Aligning the visions of global climate action, road safety and communicating the same can provide an additional push for implementation (Sakashita and Job 2016; WRI 2018; Job and Mbugua 2020).

Case example

The healthy streets approach adopted by Transport for London linked safe walking, cycling, and public transport use to physical and mental health benefits (TfL 2017). See also: Table 3.1.

Table 3.1: Case example of road safety and public health connected in the healthy streets approach.

No.	Examples	Organization, Year	Link
1	Healthy Streets	Transport for London, 2017	https://tfl.gov.uk/cdn/static/cms/documents/healthy-streets-for-london.pdf

Adopt a children-first approach

Campaigns that highlight safe environments for children can be a starting point to underscore that neighborhoods that are safe for children are safe for all (ITDP 2022).

Safe school zones ensure lowering child fatality through low-speed precincts, traffic calming measures, and enforcement.



Case examples

- South Korea's School Zone Improvement Project helped reduce child fatality by 95 percent in more than two decades through safe operation of school buses, initiating road safety education in the curriculum, collaborating with civic groups to prepare a legal framework, and road design and improvement (Jaehoon et al. 2014).
- In 2012, Amend¹ launched School Area Road Safety Assessments and Improvements (SARSAI) in Tanzania, an evidence-based package of road safety interventions with support from the FIA Foundation. For each school zone, they built additional footpaths

or sidewalks, zebra crossings, bollards, and speed calming measures in an effort to decrease crash fatalities and serious injuries. The program resulted in 26 percent decrease in traffic injuries in school zones with the interventions (Poswayo et al. 2018).

- Reducing risks on roads should not be limited to school zones alone. An example of using the children-first approach is the "Stop de kindermoord" (Stop child murder) campaign, a social movement, in the 1970s in the Netherlands. Over decades, the paradigm shift stimulated by the protests has reduced road fatalities in the country by 82 percent from 3200 in 1972 to 572 in 2021 (SWOV 2022). See also: Table 3.2.

Table 3.2: Case examples of children-first approaches.

Sno	Examples	Organization, Year	Link
1	South Korea's School Zone	The Korea Transport Institute, 2014	https://www.koti.re.kr/component/file/ND_fileDownload.do?q_fileSn=4948&q_fileId=20140423_0004948_00150840
2	SARSAI programme, Dar es Salam, Tanzania	Amend, FIA Foundation, 2012	https://injuryprevention.bmj.com/content/25/5/414 https://prizeforcities.org/project/sarsai
3	Stop de kindermoord (Stop child murder)	The Netherlands, 1972	https://www.dutchreach.org/car-child-murder-protests-safer-nl-roads/

Personalize the impact of road safety

Road safety is usually communicated in data and risks becoming a statistic. The impact of deaths

and severe injuries should be personalized, in addition to computing and presenting individual economic and social costs.

Case example

Messages can make an impact by depicting demonstrative stories by Transport Accident

Commission Victoria (Man on the Street 2020) and Global Road Safety Facility (Effective Delivery of Global Road Safety Solutions 2020). See also: Table 3.3.

Table 3.3: Case examples of campaigns to personalize the impact of road safety.

No.	Examples	Organization, Year	Link
1	Man on the Street	Transport Accident Commission Victoria, 2020	https://www.youtube.com/watch?v=k2tOye9DKdQ
2	Effective Delivery of Global Road Safety Solutions	GRSF, 2020	https://www.youtube.com/watch?v=4TUK74Uil_I&t=65s

Communicate the economic and social costs or benefits of pedestrians, cyclists, and public transport users

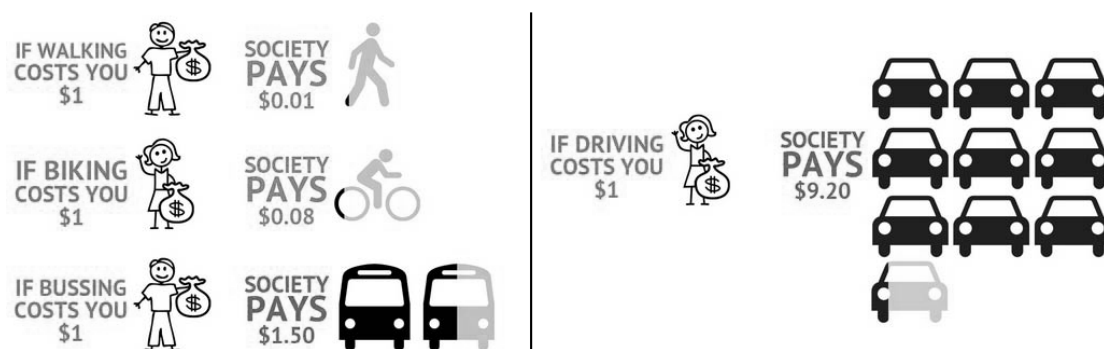
Project preparation documents in LMICs must include economic and social benefits for walking, cycling, and using public transport modes in cost-benefit analysis (CBA). Research suggests that

vehicles or cars impose costs related to emission, noise, travel time, congestion, and crashes for each kilometer driven, whereas walking and cycling can add benefits (Gössling et al. 2018). Dissemination messages through media and campaigns should highlight the benefits of active travel than time savings by motor vehicles.

Case examples

- International Institute for Sustainable Development (IISD) conducted an economic evaluation of the nonmotorized transport plan in Coimbatore city, in South India, using the Sustainable Asset Evaluation (SAVi) methodology.² This included estimating environmental, social, and economic benefits and avoided costs incurred as a result of NMT network, in addition to investment costs. The largest benefit of the network is the reduced number of fatality events and number of traffic crashes, saving INR 30,144 million, cumulatively over the project period from 2022 to 2052 (Kapetanakis et al. 2023 forthcoming).
- The city of Vancouver publicized the social, environmental, and economic benefits of cycling and walking as a part of its marketing campaign on promotion and enabling of active transportation (City of Vancouver 2013). The cost of commute calculator is an interactive tool, which estimates the cost of traveling in Vancouver. Figure 3.1 shows a comparison of transport costs for various modes—walking, cycling, bus, and car—and their corresponding social costs incurred by the taxpayers. Walking and cycling benefit society, whereas society bears the cost of personal motor vehicle use. See also: Table 3.4.

Figure 3.1: Comparison of transport and social costs.



Source : <https://streets.mn/2015/04/03/chart-of-the-day-social-vs-individual-mode-costs/>

Table 3.4 : Case examples of estimating the social, environmental, and economic benefits of active transportation.

No.	Examples	Organization, Year	Link
1	A Sustainable Asset Valuation of NMT in Coimbatore, India	Coimbatore City Municipal Corporation, 2023 (Forthcoming)	https://www.iisd.org/savi/using-systemic-approaches-and-simulation-to-support-transformation-toward-sustainable-mobility/
2	Enabling Active Transportation	City of Vancouver, 2013	https://vancouver.ca/files/cov/active-transportation-promotion-and-enabling-full-plan.pdf

Increase understanding of gender and universal access

Women, gender minorities, and persons with disabilities often face security risks in public spaces and transport (ADB 2013; United Nations 2015).

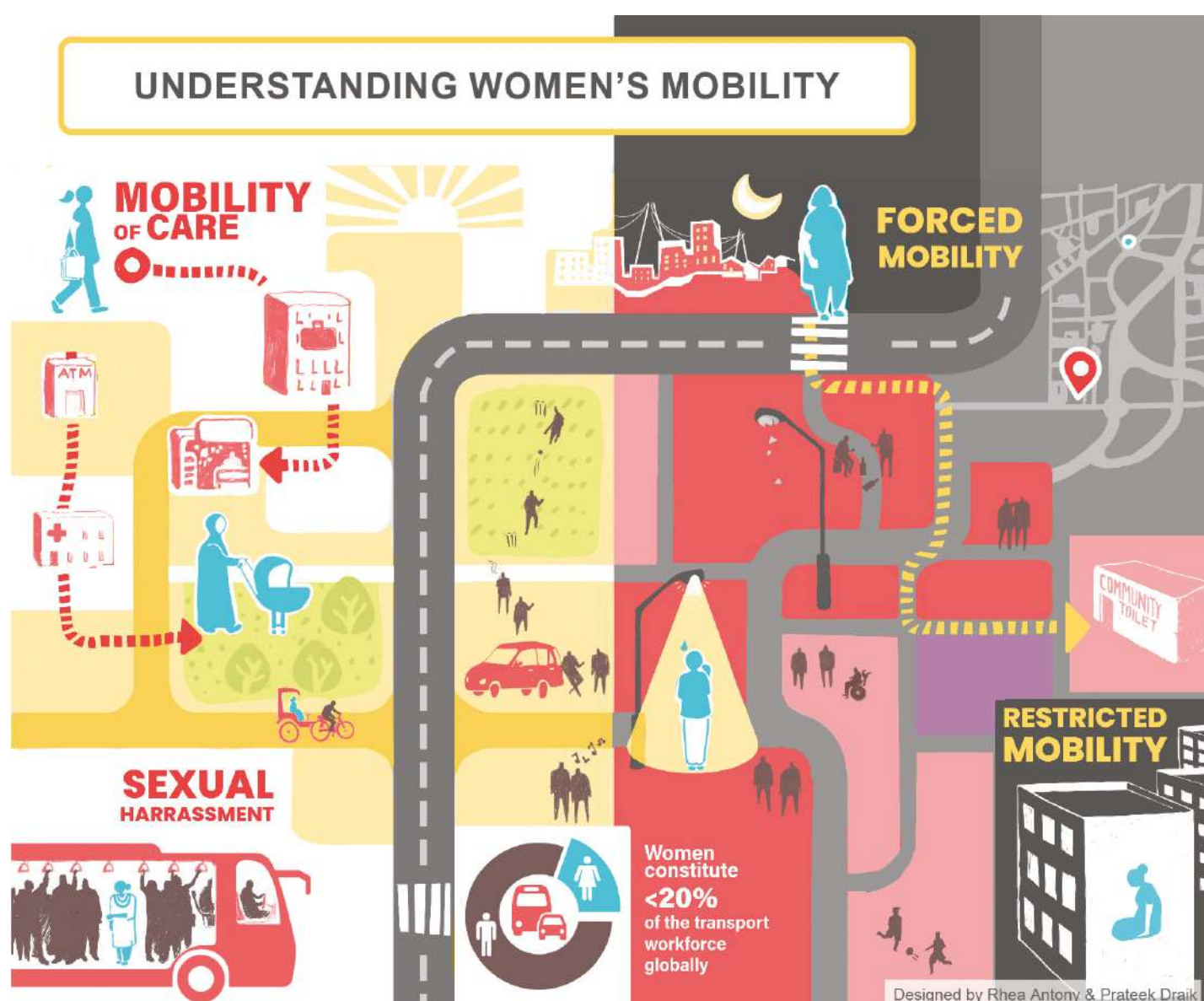
It is necessary to increase understanding by collecting gender, age, and ability disaggregated data on mobility patterns, road use, safety, and security (Obe 2019).

Case example

The Transformative Urban Mobility Initiative (TUMI) is working in three African cities to address the gender data gap in urban mobility (Baskin and Guskowski 2021). See also: Table 3.5.

Table 3.5: Case example of addressing the gender data gap in mobility.

No.	Examples	Organization, Year	Link
1	Gender data gap in urban mobility	Transformative Urban Mobility Initiative, 2021	https://www.transformative-mobility.org/assets/publications/Bridging-the-gender-data-divide-in-African-cities.pdf



3.2 Make information publicly available on projects and policies and promote their road safety value

Public and stakeholder acceptance of policies, strategies, plans, and projects is important for political support (Saylor Academy 2012). Therefore, it is important to make road safety information publicly accessible from the inception stage and

demystifying information. This can increase community involvement and support. Simultaneously, nongovernment organizations can play a key role in advocating for government accountability.

Equip nongovernment organizations to advocate for evidence-based action

Nongovernment organizations can improve government accountability in steering funding toward and implementing evidence-based interventions (Brondum et al. 2022). NGOs can advocate with governments to meet all that they

are accountable for (Global Alliance of NGOs for Road Safety 2023a). The Global Alliance of NGOs for Road Safety plays a vital role in supporting and equipping NGOs to advocate effectively (Global Alliance of NGOs for Road Safety 2022).

Resource

- The Alliance Accountability Toolkit, prepared by the Global Alliance of NGOs for Road Safety, is a set of practical tools that empowers nongovernment organizations to hold their governments accountable for the safety of all road users. See also: Table 3.6.

Table 3.6: Toolkit to improve government accountability in road safety.

No.	Resource	Organization, Year	Link
1	Alliance Accountability Toolkit	Global Alliance of NGOs for Road Safety, 2023	https://www.roadsafetyngos.org/toolkit/

Present transport and road safety projects and policies in the inception stage

Dialogues with the public not only build trust in the system but also avoid conflicts of interest through negotiations (Schmidhuber, Ingrams, and Hilgers 2020). Town halls and public hearing

platforms are some ways to ensure participation from civil society and private organizations at the inception stage of transport and road safety policies, strategies, plans, and projects. The public engagement should extend to policy or strategy or plan amendments and throughout the project stages.

Case examples

- The Open government partnership (OGP) is a large partnership with thousands of civil society groups as well as members at the national and local levels. Through the partnership, these stakeholders collaborate to design two-year action plans that include specific pledges on a variety of subjects. The OGP has members from 77 nations and 106 local administrations, including several countries in LMICs, totaling more than two billion people. One of the partnerships in Bogota, led by Secretariat of Mobility and other district entities, engaged civil society organizations and citizens through Bogotá an open digital government platform. This platform enabled real-time data on progress of actions and projects related to mobility and road safety (OGP 2022).
- Rwanda Governance Board (RGB) has implemented projects to promote good governance and empower residents to play a role in national development. The Deepening Democracy and Accountable Governance (DDAG) project aims to increase access to public information, use evidence-based information for planning and decision making and ensure gender parity in leadership. This is for timely delivery of projects and public services. It covers all public projects including transport, road or street development and public transport (RGB 2013). See also: Table 3.7.

Table 3.7: Case examples of civil society participation and involvement in transport and road safety initiatives.

No.	Example	Organization	Link
1	Open Government Partnership	Govt. of Colombia (Multiple countries)	https://www.opengovpartnership.org/members/bogota-colombia/commitments/COBOG0002/
2	Deepening Democracy through strengthening citizens' participation and Accountable Governance (DDAG)-Project	RGB, Government of Rwanda, 201318	https://www.rgb.rw/1/projects

Demystify safe and sustainable mobility concepts

Transportation and road safety concepts, policies, and laws may not be easily understood by the public. They may be unaware of the principles of the Safe System approach, sustainable safety

(SWOV 2018) and its implementation experience in LMICs, which may build social acceptance. Demystifying safe and sustainable mobility concepts through user- friendly graphics, videos, and messages can avoid such misinterpretation.

Resource

A parking myth buster was created to sensitize users about parking concepts related to parking pricing, on-street and off-street parking (Kost, Rohini, and Gadepalli 2015). See also: Table 3.8.

Table 3.8: Resource to demystify concepts related to parking.

No.	Resource	Organization, Year	Link
1	Parking myth buster	ITDP, 2015	https://www.itdp.in/resource/parking-basics/



Notes

1. Amend is a non-profit organization operating in Ghana, Mozambique, Tanzania, and other Sub-Saharan African cities.
2. SAVi is an assessment methodology that provides policymakers and investors with a comprehensive and customized analysis of how much their infrastructure projects and portfolios will cost throughout their life cycles, considering risks and externalities that are overlooked in a traditional valuation.

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4. PRODUCE AND SHARE KNOWLEDGE ON GOOD PRACTICES



It is critical to produce and share knowledge on emerging and good practices from LMICs and implementation processes of the Safe System

approach to motivate bold action by decision makers. These resources can also be used in capacity development programs.

4.1 Build and share regional evidence from low-and-middle income countries

Limited evidence or evidence base hinders informing transport investments in low-income countries. The Foreign Commonwealth & Development Office (FCDO) of the UK government funded a five-year High-Volume Transport (HVT) Applied Research Programme to address the knowledge gap for sustainable transport development in low-income countries in Sub-Saharan Africa and South Asia (HVT 2022).

Of its six priority areas, one focuses on inclusion, gender, and road safety. A preliminary key word search with the term “safety” yielded 21 publications on the state of knowledge on road safety in low-income countries, infrastructure toolkit for safe nonmotorized infrastructure, women’s safety and security in public transport among others. The gTKP—a platform to access knowledge and expertise particularly for LMICs supported by the FCDO—was also updated through an emergency fund created after the onset of the COVID-19 pandemic (IRF 2022).

Resource

Australasian College of Road Safety publishes the Journal of Road Safety (JRS), which offers a mentorship program (Australasian College of

Road Safety 2023). It supports authors from LMICs to build and document road safety evidence in their countries. See also: Table 4.1.

Table 4.1: Resources for building knowledge in sustainable transport development in LMICs.

No.	Resources	Organization, Year	Link
1	High-Volume Transport Applied Research Programme	UK Aid, 2018-to date	https://transport-links.com/
2	Platform for researchers	Journal of Road Safety	https://journalofroadsafety.org/

4.2 Encourage peer learning on the implementation process

Peer learning among cities and countries can be effective in understanding the process of

implementation, resistance, and negotiations in implementing the Safe System approach. Global road safety observatory is a formal network of representatives from governments in various countries to share and exchange road safety data and experience. It includes information based on the Global Plan 2011–2020, as well as the status of every country and region.

Case examples

- The GRSF—a global multidonor fund hosted by the World Bank—is a platform for countries to implement road safety initiatives, particularly for LMICs. The goal of the GRSF is to assist governments to build their capacity for managing road safety and scale up implementation and delivery. At the same time, the GRSF seeks to catalyze increased financing for multisectoral road safety investments in LMICs and to complement these with the creation and transfer of global road safety knowledge, expertise, and innovation (GRSF 2022).
- C40 is a network of cities aiming to create healthy, equitable, and resilient communities. Cities demonstrate their membership value through outcomes. The goals of the network are directly linked to develop integrated multimodal transport and land use planning systems. With consistent efforts toward this, cities can be transformed into greener, healthier, safer, and more accessible through prioritizing sustainable modes, and promoting public and shared transport (C40 2022). See also: Table 4.2.

Table 4.2: Case examples of global networks encouraging peer learning.

No	Case examples	Organization, Year	Link
1	GRSF	GRSF, 2011-to date	https://www.roadsafetyfacility.org/about-us
2	C40 Cities	C40, 2005-to date	https://www.c40.org/about-c40/

4.3 Build and share a repository of resources and tools

A list of case examples and resources is provided to support decision makers in implementing the

Safe System approach. These have been reviewed or provided by members of the Working Group on Road Safety (Appendix E).

These can be disseminated through an online platform for better access and outreach to decision makers and practitioners.



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CONCLUSION



  International Transport Forum

SIDE EVENT

**Enhancing Policy,
Action & Accountability
for Safe Mobility**

26 May 2023 | 9:00 - 10:30
Leipzig, Germany



We are now at a crucial juncture to address what the UN Special Envoy for Road Safety, Jean Todt, describes as an “invisible pandemic threat”.



The Safe System approach to road safety has proven to have an impact. With its implementation, we can meet the target of preventing at least 50 percent of road crash deaths and serious injuries by 2030. The Safe System approach requires political will, horizontal and vertical coordinated action within government and with civil society, private sector, and other organizations. Partnerships to deliver are needed and possible and multiple entry points are

available to leverage existing initiatives while planning for longer term change. With this report, we have collectively laid-out a process to turn high level statements into actionable work in practice. Case examples are provided at each step to demonstrate that it is feasible and impactful. Resources and tools are also available for guidance. However, the message is loud. We need to act with urgency toward a future without road crash fatalities and serious injuries.

“The report rightly recognises that the overarching priority for the coming decade is to address the operational requirements of road safety delivery at national, sub-national, and city levels.”

Said Dahdah

Head of the Global Road Safety Facility (GRSF)
Global Lead Road Safety, The World Bank



“This work exemplifies the invaluable convening power of SuM4All and the impact that it can generate. Road safety needs more than ever coordinated approaches and hands-on guidance that can help drastically reduce deaths and injuries on our roads.”

Susanna Zammataro

Director General,
International Road Federation (IRF)

“Safe mobility is a global commitment for the Michelin Group. Michelin believes it has a responsibility to make mobility safer all over the world and is therefore involved in multiple collaborations with public and private-sector partners to meet the challenge.”

Nicolas Beaumont

Senior VP Sustainable Development and Impact,
Michelin



GLOSSARY



Blackspot Analysis: It is the process of identification and assessment of road/ street sections where the frequency and severity of road crashes are substantial or where there are high risks of fatal road crashes over a longer period of time due to road conditions, traffic, weather and environment (Elvik 2007; gTKP 2019)

Collision matrix: The collision matrix is a road crash fatality risk indicator that compares road user death/s against the 'main vehicle' involved in a crash (European Commission 2022)

Forgiving roads: Road design that avoids or minimizes the harm and consequences of road crashes and injuries (iRAP 2022).

Healthy streets: Healthy streets approach is a system of policies and strategies to put people, focused on individual and public health, at the heart of decision making, where people choose to walk, cycle and use public transport (TfL 2017)

iRAP: The International Road Assessment Programme (iRAP) is the umbrella program for Road Assessment Programs (RAPs) worldwide. It has tools for crash risk mapping of the road system, star rating of roads during road safety inspections, road safety impact assessments, and designs. These can be used to prepare investment plans to determine cost-effective road upgrades and prevent deaths and serious injuries (iRAP 2023)

Road Safety Assessment: This is an assessment of the safety of a road environment and the way in which road users interact with and use it. This process involves site inspection(s) and is undertaken in reaction to road crash fatalities (gTKP, 2019; AfDB 2015).

Road Safety Audit: This is a systematic and technical safety check that identifies any potential risks to road users through all stages from planning to early operation. The potential safety deficiencies and recommendations for improvement are included in the audit report (WRI India and World Bank 2020).

Road Safety Impact Assessment: Road safety impact assessment is a proactive and strategic tool that compares various schemes of a new road design or an existing network to ensure the selected scheme delivers the best outcome for road safety and access (WRI India and World Bank 2020).

Road Safety Inspection: Road safety inspection is a proactive evaluation, including site visits of potential risks for road users on an existing road (WRI India and World Bank 2020).

Safe System approach: The Safe System approach to road safety is based on the principles that people make mistakes that can lead to road crashes, the human body has a limited ability to tolerate crash forces before harm occurs, no death or serious injury is acceptable in the mobility system and that system designers need to share the responsibility to prevent road crash fatalities and serious injuries (ITF 2016; WRI 2018).

Star Rating for Designs (SR4D): SR4D is an evidence-based program, based on iRAP methodology, that verifies and improves the safety elements of a road design to eliminate potential risks to all road users, before commencing civil works (iRAP 2022).

System designers: System designers include decision makers, policy makers, regulators, legislators, planners, designers, and engineers (ITF 2016; WRI 2018).

Vision Zero: Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all (Vision Zero Network n.d.).

Vulnerable road users: Road users may be defined as vulnerable based on the degree of risks imposed on them by motor traffic. These may be by mode, age, and socio-economic status (WRI 2015).

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APPENDIX A: METHODOLOGY

The methodology of the project primarily started with extensive research on the Safe System approach in road safety. The case examples and resources were prepared by the research team and shared by the Working Group members. The Working Group is represented by members from organizations such as Michelin, IRF, EIB, ADB, FCDO, FIA, Global Alliance of NGOs for Road Safety, iRAP, POLIS Network, UN, Walk21, World Bank, WRI, and ITF.

Individual chapters were reviewed by the Working Group between June and November 2022. The comments were compiled in a matrix and the approach was discussed with the Working Group members. The full report was reviewed four times: pre-review in December 2022, full draft review in January 2023, by GRSF and the SuM4All Steering Committee in March 2023. The comments and graphics were also discussed with the Working Group members.



APPENDIX B: GRA CATALOGUE OF POLICY MEASURES



GRA Catalogue of Policy Measures

Thematic Area: Plans and Strategies

Embed the Safe System approach into transport planning	Transport planning requires specific capacity building at the global, regional, and country levels. A Safe System approach to road safety in all aspects of national and subnational transport planning will create the resources and tools necessary to target initiatives on a scale capable of reducing road deaths and injuries significantly and sustainably, particularly in low and lower-middle-income countries. It requires further knowledge transfer at regional, national, and local levels to ensure current guidance on critical safety issues and available tools are well embedded.
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Thematic Area: Capacity Building and Human Resource Development

Build capacity across levels of government	<p>The transport system is complex and reaches across several parts of a country. Apart from a very small number of city-states, no one level or order of government can completely deal with the complexity and requirements of transport and its interactions with other sectors of the economy. Countries must ensure that coordination across all levels or orders of government is included in their national capacity. This includes coordinating across the whole national government to ensure broad and multisector issues are well considered between transport and other sectors.</p> <p>Building national and local capacity across levels of government, jurisdictions, organizations, and modes, should also include providing training and information resources. Countries should also minimize fragmentation of the legislative framework and ensure legal certainty for transport asset creation, maintenance, and operation.</p>
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Thematic Area: Promotion Campaigns and Public Awareness

Implement Awareness and Behavior Change Strategies	<p>Governments must encourage behavioral change to support sustainable transport. Transport efficiency is increased when users—both travelers and shippers—make lifestyle choices and adopt behaviors that reinforce efficient results, either within the transport sector or in residential and work locations. These include the purchase of transport-related goods—bicycles, motor vehicles, and energy-efficient trucks.</p> <p>Green mobility solutions require not only changes to the transport system but also to the behavior of the participants in the system, service providers, and users. There is no path by which the triple win of long-term economic prosperity, social, and environmental sustainability can be achieved that does not involve fundamental changes in technology, behavior, and lifestyles that dominate global trends. Governments should implement awareness and behavior change (ABC) strategies to help shift attitudes toward sustainable modes, for example, public transport, walking, and cycling, complementing another engineering, legal, or economic measures.</p>
Raise Road Safety Awareness	Countries should ensure sustained communication as a way to promote and raise awareness of road safety as a core business for government and society. It should emphasize the shared responsibility for the delivery of road safety interventions to achieve results, with safe speeds at the core of the Safe System intervention strategy.

<p>Make Information Publicly Available on Projects and Policies</p>	<p>Public understanding and acceptance of transportation plans and investment strategies is a prerequisite for broad social license and political support. This acceptance needs to be long lived and durable to support the long duration of asset creation and lengthy asset management arrangements.</p> <p>Governments should describe the role of the transport system and its supporting policies to build public support for investments, infrastructure management arrangements, and transport services. Making summary information as well as in-depth information available is critical. Regular media, social media, the web, and mobile phone applications should be included in disseminating information to the public. Governments should provide the basis for informed discussion by publishing mode-specific legislation and regulatory laws, infrastructure construction standards, infrastructure asset management standards, procurement methods, and related educational materials.</p> <p>Governments should also publish transport pricing and subsidy policies, outlining the role of user fees and public financial support.</p>
<p>Foster a Security Culture in Public Transport</p>	<p>Government should foster a security culture in the transport system to improve the efficiency and attractiveness of public transport, based on the psychological elements that make passengers feel secure while using buses, trains, and other modes of public transport. Improvements to personal security while getting to and using transport services will require a review of the national legal, regulatory, and governance frameworks that apply to personal security in public spaces and personal security while in a transport vehicle.</p>
<p>Thematic Area: Knowledge Management and Dissemination of Best Practices</p>	
<p>Share knowledge on successes and best practices</p>	<p>An efficient, responsive, and innovative transport system is built on sharing of knowledge and best practices among all parts of the system. Participants should support information sharing and the diffusion of innovation across government, organizations, agencies, companies, civil society, and the education sector. An open attitude toward improvement should be encouraged. Local practices should be compared (benchmarked) against international standards.</p> <p>Evidence-based solutions will encourage: (i) resource-efficient standards; (ii) standards able to meet new challenges, including climate change; and (iii) connections and synergies with technical developments in other areas, which could lead to reductions in costs, and extend asset life cycles. All actors in the transport system should foster a culture of learning from experience.</p>

APPENDIX C: DIFFERENT STAGES IN MAINSTREAMING THE SAFE SYSTEM APPROACH IN STREET AND NONURBAN ROAD PROJECTS



Stage I – Project initiation

1. Allocate a budget for road safety

The total project budget should allocate at least 10 percent toward road safety and 5 percent for maintenance (SSATP 2014). This includes remuneration for road safety specialists and costs related to safety inspections, surveys, and assessments.

2. Appoint a dedicated road safety team and conduct a road safety impact assessment

The road owning agency should establish a dedicated team to ensure focused attention to road safety and that the recommendations are incorporated at all stages. The team size and composition will depend on the type of road or street, network, and length, but can broadly include a road safety specialist, a crash investigator for roads with fatal and serious injuries, and a road safety analyst with experience in implementing the Safe System approach.

The following members will also be part of the road safety team for coordination with other groups (planning, engineering, and design). Their role and engagement will be based on specific requirements as approved by the road safety specialist (lead).

- **Transport planner:** A transport planner should organize surveys, supervise data assessment, and provide transport inputs to the team as required in all stages.
- **Urban designer:** The role of urban designer shall be to incorporate the Safe System approach in road design.

The team composition and engagement must ensure that the road safety specialist and transport planner are involved in all project stages (table C.1).

Table C.1: Road safety team composition.

Team member	Mandatory/ Optional	Experience [^] (years)	Project stage			
			I	II	III	IV
Road safety specialist (Lead)	Mandatory	8 - 10	★	★	★	★
Crash investigator	Mandatory for crashes with fatalities and serious injuries	6 - 8				★
Road safety analyst	Optional	3 - 4	★	★		
Shared project team members						
Transport planner	Mandatory	5 - 7 (Focus on planning for sustainable transport)	★	★	★	★
Urban designer	Mandatory	5 - 7 (With experience in street design)		★	★	★
Draftsperson	Optional	3 - 5		★	★	

Note: [^] Experience in implementing the Safe System approach

A road safety impact assessment is recommended before the planning stage for existing and new roads to assess the impact of different planning options on the safety performance of the road network (European Parliament 2008; WRI India and World Bank 2020).

Stage II – Planning and design

3. Create a stage-wise project timeline and a road safety work plan

Each project stage must meet prerequisite road safety processes relevant to its scale. The work plan involves defining road safety activities, expected outcomes and work hours. The processes may be different for existing and new roads projects (Figure 1.5).

4. Collect and analyze relevant crash data¹

This involves assessing existing data on road crashes in terms of severity, victims, speed, location, time and causal factors from secondary sources, police first information reports (FIR) and hospital records. The team should also outline strategies to mitigate them through design and enforcement.

5. Collect primary data through surveys and other assessments²

Road safety assessments include traffic counts, travel/driving behavior and user perception surveys. The traffic counts must include pedestrians, cycles, public transport modes, paratransit modes, private motor vehicles and trucks/ trailers. Travel behavior includes speeding, vehicle lane changing, yielding, nonmotorized vehicle (NMV) movement, and parking. User surveys and interviews must be disaggregated by age, gender, and ability and include safety perceptions experienced by different road users (table C.2)

6. Identify appropriate road safety tools

Road safety tools can be used depending on an existing or a new road or street. These include road safety audits and star rating for designs (SR4D). Road safety inspections or assessments, blackspot analysis, route or corridor, and network/ area analysis (for example, using the iRAP methodology) (gTKP 2019) are some tools for existing roads.

7. Define or align vision on modal split targets

The default vision in road planning and design is to reduce congestion for motor vehicles, increase their mobility and speeds, at the cost of safety. However, road safety will not improve if roads are prioritized for personal motor vehicles. The overall vision must aim to reallocate road space to those most impacted by the risks from road crashes such as active modes. Overall road safety performance increases when choice for active modes and public transport is not only possible but preferred.

8. Conduct road safety audit or relevant analysis of the final road or street design

A road safety audit is recommended for new road or street projects after completing the detailed design. For existing road or street redesign projects, road safety assessments or inspections are recommended (European Parliament 2008; WRI India and World Bank 2020). Star rating using iRAP or an internationally recognized country-based road assessment program can also be considered (gTKP 2019). Site inspections and ground truthing are useful to ensure a clear visualization of the detailed design.



Table C.2: List of surveys, checklist and requirements for road safety.

Methods	Factors	Streets/ nonurban road highways/ intercity	Rural access roads
Traffic assessment	Traffic counts ^a	*	*
Travel/ driving behavior	Speeding	*	*
	Lane changing behavior	*	-
	Yielding behavior	*	-
	Crossings for pedestrians and cyclists	*	Desirable
	NMV movement and conflicts	*	Desirable
	Parking behavior	*	Desirable
User perception surveys and interviews (with data related to gender, age and ability)	Pedestrians	*	*
	Cyclists	*	*
	Two-wheeler drivers	*	*
	Public transport and paratransit users	*	*
	Other motorists	•	•
	Others if any ^b	•	•

Legend: * Mandatory, • Desirable, - Not required

Note: a. Includes NMVs and pedestrians

b. Especially street vendors and paratransit drivers



Stage III – Implementation and monitoring

9. Create a safe work zone plan

A safe work zone plan must provide for the safety of the resource persons during the implementation of the project. This includes key project staff, managers, contractors, laborers, and drivers in addition to all road users. The tasks involve designing and installing work zones, classifying risk areas, and undertaking actions that can reduce the severity of crashes and injuries. The work zone plan for existing roads must be based on the Safe System approach including speed calming measures, road signs (cautionary and informative), road markings, visibility, and safe alternate routes for all road users, especially pedestrians and NMVs (UNECE 2021).

10. Conduct quality checks for safety devices and components

The road safety specialist is responsible for checking the quality and standards of road safety devices and components proposed in the project. The safety devices and components must be either nationally or internationally certified for use on streets and nonurban roads. The standards may also be adopted from the operational public (road) works safety regulations enforced by respective governments.

11. Conduct road safety audits or inspections or assessments after implementation

A road safety audit is recommended after implementation of new roads projects—before opening the road to traffic—whereas a road safety inspection or assessment is recommended for existing roads (European Parliament 2008; WRI India and World Bank 2020). The findings must address the safety of all road users—pedestrians, cyclists, two-wheelers, public transport and paratransit modes, and other motor vehicles. The final implementation plan is also subject to revision, if required.

12. Conduct post-construction road safety audit followed by a final road safety clearance

The audits are recommended on a weekday and a weekend to observe behavioral aspects of all users. Trials must be conducted from the perspective of pedestrians, cyclists, and motor vehicle users separately, throughout the road section (IRC 2019). The project is subject to further safety assessments if the trials recommend a safety up-gradation due to one or more risk factors. The road safety specialist clears the project once these are addressed.

Stage IV – Operation and maintenance

13. Assess road crashes and serviceability of footpaths, cycle tracks, and public transport infrastructure

The road safety team investigates crashes (if any) after six months of operations. They should evaluate the crashes in severity, road users, speed, location, time, and causal factors, while preparing an action plan to address them. Inspections must also assess whether the footpaths, cycle tracks, and public transport stops are being used as intended or are encroached, obstructed, damaged, and unmaintained. In case of one or more crashes with serious injuries or deaths, a road safety assessment is required before 12 months of operations. It is also recommended for locations with repetitive nonfatal crashes. The design team must propose new safety improvements with additional countermeasures in such locations. This step is also applicable when deficiencies are identified regarding the intended road use by active and public transport road users.

14. Report and recommendations for the project team or client

The road safety specialist shall submit the final safety report and recommendations.

Notes

1. This step is not applicable for new road/street projects.
2. For new roads, the existing movement of domesticated and other animals/ fauna should be considered.
3. It is critical to ensure safe work zones for women construction workers, provision of mobile creches, prevention of sexual exploitation, abuse and harassment and sexually transmitted infections.

References

European Parliament. (2008). Directive 2008/96/EC of the European Parliament and of the Council. Retrieved from Euro-Lex: <https://eur-lex.europa.eu/eli/dir/2008/96/oj/eng>.

gTKP. (2019). Global Knowledge Transport Partnership. Retrieved 2022, from <https://www.gtkp.com/themepage.php?themepgid=378>.

IRC. (2019). Road Safety Audit Manual. New Delhi: Indian Road Congress. Retrieved from <https://law.resource.org/pub/in/bis/irc/irc.gov.in.sp.088.2019.pdf>.

UNECE. (2021). Guidelines on Work Zone Safety. Geneva: United Nations Economic Commission for Europe. Retrieved from https://unece.org/sites/default/files/2022-02/reduced_2118906E_web.pdf.

WRI India and World Bank. (2020). Integration of Road Safety Considerations in Transit-Oriented Development Projects. World Resource Institute. Retrieved from <https://documents1.worldbank.org/curated/en/721181605154745472/pdf/Integration-of-Road-Safety-Considerations-in-Transit-Oriented-Development-projects-Good-Practice-Note.pdf>.

APPENDIX D: RESPONSIBILITY OF EACH AGENCY IN THE SAFE SYSTEM APPROACH AT THE NATIONAL LEVEL



Nodal or Lead Agency

The nodal agency is responsible for preparing and coordinating policies, strategies, programs, plans, legislation, and standards of road safety. Other key functions include institutional coordination, funding, monitoring, and data repository. The national nodal agency may also advise subnational nodal agencies in their functioning and coordination.

- » Endorse and advocate (agencies and stakeholders) to implement:
 - Safe System approach in all verticals
 - Global road safety targets for 2030
 - Existing and future safe road or vehicle or user technologies
- » Structure institutional mechanisms of road safety at national, subnational, and local levels of governance
- » Coordinate with other agencies and departments to conceptualize, prepare and amend
 - Transport and road safety policies, strategies, programs, and road maps
 - National transport/road safety vision plans
 - Legislation related to vehicles, drivers, transport, road safety
 - Street and nonurban road design guidelines
- » Collect, analyze, and develop a national repository of crash data that include
 - Accurate location of crashes (geolocation)
 - Injuries and deaths of crash victims or road users
 - Details of the vehicles and modes involved in the crash
 - Operational statistics such as vehicular speed and speed limits

Urban Planning and Development

The urban planning and development agency is responsible for preparing national policies, guidelines, and financing national programs to build integrated multimodal transport and land use systems in metropolitan areas.

Police Department

The police department is primarily responsible for traffic management, enforcement of road traffic laws and approval of street and nonurban design projects. It also plays a pivotal role in road safety management and postcrash response. The national level agency, if it exists, advises subnational agencies in their functioning and coordination. Its key roles are to:

- » Provide inputs in the preparation of development and mobility plans and approval of street and nonurban design projects.
- » Enforce road traffic rules based on the Safe System approach.
- » Collect and share crash data including injuries and deaths, victims or users, vehicles and modes, speed, and location to the nodal agency.

Health and Social Care Department

The Health and Social Care agency (department or ministry) is responsible for the postcrash response including emergency medical support and long-term physical and mental health for crash victims. The national level agency advises subnational agencies in their functioning and coordination.

- » Plan and ensure emergency medical support and resources such as emergency call numbers and ambulances in all urban, rural, and remote areas.
- » Establish accident care units and post-crash trauma centers for the crash victims to avail emergency services as well as long-term medical treatments.
- » Organize and steer road safety awareness in local communities focused on first respondent training and pre-hospital treatments.

Education Department

The education agency (department or ministry) addresses road and traffic safety awareness through primary, secondary, and university education at various scales. The national level agency advises subnational agencies in their functioning and coordination. Its key roles are to:

- » Implement basics of road traffic education in the school and college curriculum that focus on safe road use as well as postcrash response.
- » Encourage and support universities and research institutes to focus research on the Safe System approach and introduce courses in road safety management, road safety engineering, traffic safety (motorized and non-motorized), vehicle safety, roadway design, traffic or travel behavior, and crash prevention and investigation and emergency surgery.

Agencies for nonurban roads and vehicle registration and safety

These agencies are responsible for the design, implementation, and maintenance of nonurban roads and setting national vehicle registration and safety standards.



APPENDIX E: REPOSITORY OF EXAMPLES AND TOOLS



A compiled list of case examples and resources is provided to support decision makers in implementing the Safe System approach.

Example	Organization, Year	Link
Chapter 1: Embed the Safe System approach to road safety in national, subnational and urban transport planning		
1.2. Incorporate the Safe System approach in road safety and transport policies, strategies, and programs		
National Road Safety Agency (ANSV)	Ministry of Transport, Argentina, 2008	https://www.argentina.gob.ar/seguridadvial
National Road Safety Agency (NARSA)	Ministry of Transport and Logistics, Morocco, 2018	https://www.narsa.ma/
The Federal Road Safety Corps (FRSC)	Office of the Secretary, Federation of Nigeria, 1988/2007	https://frsc.gov.ng/
Vietnam's National Strategy for Road Safety during the period 2021–2030 with a vision toward 2045	Minister of Transport, 2020	https://irap.org/2021/05/vietnams-2030-strategy-targets-3-star-or-better/
Ethiopia Non-motorized Transport Strategy 2020-29	Ministry of Transport, Ethiopia, 2020	http://airqualityandmobility.org/STR/Ethiopia_NMTStrategy_EN200529.pdf
Colombia Juliàn Estaban's Law	Government of Colombia, 2021	https://www.who.int/news/item/20-06-2022-colombia-s-landmark-road-safety-law-could-save-countless-lives
Mexico National Law of Mobility and Road Safety	Federal Government, Mexico, 2022	http://www.dof.gob.mx/nota_detalle.php?codigo=5652187&fecha=17/05/2022
Tanzania The Ten Step Plan for Safer Road Infrastructure	UNECA, IRF and iRAP, PIARC, TARA, 2020-22	https://unece.org/projects-2
Women empowerment program	Kochi Metro-rail Corporation Limited, 2017	https://kochimetro.org/social-inclusion/
Increase female traffic agents, bus and subway drivers, and guards	City Government, Buenos Aires, Argentina	https://scioteca.caf.com/handle/123456789/1405
Safety audits, increase women's share in cycling, employment of women in Red Metropolitana de Movilidad (formerly Transantiago)	Ministry of Transport and Telecommunications and other agencies, Chile	https://scioteca.caf.com/handle/123456789/1405
Ethiopian Road Fund and Local Transport Funds (LTF)	Ministry of Transport, 2020	https://roadfund.gov.et/display

Legislation for Special Road Safety Fund	Committee on Public Works and Committee on Public Services, 2017	https://legacy.senate.gov.ph/lisdata/2692223132!.pdf
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Legislation for allocation of road safety funds from various sources	Parliament of Ghana, 2019	http://ir.parliament.gh/handle/123456789/2006
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1.4. Prioritize safety in street design and nonurban design guidelines

Low speed school zones, Lusaka, Zambia (and expanded city-wide)	City Government, Amend, Zambia Road Safety Trust, 2019	https://www.who.int/news-room/feature-stories/detail/lusaka-reducing-speeding-near-schools
30 kmph speed limit: Brussels, Belgium	Federal government, 2021	https://eurocities.eu/latest/road-safety-fewer-accidents-in-brussels-30-km-h-city/
Low-speed zone: London and its impact (1986-2006)	BMJ, 2009	https://www.bmj.com/content/bmj/339/bmj.b4469.full.pdf
Low-speed zone: Shanghai	Shanghai city government, 2012	

1.5: Reform legislation, standards and regulations

General Safety Guidelines	European Union, 2022	https://ec.europa.eu/commission/presscorner/detail/en/IP_22_4312
Global NCAP	Towards Zero Foundation, 2022	https://www.globalncap.org/
Used Vehicles Programme	UNEP, 2022	https://www.unep.org/explore-topics/transport/what-we-do/regulating-used-vehicles
Graduated Licensing System	VicRoads, Victoria, Australia, 2007-08	https://www.vicroads.vic.gov.au/safety-and-road-rules/driver-safety/young-and-new-drivers/victorias-graduated-licensing-system
Motor Vehicle Rules	Govt. of India, 2019	https://morth.nic.in/sites/default/files/notifications_document/MVpercent20Actpercent20English.pdf

1.6: Incorporate the Safe System approach in street and nonurban road projects

BIGRS in Brazil (Fortaleza and São Paulo)	GRSF, BIGRS, 2015-19	https://www.roadsafetyfacility.org/success-stories/sustainable-road-safety-outcomes-brazil
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Safe Intersection Program, Addis Ababa, Ethiopia	Addis Ababa City Administration and GDCI, 2017-2020	https://globaldesigningcities.org/wp-content/uploads/2022/03/Designing-Safe-and-Sustainable-Streets-GDCI_2022.pdf
1.7. Create secure public spaces and transport		
Stop Harassment	City of Quito, 2017	https://unwomenusa.org/videos/quito-city-committed-preventing-sexual-harassment-public-spaces
The call-it-out campaign	State Government of Victoria, 2019	https://blogs.worldbank.org/transport/no-one-helps-nadie-me-hace-el-paro-preventing-violence-against-women-public-transport
Dakhal Do campaign	Breakthrough, 2021	https://inbreakthrough.org/dakhal-do/
Report it to Stop it Campaign	TfL, 2021	https://tfl.gov.uk/info-for/media/press-releases/2021/october/new-campaign-launches-to-stamp-out-sexual-harassment-on-public-transport
Gender sensitive language	City of Vienna, 2008	https://www.wien.gv.at/english/administration/gendermainstreaming/
Chapter 3: Increase awareness to build support for implementing the Safe System approach		
3.1. Raise road safety awareness		
Healthy Streets	Transport for London, 2017	https://tfl.gov.uk/cdn/static/cms/documents/healthy-streets-for-london.pdf
South Korea's School Zone	The Korea Transport Institute, 2014	https://www.koti.re.kr/component/file/ND_fileDownload.do?q_fileSn=4948&q_fileId=20140423_0004948_00150840
SARSAI programme, Dar es Salam, Tanzania	Amend, FIA Foundation, 2012	https://injuryprevention.bmj.com/content/25/5/414 https://prizeforcities.org/project/sarsai

Stop de kindermoord (Stop child murder)	The Netherlands, 1972	https://www.dutchreach.org/car-child-murder-protests-safer-nl-roads/
Man on the Street	Transport Accident Commission Victoria, 2020	https://www.youtube.com/watch?v=k2tOye9DKdQ
Effective Delivery of Global Road Safety Solutions	GRSF, 2020	https://www.youtube.com/watch?v=4TUK74Uil_I&t=65s
A Sustainable Asset Valuation of NMT in Coimbatore, India	Coimbatore City Municipal Corporation, 2023 (Forthcoming)	https://www.iisd.org/savi/using-systemic-approaches-and-simulation-to-support-transformation-toward-sustainable-mobility/
Enabling Active Transportation	City of Vancouver, 2013	https://vancouver.ca/files/cov/active-transportation-promotion-and-enabling-full-plan.pdf
Gender data gap in urban mobility	Transformative Urban Mobility Initiative, 2021	https://www.transformative-mobility.org/assets/publications/Bridging-the-gender-data-divide-in-African-cities.pdf
3.2. Make information publicly available on projects and policies		
Open Government Partnership	Govt. of Colombia (Multiple countries)	https://www.opengovpartnership.org/members/bogota-colombia/commitments/COBOG0002/
Deepening Democracy through strengthening citizens' participation and Accountable Governance (DDAG)-Project	RGB, Government of Rwanda, 2013/18	https://www.rgb.rw/1/projects
4.2. Encourage peer learning on the implementation process		
GRSF	GRSF, 2011-to date	https://www.roadsafetyfacility.org/about-us
C40 Cities	C40, 2005-to date	https://www.c40.org/about-c40/

Resources

Resource	Organization, Year	Link
Chapter 1: Embed the Safe System approach to road safety in national, subnational and urban transport planning 1.2. Incorporate the Safe System approach to road safety and transport policies, strategies and programmes		
Regional Road Safety Observatories	FIA, World Bank, OECD/ITF and WHO, 2011-to date	https://www.roadsafetyfacility.org/programs/road-safety-observatories
IRTAD Database	OECD, 1988- to date	https://www.itf-oecd.org/irtad-road-safety-database
Open-source software programmes (Example: DRIVER)	World Bank and GSRF, 2017	https://www.roadsafetyfacility.org/programs/DRIVER
Handbook for Gender-Inclusive Urban Planning and Design	World Bank, 2020	https://www.worldbank.org/en/topic/urbandevelopment/publication/handbook-for-gender-inclusive-urban-planning-and-design
Gender Analysis Toolkit for Transport	ITF, 2022	https://www.itf-oecd.org/itf-gender-analysis-toolkit-transport-policies-0
Sustainable Mobility for All. 2023. Gender Imbalance in the Transport Sector: A Toolkit for Change. Washington DC, ISBN: 979-8-9882420-1-7. License: Creative Commons Attribution CC BY 3.0 IGO.	SuM4All, 2023	Link: https://www.sum4all.org/data/files/gender_imbalance_in_the_transport_sector_a_toolkit_for_change.pdf
1.3. Reorient spatial development and urban mobility plans		
SUMP Toolkit	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2019	https://changing-transport.org/toolkits/sump
TOD Standard 3.0	ITDP, 2017	https://www.itdp.org/library/standards-and-guides/tod3-0/
Integration of Road Safety Considerations in TOD projects	WRI India, 2020	https://documents1.worldbank.org/curated/en/721181605154745472/pdf/Integration-of-Road-Safety-Considerations-in-Transit-Oriented-Development-projects-Good-Practice-Note.pdf
The BRT Planning Guide	ITDP, 2017	https://www.itdp.org/2017/11/16/the-brt-planning-guide/

On-Street Parking Management: An International Toolkit	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2017	https://sutp.org/publications/on-street-parking-managment/
1.4. Prioritize safety in street and nonurban road design guidelines		
Low-speed zone	WRI, 2021	https://www.wri.org/research/low-speed-zone-guide
Speed Limits	Road Safety Observatory, 2017	https://www.rosopa.com/media/documents/road-safety/road-observatory/Roads-Speed-limits.pdf
Good Practice Manuals	Global Road Safety Partnership: 2008-2022	https://www.grsproadsafety.org/resources/good-practice-manuals/
Streets for Walking and Cycling	ITDP Africa and UN Habitat, 2018	https://unhabitat.org/sites/default/files/2020/06/streets-for-walking-and-cycling.pdf
Guide to Road Design	Austrroads, 2021	https://austrroads.com.au/safety-and-design/road-design/guide-to-road-design
Integrating Safety into Road Design	GRSF, 2021	https://www.roadsafetyfacility.org/publications/integrating-safety-road-design
1.5. Reform legislation, standards and regulations		
Strengthening road safety legislation: a practice and resource manual for countries	WHO, 2013	https://apps.who.int/iris/bitstream/handle/10665/85396/9789241505109_eng.pdf?sequence=1
1.6 Incorporate the Safe System approach in street and nonurban road projects		
Road Safety Tools and Methods	gTKP (World Bank), 2019	https://www.gtkp.com/theme.php?themepgid=375
Star Rating for Designs (SR4D)	iRAP, 2021	https://irap.org/star-rating-for-designs/
Directive (EU) 2019/1936 of the European Parliament	European Parliament, 2019	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019L1936
Road safety manuals for Africa – proactive approaches	AfDB, 2015 (gTKP)	http://www.afdb.org/en/documents/document/road-safety-manuals-for-africa-existing-roads-proactive-approaches-51935/

Road safety manuals for Africa – reactive approaches	AfDB, 2015 (gTKP)	https://www.afdb.org/en/documents/document/road-safety-manuals-for-africa-existing-roads-reactive-approaches-51936
Road safety manuals for Africa – road safety audits	AfDB, 2015 (gTKP)	http://www.afdb.org/en/documents/document/road-safety-manuals-for-africa-new-roads-and-schemes-road-safety-audit-51937/
TEM Guidelines on Work Zone Safety	UNECE, 2021	https://unece.org/sites/default/files/202202/reduced_2118906E_web.pdf

Chapter 2: Build capacity on the Safe System approach

2.1. Develop capacity amongst decision makers on the Safe System approach

Road Safety Management Capacity Reviews and Capacity System Projects	GRSF, 2013	https://www.worldbank.org/en/topic/transport/publication/road-safety-management-capacity-review-guidelines
Assessing the Maturity of National Road Safety Management Systems	ADB, 2023	https://www.adb.org/publications/assessing-national-road-safety-management-systems
Road Safety Management, Engineering and Audits Certification	IRF, 2023	https://irfnet.ch/event/regional-seminar-on-road-safety-audits-for-decision-makers-international-course-on-road-safety-engineering-and-audits-2/
Road safety training	iRAP, 2022	https://irap.org/training/
Road Policing Capacity Building	GRSP, 2022	https://www.grsproadsafety.org/programmes/road-policing-capacity-building/
Global Road Safety Leadership Course	JH-IIRU and GRSP, 2016-to date ongoing	https://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-international-injury-research-unit/education/capacity-development/training-programs/global-road-safety-leadership-course/
Road Safety Management Leadership Program	Monash University Accident Research Centre (MUARC), 2012-to date	https://www.monash.edu/muarc/news-and-events/events/muarc-road-safety-management-leadership-program
Annual Delft Road Safety Course	Delft University, ongoing	https://delftroadsafetycourses.org/annual-delft-road-safety-course/

2.2. Reorient certification courses for experts and specialists in road safety

Road Safety Tools and Methods	gTKP, 2019	https://www.gtkp.com/theme/page.php?themepgid=375
Road Safety Capacity Building Programme	GRSP and iRAP, 2021	https://www.grsproadsafety.org/road-safety-capacity-building-programme/
Road Safety Capacity Building Programme for Asia and the Pacific (Webinar series)	World Bank and ADB, 2022	https://www.roadsafetyfacility.org/events/helping-save-lives-road-crashes-asia-pacific-webinar-series-safer-road-infrastructure-asia
Road Safety Capacity Building Program	Asia Pacific Road Safety Observatory, 2021	https://www.aprso.org/event/road-safety-capacity-building-program
Guidelines on Work Zone Safety	UNECE, 2021	https://unece.org/sites/default/files/2022-02/reduced_2118906E_web.pdf

2.3. Introduce the Safe System approach in professional courses and for non-government audiences

Capacity development programme for journalists	Global Designing Cities Initiative, 2020	https://globaldesigningcities.org/2020/10/29/bigrs-journalist-training-program/
Guidance for Journalists	WHO, 2015	https://apps.who.int/iris/bitstream/handle/10665/179826/9789241508933_eng.pdf?sequence=1&isAllowed=y
Capacity-building for NGOs	Global Alliance of NGOs for Road Safety, 2015-to date	https://www.roadsafetyngos.org/what-we-do/areas-of-work/capacity-building/

Chapter 3: Increase awareness to build support for implementing the Safe System approach

3.2. Make information publicly available on projects and policies

Alliance Accountability Toolkit	Global Alliance of NGOs for Road Safety, 2023	https://www.roadsafetyngos.org/toolkit/
Parking myth buster	ITDP, 2015	https://www.itdp.in/resource/parking-basics/

Chapter 4: Produce and share knowledge on good practices

4.1. Build and share regional evidence from low-and-middle income

High-Volume Transport Applied
Research Programme

UK Aid, 2018-to date

<https://transport-links.com/>

Platform for researchers

Journal of Road Safety

<https://journalofroadsafety.org/>



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