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O.T.3.1.g Pilot Actions on 4 (6) Road Safety Thematic Areas

TA4 ROAD SAFETY NEAR SCHOOLS - MOLDOVA



RADAR – Risk Assessment on Danube Area Roads



<https://www.interreg-danube.eu/radar>

ROAD SAFETY NEAR SCHOOLS

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EXECUTIVE SUMMARY

RADAR (Risk Assessment on Danube Area Roads) aims to improve the road infrastructure safety in the Danube region by raising capacity and enhancing transnational cooperation for all road users, including vulnerable road users on Danube major, secondary and tertiary road networks. One of RADAR's main tasks is to identify risk on road networks and offer plans to systematically reduce that risk by improving infrastructure and road layout. One of the main objective of the project is the implementation of Pilot Actions on 4 Road Safety Thematic Areas in 7 countries (Slovenia, Croatia, Hungary, Czech Republic, Bosnia and Herzegovina, Bulgaria and Moldova) in order to test the best practices agreed upon beforehand. RADAR addresses all road-users but pays particular attention to vulnerable road users and safety on major roads near schools.

Two pilot cases have been selected in Moldova, representing urban and rural typical conditions in Moldova and other countries in the region, as evidence-based identification of sites and treatment selection, following the road infrastructure safety assessment. The minimum safety road elements according to local conditions are presented and options for road safety upgrade, focusing at vulnerable road users and more specifically to children, are described, including engineering and non-engineering actions. The goal is to have a safe environment around schools for the pupils to arrive and depart safely. The report focuses on stakeholder cooperation and engagement to potential improvements in order to increase road safety in the vicinity of schools, involvement of children and parents in the process of identifying risks, Star Rating methodology applicability and high-quality policy alterations.

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LIST OF ABBREVIATIONS

AADT	Annual Average Daily Traffic
ACM	Automobile Club of Moldova
ASP	Associated Strategic Partner
CRS	Child Restraint System
NIPS	National Inspectorate of Public Security
NGO	Non-governmental organization
RADAR	Risk Assessment on Danube Area Roads
RSEG	Road Safety Expert Group
SR4S	Star Rating for Schools
TA-4	Thematic Area 4
vph	Vehicles per Hour

1 Introduction

A growing epidemic of traffic injuries is devastating the next generation of children around the globe. Traffic collisions are the number one cause of death among children aged 5 to 19 around the world.¹

More than 500 children are killed every day as a result of road traffic collisions, and tens of thousands are injured, often suffering lifelong disabilities. Children living in poorer nations are most at risk. In fact, more than 90 percent of child road deaths occur in low- and middle-income countries.

IT'S A GLOBAL EPIDEMIC. A million families lose a child to a preventable injury every year around the world. Too many families don't have access to the information and resources they need to keep their kids safe from tragedies such as car crashes, drownings, fires and falls.

Every year thousands of children are killed and seriously injured while getting to and from schools. In many low- and middle-income countries school zones do not comply safe standards for children. A high number of schools are located near main roads, busy roads or rural roads without proper protection and facilities for pedestrians and especially for small children.

About 1.3 million people die on the world's roads and 20 - 50 million are injured every year. Road traffic crashes are a major cause of death among all age groups and the leading cause of death for children and young adults aged 5–29 years. The risk of dying in a road traffic crash is more than 3 times higher in low-income countries than in high-income countries. Worldwide, pedestrians and cyclists comprise 26% of road traffic deaths².

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Unsafe road design increases the risk for all road users: Roads should be designed for the safety of all road users. This means ensuring adequate facilities for pedestrians, cyclists and motorcyclists. Measures such as footpaths, cycling lanes, safe crossing points and traffic calming measures are critical to reducing the risk of injury among these road users.

Pedestrians, cyclists, and riders of motorized 2- and 3-wheelers and their passengers are collectively known as "vulnerable road users" and account for half of all road traffic deaths around the world. A higher proportion of vulnerable road users die in low-income countries than in high-income countries.

Controlling speed reduces road traffic injuries: As average speed increases, so does the risk of having a road traffic crash and the severity of the consequences should a crash occur. For every 1% increase in mean speed, there is a 4% increase in risk of a fatal crash³. A pedestrian hit by a car at 65km/h faces more than 4 times the risk of death than if the car were driving at 50km/h. That is why it is recommended that around schools the speed limit is 30 km/h. Thus, it has become first priority either to reduce the speeds of circulating vehicles around schools (look next two Figures) or to incorporate measures that will force vehicles to stop when school kids are on the road (e.g., traffic police officer, traffic lights activated by pedestrians).

¹ Safe Kids Worldwide (<https://www.safekids.org/global-road-safety-facts-children-safe-kids-worldwide>)

² World Health Organization – Road Traffic Injuries

³ World Health Organization – Road Safety – Speed facts

(https://www.who.int/violence_injury_prevention/publications/road_traffic/world_report/speed_en.pdf)

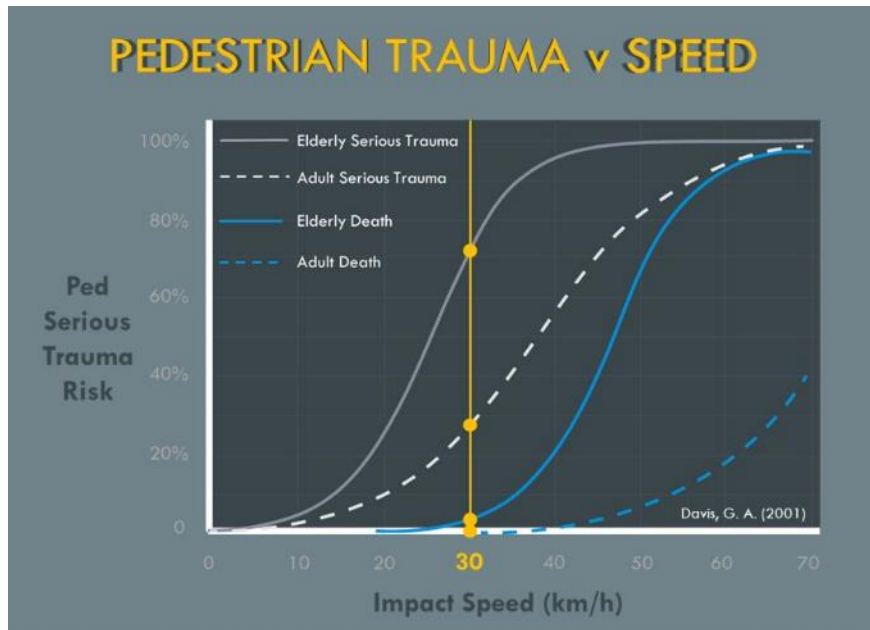


Figure 1-1 Pedestrian risk of death based on impact speed⁴

The public transportation system in many countries is not adequate to cover the needs of children to reach schools and school buses are a luxury offer, mainly from private schools. Parents are tempted to drop their children off and sometimes to pick them up with their private transportation means, thus, overcrowding the areas around schools during the rush hours and increasing the risks of accidents.

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In Moldova, the age at which people are allowed to drive a car is 18 that is why the National Inspectorate of Public Safety (the Moldovan Police) defines persons aged 0-18 as children. In Moldova, around 25 children are killed every year and another 100 are seriously injured in road crashes annually as pedestrians and car passengers. Even if the number of deaths and injuries among young ages dropped by almost 50% in the last 10 years, still, the number is too high.

Even if schools and the areas around them attract a high road traffic flow, a clear and reliable policy of safe and accessible routes from home to school and vice versa are basically missing and a wide understanding of the infrastructure gaps risks is required.

Within the framework of RADAR Research Project (Risk Assessment on Danube Area Roads), this report is intended to reflect how a Pilot Action can produce concept plans and lead to new-design plan with the main aim to reduce risks and to assess the possibility of policy changes, on evidence-based methodology. Pilot Actions serve to:

- a) evidence-based identification of sites & sections that require treatment,
- b) road infrastructure safety assessment using an evidence-based methodology,
- c) production of 'implementation-ready road layout concept plans' for treatment.

⁴ FHWA, USA

ACM is the Thematic Area 4 (TA-4) responsible project partner to design a final version of the RSEG Thematic Area 4 report.

The report focuses on stakeholder cooperation and engagement to potential improvements in order to increase road safety in the vicinity of schools, involvement of children and parents in the process of identifying risks, Star Rating methodology applicability and high-quality policy changings.

2 Pilot action identification

2.1 Stakeholders engagement

The responsibility for “safe to school and back home trip” is widely seen in many low- and middle-income countries as “parent’s duty” and the idea of safer zones around schools is quite unknown for most of the authorities. Thus, ACM started the project pilot action with the idea of a wider stakeholder’s involvement in Moldova, followed by a joint policy dialogue and a common action plan elaboration.

The following relevant stakeholders were identified:

1. National Ministry of Economy and Infrastructure (ASP)
2. Mayor’s Office and its subdivisions (including educational department and road infrastructure department)
3. National Inspectorate for Public Safety (the Police)
4. National Ministry of Education
5. Selected school’s administration and teachers
6. Parents and children
7. NGOs

In March 2020, the ACM team presented the project overview to the Minister of Economy and Infrastructure and chief of the National Inspectorate of Public Safety, with a request to help with detailed data analysis. The police agreed to present comprehensive data for the last 5 years in order to identify the most dangerous crossings near schools, in the rural and urban areas of Moldova.



Picture 2-1 Meeting with national stakeholders



Picture 2-2 Meeting with stakeholders at Chisinau

As a result of data provided and the consultation with the stakeholders, **2 school crossings**, one in **Congaz** (rural area) and one in **Chisinau** (capital city with the highest number of recorded incidents), were nominated for the pilot action. The National Inspectorate of Public Safety recommended the selection of these two sites, as it covers both rural and urban areas and record the highest number of road accidents. The representatives of Chisinau Municipality and local authorities of Gagauzia confirmed NIPS choice.

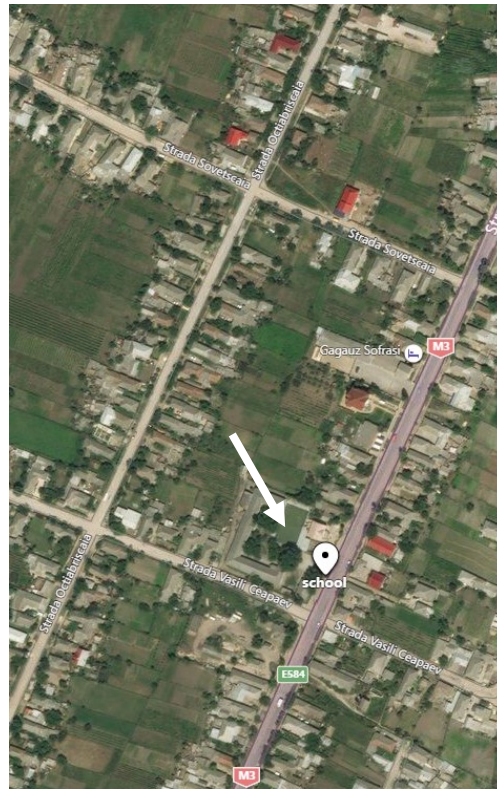
Specific characteristics for election of the Chisinau pedestrian crossing:

- The crossing is located at the entry/exit of the city, an area with heavy active traffic, being one of the main streets planned to be rehabilitated in near future
- In the immediate vicinity is situated one lyceum, one school and one kindergarten and this determines an intense pedestrian circulation
- Because the place of turn is too far away, the majority of parents park their cars across the road and cross the zebra to take their children to class, this creates traffic jams during rush hours.

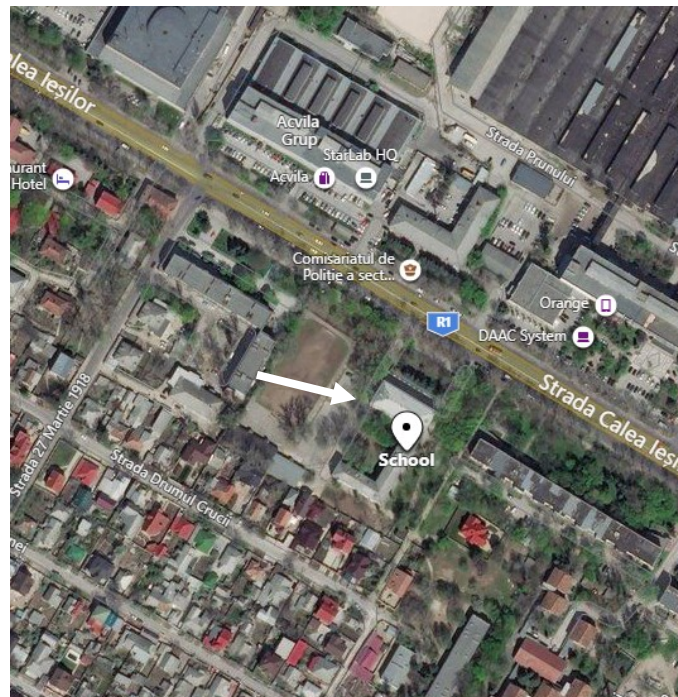
Specific characteristics for election of the Congaz pedestrian crossing:

- The crossing and the school are located on an international, transit road crossed by freight cars, trucks, etc.
- The road divides the village into two and this pedestrian crossing is the only one in the closest vicinity of the school

At the following 2 pictures, the location of the schools is shown.



Picture 2-3 Location of the school at the village of Congaz⁵



Picture 2-4 Location of the school at Chisinau⁶

⁵<https://www.google.gr/maps/place/46%C2%B005'53.8%22N+28%C2%B035'51.2%22E/@46.0987101,28.5953178,1304m/data=!3m1!1e3!4m6!3m5!1s0x0:0x0!7e2!8m2!3d46.0982855!4d28.5975579>

⁶<https://www.google.com/maps/place/Liceul+Teoretic+%E2%80%9EPrincipesa+Natalia+Dadiani%E2%80%9D/@47.040459,28.7977775,381m/data=!3m1!1e3!4m5!3m4!1s0x40c97d9343967855:0x3a3008d5f1a74d6e!8m2!3d47.0399555!4d28.7987427>

In April 2020, the inception meeting with the Deputy Mayor of Chisinau, was held, where the ACM team presented the project overview, similar experiences from other countries and expected benefits and outcomes. As a result, the Deputy Mayor agreed to support the project initiative and to identify budgetary resources to fix the deficiencies that will be identified after the star rating performance and the presentation of recommendations.

In the same period, a representative of ACM met the representatives of the Mayor of Congaz and ensured the similar support and project understanding.



Picture 2-5 Meeting with stakeholders at Congaz

The Covid-19 pandemic situation unfortunately led to the government decision (on March 15th) to close the schools until September 2020, with all children and teachers moving to on-line studies. Thus, no further stakeholder meetings could be planned until the school full-time activity re-launch, except on-line meetings.

In September 2020, children started the new academic year and ACM team arranged inception meetings with the administrations of the selected schools in Congaz and Chisinau and ensured the full support of the project. Surveys and open-air trainings with the involvement of the teachers, parents and children were held, due to Covid-19 restrictions to enter the school buildings.



Picture 2-6 Open-air meeting



Picture 2-7 Open-air survey

2.2 Data collection and analysis

According to the data provided by the automated Information System "Register of road crashes" of Moldova, at the period of 2015-2019 there were registered 2163 road crashes involving children (aged 0-18) as a result of which 87 died and 1951 were injured.

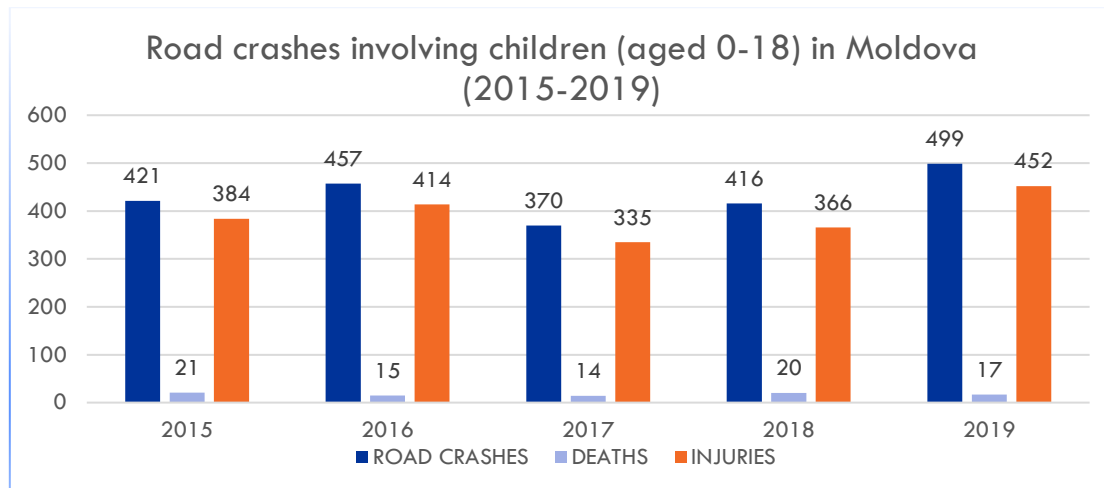


Figure 2-1 Road crashes involving children (aged 0-18) in Moldova (2015-2019). Source: National Register of road crashes

As regards the category of child road users, they were mostly involved in road crashes as **pedestrians**, 974 road accidents were recorded, resulting in 44 deaths and 917 injuries, accounting for 45% of the total number of road crashes in the entire country involving children (aged 0-18) occurred in 2015-2019. In addition, besides as pedestrians, children were involved most frequently in road crashes as car **passengers**, representing 30% of the total number of road accidents occurred in the country in 2015-2019, resulting in 26 deaths and 595 injuries.

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Chisinau is the biggest city and the capital of the Republic of Moldova. Chisinau is the most economically prosperous locality in the country and its largest transportation hub with a population of 635 994 inhabitants⁷. According to the Moldovan State Register of Transports, in Chisinau are registered 316 866 transport units⁸.

In **Chisinau** municipality, 755 road crashes involving children were recorded in 2015-2019, as a result of which 7 children died and 807 were injured. The riskiest category were pedestrians, accounting 58.7% of injuries and fatalities.

⁷ <https://www.worldometers.info/world-population/moldova-population/>

⁸ <http://www.asp.gov.md/ru/rst>

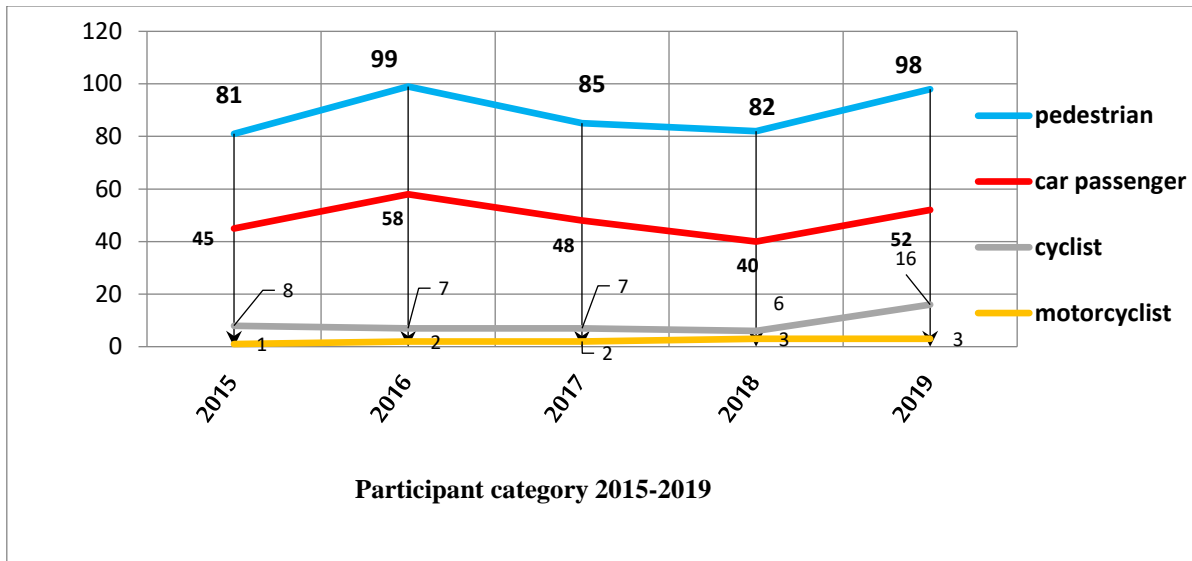


Figure 2-2 The most vulnerable categories of road traffic participants (children aged 0-18) in Chisinau (2015-2019)⁹

In Gagauzia region, **Congaz** being part of it, 74 road crashes were recorded in 2015-2019, with 4 deaths and 67 injuries among children.

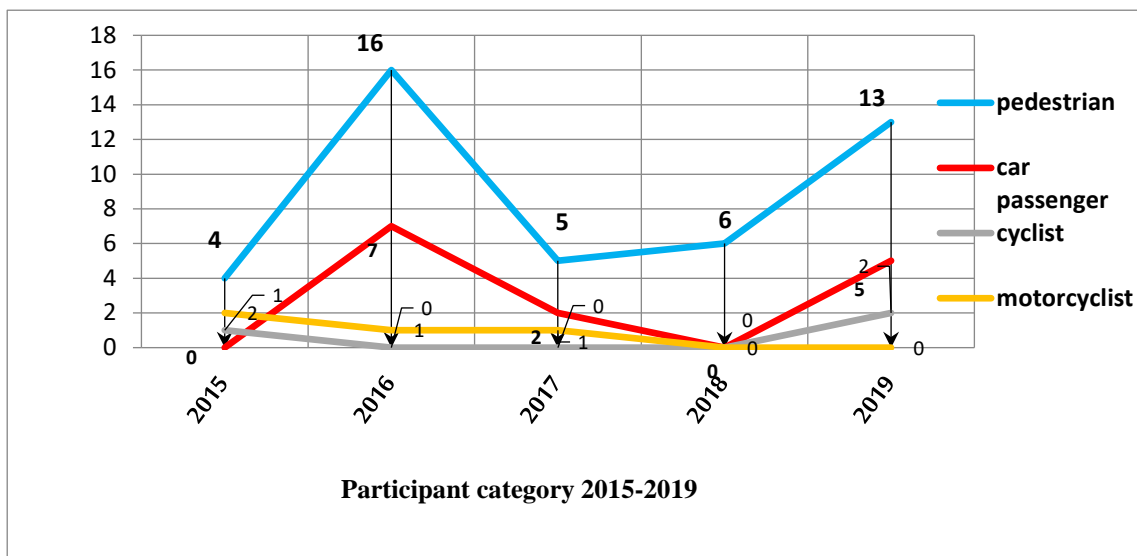


Figure 2-3 The most vulnerable categories of road traffic participants (children aged 0-18) in Gagauzia (2015-2019)

As for the selected locations, the detailed analysis of the statistical data for the period from 2015 to 2019 revealed the following:

- “Princess Natalia Dadiani” school in Chisinau: 24 crashes in the surrounding area, where 1 child died and 7 were injured,
- “Nicolae Cebanov” school zone in Congaz: 8 crashes in the surrounding area, with 3 children injured.

⁹ Official NIPS data

It is worth mentioning that the riskiest category of road traffic users near the selected locations are pedestrians, that amount to 65% of the total number of road accidents involving children.

To examine the safety level of the selected locations only the main data of road accidents occurred within a 50-meter distance¹⁰ from the designated crossing, in the last five years during school open hours, were extracted.

The locations of the pilot action implementation were selected (as the result of consultation between the various stakeholders) based on the significant number of crashes, fatalities and injuries recorded.

The crash data records were taken into consideration, in combination with the exposure data and potential exposure to risk per traffic characteristics and per time evaluated, utilizing the Star Rating for Schools App (SR4S). During the data collection and analysis, the ACM team investigated the impact of various infrastructure elements (geometric characteristics, electric lighting, parking, driver training, enforcements, etc.) on road crashes severance in order to propose safer solutions, based on SR4S App.

Not all the data, especially concerning specific categories and small crashes with minor injuries were necessarily reported by the police, but appeared in health sector data, mainly coming from hospitals and the ACM team added them during the cross check to better evaluate the risk.

¹⁰ The Police recommendation is for 50 meters, since a high number of pedestrians do not cross the street at the designated area (i.e. pedestrian crossing) but rather around it. This is mainly due the poor quality of road markings but also due to their behaviour as pedestrians (not fully respecting the traffic rules due to lack of training or lack of adequate infrastructure). Furthermore, according to Police, the recorded GPS data at the place of crash should be considered with accuracy of ± 50 meters.

3 Preliminary assessments and findings

After the identification in collaboration with the National Inspectorate of Public Safety of the 2 most dangerous school zones, the ACM team held some preliminary traffic and pedestrian flow observation on 25-27 March 2020, near the selected schools, but also assessed the general pavement condition, traffic sign and markings status¹¹, as well as the adequacy of the road infrastructure to the minimum road safety standards.

As of result of the schools lock down caused by the Covid19 pandemic, the preliminary assessment revealed only some generic infrastructure deficiencies, common for the both school area, rural and urban:

- Lack of the marking of the crossings, or very poor condition of the marking.
- Lack of signs “Attention school zone”.
- Lack of low-speed zone in the proximity of the school crossings.
- Lack of speed calming measures, such as speed bumps.

Some behavioural gaps among the road users were also observed:

- Crossing of the street outside of the official pedestrian crossing
- Running while crossing of the street
- Car parking on the pedestrian crossing or the immediate proximity
- Vehicles speeding and non-giving way to pedestrians

3.1 School zone at Congaz

The main road at the school vicinity is the national road M3, with a speed limit of 50km/hr and operating speed approx. 60 km/hr. The Annual Average Daily Traffic (AADT) of M3 at this section is approx. 12,000 vehicles. Pedestrian flow is around 60 pedestrians per hour at the drop-off rush hour, on both sides of the road.

The initial specific road safety issues that were identified for the school “Nicolae Cebanov” in Congaz include:

- vehicle parking close to the pedestrian crossing
- inadequate sight distance
- pedestrian sidewalk not linked to the pedestrian crossing (next picture).

¹¹ Performed by visual checks from experienced staff using Star Rating for Schools application (SR4S App)



Picture 3-1 Identified pedestrian crossing at Congaz

The first preliminary set of recommendations were made to the local authorities to be implemented urgently before the end of the lock down and return to school of the pupils. Thus, in order to decrease the potential risk before any major infrastructure update, the following were proposed:

- re-painting of the markings
- installation of warning signs “beware children” and “school zone”
- installation of temporary calming measures such as removable speed bumps
- identification of the possibility to involve a crossing supervisor during the rush hours
- identification of the possibility to involve patrolling police during the drop off hours to ensure speed management and non-parking near the crossing.

Following the preliminary assessment recommendations presentation, the local authorities decided as short-term measures, until the Star Rating assessment will be made and the full set of recommendations will pass the council approval, to:

- ✓ Re-paint the crossing, using the alternate red and white stripes for increased visibility
- ✓ Install the sign “Attention children” and “Attention school zone”
- ✓ Starting from September 1st, to ensure the presence of a crossing supervisor from 7:40 to 8:15 AM by the end of September. The supervisors were selected from a number of volunteer parents and trained accordingly by the ACM team on crossing rules, using reflective materials, CRSs, etc.

Only a part of the decisions has been really implemented, such as re-painting of the marking, a new marking “School”, even though not previously discussed (Picture 3-3), and the crossing supervisor presence during the rush hours. There were not installed the warning signs “Beware school” and “Beware children”; there were not installed the temporary speed bumps and no police officers were involved in rush hours as was recommended.

The problems of the “initial solutions” were discussed with the local authorities during the second round table beginning of October 2020, among the results of September monitoring of the results. The main issues of the “initial solutions” were the following:

- The painting of the marking was at very low quality, especially after the rainy period and high traffic flow, so in less than 1 month it started to fade.
- The crossing supervisor was not present all the days in September, and the school administration informed us that the volunteers are not always reliable and sometimes do not appear even after confirming their availability.



Picture 3-2 Initial solutions implemented

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Picture 3-3 Faded markings

3.2 School zone at Chisinau

The main road at the school vicinity is Calea Iesilor Str., with a speed limit of 50km/hr and operating speed approx. 60 km/hr. The Annual Average Daily Traffic (AADT) of Calea Iesilor Str. is around 48,000 vehicles. Pedestrian flow is more than 100 pedestrians per hour during the rush hour, on both sides of the road.

At the initial stage, the specific problems for the “Principesa Natalia Dadiani” school in Chisinau identified were:

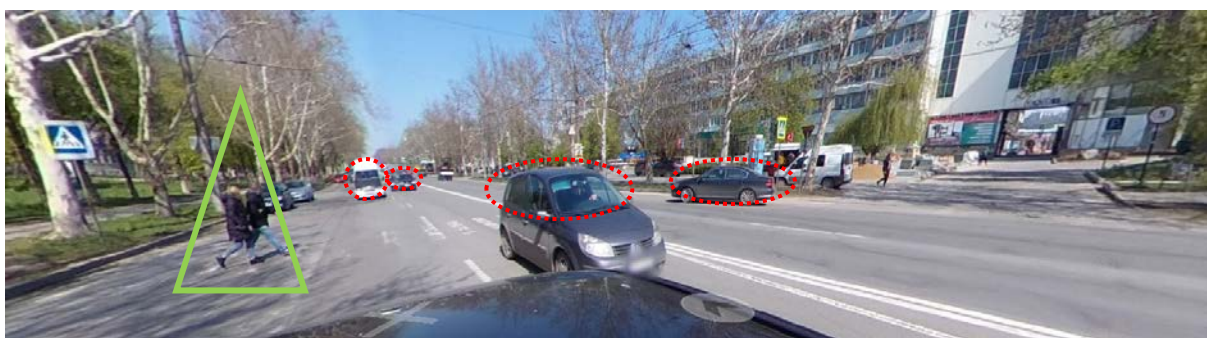
- pedestrian crossing (following picture), below minimum safety standards as for a 6 lane road (2-way road with 3 lanes per direction) with heavy traffic
- illegal vehicle parking close to the pedestrian crossing
- very poor sight distance.



Picture 3-4 Identified pedestrian crossing at Chisinau

At the specific road segment of approx. 850m between traffic lights, there are 4 unsignalled-protected pedestrian crossings every 130-180m. The traffic is dense (approx. 6,000 vph) and the pedestrian risks high.

Due to the specific location and the traffic conditions, the simultaneous presence of pedestrians and moving vehicles on the pavement is a typical situation (next picture).



Picture 3-5 Simultaneous movements of pedestrian and vehicles at Chisinau

The first preliminary set of recommendations were made to the local authorities to be implemented urgently before the lock down end and return of the scholars in order to decrease the potential risk before any major infrastructure update:

- re-painting of the markings
- installation of the warning signs “beware children” and “school zone”
- installation of the temporary calming measures such as removable speed bumps
- identification of the possibility to involve a crossing supervisor during the rush hours
- identification of the possibility to involve patrolling police during the drop off hours to ensure speed management and non-parking near the crossing.

Following the preliminary assessment recommendations presentation, the local authorities decided as initial measures, until the Star Rating assessment will be made and the full set of recommendations will pass the council approval, to:

- ✓ Re-paint the crossing, using the alternate red and white stripes for increased visibility
- ✓ Install the sign “Attention children” and “Attention school zone”
- ✓ Install the calming measure – speed bumps 1 meter in front of the crossing, each way and to mark it with the sign “Attention, speed bump”
- ✓ Starting from September 1st, to ensure the presence of a patrol police officer from 7:40 to 8:15 AM near the crossing by the end of September.

However, only a part of the decisions has been really implemented, such as re-painting of the marking, installation of the sign “Attention speed bump”, “30 km/h” speed zone (not initially discussed) and the patrol police officer presence during the rush hours. Speed bumps were never physically installed, as well as the sign “Attention school zone” and “Attention children”.

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The problems of the “initial solutions” were discussed with the local authorities during the second-round table middle of October, among the results of September monitoring of the results. Among the main issues of the “initial solutions” were:

- The quality of the marking was very low, so after the rainy period started with high traffic flow, in less than 1 month it started to vanish.
- The drivers who initially were tempted to slow down after the installation of the sign “Attention speed bump” and “30 km/h” speed zone, when passing from the specified point realised that the bumps were not present and started to ignore the signs.
- The patrol police officer was not present all the days in September, and police informed us that they cannot ensure the police officer presence any longer in October.



Picture 3-6 The painted pedestrian crossing after one month



Picture 3-7 The installed signs and the patrol police officer during duty

4 Surveys performed

In the period of September 7th - October 1st 2020, two discrete surveys were performed by ACM team supported by volunteers near the selected schools at Congaz and at Chisinau.

4.1 School area at Congaz

The period from September 7th until September 11th 2020, near the school “Nicolae Cebanov” gymnasium, the designed surveys took place. More specifically, traffic volumes were recorded during morning peak hour. Additionally, a survey comprising 2 questionnaires was organised near the designated pedestrian crossing.

The first questionnaire was intended for parents, comprising 12 questions (included at Annex 1), such as:

- How often you're using your personal transportation means to bring kids to/from the school
- Do the drivers stop when you or your kids are crossing the road?
- How safe do you think the road to/from school is?
- What would you propose to improve in order to raise safety of the zone around school?

A total of 67 parents were interviewed, from which 63 agreed to respond to all the questions and 4 responded partially. The main conclusions from the survey are:

- 79% of the respondents considered the pedestrian crossing near the school to be dangerous
- 14% confirmed the drop off to the school with their private car and confirmed the increased number of parents carrying their children to the school with private transportation means
- 53% of respondents considered speed limitation measures (raised crossing, speed bumps, traffic lights) to be the most efficient for road safety near the school.

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The second questionnaire was addressed to children, comprising 13 questions (Annex 2), similar to the questions addressed for parents. A total of 112 pupils were interviewed. The main outcomes from the responds are the following:

- approximately 49% of the children feel safe while going on foot to the school and crossing streets, while most of them complain about speeding drivers
- 19% of the pupils confirmed the increase in the number of cars around the school during the rush hour
- 36% of the children would prefer a traffic light at the pedestrian crossing

The traffic flow counts were held September 7th - September 9th and September 23th – September 25th 2020, between 7:30-8:30 AM. An average number of 300 vehicles per hour were counted, with a 20% increase during the drop off time (7:45-7:55 AM)¹².

¹² An unmarked police car was used, equipped with radar during an hour at each location in order to measure the average speed of the traffic flow. This was performed unofficially, as if it was performed officially all the offending drivers should have been punished and the infringements recorded officially; but this was not the objective. The goal was to identify the drivers' operating speed.



Picture 4-1 Daughter is filling-in the parents Questionnaire, with her father in Congaz

4.2 School area at Chisinau

A survey was conducted between September 14th - September 18th and September 28th – October 2nd 2020 in Chisinau, near “Principesa Natalia Dadiani” school. The same 2 questionnaires with Congaz were utilised, and traffic flow counting near the main crossing took place.

A total of 182 parents responded to the questionnaire (Annex 1). The results are the following:

- 84% of the respondents considered the crossing near the school as dangerous.
- 31% confirmed the drop off to the school with their private car and confirmed the increased number of parents transporting their children to the school by private transportation means.
- The majority of respondents (71%) considered speed constraint measures (raised crossing, speed bumps, traffic lights) to be the most efficient countermeasure for road safety near the school.

The survey for pupils (questionnaire at Annex 2) had 201 responses. The main conclusions from the replies are:

- only 23% of the children feel safe when they walk to/from school and cross streets, even though most of them complain for speeding drivers.
- 34% of the pupils confirmed the increase number of cars around the school during the start and end hours of school time.
- 58% of the children would favour a traffic light at the crossing.

Discussions with pupils, parents and teachers revealed another safety issue. More specifically, the provisional sidewalk during rehabilitation works are flooding during and after heavy rain, creating obstacles to the pedestrians.

The traffic flow survey was held from September 23th to October 2nd 2020, between 7:30 - 8:30 AM. An average number of 2.000 vehicles per hour were counted, with a 43% increase during the drop off period 7:45-8:15.



Picture 4-2 Survey for schoolchildren in Chisinau

4.3 Trainings and campaigns

To ensure proper understanding of the necessity of pilot actions, ACM team developed a series of trainings and a short “Safe to school, safe to home” campaign aimed at joint assessment and identification of the risks and unsafe zones on the way from home to school by children by mapping the routes used by pupils every day, as well as at raising the level of knowledge and awareness and attention to road safety and behaviour on roads.

On-line and off-line meetings were organized between teachers, parents and pupils with the help of local administration and mentors. There were a lot of road safety issues discussed, relevant to the area where the school is located, as well as measures for road risk reduction and road crash prevention, involving the local community. Therefore, pupils together with their parents and teachers discussed the routes between school and their home in order to identify all road traffic risk factors and the means to avoid them, by (i) changing the road crossing points, (ii) modifying the route, (iii) improving behaviour, or (iv) complaining constructively to the responsible authorities.

Various materials, such as reflectors and informative brochures, video materials and posters with different road safety messages were supplied to teachers in order to distribute them. Additional meetings and road safety training sessions are foreseen for parents and teaching staff.

This practice is an example of complex approach of Safe System, combining road design, education, involving the project target groups and dialogue with authorities.



Picture 4-3 Pupils filling-in their questionnaires



Picture 4-4 Meetings between pupils, teachers and ACM team

5 Star Rating for Schools (SR4S) Assessment

The ACM team started the Star Rating assessment for the selected locations in Chisinau and Congaz taking into consideration that Star Rating for Schools (SR4S)¹³ is the first evidence-based tool (cloud based free-to-use application) for measuring, managing and communicating the risk children are exposed to on a journey to their school and it supports quick interventions. The assessments were held using iRAP protocols and the SR4S coding guide at the SR4S application.

The multiple assessment approach was selected, including education, enforcement and engineering. The assessor physically inspected the area around the school and especially the identified pedestrian crossing, measuring the distances from the parked vehicles, comparing the real-life road traffic flow situation with the data analysis provided by the surveyors during their preliminary assessment, estimated the quality of the pavement and markings, taking pictures from different angles and distances. The ACM team ensured assessor contact with the school administration and the broader school community to explain the project's aims.

During the inception meetings with school teachers and children parents, the assessor stated the project objectives, listened to their input and gained their support. The potential benefits of the project and the involvement of the local community was insured.

All collected information was inserted into the project on starratingforschools.org and after the approval from the project supervisor were star rated.

Based on the Star Rating result, the assessor measured the risk, designed and proposed road treatments, in order to achieve the minimum of 3 stars for each of the selected locations. 2 different models of interventions based on the cost effectiveness and impact on safety were simulated and proposed to the authorities to be considered:

- The low-cost, low engineering interventions that can ensure at least 3 stars.
- Adequate cost (medium to high) and combined enforcement and engineering intervention for maximum efficiency and at least 4 stars performance.

The potential countermeasures for the locations assessed were conveyed to the different interested parties and some of the technical information was translated into compelling messages in order to ensure easy understanding for all parties involved.

The ACM team and the Star Rating assessor also evaluated other, non-engineering solutions to improve road safety around schools, but also the general safety of children in the school areas and routes between school and home. The air pollution caused by the private transport means, limitation of the drop-off area and parking in front the school gate, were among the topics discussed with the stakeholders and the beneficiaries of the pilot project.

5.1 High risk pedestrian crossing in rural school area, Congaz

The school in Congaz, one of the biggest villages in the Eastern Europe in terms of population – approximately 13000 inhabitants, has 297 children, from 1st to 9th grades (aged 7-15). The

¹³ <https://www.starratingforschools.org/>

operating hours are 08:00 AM to 05:30 PM, leaving gradually in the afternoon. The school is located near to one of heaviest traffic national roads in the Gagauzia region, M3 (E584) Kongaz.

The main attributes recorded by the assessor were:

1. one wide lane each way with an undivided carriageway type, medium grip and medium road condition
2. heavy traffic of around 12,000 vehicles per day and a lack of speed management
3. lack or poor quality of markings, including school zone warnings
4. poor crossing design quality and lack of calming measures
5. operating speed below general admittance and much over recommended school zone admittance

The recorded attributes resulted after Star Rating performance into 2* stars.



Figure 5-1 Current Star Rating scoring (Congaz)



Picture 5-1 Assessing the infrastructure with SR4S app (Congaz)

The following 2 options for road safety improvements were proposed to the Congaz authorities.

Option 1 - Low cost measures

- Installation of warning signs ‘School zone’ and ‘Beware kids’
- Presence during the rush hours of a crossing supervisor

- Widening of waiting area so that several pupils can stand at the roadside side by side and make a proper assessment of approaching cars
- Lowering of the curb stone in order to increase accessibility for the handicapped and people with prams
- Installation bollards at the roadside in order to avoid illegal parking



Picture 5-2 Crossing supervisor on action (Congaz pedestrian crossing)



15.07

Figure 5-2 Star Rating scoring with low cost measures implementation

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The proposed improvements were expected to raise the Star Rating to 3* and to reduce the risks. The school administration and the local authorities agreed on a quick implementation of the fixings as little budgetary efforts were needed, since the crossing supervising duties could be carried by volunteering parents. During the month of September, the crossing supervisor model was tested after the preliminary recommendations made by ACM, and the result were quite impressive, with 0 incidents comparing to 2 incidents in the same period of 2019. The crossing supervisor model will be extended by the end of the year and upon the necessity until the re-design of the crossing.

Option 2 - Moderate cost measures

- Installation of warning signs ‘School zone’ and ‘Beware kids’
- Redesign of the crossing into a colourful marked pedestrian crossing
- Upgrade the crossing quality from poor to adequate
- Installing of a low speed zone 30km/h during school times (with an expected 40km/h operational speed), supported by enforcement from local patrol police
- Using of the crossing supervisor during the drop off hours and pick-up hours.



Figure 5-3 Star Rating scoring with moderate cost measures implementation

The proposed improvements are anticipated to raise the Star Rating from 2* to 5* and to reduce the risks to minimum. The school administration and the local authorities agreed on discussion of the proposed improvements for the next year, as the budget for the current year does not permit the costs.

5.2 High risk crossing in urban school area, Chisinau

The school in Chisinau, the capital city of Moldova, has approx. 1300 children, grades from 1 to 12. The school operating hours are from 08:00 to 17:30. The school is located near one of the busiest national roads in the city, R1 (E584).

The main attributes recorded by the assessor were:

1. three wide lanes for each direction with an undivided carriageway type, medium grip and medium road condition
2. heavy traffic of around 48,000 vehicles per day and a lack of speed management
3. lack or poor quality of markings, including school zone warnings
4. poor crossing design quality and lack of calming measures
5. operating speed below general admittance and much over recommended school zone admittance

The recorded attributes resulted with Star Rating scoring into 1* star.

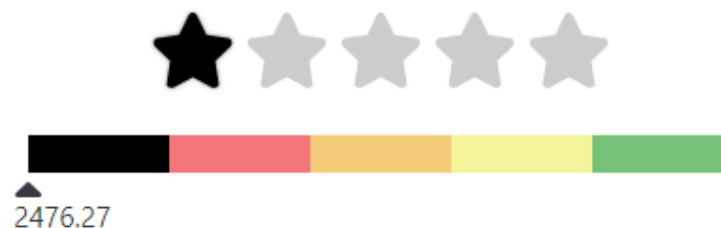


Figure 5-4 Current Star Rating scoring (Chisinau)



Picture 5-3 Assessed pedestrian crossing (Chisinau)

The following two options (in terms of budget) for road safety improvements were proposed to the Chisinau authorities:

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Option 1 - Low cost measures

- Installation of warning signs ‘School zone’ and ‘Beware kids’
- Engage, during the rush hours, a pedestrian crossing supervisor.

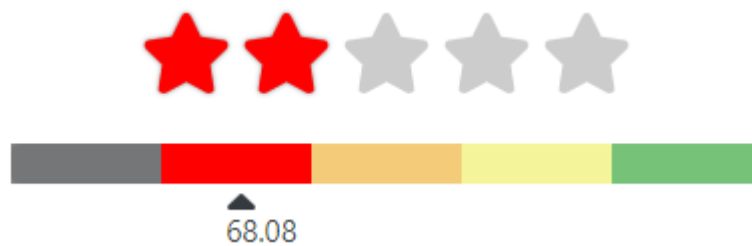


Figure 5-5 Star Rating scoring after low cost measures implementation

The proposed improvements were expected to raise the Star Rating to 2* and to slightly reduce the risks. The school administration and the local authorities agreed on a quick implementation of the proposals as little budgetary efforts were needed (the crossing supervisor duties would be carried out by volunteering parents). During the month of September, the crossing supervisor model was tested after the preliminary recommendations made by ACM, and the result were good, with 1 incident comparing to 6 incidents in the same period of 2019. The crossing supervisor model would be extended by the end of 2020 and upon the necessity until the re-design of the crossing. Starting from October 1st, one police officer is helping the crossing supervisor to ensure low speeds around school and safe crossing of pupils.



Picture 5-4 Crossing supervisor at Chisinau pedestrian crossing

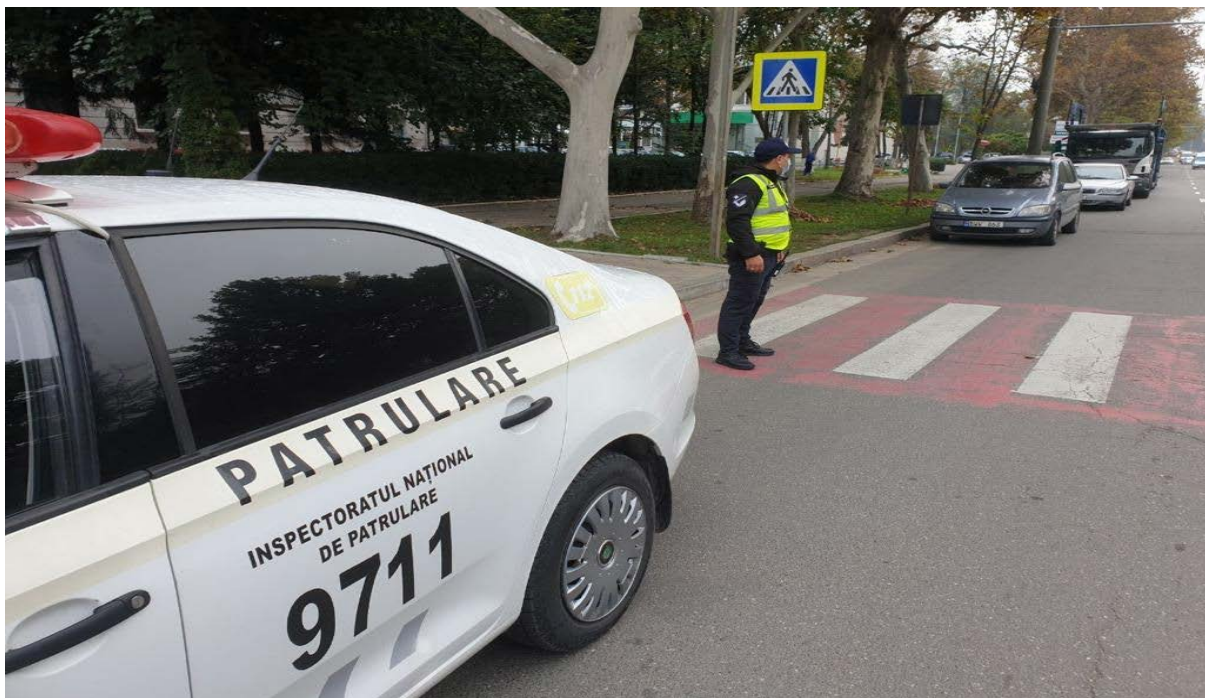
Option 2 - High cost measures

- installation of warning signs ‘School zone’ and “Beware kids”
- redesign of the crossing into a raised and marked pedestrian crossing
- refuge island for pedestrians
- Upgrade the crossing quality from poor to adequate
- banning vehicle parking near the pedestrian crossing
- installing of a low-speed zone 30km/h during school hours (with an expected 40km/h operational speed), supported by enforcement from local patrol police
- Engage a crossing supervisor during the drop off hours.

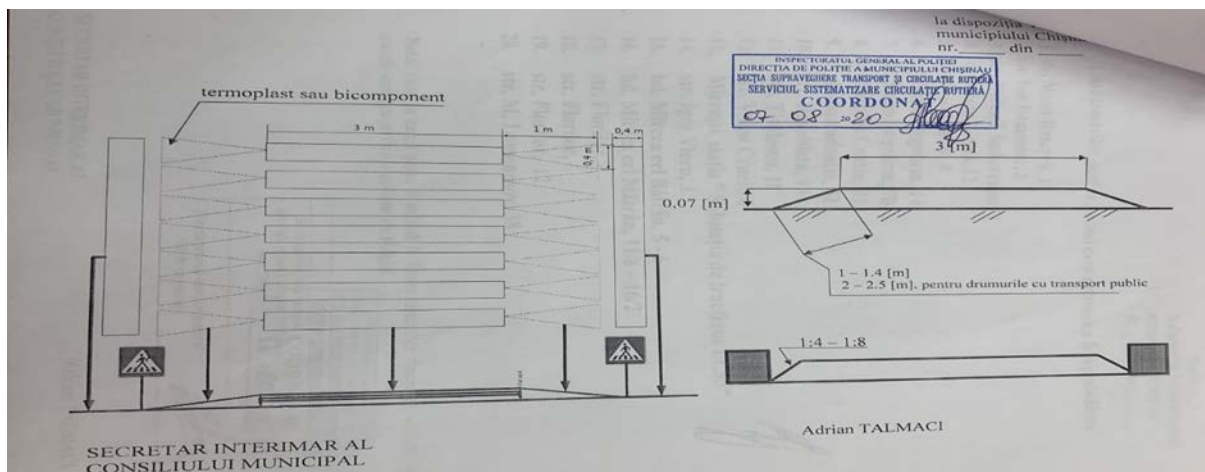


Figure 5-6 Star Rating scoring after high cost measures implementation

The proposed improvements are expected to raise the Star Rating to 4* and to reduce the risks. The school administration and the mayor office agreed on the proposed improvements for the next year, as the budget for the current year did not allow the proposed implementation costs. The project for the redesign of the pedestrian crossing according to the high costs proposals were elaborated in cooperation with the Road and Transport Department of the Municipality.



Picture 5-5 Patrol officer at Chisinau pedestrian crossing



Picture 5-6 Chisinau raised pedestrian crossing design by the Road and Transport Department of the Municipality

5.3 Learnings from the assessment performance

The assessment performance can be a challenging and time-consuming procedure. The stakeholder's identification at the initial stage will contribute to raise awareness, to initiate policies changing dialogue and to establish reliable partnerships.

A strong motivational campaign, launched simultaneously with the assessment to explain the necessity of engendering transformation and the safer zones around school concept, can ensure community and media support.

Data collection for a specific location might be difficult due to the fact that in many developing countries, police and local authorities are not collecting a GPS based accident point, but only general data about an accident location. So, one needs to sort out manually the data to find out if the crashes occurred near the schools. Black spot mapping is also missing in many police reports.

When the assessment is made near the schools, it's important to find out not only the statistical data, but also to collect more specific data about changing of the traffic flow in the drop-off and pick-up hours, channelization of the pedestrian flow near different crossings around schools, parking distances and low speed zones.

Star Rating for Schools is an excellent tool to provide to the decision makers the real problems and risks around schools. Still, the Star Rating assessment must be supported by adequate training of the users and the benefits of Star Rating assessment should be widely explained.

In many cases, the assessment results are a quick win solution that can trigger the authorities to accept the investment into a safe transformation. But it's mandatory to take into consideration that the budget for city expenses are adopted every end of the year for the following year, thus decisions of major transformations and countermeasure implementations are directly dependent on the budgetary limitations and can be approved only for the next year after the decision taken.

As costly major engineering transformations can be time consuming, the proposal of two phases of the transformation can be a more pragmatic solution. As initial phase, the low cost investments and less efforts solutions, such as installation of warning signs, markings painting and crossing supervisor can be an asset. In the following phase, major engineering transformations, based on Star Rating for Schools toolkit could be advocated to the authorities. Raised and marked good quality crossings in the places where traffic lights cannot be physically installed are highly recommended. If the budget allows, a crossing near a school should include traffic lights and ideally a refuge island if 2 or more lanes per direction of travel are existent.

Training sessions for teachers, children and parents on road safety bring an added value to the engineering transformation and can lead to a significant reduction of the risk levels.

6 Policies dialogue

One of the main goals of the pilot project is to demonstrate the necessity of sustainable policies changings. At the moment, in Moldova there is no regulatory document explicitly referring to the necessity of a safer zone around school buildings. The “Road Safety Strategy 2010-2020” includes safer roads for kids only as a general approach and some common educational elements involving civil society and police. So, no specific guidelines or safety features around schools are recognized.

Our priority was to engage responsible authorities into a policy changing dialogue, and emphasise the necessity of a long-term action plan, with sharing responsibilities and implementation of fast cost-effective interventions to avoid risks. This would be initiated by assessing and analysing the risks.

Upon the finalizing of the Star Rating process, the results of the assessment were presented to the National Council of Road Safety (NCRS) permanent bureau and to the local authorities’ administration.

The permanent bureau of the NCRS decided to develop a recommendation to the future annual meeting of the NCRS to include the safe zones around school’s formulation into the new road safety strategy 2021-2030, which is under development that would be adopted by the beginning of 2021. Also, the bureau concluded that the definition for safer zones around schools should be formulated and ensured into the corresponding stakeholders documents.

Local Mayor’s offices in Chisinau and Congaz agreed to include the safe zones around school’s formulation into their future road safety improvements action plans.

The steps to be considered:

- New Road Safety Strategy 2021-2030 to comprise a dedicated definition of the safe zones around schools and to provide guidelines to the central and local authorities to ensure safety design and safety standards
- The National Action plan for road safety for 2021 to consider the finding of at least 2 transformation of school zones, based on the Star Rating assessment and recommendations



Picture 6-1 Meeting with the National Council of Road Safety

7 Implementation and recommendations

It has been demonstrated at the previous sections that the 2 pedestrian crossings impose many risks to the pedestrians that use them, and more specifically the pupils that go to the nearby schools. The need for improving the circumstances under which the pupils (with or without their parents/guardians) cross the high density – speeding vehicles roads has been well established, not only from the surveys performed by the ACM team but with the well documented and worldwide accepted tool SR4S, as well.

These specific locations could be utilised as case studies for the replication at similar locations around the country. As it has been included at the Report of Thematic Area 4 - Road Safety Near Schools, the specific circumstances that are present should be taken into consideration for the countermeasures implementation.

A holistic approach should be adopted for the implementation of feasible sustainable measures, and these may comprise engineering-infrastructure countermeasures, non-engineering measures and training-awareness campaigns, all focusing at vulnerable road users.

7.1 Fixing the high risk crossing in Congaz in a rural school area action plan

The identified high risk pedestrian crossing is located at an important national road (M3). The specific national road, due to its characteristics has high volumes of traffic with a high percentage of heavy vehicles. Additionally, M3 (European Road E584) serves long-distance trips, with traffic just passing through built-up areas. The road alignment, when passing through Congaz (almost at its outskirts) is a long straight stretch. Thus, the drivers entering the village of Congaz do not reduce their operating speeds (as the highest percentage is through traffic).

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Therefore, taking into account the specific location characteristics and circumstances, the following are noted:

- a) the most important is to inform the passing through drivers that they are approaching a school area and a pedestrian crossing that many young children (ages 6-13) accompanied or not, are crossing the road during school start and end times.
- b) since a high percentage of drivers are on long-distance trips, passing-through the area, their speeds are usually higher than the speed limit, and it has been documented (internationally¹⁴) that they do not obey the traffic rules. Thus, signs alone do not have the anticipated effects on the drivers.
- c) The pupils crossing the road are concentrated at specific time periods (morning for incoming pupils and afternoon for outgoing pupils). Moreover, during summer vacations and holidays, there is no such dense pupils' movements at the specific crossing. Hence, the measures applied should be present at these specific periods, and not impose obstacles to through traffic the rest of the times.

As a result of the surveys, meetings and assessment, the following measures are included at the action plan for the next period:

¹⁴ Drivers' speed behaviour on rural roads, Kanellaidis.G et.al., Traffic Engineering & Control, 1990.

- 1) Considering that signs informing the through traffic that they are entering a built up area, are present (at the village boundaries), signs for the existence of pedestrian crossing should be present as well. The specific pedestrian crossing should be painted with high-grade and retroreflective paint (e.g. thermoplastic) with colors (in order to attract the attention as different from the rest) which will last for long time. In case the markings are not adequately bright, they should be regularly maintained.
- 2) Signs “Warning - Crossing kids” should be installed (needless to mention for both directions of travel).
- 3) Traffic code compliance, e.g. no parking is allowed before and after the pedestrian crossings, no parking regulations apply.
- 4) Vehicles need to be ‘forced’ to stop at (at least) the specific pedestrian crossing when pupils (with or without guardians) are present. In order to achieve this, the most effective measure is the presence of a Police (Patrol) Officer. This Police Officer is mostly required for 30 minutes only, before and after school operating hours.

This is not possible sometimes, meaning either there is no available staff at the local police station or that at extreme occasions the policemen would participate at other events. Hence, more convenient is the same tasks to be performed by nominated persons. These persons could be either volunteers (i.e. parents or guardians of pupils of the specific school) or unemployed persons with a small compensation for this task. At the latter case, these again could be parents/guardians.

Since we have information that this measure was practiced for a period of time, and it was efficient, we have documented its importance and effectiveness. The issue is that sometimes the volunteers were not showing up. This is very problematic because consistency is one of the fundamentals for road safety. If children think that they will always be protected, due to the presence of crossing supervisor, then they will not pay the proper attention to the road. So, when he/she is absent, the risk would be very high. Therefore, in such a case, the best solution is the installation of a pedestrian traffic light activated by a button. This traffic light is not regulating traffic at an intersection and is always green for traffic. It is only activated by a button, which is pressed by pedestrians when they are present and wish to cross the road. So, when the button is pressed and the signaling program is activated, the warning signals (which are 150m ahead of traffic) are activated in order to inform the incoming traffic that will face a red traffic light. After a few seconds the traffic light turns red and the signal for pedestrians is green, giving them the right-of-way. This countermeasure can be considered effective, but the most important is that it is the only sustainable measure, and in comparison with the traffic policeman or the crossing supervisor, it operates all times (not only during start-end school times). A traffic police officer or crossing supervisor should be present until the operation of the proposed traffic light.

Taking into account (i) the cost - required budget for installation, (ii) the procedures – administration approvals required by the responsible authorities and (iii) the time – needed for budget allocation and procedures finalisation; the feasible action plan for the implementation of the countermeasures and road safety upgrade is the following:

The signs to be installed:



Immediate action - the cost is minimum and no procedures are required, since these signs should be present according to the traffic code.

The road markings to be installed:



Immediate action - the cost is very small.

The traffic lights to be installed, along the warning lights and signs:

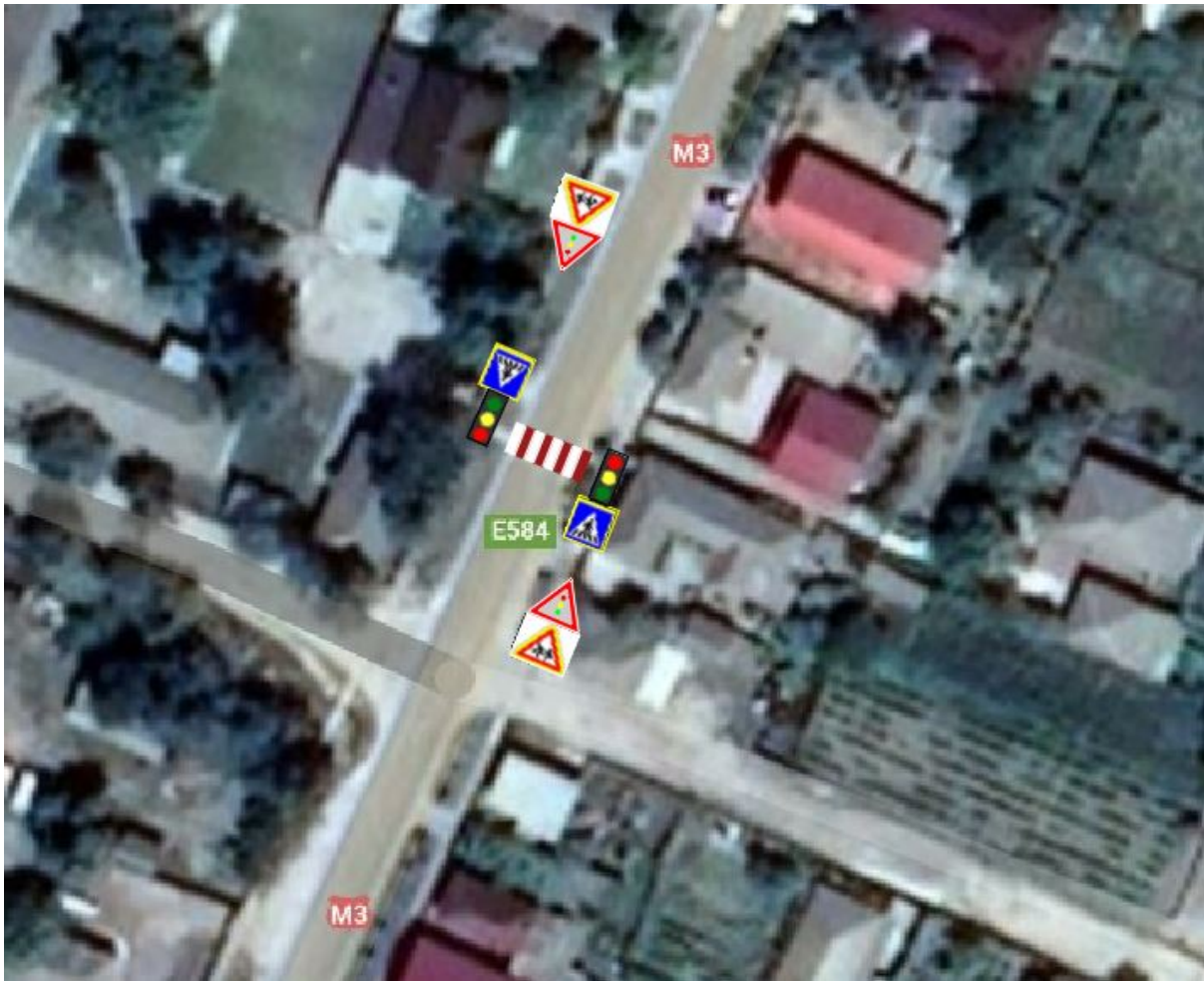




Immediate action: campaigning about the traffic light importance

Next steps: initiate required approvals by relevant authorities (road operator) and start the design according to national standards.

Implementing the above mentioned countermeasures, the pedestrian crossing will be looking as the following Pictures.



Picture 7-1 Overview of the proposed countermeasures at Congaz pedestrian crossing



Picture 7-2 Congaz pedestrian crossing with traffic lights



Picture 7-3 Congaz pedestrian crossing with traffic lights

7.2 Fixing the high risk crossing in Chisinau in an urban school area action plan

The identified pedestrian crossing is located in the capital city of Moldova and at a very busy road, which is not only an arterial street and a national road (M21) but also a very wide road, comprising of 6 lanes of traffic (3 through traffic lanes in each direction).

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Therefore, taking into account the specific location characteristics and circumstances, the following are noted:

- a) the most important is to **inform the passing through drivers** that they are approaching a school area and a pedestrian crossing that many young children (ages 6-13) accompanied or not, are crossing the road during school start and end times.
- b) since a high percentage of drivers are long-distance passing-through the area, their speeds are usually higher than the speed limit, and it has been documented (internationally) that they do not obey the traffic rules. Thus, **signs alone do not have the anticipated effects** on the drivers.
- c) The pupils crossing the road is **concentrated at specific time periods** (morning for incoming pupils and afternoon for outgoing pupils). Moreover, during summer vacations and holidays, there is no such dense pupils' movements at the specific crossing. Hence, the measures applied should be present at these specific periods, and not impose obstacles to through traffic the rest of the times.

As a result of the surveys, meetings and assessment, the following measures are included at the action plan for the next period:

- 1) Since signs for the existence of pedestrian crossing are present, supplementary the **warning signs of children presence** should be installed (needless to mention for both directions of travel). Additionally, the specific pedestrian crossing should be painted with **vivid colors** (in order to attract the attention as different from the rest at the same road

- segment) which will last for long time. In case the markings are not adequately bright, they should be regularly maintained.
- 2) Since the road width that pedestrians have to cross is more than 20 m., according to international practices, a **refuge island** is recommended. This is because the time for a pedestrian to cross a 6-lane road is considerable, and his/her exposure to traffic is considered as high. The refuge island assists the pedestrians to cross the road at two segments, thus requiring less time for each one of them. There are also benefits to the traffic, since the total delays are less than halting traffic at both directions for the whole time that pedestrians need to cross the 6-lane road.
 - 3) Vehicles need to be 'forced' to stop at (at least) the specific pedestrian crossing when pupils (with or without guardians) are present. In order to achieve this, the most effective measure is the **presence of a Police (Patrol) Officer**. This Police Officer is mostly required for 30 minutes only, just before and after school operating hours.

This is not possible sometimes, meaning either there is no available staff at the local police station or that at extreme occasions the police officers would participate at other events. Hence, more convenient is the same tasks to be performed by nominated persons. These persons could be either **volunteers** (i.e. parents or guardians of pupils of the specific school) or unemployed persons with a small compensation for this task. At the latter case, these again could be **parents/guardians**.

Since we have information that this measure was practiced for a period of time, and it was efficient, we have documented its importance and effectiveness. The issue is that sometimes the volunteers were not showing up. This is very problematic, because consistency is one of the fundamentals for road safety. If children think that they will always be protected, due to the presence of crossing supervisor, then they will not pay the proper attention to the road. So, when he/she is absent, the risk would be very high.

Therefore, in such a case, the best solution is the installation of a **pedestrian traffic light** activated by a button. This traffic light is not regulating traffic at an intersection, and is always green for traffic. It is only activated by a button, which is pressed by pedestrians when they are present and wish to cross the road. So, when the button is pressed and the signaling program is activated, the traffic light turns red and the signal for pedestrians turns into green, giving them the right-of-way. This countermeasure is efficient and effective, but the most important is that it is the only sustainable measure. At such cases (this kind of traffic signal for pedestrian crossing at urban areas), the signal program is designed in such a way that is not activated if an adequate amount of time has passed, in order to give time to the traffic as well. In comparison to the traffic police officer or the crossing supervisor, the traffic lights operate all times (not only during start-end school times), thus facilitating upgraded road safety conditions for pedestrians the whole day. A traffic police officer or crossing supervisor should be present until the installation and operation of the proposed traffic light.

- 4) Additional interventions will be considered to fight the illegal parking problem in the vicinity of the crossing which can be detrimental for the visibility and safety of pedestrians.

Taking into account (i) the cost - required budget for installation, (ii) the procedures – administration approvals required by the responsible authorities and (iii) the time – needed for budget allocation and procedures finalisation; the feasible action plan for the implementation of the countermeasures and road safety upgrade is the following:

The signs to be installed:



Immediate action - the cost is minimum and no procedures are required, since this sign should be present (due to high flow of students) according to the traffic code.

The road markings to be installed:



Immediate action - the cost is very small.

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The refuge island to be installed:

The most essential, effective and efficient measure is the refuge island. This installation will firstly minimise the time exposure of pedestrians to through traffic and alert the drivers for the surrounding conditions.

At the next pictures the proposed refuge design is shown, at Calea Iesilor Street.



Picture 7-4 Refuge island at Calea Iesilor Str.



Picture 7-5 Refuge island design (Calea Iesilor Str) - aerial view



Picture 7-6 Refuge island view at pedestrian crossing (Calea Iesilor Str)

The traffic lights to be installed, along the warning lights and signs:







Immediate action: campaigning about the traffic light importance

Next steps: initiate required approvals by relevant authorities (road operator) and start the design according to national standards.

7.3 Monitoring the improvements recommendation

ACM will monitor the progress of the proposed improvements implementation.

Since the proposals are adopted by the school society (Director, teachers and parents) then, the responsible authorities (i.e. Municipality, Road Operator, Traffic Police, etc.) should initiate planning the activities for the proposals implementation.

7.4 Non-engineering interventions to reduce risks

In order to reduce the exposure of pedestrians (and more specifically pupils) to risks, special training sessions should be performed. The trainings will be clustered at 2 major themes, for guardians and for pupils.

The adult pedestrians have completely different knowledge, perception, understanding and needs from the minor ages. Thus, apart from the focus that should be given to the kids, the parents and guardians should hear from road safety experts specific rules and practices that would upgrade their knowledge on moving by foot.

The training sessions for kids will be interactive and dedicated to the children ages using explicit education tools. Thus, three separate groups of pupils will participate, the ones up to 9 years old, 9-15 years and the older than 15 years, since it has been recognised that there is not the same knowledge and information comprehension from different ages.

Road safety campaigns should run at the local communities. International experience gained by ACM through the active involvement over the past 10 years at road safety related projects, funded by various international institutions. The awareness campaign would benefit not only the specific project targets, but also the community and their issues and needs with long term results.

Various non-engineering good practices may be adopted for the safe movement of pupils (and their guardians) from-to school.

One of them is the “walking bus” or ‘safe-train-2-school’. The pupils form an alive train, starting from the pupil that lives the further distance from school. He/she (along with his/her guardian) starts from home and passes from the home of other pupils on his/her way to school. They form a line and move altogether towards school. On their departure from school, they follow the opposite route and reverse the procedure (i.e. each kid leaves the ‘train’ and goes home).

Lastly, as mentioned previously, the presence of a traffic policeman (or authorised ‘traffic parent’) could regulate traffic in front of schools during arrival and departure of pupils (i.e. morning and afternoon specific time-frame) as an added value to all measures applied.

Action plan:

- Training sessions for behaviour on the route to/from school and traffic conditions to pay attention, targeting pupils (3 clusters according their age group)
- Training sessions for road safety issues, targeting parents-guardians
- Road safety awareness campaign for the community

8 Conclusions

Children's safety is the most important duty that the society should guarantee. Road safety is often neglected, due to faulty prioritisation.

Only 17 percent of the world's population are covered by an adequate child restraint law (that keeps small children in the back seat and requires child restraints based on the age, weight and height of the child)¹⁵. Many nations do not have any laws requiring children to wear helmets while riding on motorcycles or bicycles, and enforcement is often lax.

The safety of pedestrians, school zones and school buses are overlooked in many communities or even entire nations, and thousands of children die each year on their way to and from school.

The school zones are where focus should be given by the society. Since the density of children is very high, and usually they are exposed to through traffic, road safety features should be applied. There are many infrastructure and non-engineering measures, but since each school is different from another, an initial assessment should precede any actions. Education and involvement of all stakeholders (community, schools, NGOs, researchers, engineers, police, authorities) should be taken into practice by all practitioners to reduce road risks.

The steps followed within this report may be considered as a guide for other schools in Moldova or elsewhere. The awakening of the community (parents of children would be more interested and engaged) about the road safety hazards in the vicinity of schools is the determinant force for the implementation of the necessary for safety features by the responsible authorities.

Most of the times, the limited budget is often the excuse for the reluctance of the authorities to implement infrastructure elements that will upgrade the level of road safety. When the civil society is pushing for such implementation, then the political decisions will force the administrative bodies to work towards the society's needs.

¹⁵ <https://www.safekids.org/global-road-safety-facts-children-safe-kids-worldwide>

Annex 1

Road safety survey "Safety zone near the school"

QUESTIONNAIRE for schoolchildren

1. What grade are you?

How old are you?

2. How do you get to school?

- 1) By car with parents
- 2) On public transport
- 3) By foot
- 4) On the bike
- 5) Other _____

3. During the last month, where did you sit when you came to school with your parents by car (only those who go by car answer)?

- 1) In the front seat
- 2) In the back seat

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4. During the last month, did you sit in a car seat (or a booster) when you came to school with your parents in a car (only those who go by car answer)?

- 1) Yes, always
- 2) Sometimes
- 3) Very rarely
- 4) Never
- 5) No, because I'm over 12

5. During the last month, how often did you fasten your seat belt when you came to school with your parents by car (only those who go by car answer)?

- 1) Yes, always
- 2) Sometimes
- 3) Very rarely
- 4) Never

6. Do you know why you need to Fasten your seat belt (everyone answers)?

- 1) Yes, for my safety
- 2) Yes, because the police will fine you
- 3) Yes, because parents insist
- 4) No, I don't know.

7. How do you most often cross the road (everyone answers)?

- 1) At the traffic lights
- 2) On a pedestrian crossing
- 3) I go where it's convenient for me
- 4) I only cross with a large group of people

8. What color of the pedestrian traffic light did you most often cross the road (everyone answers)?

- 1) Regardless of the traffic light signal
- 2) On green
- 3) On red

9. Do you think your way/road to school is safe?

- 1) Yes, is safe
- 2) No, it's quite unsafe
- 3) I did not think about it

10. During the month when you crossed the road around the school, did the drivers stop? Did they give way to you? (everyone responds)

- 1) Yes, always
- 2) Sometimes
- 3) Very rarely
- 4) Never

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11. What do You use to increase their visibility on the road?

- 1) Flashlight
- 2) Bright clothing
- 3) Reflective elements
- 4) Nothing
- 5) Other _____

12. Since the Covid-19 pandemic began, are there more cars near the school during rush hours (driving, parking, etc.), (all responding)?

- 1) No, just like during other years/months of studying
- 2) Yes, more
- 3) Less than in other academic years

13. Since the Covid-19 pandemic began, are there more children who commute to school by Bicycle or other alternative means of transportation (scooter, etc.) (all responding)?

- 1) Yes, there are more of them

- 2) Nothing has changed
- 3) No, there are fewer of them

14. Since the Covid-19 pandemic began, have the environmental situation and air pollution levels in the school area changed (all respond)?

- 1) Yes, very
- 2) Nothing has changed
- 3) Didn't notice

15. What improvements would you suggest to improve the road safety level near the school?

- 1) Speed limit up to 30 km/h
- 2) Installation of speed limiters (including bumps)
- 3) Installation of several warning signs with high visibility (more visible)
- 4) Installation of a car-free zone around a wide perimeter around the school
- 5) Lighting and other visibility measures
- 6) Traffic lights
- 7) Other _____

Thank You for participating!

Annex 2

Road safety survey "Safety zone near the school"

QUESTIONNAIRE for parents

16. What grade is your child?

How old is he/she?

17. During last month, where was your child sitting when you brought him to school by car (only those who bring children by car answer)?

- 1) In the front seat
- 2) In the back seat

18. How often do you bring your child to school by car?

- 1) Always
- 2) Sometimes
- 3) Very rarely
- 4) Never

19. How often do you remind your child about road traffic rules when crossing the road?

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- 1) Always
- 2) Sometimes
- 3) Very rarely
- 4) Never

20. Do you think that the pedestrian crossing at the school is safe?

- 5) Yes, it is very safe
- 6) No, it's quite dangerous
- 7) Didn't notice

21. What does your child use to increase their visibility on the road?

- 6) Flashlight
- 7) Bright clothing
- 8) Reflective elements
- 9) Nothing

22. How do you cross the road most often (everyone answers)?

- 5) At the traffic lights
- 6) On a pedestrian crossing
- 7) I go where it's convenient for me

8) I only cross with a large group of people

23. During the last month when you crossed the road near the school, did the drivers stop? Did they give way to you? (everyone responds)

- 5) Yes, always
- 6) Sometimes
- 7) Very rarely
- 8) Never

24. Since the Covid-19 pandemic began, are there more cars near the school during rush hours (all responding)?

- 4) No, just like during other years/months of studying
- 5) Yes, more
- 6) Less than in other academic years

25. Since the Covid-19 pandemic began, are there more children who commute to school by bicycle or other alternative transport means (scooter, etc.) (all responding)?

- 4) Yes, there are more of them
- 5) Nothing has changed
- 6) No, there are fewer of them

26. Since the Covid-19 pandemic began, has the environmental situation and air pollution levels in the school area changed (all respond)?

- 4) Yes, very
- 5) Nothing has changed
- 6) Didn't notice

27. Do you believe that the road to your child's school is safe? (all respond)

- 1) Yes, it is very safe
- 2) No, It's quite dangerous
- 3) I have not think of this aspect

28. What improvements would you suggest to improve the road safety level near the school?

- 8) Speed limit up to 30 km/h
- 9) Installation of speed limiters (including bumps)
- 10) Installation of several warning signs with high visibility (more visible)
- 11) Installation of a car-free zone around a wide perimeter around the school
- 12) Lighting and other visibility measures
- 13) Other _____

Thank You for participating!