Safer Streets, Streets for Life

Guide for Local Public Authorities in Moldova

Developed by Automobile Club of Moldova with the support of the Eastern Alliance for Safe and Sustainable Transport (EASST)

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BACKGROUND

Road accidents are a major public health problem, being the leading cause of death and injury for people 5 to 29 years old around the world.

About 1.19 million people die on roads around the world every year, with more than half of the deaths occurring among pedestrians, cyclists and motorcyclists, especially those living in low-and middle-income countries.

Road tragedies cause huge social costs for individuals, families and communities. Moreover, car crash injuries place a heavy burden on health services and economies.

Car crash costs for highly motorized countries can be between 1% and 3% of their gross domestic product. As motorization increases, car crashes are becoming a rapidly growing problem, especially in developing countries.

Urgent, appropriate and clearly targeted actions are needed. Introducing and enforcing appropriate speed limits, creating a safer infrastructure, imposing limits on blood alcohol levels and improving vehicle safety are all steps that have been repeatedly tested and shown to be efficient.

Traditionally, mobility system design and organization focuses primarily on motorized transport. Thus, road infrastructure and road traffic are designed and organized according to the principle of car priority, leaving vulnerable users such as pedestrians, cyclists or public transport passengers overshadowed.

Car prioritization arises from the need to give motorized transport maximum maneuvering space and conditions that favor moving at high speed to reduce travel time.

Though it is an efficient approach on intercity roads and highways, in densely populated areas such as towns and villages this type of approach proves to be unproductive. Due to a high concentration of cars, frequent intersections and the need to share roads with other categories of road users, moving cars at high speed are dangerous, creating an increased risk for other road users, especially vulnerable ones.

Speeding (i.e. above the speed limit) and inappropriate speed (i.e. too high for driving conditions, which is related to the driver, vehicle, road and traffic configuration rather than the speed limit) is universally recognized as factors contributing predominantly to both the number and severity of road accidents.

In this context, the role of local public authorities (LPAs) in ensuring a safe road infrastructure within localities is of utmost importance. Municipalities and relevant local bodies are the ones that have the legal responsibility to implement actions to secure the infrastructure and calm the traffic in order to prevent road accidents.

Thus, the national legal framework[1] stipulates that it is the competence of LPAs to manage, maintain, repair local public roads and road structures and equip them with signaling means, as required by road traffic safety.

The Road Traffic Regulation sets 30kmph as the maximum speed limit in areas adjacent to schools, hospitals, parks and historical city centers.

LPA is the authority responsible for improving local public roads as a means of systematizing and organizing road traffic to guarantee safety, but also for improving sidewalks and cycle tracks to ensure a safe, accessible and comfortable environment for all road users, especially vulnerable ones.

Driver speed management involves a wide range of actions, including setting speed limits, using technical measures designed to reduce speed, and holding awareness campaigns to educate the public.

At the same time, the relevant actions of LPAs must be guided by modern principles of sustainable urban mobility, based on the inverted mobility pyramid and the principle of prioritizing alternative transport (public transport, bicycles, electric scooters, etc.).

This manual presents best practices in speed management and aims to provide support to local authorities in their effort to improve road safety in the towns and cities of Moldova.

[1] LAW on road traffic safety No 131 of 07.06.2007, Article 16.

OVERCOMING CHALLENGES

The process of developing safer streets in localities will inevitably face a series of typical challenges that can cause the authorities to give up before they start.

Recognizing and overcoming these challenges is paramount.

Challenge 1: Taking responsibility

Taking responsibility is the trickiest thing for LPAs in developing safer streets.

Most of the time, mayors and municipality officials tend to avoid being accountable for road safety. There is a tendency to put this responsibility on the shoulders of the police and the Ministry of Internal Affairs, the State Road Administration, or architects and designers.

However, we need to understand that, at the local level, LPA has the main responsibility for road safety.

As mentioned earlier, the existing legal framework provides that the municipality is the structure that decides how traffic is organized and how the road and pedestrian infrastructure is arranged. And this is the starting point towards creating road safety in localities.

Indeed, there are other structures and decision-makers involved in this area, such as the police, the State Road Administration, designers and engineers, but the role of leader with initiative and the obligation of implementing road safety actions in the locality lies directly with the LPA.

Understanding and assuming this is the first step in creating safer roads.

Challenge 2: Understanding the mobility pyramid

Paradoxical as it may seem, we must start by realizing that cars are not the main means of transport in a city.

According to modern urban mobility planning and design principles, walking comes first, followed by alternative ways of travel (bicycle, scooter) and public transport.

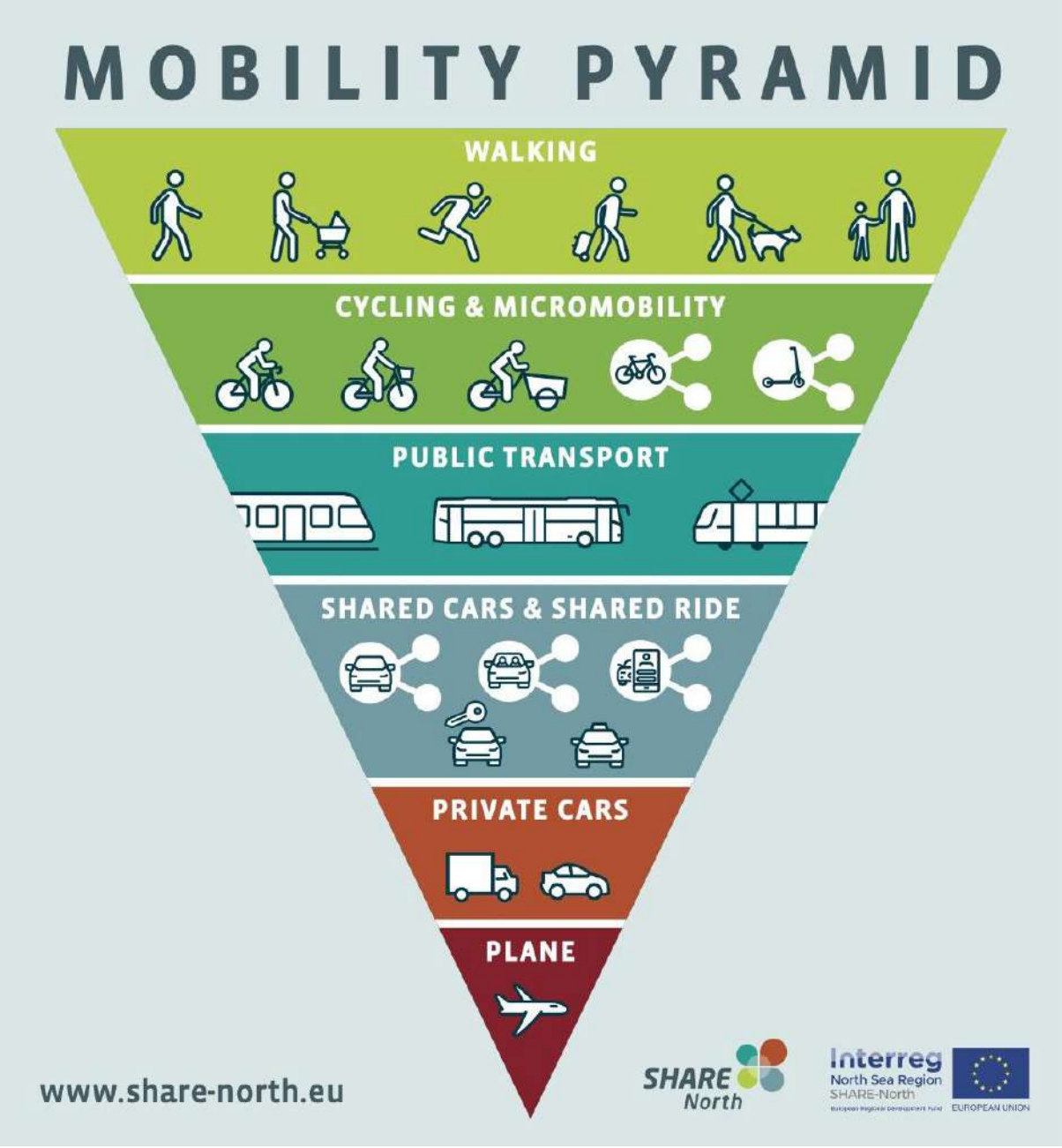

Figure 1: Inverted pyramid of urban mobility Source: share-north.eu

This graphical representation implies that priority in providing space and funding in towns and cities should be given to more efficient travel modes.

Besides being the source of exhaust emissions, accidents and noise, private cars also take up a lot of public space which is a limited resource, especially in dense urban areas.

Estimates by specialists show that the spatial footprint of transport in cities can be around 10% to 25%[2]. The biggest problem is the inefficient use of vehicles: cars are parked most of the time, and when used, they have a low occupancy rate[3], often carrying only 1 or 2 people.

In other words, it is inefficient and inappropriate to give all the space on a street only to cars (for driving and parking), as is usually the case in our cities. If we do so, other modes of travel no longer have space and become impossible to use.

Pedestrians can no longer walk because sidewalks are broken and loaded with parked cars, which making crossing the roads dangerous.

Cyclists or electric scooter users cannot move around the city because there are no dedicated lanes. They cannot ride on sidewalks because the sidewalks are broken and full of cars, and cars travel at high speeds on the roadway, which is very dangerous for cyclists and scooter riders.

Public transport users cannot move properly either, because public transport does not comply with its schedule due to traffic jams. Bus stations are blocked by parked cars or street trading. And the quality of public transport units usually leaves much to be desired.

So, the only solution for most citizens is to buy their own car and use it as often as possible. This trend leads to an increased number of cars, causing traffic jams. In addition, the growing number of vehicles is putting an increasing pressure on road infrastructure and generating an increasing demand for parking spaces.

It is a vicious circle in which the growing number of cars damages the infrastructure and undermines the efficiency of other transport modes. And this, in turn, leads to a growing number of cars. So, the circle repeats itself infinitely.

All interventions to improve road safety must involve efficient actions that would reduce the space occupied by cars on a street or limit their access and driving speed.

For this reason, road safety interventions are perceived as attacks on the rights of car owners, causing their discontent and objections. Typically, this category is the most

[2] https://www.transportshaker-wavestone.com/urban-transports-spatial-footprint-much-space-used-transports-city/

[3] https://www.eea.europa.eu/publications/ENVISSUENo12/page029.html

vocal and influential, and the authorities tend to comply with their requests, forgetting about the other categories of public space users.

Thus, understanding the urban mobility pyramid becomes the theoretical basis and the main argument that can help us to promote interventions to calm traffic, limit speed, restrict parking or prioritize public transport or bicycles on certain streets.

Challenge 3: Identifying expertise and obtaining approvals

Having taken responsibility and used the urban mobility pyramid to argue the need to implement road safety actions in a particular area, we need to move on to the technical part. Interventions such as removing parking lots from the sidewalk, securing pedestrian crossings with delimiters or creating the 30kmph zone by installing special signaling are easy to achieve and do not require advanced technical expertise.

However, most of the traffic calming and speed reduction elements and installations described in the previous chapter require, at least, a technical sketch to be coordinated by the police and/or officials responsible for organizing road traffic at town or city level or by the State Road Administration, if the road is under its management.

At this stage most road safety initiatives by LPAs stall because identifying a designer or traffic engineer who would agree to make the technical sketch is complicated and expensive. And obtaining endorsements and approvals for this sketch from the police or the SRA is even more complicated.

This challenge can be overcome by:

1. **Finding allies.** Some local civic groups might support your initiative. Parent groups or management and teachers of schools in the area chosen for intervention can become your allies and support the initiative in public consultations or debates involving the police and other authorities or groups of drivers dissatisfied with your initiative.
2. **Calling for support.** Civic associations and NGOs such as Automobile Club of Moldova (ACM), Chisinau Bicycle Alliance (ABC), Road Safety Observatory and independent experts specialized in road safety or urban mobility can provide educational support, expertise and know-how in implementing low-speed zones or projects to increase road safety in your home town.
3. **Accessing information.** A multitude of relevant resources are available, such as guides and teaching aids and informational materials developed by international organizations. Online resources such as Global Designing Cities Initiative (GDCI),

Bloomberg Foundation, International Road Assessment Programme (iRAP), FIA Foundation, EASST (Eastern Alliance for Safe and Sustainable Transport) and others can serve as a sufficient source of information both for generating ideas and for developing ways to implement road safety projects.

Challenge 4: Funding road safety interventions

No funding is the most common explanation for the absence of road safety interventions.

Both local authorities and the government always use this argument when trying to explain why they fail to implement projects and actions to calm traffic and reduce speed.

This explanation is valid to a great extent, as the budgets of such structures do not include separate costs for road safety activities. However, it does not mean that these budgets cannot be allocated.

Speed reduction facilities and actions are normally not very expensive compared to road construction and maintenance.

The practice of implementing this type of projects in Moldova shows that the cost of an intervention to calm traffic or to secure a pedestrian crossing ranges from several thousand to several hundred thousand lei, depending on the amount and complexity of the intervention.

We can list the following main sources of funding for road safety projects in towns and cities:

1. **Local budget**. Each locality has a dedicated budget for road infrastructure maintenance. The role of LPAs is to ensure that road safety lines are planned within these budgets and that the money allocated is used as intended.

2. **SRA budget.** The State Road Administration is the structure responsible for managing and maintaining regional and national roads which manages a large part of the Road Fund budgets. Within these budgets there is a line dedicated to road safety actions. If the proposed intervention is to be carried out on a national or regional road that crosses your locality SRA could fund such works from this available budget. However, this would require an official request to be submitted to SRA on behalf of the municipality and the technical project to be coordinated with the organization's experts.

3. **Projects with external funding.** There are international organizations that provide funding for road safety, speed reduction and 30kmph zone projects. Most often these projects are managed by specialized NGOs such as Automobile Club

of Moldova or local offices of international organizations (UNDP, UNICEF, World Bank etc.). These projects allow your locality to enjoy financial support both for the technical project development and for materials and works.

4. **Tactical urbanism.** In the event that funding is not available in the current budget year, some security actions can be taken using tactical urbanism methods. This involves interventions with simple, prefabricated materials such as plastic pillars, delimiters, urban furniture and paint.

These materials are relatively cheap, easy to purchase and install, and do not require construction and asphalting works. And tactical urbanism interventions can be easily modified or removed, if necessary.

Usually, tactical urbanism is used to eliminate parking lots, improve public spaces, secure pedestrian crossings and sidewalks, and arrange cycle tracks. There are guides dedicated to tactical urbanism interventions[4] that can be easily accessed and used in your projects.

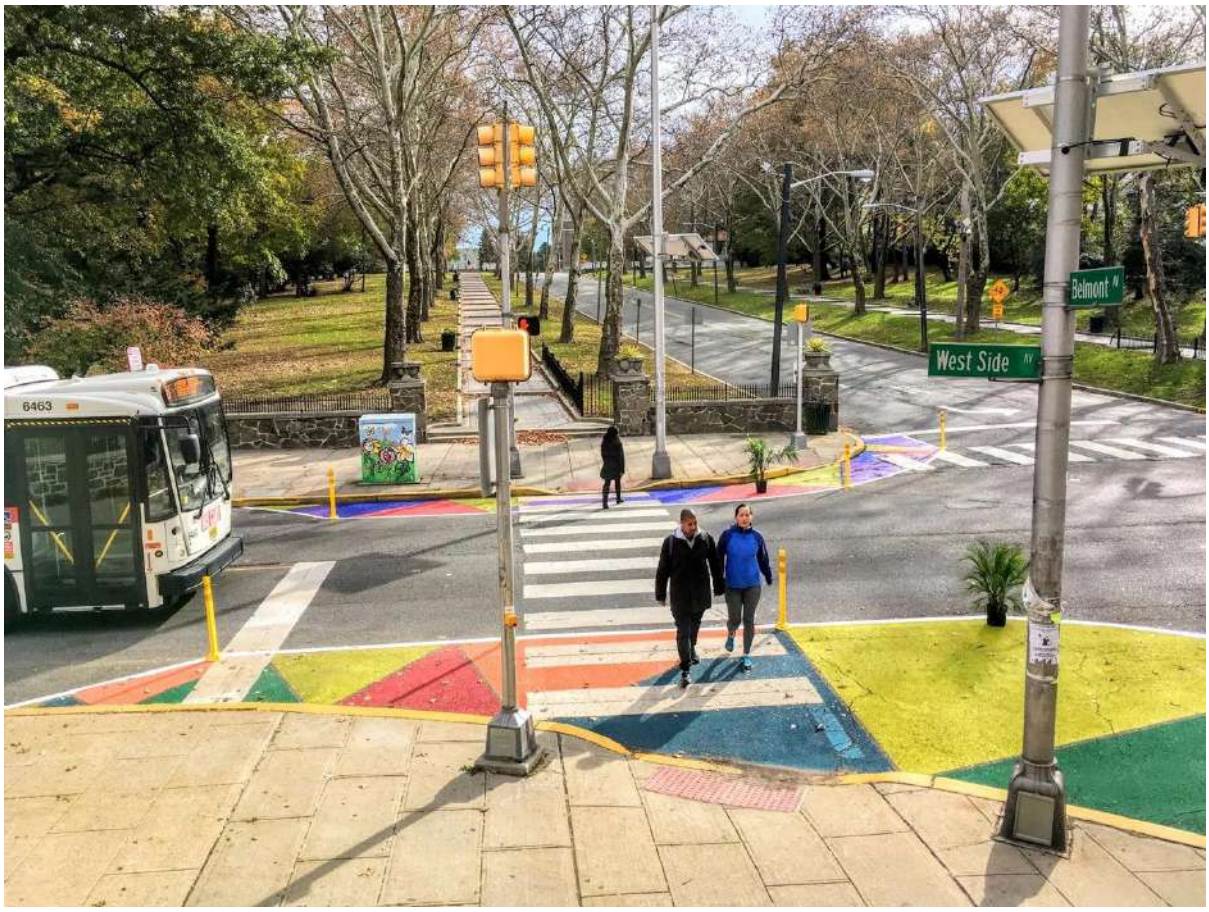

Figure 2: Example of pedestrian crossing safety actions using tactical urbanism. Source: street-plans.com

[4] https://tacticalurbanismguide.com/

Key ideas

- **Taking responsibility** – Road safety and traffic organization is the direct responsibility of LPAs, as provided by the law.
- **Applying the inverted pyramid of urban mobility** – The inverted mobility pyramid implies that priority in providing space and funding in towns and cities should be given to more efficient travel modes (public transport infrastructure, pedestrian infrastructure, bicycle infrastructure).
- **Identifying external expertise and assistance** – LPAs can call on the civil society, NGOs and experts for developing and implementing projects to calm and secure road traffic.
- **Identifying funding sources** – Municipalities must allocate budgets for road safety interventions and/or seek financial support from development partners.

IMPORTANCE OF LOW-SPEED ZONES

Speeding

Speeding and inappropriate speed is the most important factor contributing to the severity of car crash injuries faced by many countries.

The higher the speed, the greater the distance required to stop, which increases the risk of a crash. The more kinetic energy must be absorbed during a high-speed collision, the greater the risk of injury in the event of a car crash.

High speed not only increases the stopping distance, but also reduces the driver's field of vision and peripheral vision. This is because there is a greater perceptual and cognitive demand for road users at higher speed (given a faster flow of information), as well as the need to focus on a point further along the road at higher speeds.

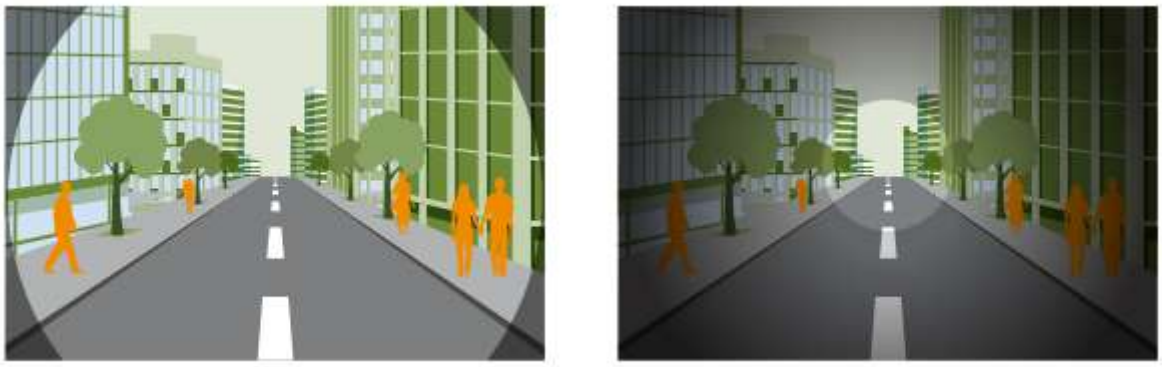

Figure 3: Peripheral visual field at travel speeds of 30kmph (left) and 50kmph (right). Source: Toronto Police Traffic Services.

Vulnerable road users, such as pedestrians, cyclists, electric scooter riders or motorcyclists, face a higher risk of serious or fatal injury when colliding with a vehicle. This is because they are often completely unprotected or, in the case of a motorcyclist, have very limited protection.

The likelihood that a pedestrian will be killed if hit by a motor vehicle increases in proportion to speed. Figure 1 illustrates the likelihood of a fatal injury to a pedestrian in a car crash.

Research indicates that while most vulnerable (unprotected) road users survive if hit by a car going at 30kmph, most are killed if hit by a car going at 60kmph.

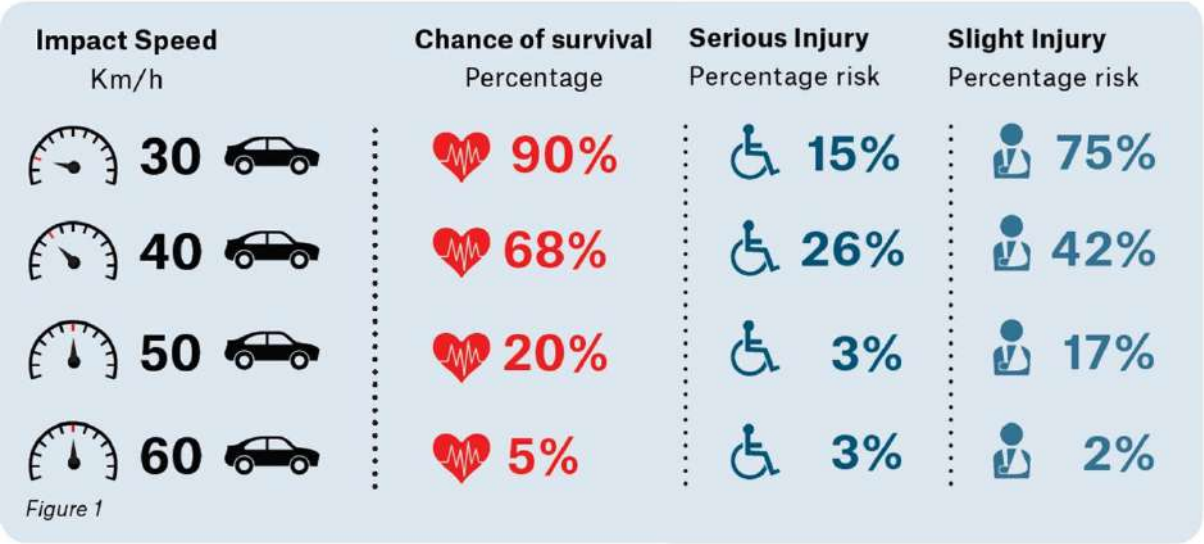

Figure 4: Pedestrian survival chances depending on the car speed. Source: Public Transport Association Australia New Zealand (PTAANZ).

The risk of pedestrian death increases faster with any small increase in collision speed between 30kmph and 70kmph. A meta-analysis of 20 studies assessing the risk of pedestrian death showed that the chance of pedestrian death increases by 11% for every 1kmph of speeding over 30kmph. With this in mind, the speed of 30kmph is recommended for heavy foot traffic areas.

Like many other countries, Moldova faces serious and sometimes even grave road safety problems.

According police statistics, 2,009 car crashes were registered in Moldova in 2024, resulting in 209 deaths and 2,386 injuries.

Despite the impressive decrease in death toll by 51% during 2011-2023, the death rate of 7.88 in Moldova is significantly higher than the EU-27 average of 4.55. Such figures cause huge economic costs and, depending on the source of data for Moldova, various estimates of socio-economic costs range from 1.26% to 10.5% of GDP.

Speed management

Speed management is an essential part of a safe road system, since there is a direct relationship between the speed of collision and the likelihood of death. The most vulnerable road users, such as pedestrians and cyclists, can usually survive at impact speeds of up to 30kmph, above which the chance of survival drops dramatically.

A similar impact speed applies to other unprotected road users, such as those using two- and three-wheeled motor vehicles. However, increasing compliance with speed limits and reducing dangerous traffic speeds is not an easy task.

This instrument comprises a range of actions aimed at striking a balance between safety and speed efficiency of vehicles on a road network, in order to reduce the rate of driving

at inappropriate speed compared to existing conditions and to maximize compliance with speed limits.

Many drivers do not recognize the risks involved, and often the seeming benefits of fast driving outweigh the understanding of potential resulting problems.

Speed management remains one of the biggest challenges faced by road safety professionals worldwide and requires a concerted, long-term and multidisciplinary response.

It is important to reduce the speed of motor vehicles in areas where the mix of road users includes a significant number of vulnerable road users, such as pedestrians and cyclists.

The "Safe System" or "Vision Zero" approach is a human-centered approach that dictates the design, use and operation of the road transport system to protect human road users.

A safe system approach means that any road safety intervention should ensure that the speed of impact remains below the threshold that can lead to death or serious injury in the event of a car crash. Typically, the impact speed must remain below 30kmph for a pedestrian hit by a vehicle. 30kmph zones protect pedestrians, cyclists and motorcyclists.

History shows that countries that have adopted the Vision Zero approach implement interventions such as 30kmph zones and tend to have the lowest death rate per population and the fastest decrease in death rate.

If every country in the world implemented speed management as part of an integrated set of road safety interventions, great progress could be made towards global road safety goals. The road safety benefits of low-speed driving include:

- Timely hazard recognition/detection;
- Reduced travel distance during hazard response;
- Reduced stopping distance of the vehicle at the time of braking;
- Improved ability of other road users to assess speed and shorter stopping time before a potential car crash;
- Increased opportunity for other road users to avoid getting involved in a car crash;
- Low probability that a driver will lose control of the vehicle.

This guide provides recommendations and instructions to policy makers and road safety professionals in Moldova and draws on the experience of countries that have already launched speed management programs.

The guide explains the steps needed to design, plan and implement a program, including how to raise funds, set up a working group, develop an action plan and implement speed reduction actions on city streets.

What is a low-speed zone?

The main purpose of low-speed zones is to reduce the speed of motor vehicles in a defined area to improve the safety of people walking, cycling, using electric scooters or other modes of human-scale mobility, accessing public transport, or driving a motorcycle or a car.

Reducing the speed of vehicles is essential to improve road safety, as it reduces the chances of accidents and their severity.

The low-speed zone can range in size from a single block (e.g. a school zone) to an entire residential neighborhood, commercial district, or city, depending on street classification and the capacity of the wider traffic network.

A variety of strategies can be implemented to encourage speeds below the target speed. The most important strategy is to modify the physical parameters of the roads that encourage higher speeds. Whereas, other strategies include enforcement, education and changes to speed limits.

A number of physical features have been developed by road safety and traffic management engineers, which encourage or force drivers to reduce their speed. This kind of intervention aims to make drivers feel uncomfortable while driving at above the legal or recommended speed. Some examples include artificial speed limiters or elevated pedestrian crossings, narrowing of roads (lanes) or elevated intersections that signal to drivers about altered traffic conditions to make them slow down.

Usually, the most efficient approach is a combination of strategies. This can bring a variety of benefits.

Low-speed areas have several benefits, including:

* Fewer traffic deaths and serious injuries;

* Increased physical activity and play due to improved comfort for people using active modes of travel;

* Improved quality of life through reduced traffic and traffic noise;

* Economic development through environments that feel safer and are more welcoming to people who prefer walking, encouraging them to linger, socialize and shop;

* Improved public health through reduced emissions and increased physical activity related to walking and cycling.

Why are low-speed zones needed?

Determining whether a low-speed zone is necessary is generally based on a safety risk assessment.

When determining the need for a low-speed zone, we consider both historical accident data and proactive estimates of a location's future safety performance. Thus, low-speed zones can usually be applied in:

- Locations with significant numbers of pedestrians and cyclists (existing or potential);
- Locations with a high percentage of children, elderly people or people with reduced mobility (existing or potential);
- High-density or mixed-use commercial districts;
- Historical or tourist districts;
- Residential streets or neighborhoods;
- School areas;
- Hospital areas;
- Areas around places of worship.

Of course, sometimes the implementation of speed limits comes at odds with specific street features. Arterial roads with large amounts of traffic are called transit roads and are dedicated to the priority movement of cars, within functional hierarchies of roads developed by traffic engineers.

However, it is important to note that sometimes the classification of a road does not match its use due to changes in population and road development. In many countries, for example, roads built and classified as highways become busy commercial roads as population numbers increase and city boundaries expand.

In these cases, the use of the road should be a major consideration. In situations where safety, flow and access needs conflict with each other (e.g. if a school is located on an arterial road), other solutions should be sought, such as a combination of design and signal control to safely separate the different types of roads, with a particular focus on protecting pedestrians and cyclists and ensuring that safe and convenient crossing options are available to users.

These components are often addressed in sequence – that is, first necessity, then adequacy, then feasibility – but a different order is also possible and may be appropriate in certain circumstances.

Traffic calming actions, such as lane narrowing, reduce the area of land dedicated to vehicle movement and parking; the resulting additional space can be used as a green area for community activities, a safer, more convenient and comfortable space for walking and cycling, or additional space for public transport.

This results in friendlier and more livable public streets that encourage community interaction and attract customers to shopping areas. Improved walking and cycling

opportunities also mean that people are more likely to walk or cycle than to drive. This helps to reduce air pollution and improve the attractiveness of the environment.

Traffic calming facilities

In the low-speed zone, traffic calming elements help to keep the speed of cars below a certain target speed.

Traffic calming elements reduce traffic speed in areas where pedestrians, cyclists and motorcyclists are present, the safety quality of road infrastructure is poor and/or vehicles enter a built-up area via a rural road.

The most practical traffic calming installations include:

• **Speed limiters:** a plastic or asphalt installation elevated against the roadway which stretches over the entire width of the road. They can cause drivers to slow down, especially when approaching a pedestrian crossing point. If properly designed and installed and having the right height, inclination and width, these present minimal disturbance to residents in terms of noise and have minimal influence on response time of emergency vehicles.

Figure 5: Speed hump. Source: Observer-reporter.com.

• **Raised pedestrian crossings**: pedestrian crossings that are slightly raised above road level to slow down vehicle speed and make pedestrians more visible. These elevations cause drivers to slow down, providing safety for both pedestrians and drivers.

Figure 6: Raised pedestrian crossing. Source: Automobile Club Moldova.

• **Raised intersections**: Raised the level of the intersection of two roads to slow down a vehicle as it approaches and/or passes through the intersection.

Figure 7: Raised intersection. Source: Global Designing Cities Initiative (GDCI).

• **Midblock crosswalks:** Designates suitable locations for pedestrians to cross a road in places that are not intersections. Such pedestrian or bicycle crosswalks are located away from intersections, such as a regional route or roads with few intersections. Suitable locations include bus stops, subway stations, parks, squares or entrances to key destinations.

Figure 8: Raised intersection. Source: GDCI.

• **Raised midblock platforms**: Raised pedestrian crossings located in areas where there are no road intersections.

Figure 9: Raised midblock crosswalk. Source: GDCI.

• **Chicanes:** artificial curves, created either by road markings or concrete curbs that cause vehicles to reduce speed on straight roads. Chicanes are meant to slow down vehicles through the horizontal deviation (or movement) of vehicles.

Their design varies depending on the degree of desired speed control, as well as the driving environment. Properly installed chicanes are efficient, especially in urban environments. They can be used as an integral part of traffic calming devices, but also in high-risk locations, for example where pedestrians and other vulnerable road users cross.

Figure 10: Curb chicane. Source: GDCI.

• **Refuge islands and curb extensions**: Concrete curbs that extend into the roadway to reduce the road space reserved for vehicles. Refuge islands and medians can help pedestrians cross the road by allowing a phased crossing and simplifying decision-making. Curb extensions can also improve pedestrian safety by reducing crossing distance and the time pedestrians are in danger. This is particularly useful for older people or people with reduced mobility who may have difficulty choosing a safe place to cross. At the same time, these interventions narrow the lanes, contributing to lower speed.

Figure 11: Curb extension. Source: GDCI.

• **Lane narrowing**: Roadway reorganization due to lane narrowing. Narrower lanes cause drivers to drive carefully and reduce speeds. Narrowing can be achieved through marking (temporary or permanent) or plastic pillars.

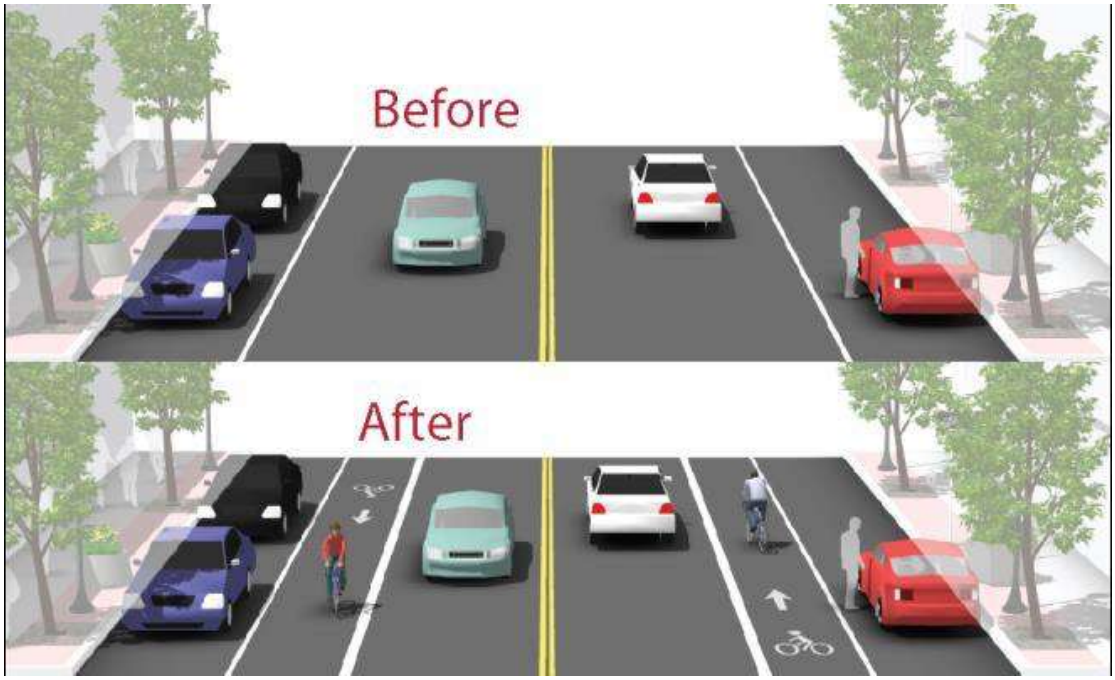

Figure 12: Narrowed traffic lanes. Source: GDCI.

• **Roundabout:** A circular central island, arranged at the intersection of two or more roads where all vehicles must travel in one direction, forcing drivers to slow down.

Figure 13: Roundabout. Source: nycstreetdesign.info

These traffic calming facilities are set up in densely populated areas where there are flows of pedestrians, cyclists and other vulnerable road users.

In practice, these would include residential areas, areas around markets and public institutions, school areas, healthcare units and hospitals, places of worship, universities, public transport hubs, city centers and central business areas.

Underground crossings and pedestrian bridges

Very often, underground crossings and pedestrian bridges are seen as a road safety solution. They prioritize high vehicle speeds and uninterrupted traffic flow over access for vulnerable users.

But these solutions are only applicable in certain situations (railway, highways) and are not recommended for urban areas. Therefore, they should be built cautiously and selectively based on ambient conditions.

In cities, underground or above-ground pedestrian crossings give drivers the feeling that there are no vulnerable road users (pedestrians), so they are no longer so cautious at unexpected roadside events.

At the same time, these constructions are extremely expensive compared to land crossings and can cause problems in terms of convenience, access and personal safety. Forcing people to climb stairs discourages the use of underground crossings or even becomes impossible for the elderly or people with reduced mobility.

Likewise, poor maintenance of these crossings and bridges poses safety hazards, especially for women, and climbing a ramp and/or stairway takes more time and effort.

For these reasons most users choose not to use the underground crossing and prefer jaywalking instead, which leads to serious road accidents.

Key ideas

- **Speeding is the leading cause of car crashes resulting in serious injuries and deaths** – Speeding is the leading cause of serious car crashes. Driving over the speed limit and at speed inappropriate for urban infrastructure is the main factor of serious road injuries and deaths.
- **Speed can be reduced through infrastructure interventions** – In rural/urban areas speed must be limited. The most efficient method of limiting speed is to build road infrastructure in a way that makes speeding impossible or harmful to the condition of the car.
- **Low-speed zones should be arranged in areas where vehicle traffic intersects with pedestrian traffic** – Low-speed zones should be arranged in places within the city where there is a higher risk of accidents involving vulnerable pedestrians: near schools, kindergartens, healthcare centers and social institutions.
- **There are multiple traffic calming methods and tools** that are used depending on the specific location and road infrastructure available. Some interventions can be simple and inexpensive, while others require infrastructure design and reconstruction.

WHERE AND HOW DO WE INTERVENE?

Creating low-speed zones requires a few steps as described below:

Selecting a location

First, when looking for a location suitable for intervention, we need to look at places where speed limitation can have a greater impact.

Thus, we need to identify and analyze the most dangerous areas in the city. These are places where car crashes happened in the past or are highly likely to happen in the future.

Information on accidents involving pedestrians and other vulnerable categories can be provided by the police (INSP) and/or the municipality department in charge of transport.

If there is no data available on accidents, you will have to look for alternative ways to identify priority locations. Statistical data on road safety are very important when assessing locations. Appropriate, accurate, complete and high-quality data may not be available every time, but dangerous locations where speeds are excessive and inappropriate are obvious and known. So, you can talk to school and kindergarten management, local civic activists, local NGOs or even residents of different areas with heavy transport flows.

Road users, drivers, pedestrians, cyclists, parents with children, the elderly and people with reduced mobility, as well as public transport users are the direct sources that can tell us where they feel at risk when walking or crossing the road.

Following this analysis, we will certainly identify 3 to 5 high accident risk locations in the city.

Collecting key data and involving residents

Once locations have been identified, we can start collecting information about the institutions located in the area.

Whether it is a school, a kindergarten, a hospital, a market, a church or a residential block, all these institutions and buildings generate a constant flow of pedestrians.

To better understand the problems related to road safety and the mobility needs of people who attend these places, one should contact the management of institutions in the area and involve them in the decision-making process.

Discussions with them can give us more details about the car crashes that happened in the neighborhood, as well as people's opinions about potential solutions that could improve road safety in the area.

We may also collect the following information:

- The institution's working hours (when people come and when they leave);
- The number of children or adults attending the institution;
- The routes people use to get to a selected location;
- The modes of travel that users/residents use. How many of them come by car/on foot/by bicycle/by public transport.

A member of the institution's management (a member of the parent committee or the Tenants' Association) could be invited to be part of the Low-speed Zone Working Group. Resident participation in decision-making helps to gain trust and motivates them to support the initiative and even help.

Decision on areas to be assessed

Assessment of the selected area should begin by examining, first of all, the building's entrances and exits and then be extended outward to cover the area of the courtyard (if any).

Entrances to and exits from the building (courtyard) are the main hub of pedestrian activity. All routes will lead to these points which will be busiest at the beginning and end of the day.

No matter how people move – on foot, by bicycle, by private car or by bus – they all become pedestrians a soon as they access the building/courtyard.

It is essential that the immediate areas around entrances and exits provide enough space for large numbers of pedestrians to be accommodated at the same time without people having to go out on the road.

Access to the building (courtyard) must be provided via an accessible sidewalk at least 1.5m wide, clearly separated from traffic and parking lots.

It should be high/wide enough for the pedestrian flow during the busiest times of the day, and ideally fences or greenery should be installed to separate people from the roadway.

If there is room, then street furniture and landscaping can also be used to make the area safer and more attractive for pedestrians.

Any bus stops, car or bicycle parking, or passenger pick-up/drop-off areas should be removed from the entrances to and exits from the building/courtyard to ensure that there is free space at the door or gate.

If there are several entrances, all routes used by people to enter and exit should be examined.

Out of all the access points examined, those leading to the busiest traffic street in the area should be selected. Most likely, there is at least one large street with two or more lanes near the institution where there is heavy traffic and where 1-2 pedestrian crossings are located, being closest to the institution under consideration.

There may be cases when there is a street with heavy traffic, but there are no crosswalks nearby. In such instances, we should consider whether there are frequent cases of jaywalking.

As pedestrians, people tend to shorten the path to their destination as much as possible. Specifically, if they have travel problems (elderly people, people with disabilities, parents with strollers, people with heavy bags), people choose to break the rules and jaywalk rather than go a few hundred meters to the nearest crosswalk.

In such locations the need for intervention is even greater, so they must be selected as a priority.

Speed

The relationship between speed and the severity of car crashes has well been established. Speed greatly increases the likelihood of death and serious injury. An average speed increase of just 1kmph results in a 3% higher risk of injury and a 4-5% higher risk of fatal injury.

The World Health Organization recommends speed limits of 30kmph in areas where pedestrians and cyclists mix with motor vehicles. The Stockholm Declaration adopted at the Global Ministerial Conference in February 2020 reinforces this message with a call for the introduction of maximum travel speed of 30kmph where there is a mix of vulnerable road users and vehicles.

Particularly, low-speed zones are needed near schools, kindergartens and children's playgrounds.

But traffic signaling of low-speed zones is not enough. Very often drivers will ignore speed-limiting road signs and consciously exceed the speed limit.

For this reason, low-speed zones require additional traffic calming measures (described in Chapter I of this Guide).

Without systematic speed management, drivers can exceed the legal speed limit, creating an increased risk for pedestrians and other vulnerable users.

Therefore, we must answer the following questions when evaluating the selected area:

- What is the speed limit? Does it meet the requirement of 30kmph or less?
- If there is a school zone with a low-speed limit, roughly what area does it cover?
- Is the speed limit clearly marked at the entrance to the school area, with visible road signs pointing correctly in all traffic directions?
- Is the speed limit also indicated by clearly painted road markings?
- Is a speed monitoring camera or other automatic speed measuring equipment installed?

If there is no set speed limit of 30kmph or less in the examined area, we can state that the speed limit applied is the general one set for localities, i.e. 50kmph.

Normally drivers can easily exceed this speed limit by 10kmph and more, if the design and condition of the road allows speeding.

If the crosswalk under examination does not have traffic lights, the 50kmph speed limit and the lack of traffic calming elements can be the perfect recipe for car crashes involving pedestrians. The risk is even greater where there is no crosswalk and people constantly jaywalk.

Road infrastructure

Examining the road infrastructure in the selected area is necessary to understand the risks for vulnerable users.

We can start by listing the parameters of the road/street under consideration:

- How many lanes are there in each direction and how wide are they?
- If there are more than 2 lanes, are there refuge islands in between?
- Is there clearly visible road marking?
- What kind of vehicles use the road and at what speeds?
- Is there a parking space? Is the parking authorized (marked and signposted) or unauthorized (with a "no parking" sign)?
- Is there a clearly marked school area? If so, are there any signs or other markings that clearly identify when drivers enter this area?
- Is there a "children" or "school" warning sign in the school surroundings on each of the streets leading to the school?

- Are there any traffic calming elements such as speed limiters, speed bumps, chicanes or raised crosswalks?
- Are there large intersections and are they provided with visible and safe pedestrian crossings?
- Is there a clear separation between pedestrians and vehicles?

Clearly marked school zones with a maximum speed limit of 30kmph and visible signage and road marking should be arranged around schools. The exact size of a school area will depend on the layout and conditions of the local road, but it should cover a distance of 300 to 500 meters.

When examining the road infrastructure, we also pay attention to the condition of the asphalt coating on the road. On roads with fresh asphalt in good condition, drivers tend to violate the speed limit more often.

If there is an intersection in the area under consideration, we examine all pedestrian crossings at the intersection.

If there is no pedestrian crossing near the Institution examined, we need to see which are the locations where people most often cross the road (i.e. jaywalk).

Pedestrian infrastructure

Additionally to road infrastructure, it is vital to ensure there is good infrastructure in place to keep pedestrians safe.

In this regard, sidewalks are a priority. Each road/street in the analyzed area must have a well-designed and arranged sidewalk so that pedestrians do not have to walk on the roadway.

The sidewalk should be paved, clearly separated from the road and ideally be 1.8–2.4m wide in residential areas and 2.4–4.5m wide in areas with a lot of pedestrians.

There should be an additional space for meeting and waiting for children near the entrances to public institutions (especially schools and kindergartens).

Additionally, the sidewalk should be pothole-free and unobstructed to allow access and comfortable movement of people in wheelchairs or parents with strollers.

It is important that sidewalks are not obstructed by street vendors, extensions or terraces, as well as other obstacles or activities that force pedestrians to walk on the roadway.

Ideally, the sidewalk should be physically separated from the roadway by buffer zones that could include green spaces, trees, planters and street lighting poles, and/or urban furniture. On streets without such physical separation, sidewalks must be protected by separation poles which also prevent parking on the sidewalk.

Pedestrian infrastructure must be accessible to all pedestrians and therefore there should be dropped curbs or access ramps at every crosswalk and road intersection.

When reviewing pedestrian infrastructure, we must necessarily examine whether pedestrian crossings have a good enough visibility angle. Very often, cars parked too close to the pedestrian crossing obstruct visibility and do not allow drivers to notice pedestrians about to cross the road (especially children) in time for braking.

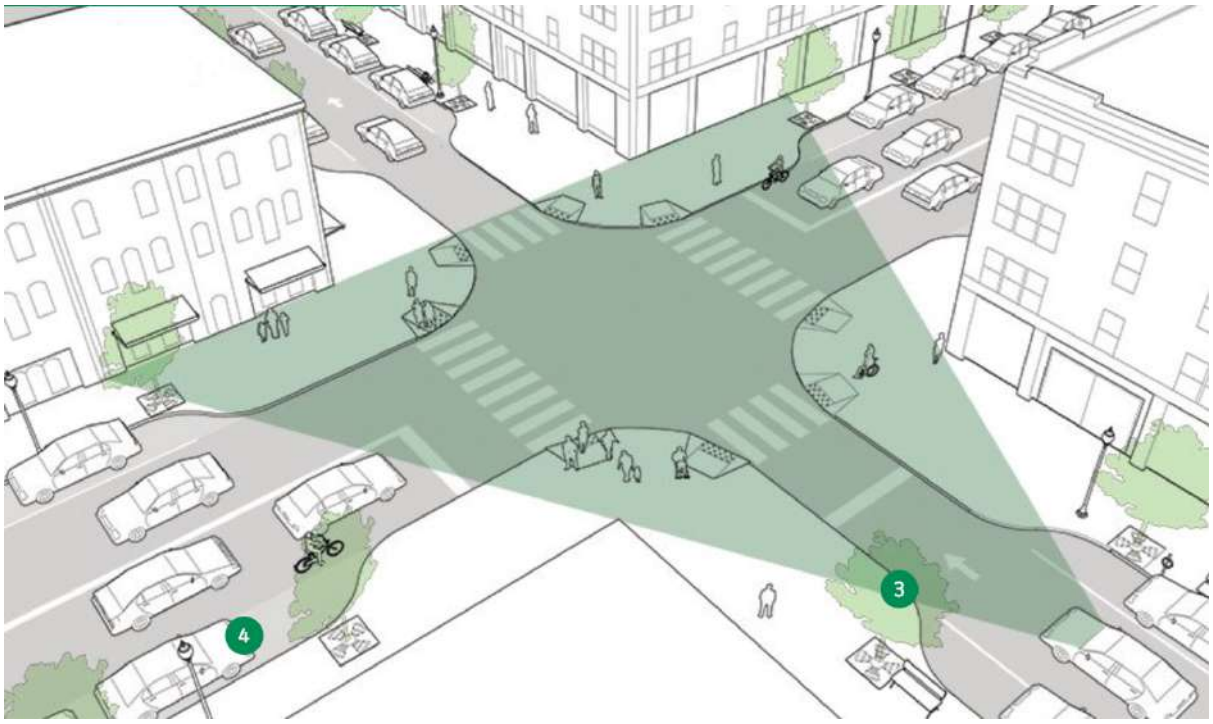

Figure 14: Narrowing traffic lanes around crosswalks prevents car from parking and provides a sufficient angle of visibility. Source: GDCI.

Most often, on central city streets, sidewalks get blocked by cars legally or illegally parking on sidewalks. Drivers believe that, when parked on the sidewalk, their car does not interfere with traffic. Instead, by occupying the sidewalk, cars reduce pedestrian traffic space, degrade the sidewalk surface and reduce the attractiveness of urban public space.

Parking on the sidewalk (in herringbone, below 45 degrees) confuses both pedestrians and traffic, as every entrance to and exit from the parking lot involves stopping the flow of cars. Thus, on large streets, where there are heavy flows of pedestrians, public transport and cars, parking must be restricted and arranged on the roadway at the account of the first traffic lanes or transferred to adjacent streets with low traffic flows.

When examining the pedestrian infrastructure we must determine the following:

- Is there a sidewalk along all the roads in the examined area?
- Is the sidewalk paved/asphalted and unobstructed?
- Is there enough room on the sidewalk for all pedestrians to walk without having to go out onto the roadway during peak hours (morning and evening)?
- Are there any spots where pedestrians are forced or choose to walk on the roadway?
- Are there obvious dangers or degraded areas on the sidewalk (potholes, ditches, bumps, stairs protruding onto the sidewalk etc.)?
- Are there places where water gathers when it rains?
- Are there dropped curbs and ramps for pedestrians in all necessary spots?

Accessibility

The design of pedestrian-safe streets must take into account the needs of people with disabilities and be accessible for all members of the community.

The risk for pedestrians with disabilities is higher on streets because people with mobility impairments can cross roads more slowly and be more likely to fall down if sidewalks or road surfaces are uneven.

People in wheelchairs will be disadvantaged if dropped curbs or accessible routes are missing and it will be much more difficult for them to avoid traffic. And people with visual or hearing impairments may not be able to anticipate and avoid other road users.

There are various ways in which streets can be designed safe for pedestrians with disabilities. These include:

- Well-maintained sidewalks with an even surface and wide enough for comfortable pedestrian movement;
- Avoiding unnecessary "congestion" on the street – furniture, stairs, parking lots, street vendors standing in the path of pedestrians; such congestions are dangerous, in particular, for people with visual impairments;
- A sidewalk with a large asphalt or pavement surface reduces the risk of uneven surfaces and stumbling or falling, and makes using wheelchairs easier and more comfortable;
- Dropped curbs to ensure accessibility for wheelchair users;
- Safe crosswalks with signs that can be detected by those with visual or hearing impairments and with longer crossing times for people with mobility difficulties to manage to cross the road safely;
- Tactile paving at edges of stairs, sidewalks and crosswalks;
- Safe access ramps; they should be built of non-slip materials and have a maximum slope of 1:10 (ideally 1:12); for users who are not in a wheelchair but are otherwise mobility-challenged, handrails can be very important in certain situations.

Parking, visibility and lighting

Around public institutions and on central city streets, parking is a major problem for traffic, but also for pedestrian safety.

Parking can be a major hazard especially around schools and kindergartens, as significant numbers of children are brought in and picked up from school/kindergarten by private car.

Normally, in the morning and in the evening, when children come and go, the areas around entrances to school courtyards are a chaos.

Parents tend to park as close to the entrance as possible and stay in close proximity to the crosswalk or on sidewalks, thus creating risk situations for all pedestrians in the area, especially for children. Because children are smaller in stature than adults, they are often harder to see for drivers. And parked cars, further reducing the field of vision, can increase this risk.

Another danger generated by vehicles parked near public institutions is that drivers leave the car engine running while they wait for their passengers. Running engines are a reason of larger emissions of harmful gases that degrade air quality and can contribute to respiratory diseases. This is particularly harmful around schools and hospitals.

Thus, public institutions, in particular schools, kindergartens and healthcare centers must have parking lots or specially equipped areas reserved for picking up/dropping off passengers.

We should carefully consider the arrangement of parking in school areas to make sure that:

- It is far from any section of road where good visibility is required – especially near crosswalks, intersections or school entrances and exits;
- It is safe for passengers getting in or out of cars – away from other traffic and in an area with very low-speeds or designed so that children can get from the car to the sidewalk without interacting with traffic;

If there is not enough space for a safe parking, a dedicated kiss-and-ride area could be set up – a properly marked area where children can be dropped off safely and quickly; It should be at a safe distance from the school gate or any area where many children gather.

Good quality street lighting is also vital for the safety and security of pedestrians and other road users at night.

Lack of lighting, blind spots (street areas not covered by existing lighting) or poor quality lighting contribute to poor visibility of pedestrians and cyclists by drivers, increasing the risk of collision.

Streets near public institutions should have good lighting in all areas where pedestrians and other vulnerable road users, including cyclists, travel.

Uniformly lit streets provide all road users with better visibility at night and an improved perception of comfort and personal safety.

Figure 15: Kiss-and-ride parking in a school area. Source: szczecin.wyborcza.pl

Key ideas

- We need to identify and analyze the most dangerous areas in the locality: places car crashes have happened in the past or are highly likely to happen in the future.
- To better understand the safety issues of pedestrians who attend the selected location, we need to contact the managements of local institutions.
- Assessment of the selected area should begin by examining, first of all, the entrances to and exits from the building, and then expand outward to cover the courtyard (if any).
- If the crosswalk under examination does not have traffic lights, the 50kmph speed limit and the lack of traffic calming elements can be the perfect recipe for car crashes involving pedestrians. The risk is even greater where there is no crosswalk and people constantly jaywalk.
- Clearly marked school zones with a maximum speed limit of 30kmph and visible signage and road marking should be arranged around schools. The exact size of a school area will depend on the layout and conditions of the local road, but it should cover a distance of 300 to 500 meters.

- The design of pedestrian-safe streets must take into account the needs of people with disabilities and be accessible for all members of the community.
- The risk for pedestrians with disabilities is higher on streets because people with mobility impairments can cross roads more slowly and be more likely to fall down if sidewalks or road surfaces are uneven.
- Parking can be a major danger especially around schools and kindergartens. Parents tend to park as close to the entrance as possible and stay in close proximity to the crosswalk or on sidewalks, thus creating risk situations for all pedestrians in the area, especially for children.

BEST PRACTICES AND CASE STUDIES

Traffic calming and speed reduction measures are widely applied in many cities in different areas of the world.

Below your will find a number of examples, from cases of complex intervention to minor infrastructure improvements using tactical urbanism techniques.

Ljubljana, Slovenia

Slovenska Street is the backbone of Ljubljana, the capital of Slovenia. The street represents an important North-to-South link and the cultural and economic core of the city.

In the 1960s, the street was widened and converted into a four-lane road. In 2012, through comprehensive and consistent traffic policies and after implementing alternative vehicle routes, the city banned cars from a very busy section of Slovenska Street.

The New Street is designated as a common space, despite large volumes of pedestrian and car traffic.

Figure 16: Slovenska Cesta Street, Ljubljana, Slovenia, before and after the intervention. Source: City of Ljubljana.

In 2012, four local architecture companies worked together to re-design the 30-meter-wide street.
The redesign aimed to prioritize pedestrians, cyclists and transit users and increase transit reliability and efficiency. All users can participate equally on the common road, since the design does not prioritize car traffic.

Figure 17: Slovenska Cesta Street, Ljubljana, Slovenia. Source: Wikipedia.

Such interventions are complicated and expensive. However, changes like this provide major urban comfort and greatly improve road safety in the city.

Bucharest, Romania

Improved road safety on Nicolae Golescu Street in Bucharest was the result of removed parking lots and narrowed roadway.

Figure 18: Nicolae Golescu Street, Bucharest, Romania. Source: www.urb-i.com.

The street has become more accessible and comfortable for pedestrians while preserving the possibility of car movement.

Calea Grivitei Blvd was also reorganized by widening the green area and removing the sidewalk parking.

Figure 19: Calea Grivitei Blvd, Bucharest, Romania. Source: www.urb-i.com.

Fortaleza, Brazil

The transformation of a street can also be achieved without complex interventions or high costs.

The Cidade da Gente (City of the People) Program in Fortaleza allowed the radical transformation of a 5,000m2 site in the city center.

The streets were remodeled with paint and mobile street furniture. Tighter turn radii and fewer and narrower traffic lanes allowed for wider sidewalks and shorter crossing distances.

These improvements were originally planned as temporary but, due to high public support and increased safety, have become permanent.

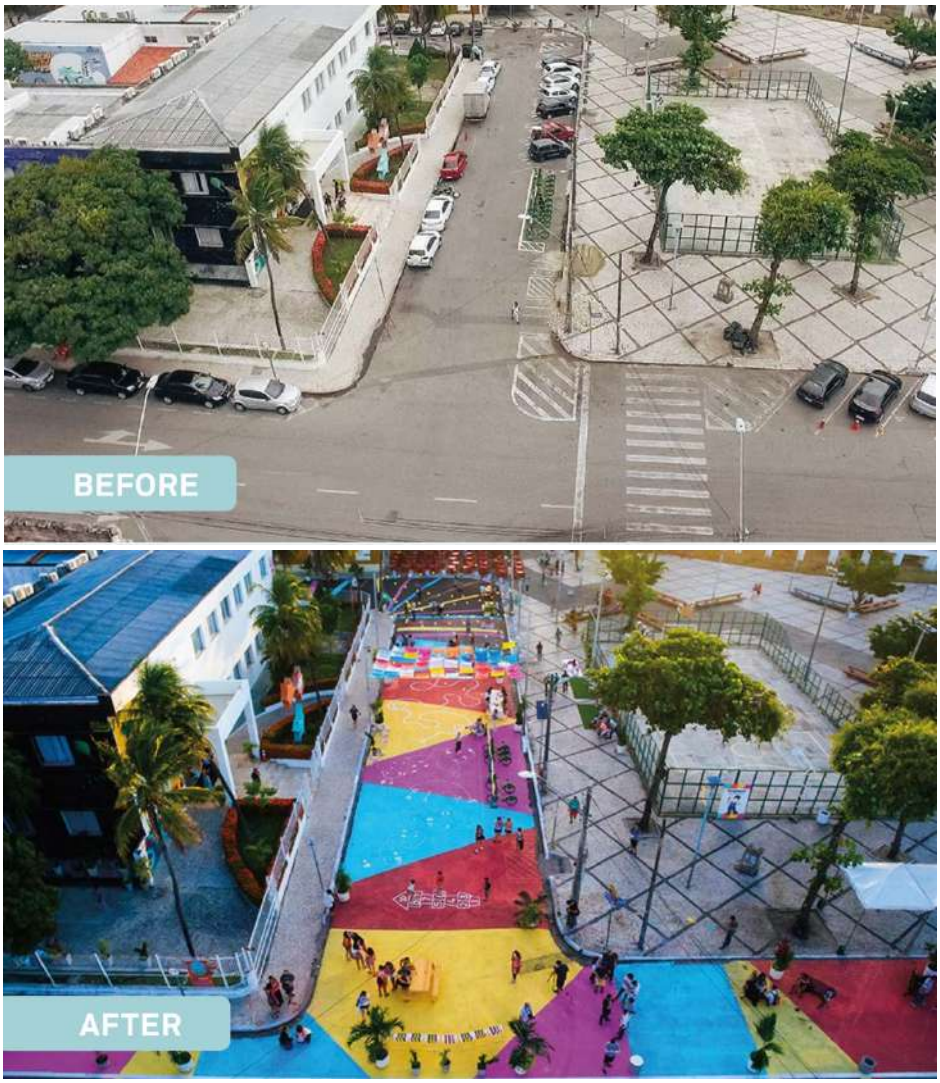

Figure 20: Street secured by tactical urbanism interventions. Fortaleza, Brazil. Source: GDCI.

Republic of Moldova

In recent years, a number of localities have enjoyed support in implementing low-speed zones near schools as part of road safety projects implemented by Automobile Club Moldova.
In Singerei, for instance, the crosswalk near Dimitrie Cantemir High School was secured.

Figure 21: N. Testemitanu Street, Singerei, Moldova. Source: ACM.

Tactical urbanism was used to remove parking near pedestrian crossings, narrow down traffic lanes and install road signs limiting the speed of driving to 30kmph.

Figure 22: Intervention to secure the crosswalk on N. Testemitanu Street, Singerei, Moldova. Source: ACM

The area around Petre Stefanuca High School in Ialoveni has been made safer with space for vulnerable traffic participants. The parking spaces in front of the access gate to the courtyard have been transformed into an attractive pedestrian area, and the creation of a raised pedestrian crossing offers more safety to road users.

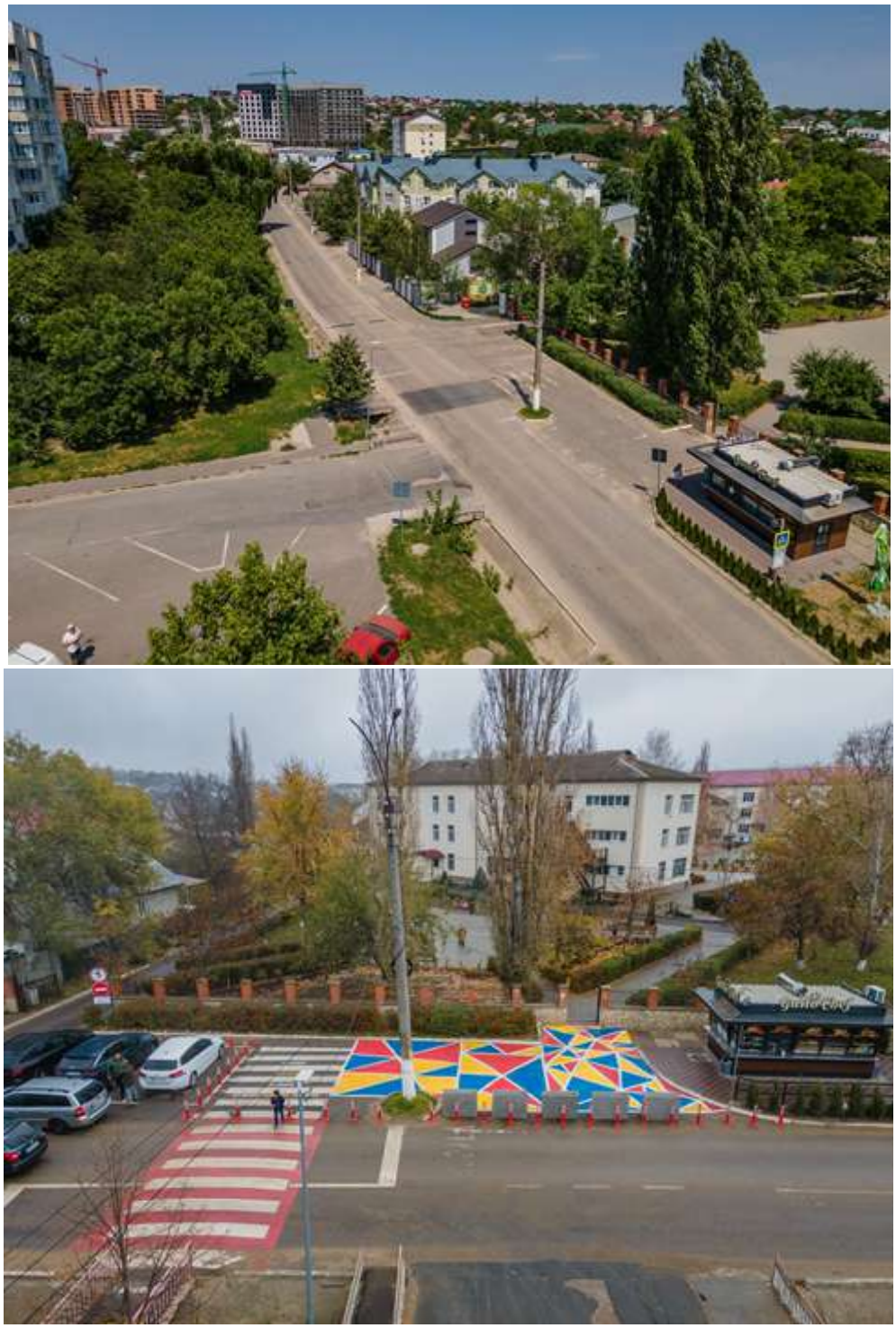

Figure 23: Intervention to secure the crosswalk on Basarabia Street, Ialoveni, Moldova. Source: ACM.

In the city of Chisinau, raised pedestrian crossings were set up on several high-traffic arteries.

Figure 24: Raised pedestrian crossing, Florilor Street, Chisinau. Source: Chisinau Municipality.

These bumps cause drivers to reduce speed and be more careful at pedestrian crossings.

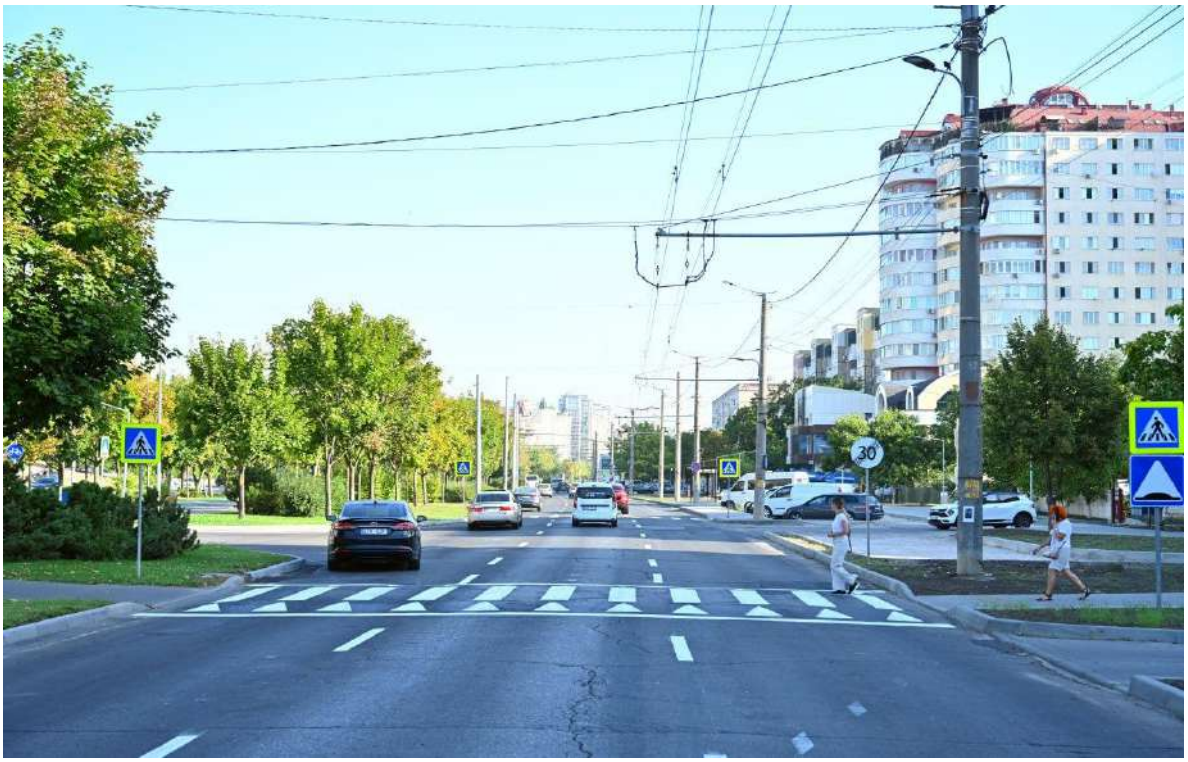

Figure 25: Raised pedestrian crossing, Mircea cel Batran Blvd, Chisinau. Source: Chisinau Municipality.

CONCLUSIONS

Car crashes resulting in deaths and serious injuries are the painful and very visible result of the lack of road safety infrastructure elements, which is induced, in particular, by speeding cars.

With a steady increase in urban population, the demand for safe mobility tends to overwhelm transport systems, particularly those based on private cars.

Many countries continue to design and build mobility systems for vehicles rather than humans, where safety is not a priority. This hampers efforts to prevent tragedies and protect vulnerable road users.

One solution to this growing problem is low-speed zones which can protect all users and save lives.

The implementable principles of designing a low-speed zone are not new. They are rather a simple methodology that interweaves traditional road elements with more innovative solutions to best adapt to all street users.

Creating 30kmph zones is a vital step towards safer neighborhoods and streets for life.

By following this guide, LPAs in Moldova can create a collaborative and supportive environment for vulnerable road users, building more resilient and vibrant urban spaces.

This guide focuses on changing existing urban areas, the same principles being true for developing new streets or neighborhoods with commercial, residential or social functions.

Streets can be attractive, welcoming and vibrant public spaces, or they can continue to be roads that pose deadly dangers. This guide is intended to inform, educate and empower community leaders, designers and responsible authorities on the planning, design and construction of low-speed areas in their community.

The solution begins with one voice, encouraging and empowering the principles and recommendations in this guide, and a willingness to act and make a change.

The UN Global Road Safety Plan 2021-2030 outlines the main steps to achieve the goal of halving road fatalities by 2030, each with a role to play to make safe, inclusive and sustainable mobility a reality.

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