Tools for the Implementation of Safe Routes to School in Latin America and the Caribbean region

2020 UPDATE

Marisela Ponce de León
Carly Koinange

IDB
Inter-American Development Bank

Coordination:
Marisela Ponce de León from the Inter-American Development Bank (IADB) and Carly Koinange from United Nations Environmental Program (UNEP).

Development support:
Sonia Aguilar and Saúl Alveano from WRI Mexico and Gonzalo Peón and Clara Vadillo Quesada from ITDP Mexico.

Style and information editing:
Jorge Gordillo Matalí.

Translation from Spanish to English:
Ayla de la Cruz.

Editorial design / cover design:
Brenda Martínez Sandoval / Giovanny Guzmán.

Acknowledgements:
- National Commission of Road Safety (CONASET from its acronym in spanish), Chile.
- Ministry of Public Works (MOP from its acronym in spanish), Chile.
- Municipality of Peñalolén, Chile.
- Organizations and associations from Chile: Educleta, Conciencia Vial
- National Agency of Road Safety, Argentina.
- Buenos Aires' Autonomous City Ministry of Education, Argentina.
- Buenos Aires' Autonomous City Department of Public Safety, Ministry of Justice and Safety, and Sub Department of Crime Prevention, Argentina.
- Consultant Lucas Galak, Argentina.
- Buenos Aires' Autonomous City Department of Transport (Pedestrian Design and Innova tion), Argentina.
- Ministry of Transport and Public Works, Direction of Land Transport, Transit and Road Safety, Ecuador.
- Metropolitan Agency of Transit (AMT from its acronym in spanish), Ecuador.
- CAVAT Foundation, Ecuador.
- Panama's City Hall Urban Planning Direction, Panama.
- Educación Vial Foundation, Panama.
- Education Ministry, Panama.
- FIA Foundation, Donor for the UN Environment Share the Road Programme.
- IADB's transport specialists Raúl Rodríguez, Edgar Zamora and consultant Silvia Barrantes for the revision of the former publication.
- Road Safety Coordinator from WRI México, Sonia Aguilar, for her contribution to the 2020 update.

IDB In collaboration with UN Environment, WRI and ITDP.

Contents

Introduction

We want healthy streets prioritizing people, not cars; we demand streets which encourage walking, cycling and outdoor play; we call for reduced urban traffic speeds for communities, and especially around schools; we need safe crossings and sidewalks so children can reach their education without risk of death and injury.

Zoleka Mandela, Global Ambassador of
Child Health Initiative

Every year, around 80,000 girls and boys between the ages of 5 and 14 in developing countries lose their right to education for one tragic reason: they are killed on this world's roads, often while making the trip to school.

Dr. Kevin Watkins, UN Development Adviser

Girls and boys, their families and the school community, have the right to travel safely to the educational institutions. Therefore, the **Inter-American Development Bank (IADB), together with the Share the Road Initiative supported by the United Nations Environment Program (UNEP) and the Federation Internationale de l'Automobile (FIA) Foundation**, are leading the initiative named **Safe Routes to School in Latin America and the Caribbean (LAC)**, as one of the strategies that can be used to respond to the issues of high rates of road traffic collisions involving girls and boys.

According to data from the World Health Organization (WHO, 2014), traffic injuries are the second leading cause of death in the world among girls, boys and adolescents between 5 and 14 years of age. Children are seldom considered when planning cities; therefore, the goal of Safe Routes to School programs around the world is to promote the creation of safe routes on school environments, promoting the active mobility modes, such as cycling and walking, as well as secure connectivity with public transportation routes. Particularly in the Latin American and Caribbean region (LAC), these are the main modes of transportation for both adults and young people.

However, the lack of road and public safety have contributed to hinder mobility on bike and foot, and to increase trips in private motorized vehicles, such as cars and motorcycles, which represents negative externalities to the physical and mental health of children, environmental deterioration, and increased traffic and speed on the streets.

According to the **17 Sustainable Development Goals by the United Nations (UN)**, transportation systems, road safety and public spaces should be improved for the child population. This is reflected on the **targets of goal 11 (Cities and Communities)**:

- *Providing access to safe, affordable, accessible and sustainable transportation systems for all and improving road safety, particularly through the expansion of public transportation, with special attention to the needs of vulnerable people: women, children, people with disabilities and senior citizens.*
- *Providing universal access to safe, inclusive and accessible green areas and public spaces, particularly for women and children, senior citizens and people with disabilities.*

The document **Safe Routes to School in the Latin America and Caribbean Region** also considers the **Goals of the Decade of Action for Road Safety 2011-2020 by the World Health Organization**, in which the goal is set for reducing deaths and injuries due to road traffic collisions at a global level, as well as the **Share the Road Initiative** which has a goal of introducing public policies in government agencies that act as a catalyst for investments in road infrastructure for walking and cycling, for the benefit of the environment, safety, and accessibility. For more information on the **Share the Road Initiative**, see: www.unenvironment.org/explore-topics/transport/what-we-do/share-road

Challenges and relevance of the problem

Challenge: Save lives. Every day, 500 lives of girls and boys aged 5-14 are lost due to road unsafety (WHO, 2014). This equates to two planes with healthy boys and girls on board crashing every day.

Challenge: Foster equity. 95% of deaths from traffic injuries among boys and girls occur in low and middle-income countries. The LAC region consists of 85% of countries in this income level. (WHO, 2015).

According to an international study, "children in lower socio-economic positions and living in disadvantaged areas are more constantly at risk than others" (Laflamme and Diderichson, 2000).

Challenge: Reduce fear. In addition to the serious death and injuries issue, road unsafety discourages cycling and walking. 44% of girls and boys injured in road traffic collisions were pedestrians and cyclists (WHO, 2015).

Developing countries show increasing crime rates. The implementation of safe school environments would foster community interaction and increase safety in the school zone (IADB, 2016).

Challenge: Increase health. Regular physical activity can help children and adolescents improve cardiorespiratory fitness, reduce symptoms of anxiety and depression, and reduce the risk of developing health conditions such as heart disease, cancer, type 2 diabetes, high blood pressure, osteoporosis and obesity (US Physical Advisory Committee, 2018). In 2013 at least 127 thousand boys and girls died from respiratory diseases (Save the Children, 2017) and three million breath polluted air daily (FIA Foundation).

Challenge: Improve air quality. In 2013, at least 127 thousand girls and boys died from respiratory diseases (Save the Children, 2017) and 300 million of them breathe polluted air daily (FIA Foundation, 2018).

Challenge: Reduce the economic burden. Road unsafety costs $ 100 billion per year to developing countries (WHO, 2015), and household expenditures due to hospitalization or rehabilitation after an injury on the road are so high, that they can lead to poverty for a family of median income (UNICEF, 2018).

The cost of deaths by road traffic collisions of in Argentina is the equivalent of between 1.5 and 2.9% of the GDP. In Colombia, between 1.6 and 3.1%; in Mexico, between 1.8 and 3.5%; and in Paraguay, between 2.0 and 3.9% (Bhalla et al. 2013; Rode et al. 2014). This shows that deficient policies which have favored urban growth and infrastructure designed around automobile mobility generate conditions that lead to road traffic collisions and create collateral damage that negatively impact the urban economy.

Benefits of Safe Routes to School

The more boys and girls walk, bike and use public transportation, the following direct and indirect benefits will be obtained:

- Improving the visibility and readability of the school environment, as well as of road and public safety through adequate infrastructure and the attraction of walking and biking trips.Reducing pollutant emissions and Greenhouse Gas (GHG) emissions.
- Relieving the burden of public and private health expenditures.
- Raising awareness to new generations regarding the dependence on car usage.
- Promoting physical activity and attention to obesity.
- Increasing opportunities for socialization and community cohesion.
- Empowering girls and boys by strengthening their autonomy trough promoting their independent mobility.

What is this toolkit for?

This is a reference resource to guide and promote the planning, design and implementation of projects and initiatives that improve road safety in travels to and from schools in the Latin America and Caribbean region.

The implementation of a Safe Routes to School project will depend on its scale and the goals that are set at the local level. It is important to point out that each solution must be adapted to its own context, so this document is not intended to be a methodology, but a presentation of elements, tools and recommendations based on the Latin American context.

Who is it for?
It considers actors from different areas, both local and regional: educational, transit, health, works, sports and leisure authorities, as well as parents and/or guardians, educational personnel, and society. Therefore, this tool can be used by school communities, public authorities, associations, civil organizations and all those interested in developing a Safe Routes to School project.

These kinds of projects must also be understood as the beginning of a process leading to better mobility and accessibility for all inhabitants and users of the neighborhoods around the involved school areas.

What are its four sections about?
The document is organized in four sections, starting with the **Introduction**, which addresses the relevance of the program and explains what a toolkit is. Then we have the **Where to start?** Section, which briefly introduces the first steps and functions of the Toolkit's six tools. The third section contains the six **Tools** explained further and in a practical way to fit each project. The fourth section, **Case studies**, documents six Latin American cases, highlighting different elements of the project planning and implementation process in each one, with the goal of identifying a variety of appropriate solutions to the problems and conditions of each site and its context.

WHERE TO BEGIN?

In many cases, the first step for starting a project is the definition of goals and objectives and although these can be modified as information is gathered to develop the project, having a clear idea of such initial intentions, goals and objectives is an important part of the journey. Those will be called initial objectives.

The group or institution setting the initiative may review the **initial objectives** of their project aided by the following questions:

1. What is the main interest in developing the project?
   - Supporting schools, but there is no selected school yet?
   - Improving the general environment of my school?
   - Improving a school-specific crossing or route?
   - Improving safety around schools in a particular neighborhood or city.
   - Other? Identify it.
2. When a school is defined, is there any way to contact them and the authorities responsible for improving road safety where the school is located?

Once the **initial objectives** have been defined, **they will need to be analyzed using the Toolkit tools**, which are briefly explained below and further developed in the next chapter.

Introduction to the Toolkit tools

1. Context Assessment.
A diagnosis is needed to go into the specific conditions of the case, its context and the extent of the problem. In order to perform it, information on the school community and its environment is needed, such as:

- Number and ages of students.
- The various localities passing through the area.
- Modes of mobility, routes, geography and climate.
- Data on road safety related to road traffic collisions in the area, infrastructure, and traffic control, among others.

2. Education, Community and Communication
Involving both students and teachers, neighbors, other members of the community near the school, and civil society organizations is a key factor for the project's success. It is also important to translate the project into clear messages for the general public, which can be impacted by the involvement of the media. This can be achieved using tools like:

- Introductory talks on the topic and the project.
- Road education courses for all people, by age group.
- Workshops and walks that provide information for the project.
- Neighborhood campaigns.
- Inviting the media to key activities or dissemination events.

3. Road Design.
Having a road infrastructure that regulates the behavior of road users and controls the speed of vehicles is vital, and will also allow the reduction of road traffic collisions. This can improve road safety if the following characteristics, among others, are addressed:

- Accessibility for pedestrians, disabled people and cyclists.
- Connectivity between routes and with public transport.
- Elements for reducing the speed of motor vehicles.
- Signage and lighting.

4. Regulation, Policies and Institutions
In addition to reaching out to the community, civil society organizations and the media, as proposed in Tool 2, the project must be carried out hand in hand with the responsible government institutions, supported by regulations related to the topic. What is required?

- Learning and relying on the rules, laws and regulations that support and strengthen the proposed program, while also identifying gaps in the proposed program and promoting its updating.
- Defining public agreements and policies that allow the project to be carried out.
- Identifying and working with public institutions and agencies responsible for the project's planning, inter-institutional linkage and development.

5. Monitoring and Evaluation

A monitoring and evaluation plan is developed, based on the construction of a work plan with customized indicators for the different stages, goals and the estimated budget. This facilitates acknowledgement of results, feedback, and decision making. Three monitoring and evaluation key moments are identified, as follows:

- Project implementation process (before).
- Immediate results after the improvement of school environments (during).
- Final performance of the project (after).

6. Financing and Sustainability.

Financing the project can happen by obtaining monetary resources from various stakeholders. Sustainability refers to the implementation and permanence of the project in the long term.

- Financing can be obtained from the government, multilateral banking or private initiative, for example.
- Sustainability refers to the durability of the funding for continuously driving projects, law enforcement which maximizes the benefits of the project (abidance of traffic regulations or signage, for example) and regular maintenance of the intervened road's infrastructure.

The Toolkit

The Toolkit

1. Context Assessment

Developing a diagnosis helps in focusing the project and optimizing the available resources and time for its implementation. Doing so requires basic data on mobility and road safety in school environments. This tool proposes five steps to collect this data which will meet the **initial objective** of the project, in a previously defined school environment.

Schools, by concentrating a vulnerable population, are relevant areas for improving road safety from a **precautionary approach** (ITDP, 2018). However, a **reactive approach** can also be applied by identifying school environments with the highest number and severity of collisions, based on an analysis of city-wide road traffic collisions data. More information on this can be found on Stage Four of this tool.

This will require **mapping the query sources** in advance to help answering questions such as the following:

- Are there available data that typify the school community (boys, girls, education personnel, parents)?
- Are there mobility data available for the study area?
- Are there data on road traffic collisions in the area?

Stage one
Context of the study area

Collect and analyze data on:

1. **Background in public policies**, programs or interventions.
2. **Climatic, geographical and topographic factors** which influence the behavior of people (adults and minors) in their school trips. Cold, heat, rain, and slopes change mobility dynamics.
3. **School population data** such as density, age and gender of girls and boys.
4. **Traffic and congestion data** of the school area.

Stage two
Mobility surveys

It is important to use surveys for identifying the predominant modes of mobility of girls and boys, and their companions if any, as well as the routes they use most. Depending on the project's approach, the range of the school population it will be applied to will be determined, and whether parents need to be surveyed.

The main questions should be focused on the mode girls and boys usually travel by:

- Origin (home)
- Destination (school)
- Modes of transportation
- Schedule
- Route they normally use
- Their perception of problems on their way to school

To carry out the surveys, one or more methods can be applied, such as:

1. Basic survey using attendance lists.
2. Detailed survey for parents about the mobility habits through which their daughters and sons arrive at school; Annex 1 on this document includes a template for the survey, adaptable to each school environment.
3. Community mapping: on a map of the school area, parents and/or girls and boys place the origin, destination (including point of arrival in the school area), as well as the most frequent routes and modes of transportation they use to get to school.

Based on the information from the surveys, routes are mapped, in which the identification of the most frequent routes by mode is suggested: on foot, bicycle, public transport, car and motorcycle.

Stage three
Route identification

It is important to prioritize the identification of routes on foot and by bike, in addition to considering the last mile (1.60 km) of the transfers that take place after descending from public transport, the car or motorcycle. The implementation of community mapping in Stage two also allows to identify the arrival points for people in the surroundings, critical to propose improvements.

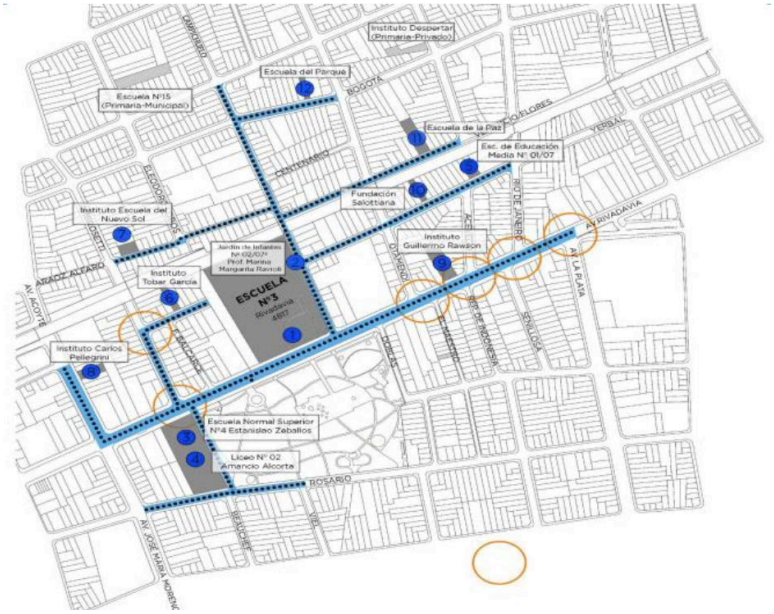

Figure 1. Map identifying routes in the school surroundings of El Caballito, Argentina.

Source: Ministry of Transport of the City of Buenos Aires

Stage four
Road safety issues

The highest concentration of road traffic collisions involving users of the pathway, and in particular girls and boys on entry and exit hours of the chosen school should be identified through the analysis of databases of road traffic collisions.

The scope of this analysis depends on technical personnel and the availability of geo-referenced data on road traffic collisions. In case of lack of databases on the subject, road safety issues can be assessed through on-site audits or inspections, which are explained in Stage five of this tool.

Basic elements for analyzing traffic collisions databases:
- Total number of incidents involving girls and boys.
- Total injuries and deaths of girls and boys caused by transit.
- Type of incident (hit, collision, rollover, etc.).
- Age of those involved (can be divided by school grade).
- Type of user (pedestrian, cyclist, public transport user, car or motorcycle).

Temporary characteristics of the facts:
- Month
- Day of the week
- Time (emphasis on correspondence with school hours)

Characteristics of spatial frequency patterns:
- Where are the largest number of road traffic collisions, deaths and injuries grouped?
- What kind of road?
- What is the speed allowed at high frequency points?

Road traffic collisions frequency and characteristics can be identified by using heat maps or high frequency points, as shown in Figure 2.

Figure 2. Frequency of road traffic collisions registered in pedestrian sections of school environments.

Picture by Sonia Aguilar González

Stage five Road Safety Inspections

According to the World Resources Institute (WRI), a Road Safety Inspection is a methodological process for assessing the operation and performance conditions of the road infrastructure. Its aim is to identify risk factors that contribute to the generation of traffic collisions.

The places where inspections can be performed can be defined from:

- Identified routes to school (Stage 3) through survey data (Stage 2).
- The location of high road risk points shown by the data-based road traffic collisions analysis (Stage 4).
- The immediate surroundings of schools are important areas for improving road safety since they concentrate vulnerable population (ITDP, 2018).

The Road Safety Inspection process can include:

- Organizing **on-site audits** with the school community, including the participation of educational personnel, girls, boys, and parents to assess the infrastructure both on **identified routes** on the school surroundings, as well as at **high-frequency collision points** or **around schools**, depending on the case.
- Identifying the **perception of girls and boys** on their way to school, which will provide a new dimension to the issue, as their vision may be very different from that of adults.

Key elements to analyze:

Curbs. Are sidewalks completely flat? Do they have physical barriers that prevent passage, such as poles, telephones, street vendors or parked cars? Do they have fan ramps on corners to provide accessibility? Is their width accessible enough for a wheelchair in each direction?

Pedestrian crossings. Are there zebra crossings painted? Are they respected by vehicles? Are there vehicle and pedestrian traffic lights? Is pedestrian crossing time enough? Are there School Zone signs on posts and pavement? Is there enough room and safety for pedestrians in median cut throughs?

Accessibility to public transportation. It is necessary to evaluate the connectivity of the school environment with public transportation, to verify its proximity or remoteness, and the number of frequent routes and stops to improve accessibility.

Public transport stops. Are there any stops? Do they have signage on the pavement, horizontal signs and shelter elements for facing climatic conditions (rain or extreme heat)? Do they have enough space to accommodate the maximum demand of users? Do drivers respect stops?

Speed. Is the entrance and exit of the school located on a primary road? Are there speed reducers and 30 km / h maximum speed signs? Do drivers respect the established limit?

2. Education, Community and Communication

In order to use this tool correctly, it is advisable to integrate specialists in pedagogy, socialization and communication with technical specialists in the field of mobility and road safety, since this will facilitate the processes pertinent to these issues. These tools are linked, since **road safety education** processes can serve to strengthen **community actions**, and these two, in turn, will be useful for defining the **communication messages and actions**.

Road education is part of the comprehensive training of boys and girls, both for their road safety and for that of others. We should not confuse it with merely the acquisition of contents linked to vehicle driving or identification of traffic signs, but rather to understand it as an education in values that improve road behavior and that serve to generate positive habits and attitudes in the relationship between people using the road and its surroundings, such as pedestrians, drivers or passengers of the different modes of transportation (Hernández & Torres Jaramillo, 2018). Below are some suggestions of strategies on the matter:

Road education for teachers
Educational staff will be able to receive training on road safety in order to generate ownership of the project as well as to convey the subject to boys and girls with the correct approach, regardless of the mode of transportation used.

Road education for girls and boys by age range
Students should be informed about the program through strategies and pedagogical materials, which can be implemented by age according to their cognitive development level. Helping them understand the various challenges to improving road safety can increase their curiosity about the topic.

Workshops, reports and inclusion of mothers and fathers
Mothers and fathers should also have a greater understanding of road safety issues and their solutions through workshops, reports and active participation in the project or program. In this way, they will be aware of their relevance and of how they can contribute to its operation.

Figure 3. Incorporation of mothers and fathers into the El Caballito School Road program, Argentina.

Source: caballitotequiero.com

Strolls through the interventions
Mothers, fathers, girls, boys and educational staff should be aware of the changes that will be made to their environment. Site visits and strolls, combined with other road education strategies, will provide a greater understanding of infrastructure elements that improve road safety in the school environment.

The project can detonate **community organization** and other safety improvements in the neighborhood, settlement or locality where it is located. Extending the community collaboration networks, permanence of the project is strengthened and fosters the safety and health care for girls and boys. The following are some examples of actions to be undertaken with the community:

Getting to know the community
Socialization of the project will be based on the identification of local actors who can commit to the issue. For knowing who to approach, it is important to recognize the different types of actors that inhabit the school zone and its surroundings. It is therefore advisable to consult the educational authorities, make a map and prioritize the approach to be taken with the different actors of the community.

Introductory talks and school meetings
Local actors can be invited to collaborate in the project through the organization of meetings at the school or other nearby locality. The project leader will be responsible for exposing the importance of safe school environments for girls and boys. Listening to all the opinions that arise is useful in order to identify common objectives and to reach agreements.

Godmothers and godfathers
Godmothers and godfathers are the mothers and fathers who monitor the safe trips of girls and boys on a voluntary basis. They can be trained with a focus on children's rights and help protocols to support students when they face a risk situation, and so they are able to ask for their help when they go knocking on their door when they need to. Godmothers and godfathers may also be in charge of transportation systems such as the following:

- **Walks to school or PediBus** are a group of girls and boys who walk from home to school, accompanied by adults who follow established routes and schedules.
- **Biking to school or BiciBus** is a cycling squad which cycles picking up girls and boys near their homes on the way to school, for which it is necessary to have several adult volunteers to pedal with the group and to coordinate a route, stops and timetables (STARS Madrid, 2015).
- **Car-sharing** is done through a car trip handled by an adult driver through a preset route, using a single car trip to drive several students to school or back to their homes.

Involvement of neighbors and local businesses
Neighbors and local businesses can participate in the project, both in the introductory talks and by contributing to the visibility of a Safe Route to School in front of their homes or shops through the placement of posters or stamps, as well as in the surveillance of the girls and boys safety on their way to school or back. These actions also provide community support and validation to the project.

Giving the floor to girls and boys
It is fundamental to involve girls and boys in the process of evaluating and improving their environment, through workshops. Knowing their route concerns and perceptions will help adapt the strategy to their needs. What would they like to change on their routes? Do they prefer any mode of transportation and/or route to get to school? Do they prefer walking in groups of friends?

Communication is transversal and fundamental before, during and after the project, since it will allow the structuring and transmission of clear messages which punctually respond to various types of doubts from citizens, while providing information about road safety, its solutions, benefits and beneficiaries. Similarly, the efforts of those who promote these projects can be assessed. Below, the explanation of two elements that can be useful for these purposes:

School and neighborhood campaigns
The dissemination of Safe Routes to School can be supported by the placement of posters or stamps in schools and at the neighbor's houses, local traders' and public spaces. If the results are positive, society at large will support and strengthen the project, facilitating its sustainability over time. The materials of these campaigns can also be disseminated on the school and neighborhood community's digital media.

Invitations to media to key activities or dissemination events
Key events can be identified or created during the project's development, and they may be of interest to local and national media. It is recommended that media be invited and given the

opportunity to ask questions and, in the case of informed consent from mothers and fathers to take pictures of their daughters and sons.

3. Road Design

Road design is the main factor influencing the occurrence of deaths and injuries caused by road traffic collisions, and therefore, it is one of the essential tools of Safe Routes to School, which should be primarily focused on the safety, connectivity and accessibility of pedestrians and cyclists, be they girls, boys, or adults.

Safe infrastructure design has proven to be effective in all scenarios, including low and middle-income countries, and can provide a "quick win" in improving road safety.

Below are the main elements of safe infrastructure to be used in school environments, based on five strategies:

Strategy 1
Traffic calming

Speed reducers. Elevations on roads, which allow to reduce vehicle speed in a determined way, depending on its height and length. Ideally, vehicles should move at the constantly expected speed along a road.

Figure 4. Speed reducer on a school zone in Mexico City.

Source: Cities Safer by Design, WRI

Speed cushions. They are narrower speed reducers located in the center of the road with space between them. They aim to slow down transit for certain vehicles, while larger ones can pass them easily, as they do not hinder their pace.

Figure 5. Cushion speed reducer in Paris, France. It slows down traffic before an intersection.

Source: Cities Safer by Design, WRI

Chokers. Chokers use the road space that exceeds the standards set by local or national regulations to cut the width of a street, in order to reduce the distance from pedestrian pass, and the speed of vehicles. Along with the chokers, sidewalks can be extended in these sections, and vegetation, bike paths or bike parking can be added.

Figure 6. Choker with bike parking.

Source: doblefila.org, picture by Brent Granby.

Chicanes. In order to create them, the width of the road is reduced from one or both sides in a stepped pattern which prevents drivers from driving in a straight line, thus reducing traffic speed in one or two-lane streets.

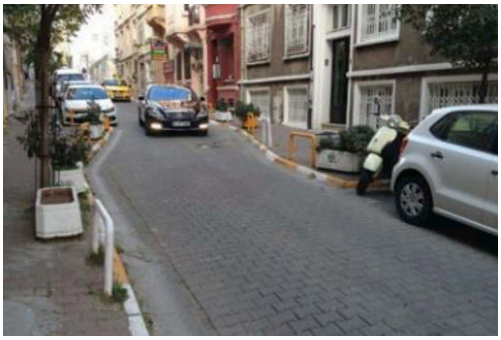

Figure 7. Example of chicane in Istanbul.

Source: Cities Safer by Design, WRI.

One-way street. Changing the direction of a two-way street to one-way increases safety, especially if it is a multi-lane street.

Pedestrian-only street. Pedestrian-only streets, also known as "car-free zones" or "pedestrian shopping malls", are reserved exclusively for the use of pedestrians. Transit of all types of vehicles is prohibited, excepting delivery trucks to shops, which must transit for specific periods of time, and emergency vehicles.

Strategy 2
Improving intersections

Pedestrian crossings. Crossings should be as direct and as short as possible. Their goal is to minimize pedestrian exposure to traffic flow and to provide a marked safe area when they are exposed to it.

Pedestrian crossings at sidewalk height. They are elevations in the road at sidewalk height which create greater accessibility in points where pedestrians cross, either at an intersection or in the middle of a block, with ramps in the same direction as the vehicle lane. They reduce vehicle speed and can be combined with bollards at the edge of the sidewalk to provide more safety.

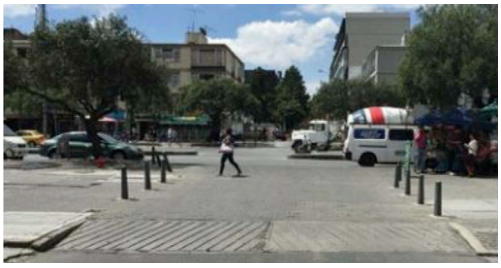

Figure 8. Pedestrian crossing at sidewalk height in Bogotá.

Source: Cities Safer by Design, WRI.

Mini roundabouts. Mini roundabouts are usually circular islands in the middle of an intersection. In most cases, they replace traffic lights, since usually, cars that come to the mini roundabouts should reduce their speed and move in a single direction.

Figure 9. Mini roundabout.

Source: Cities Safer by Design, WRI.

Medians. Medians are barriers between lanes, normally located in the central part of bidirectional roads. Their width and design can vary largely, as they can be from narrow concrete edges to promenades with trees and landscaped boulevards.

Pedestrian shelters. They are located in the medians to provide a safe space for crossing pedestrians. Pedestrian shelters or islands are located either in the middle of a block or at intersections.

Figure 10. Median with pedestrian shelter at intersection.

Source: Cities Safer by Design, WRI.

Figure 11. Example of a median with mid-block crossing.

Source: Cities Safer by Design, WRI.

Elevated or underground crossing. It is recommended to avoid them unless it is extremely difficult to make a crosswalk at street level. With them is possible to join areas separated by barriers such as deep ravines, waterways, railroads or conflicting points on highways, and they should provide with elevators for people with disabilities or limited mobility. To prevent the passage from becoming unsafe, crime prevention must be taken into account through design.

Fences. This component prevents the passage of pedestrians to a dangerous area, physically restricting it with hard or soft barriers. It is recommended to implement them minimally, since their use is usually disproportionate or without technical support, blocking pedestrian and cyclist desire lines.

Figure 12. Fences in school environment of rural school in Chile.

Source: WRI.

Strategy 3
Sidewalks/ walkways/ pavement

Sidewalk extensions. They occupy the non-effective lane adjacent to traffic (usually a parking lane), either at an intersection or a mid-block, reducing pedestrian crossing distance, allowing pedestrians to be more visible and lowering the speed of vehicles. See **Chokers** in Strategy 1.

Ramps. Fan ramps allow all users (including wheelchair users with limited mobility, such as seniors) to make the transition from street to sidewalk.

Tactile paving/Detectable warnings. Texture on the ground surface for people with visual impairment. It is identified through footwear or canes and helps finding the safest place to cross the street.

Bus stops. Planning, design and construction of bus stops involve thinking of existing and new stops at a macro level (system design) as well as micro level (the conditions of the stop's environment, boarding, weather, lighting and comfort).

Figures 13 and 14. Bus stops in the surroundings of a Chilean rural school.

Source: WRI, Mexico site visit with Ministry of Public Works, Chile, 2017.

Strategy 4
Cycling infrastructure

Bikeways. A part of the street, in one or both traffic directions, is physically separated, creating an exclusive lane for cyclists, thus increasing the perception of safety and motivating more people to travel by bicycle.

Figure 15. Bikeway with physical confinement in Mexico City.

Source: ITDP Mexico.

Figure 16. Independent layout bikeway in Chile.

Source: WRI Mexico site visit with Ministry of Public Works, Chile, September 2017.

Bicycle mobility networks. A well-connected network should consist of bikeways (separated from the traffic with physical elements), bike lanes (painted and without physical confinement), bike priority lanes, traffic calming streets and special considerations for intersections, designed to prioritize the needs of cyclists. Each type of cycling infrastructure must be adapted to the type of road to be considered: with higher speed and more motorized traffic, greater cyclist protection is required.

Road safety at intersections. It is necessary to reduce conflicts at turning points and for drivers to see the cyclists, being able to include elements such as bicycle boxes, signs and traffic lights for cyclists with simultaneous green phases.

Figure 17. Bike box, cyclist waiting space at intersections that prioritizes this mode of transportation.

Picture by: Jorge Gordillo Matalí.

Parking facilities. Bicycle thefts can be very frequent; therefore, availability of safe parking is an important element to make the bike trip more attractive.

Strategy 5
Signage and other elements

Stop lines at intersections. These are front lines located on the road before the pedestrian crossing. Their aim is that motorized traffic leaves at least four free feet (1.20 meters) before the pedestrian crossing. They increase visibility of pedestrians to drivers, and are particularly important around schools, since girls and boys are harder to see than adults.

School zone stencils. Street marks or stencils serve to warn drivers of the presence of school-aged girls and boys. Typically, the templates consist of the legend “SLOW SCHOOL” at least 100 feet (30 meters) before a school crossing.

Traffic lights. It is essential to schedule longer green phases for pedestrians and cyclists, supported with **pedestrian shelters** that allow them to cross the street in two stages, as not all people have the same ability to move.

Lighting. Lighting needs to be adapted for people moving on foot or by bicycle, as it does not benefit them in the same way as moving cars. Particularly among girls and women, it contributes to enhancing their real and perceived security in the face of violence.

Parking management. It refers to the various policies and programs regarding the more efficient use of parking resources for motorized vehicles, on and off the public roads, including reordering and reducing the number of parking spaces, or creating a parking meter program (charging parking on public spaces).

4. Regulation, Policy and Institutions

The infrastructure elements will prevent the risk, but it is necessary to apply restrictions to those who do not comply with the regulations, which should be focused on eliminating danger on the streets, and not in removing girls and boys from an environment perceived as dangerous, as it is their right to move freely, actively and healthfully under safe conditions.

This tool could partially or completely push the implementation of Safe Routes to School projects or programs and help generate a commitment by public institutions to improve school environments in a sustainable way. In order to do this, it is necessary to work hand in hand with the responsible governmental institutions, supported by the regulations related to the subject.

Identification of **legislation and regulations** will serve as a starting point to consolidate the project or to encourage the creation of an initiative which takes the child population safe mobility needs into account. Some initial questions that can help identify them are:

- Is there legislation and regulations focusing on road safety in school zones?
- Are there speed regulations in place in school zones?
- Are there policies that promote investment in walking and cycling infrastructure?
- Are existing laws implemented effectively or is there a need to create new ones?

Regulation and enforcement of transit rules. If there are rules in favor of the safe and sustainable mobility of girls and boys, the existing traffic guidelines in the area should be applied; for example, penalties for not respecting exclusive pedestrian areas, the red traffic light, bike lanes or the preference for cyclists, pedestrians or public transportation, as well as for not respecting the prohibition of continuous right-turn.

There are different types of **institutions** in terms of issue and scale of action, as well as in programs defined at national, municipal, or local and neighborhood levels. The agencies that influence the implementation of the project could count on trained personnel and resources for the implementation of the project. Identifying their capabilities and improvement areas will help devise strategies. The following questions are useful for this purpose:

- What are the institutions responsible for education?
- What are the institutions responsible for planning, building and operating the roads in school zones?
- Do the co-responsible institutions know the extent of the problem with road and public insecurity in school settings?
- Are there professionals in the field of road safety involved?
- Are there funding, equipment and materials for the implementation of the program?

The degree of **inter-agency** linkages between the co-responsible agencies will have a direct impact on project planning. The success of long-term projects largely depends on the link between various actors, since road safety in school environments is a multifaceted problem which is addressed through simultaneous actions carried out by various institutions such as municipalities, ministries or secretariats of works, education, health, public safety, etc. A key question:

- Are there plans and/or programs on road safety or school or child mobility which link institutions and are also funded?

Regulating speed limits is relevant as they are a contributing factor to about half of the fatal road traffic collisions in low and middle-income countries, so it is important to:

1. Establish a maximum speed of 20 km/h on the streets surrounding schools, which will reduce road risk for girls and boys. The measurement can be monitored through the application of photo tickets at points where the highest speeds are recorded.
2. Create regulations of micro traffic through traffic management by road agents at the school zone during entry and exit hours, directing traffic with dynamic closures, reduction of lanes, or installation of temporary elements to reduce speed.
3. Regulating parking in places that block free movement on sidewalks or pedestrian crossings, which will contribute to increased road safety for girls and boys as they walk and cross the streets.

5. Monitoring and Evaluation

The follow up and monitoring of the project or program demonstrates the commitment and responsibility to it, and its objectives. The presentation of results obtained through this tool will contribute to the improvement of the project or program, the construction of broader goals and the application of best practices, according to the context.

A monitoring and evaluation plan is carried out based on the construction of indicators customized to the work plan (based on the tools and stages described above) and adjusted to the budget and previously defined goals, to be conducted in three key moments:

- The process prior to the project implementation (before).
- Results immediate to improvement (during).
- Final performance of the project (after).

An example: applying a road safety analysis to the infrastructure during any of the three key moments, and ideally at all, through inspections at the high frequency points of road traffic collisions identified in the diagnosis and/or at the points to be improved through Road Design.

6. Financing and Sustainability

The project can be financed by obtaining monetary resources through various actors and institutions at the beginning and throughout the project or program. Sustainability refers to the long-term permanence of the project or program and, therefore, to the financing for its maintenance, as well as to its appropriation by the school zone community, and to the application of the law that maximizes its benefits, such as respect for regulations or traffic signs. Below are the relevant elements for this tool:

Local or national public subsidies or grants. Depending on the area of work, there may be government support that completely subsidizes the project or a certain percentage of it (for more information, see Tool 4: Regulation, Policy and Institutions). Some questions that may help in regards of this kind of financing are:

- Are there any precedents for financing this type of projects that can be used as a reference for financing new ones?
- Is there a source for the project's implementation from its origin?
- For how long is this funding?
- Is funding available for the project's long-term sustainability?

Multilateral banking. Latin America is the region with the largest number of operating multilateral banks, and these organizations can provide resources for the implementation of Safe Routes to Shcool projects.

Private initiative. Private initiative can provide resources through the creation of agreements for the benefit of all participating parties in accordance with the objectives of the project.

Maintenance. Road interventions require maintenance. Materials management and costs should be considered within the project, to ensure the safety of users over time.

Application and regulation. A regulatory framework should be sought to act upon the implementation and monitoring of such projects by authorities at the state and national levels (see Tool 4: Regulation, Policy and Institutions).

Community. Working with the school and neighborhood communities will create project ownership and will contribute to its permanence over time (see Tool 2: Education, Community and Communication).

Case studies of Safe Routes to School projects and programs

Case 1 Rural Schools in Chile

The need to implement Safe Routes to School in rural areas of Chile was first identified in 1999. The first project was carried out between 2000 and 2001, in a stretch of 8 km in the Pudahuel sector and was possible due to data from a participatory survey applied to mothers, fathers, girls and boys. Subsequently, the Ministry of Public Works of Chile (MOP) began **receiving letters from the community** (**Education, Community and Communication**) with complaints about the insecurity situation in rural school environments.

The citizen letters drove the MOP to perform a study on road traffic collisions in 2008, focusing on deaths of people in school age that occurred on national roads. Although no data were available to determine whether the events occurred during school hours, approximately 700 girls and boys were identified as dead by road traffic collisions throughout the country in 2008, and that the average speed on rural roads was 100 km/h.

In 2009, the MOP, through its attribution for road infrastructure, promoted an Interurban Road project and **achieved an alliance with the National Commission for Traffic Safety (CONASET) and the Ministry of Education** (**Regulation, Policy and Institutions**). The latter provided data that allowed for more specific studies, which determined through the work with the Ministry of Public Works that 95% of the rural schools analyzed were public and of limited resources, and priority was also given to schools with high road risk. In the same year, funding for intervening 90 rural schools was generated.

By 2017, more than 550 rural schools (approximately 21% of the country's total schools) had been intervened throughout Chile, and by 2018, an additional 400 km of intervention had been added to the program. What began as a small-scale project is currently a program with an **annual budget** (**Financing and Sustainability**) of between 4 and 5 million Chilean pesos designated for road infrastructure interventions in the surroundings of about 50 to 60 schools. The communities also continue to apply for such projects on several occasions.

Among the improvements, **the modification of the Transit Act** was also achieved (**RPI**) which now prohibits to travel over 30 km/h at entry and exit hours of schools in rural areas; for urban areas a speed limit of 50 km/h was established.

It is worth noting that **the technical team that promoted and built the program has been maintained throughout the program itself** (**FS**), regardless of political changes. On the other hand, school communities work to maintain the infrastructure through cleaning, lighting and other actions; these, however, lack technical maintenance abilities.

Some of the improvements have been:

- Reducing road width for drivers to slow down and realize that they are entering a school zone.

Figure 18. Reduction of road width.

Source: WRI Mexico site visit with Ministry of Public Works, Chile, September 2017.

- Adapting standard public transportation stops, which provide shelter and are physically integrated with the school through bike paths and sidewalks with safety rails to guide pedestrians to the safe crossing

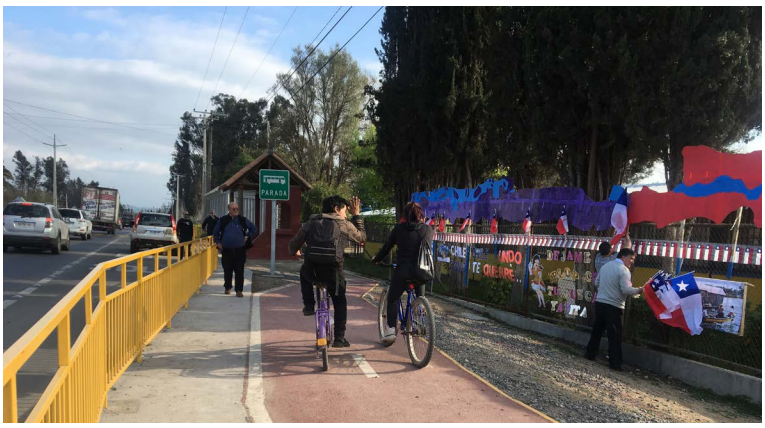

Figure 19. Stop.

Source: WRI México, site visit with the MOP, Chile. September 2017.

Regarding disclosure of the project to the community, at the beginning, the MOP gave talks for girls and boys to inform them of the program's goal. Based on the views expressed by girls and boys, the best phrase was selected and published on a poster at the school's entrance. This initiative was a great incentive for participation, but it was neglected due to the lack of trained professionals in road education within the school.

Figure 20. Project disclosure.

Picture by Rene Verdejo Barraza, MOP.

Toolkit Summary

1. Context Assessment: Surveys and studies were carried out and data were used to identify the schools to intervene.
2. Education, Community and Communication (ECC): Although participation was not planned by public institutions, community requests were met.
3. Road Design: Various improvements were implemented in the school environment.
4. Regulation, Policy and Institutions (RPI): The MOP took the lead, alliances were made, and regulations were amended to the benefit of the program.
5. Monitoring and Evaluation: There is a record of the program's scope.
6. Financing and Sustainability (FS): The team that began has been maintained, and budget was allocated as a project and subsequently as a program; however, there are neglected parts, such as maintenance.

Case 2 *El Caballito* School Road in Buenos Aires, Argentina

One of the main criteria for the achievement of the *El Caballito* School Road was **the potential to form a network of schools** with the highest possible enrollment of students, **as well as having various routes with opportunities for improvement**, in this case, sidewalks in poor shape. Another factor was the existence of a previous project like Safe Routes to School, but which did not have a differentiating path through paint and signage, nonexistent in the city's regulation for Safe Routes to School (**Context Assessment**).

Planning began in February 2016 through the alliance between different agencies from the Government of the Autonomous City of Buenos Aires (GCBA). The Ministry of Education was responsible for conducting studies in the schools from which the Ministry of Transportation determined the diagnosis, resulting in the selection of a network of 12 schools with 2.8 km of linear path defined for the School Route, with 6 613 pupils benefited.

Works on site started in April 2017, and in September same year, they already showed 85% of progress. **The Ministry of Transportation oversaw the project** and its works execution, which facilitated its realization, with the addition of having the same team that had worked in the technical areas on previous mandates, regardless of government changes (**RPI**).

The *El Caballito* School Road network benefits both public and private schools, focusing on elementary students of an age range in which some are accompanied, and others start traveling alone to school. Its goal is promoting and facilitating that more students travel on foot or bicycle in safe conditions and in a progressively autonomous way; that is to say, without the company of an adult.

The Ministry of Transportation relied on the technical methodology illustrated below for the identification and implementation of this project:

1. On-site studies on Rivadavia Avenue: Pedestrian counts, pre-intervention perception surveys, and analysis of pedestrian priority and speeds used by motor vehicles in the area.
2. Definition of layout derived from the territory analysis and surveys to students and educational personnel. Schools are central nodes of safe roads and layout can also be extended to a network of commercial establishments.

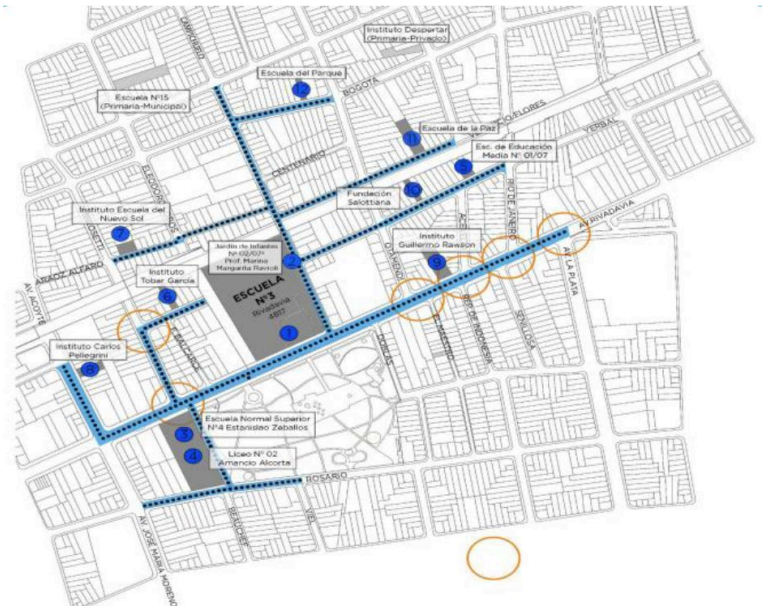

Figure 21. In navy blue, the schools' nodes. In sky blue, the network layout between the nodes.

Source: Ministry of Transportation, GCBA.

3. **Redesign and geometric adaptation were carried out under simple implementation and low-cost criteria** (**Road Design**). Intersections were addressed through modifications in geometry, turning radiuses, extension of loops and differentiation of lanes on the safe path.

Figure 22. Rivadavia Ave. and Ambrosetti, School Roads.

Source: Directorate-General for Mobility Planning of Buenos Aires, September 2017.

4. **Speed limit on school zones was halved**: 30 km/h in avenues and 20 km/h in inner streets (**RPI**).

5. Inventory, relocation, withdrawal, maintenance and cleaning of existing signals were executed, as well as the creation of new ones for identifying and marking public transportation onboarding - offboarding points, prohibition of parking on the road, speed limits, as well as "Slow School Zone" signs and maps of the new Safe Route to School.

Figure 23. Map of the paths of the *El Caballito* School Road.

Source: WRI Mexico, 2017

The alliance between government agencies also included the Ministry of Security, which incorporated agents in school settings for the safety of girls and boys on their way to school, and which actively collaborate with citizens, parents and neighbors. Furthermore, in coordination with the Ministry of Education, the project was presented to the students of the participating schools through materials developed by the Road Safety Education team.

Toolkit Summary

1. Context Assessment: Previous studies with the schools and on site were conducted, which helped to define the intervention locations and goals.
2. Education, Community and Communication (ECC): The project was presented to schools and materials for students were created.
3. Road design: Several improvements were made throughout the project's layout.
4. Regulation, Policy and Institutions (RPI): An inter-institutional alliance was developed and changes to the allowed speeds in the area were made.
5. Monitoring and Evaluation: Not applicable.
6. Financing and Sustainability (FS): The project was carried out from start to finish.

Case 3 Safe and Friendly Road in Peñalolén, Santiago de Chile

In 2010, the Chilean Office for the Protection of the Rights of Children and Adolescents initiated the development of the pilot project for Safe and Friendly Road in the commune of Peñalolén, in the city of Santiago, Chile. It had a **preventive approach** focused on avoiding situations of violation of rights, such as the right to education, creating a protective space for the whole community, especially for girls and boys.

In 2012 the first path of the program called Colegio Santa María was inaugurated, and in 2014 the project "Friendly Neighborhood: Incorporation of the Community in Social Problems" was developed. In 2015 the Operational Unit of Transit Control of Chile (UOCT) **assessed the impact of the project from 2010 to 2013** in terms of road traffic collisions, which showed the reduction of these in over 35% (**Monitoring and Evaluation**). With these results, this program, similar to Safe Routes to School, **was reactivated and strengthened in 2016 through the addition of municipal routes and projects, allocating new resources for improvements implementation** (**FS**), to set up public space and to recruit new godmothers and godfathers, who are responsible for supporting children when they face a risk situation. Financial sustainability of the program was achieved in 2017 dependent from municipality resources management.

The planning process for the overall the project was executed in a participatory manner (**ECC**) through neighborhood meetings with the school community and various organizations in the area, such as the Carlos Fernández Peña school's Good Treatment Brigade and the Family Care Center, and workshops for girls and boys regarding their rights. Additionally, the process included pedestrian and motorized strolls for people to detect factors contributing to road traffic collisions, as well as traveling with girls and boys and analyzing the routes they normally use.

Figure 24. Participation of children in the project.

Source: Peñalolén Municipality, Friendly Safe Road.

The participatory process included the articulation of community institutions and organizations with territorial presence as the focal point of the community in order to ensure reciprocity. Activities beyond the school were conducted, such as the recovery of public spaces, which would complement the generation of community with the protection of boys and girls, so that they feel confident to go knock on the door of the godmother or godfather whenever needed, to improve their personal safety and to strengthen their autonomy.

The definition of godmothers and godfathers, who were trained with a focus on children's rights and protocols to help ensure children safety, was a key element of the program.

In the interventions, while the CAF-Development Bank of Latin America took care of the cleaning and beautification operations, the municipalities took things identified in the participatory strolls to make low-cost infrastructure implementations as basis, such as the pruning of trees for visibility improvement at intersections, removal of abandoned cars, lighting in streets and sidewalks, addition of vertical signage, painting of various elements such as zebra crossings and stop lines, installation of speed bumps and repair of potholes in roads, as well as the construction of green areas and the installation informative spaces regarding the project.

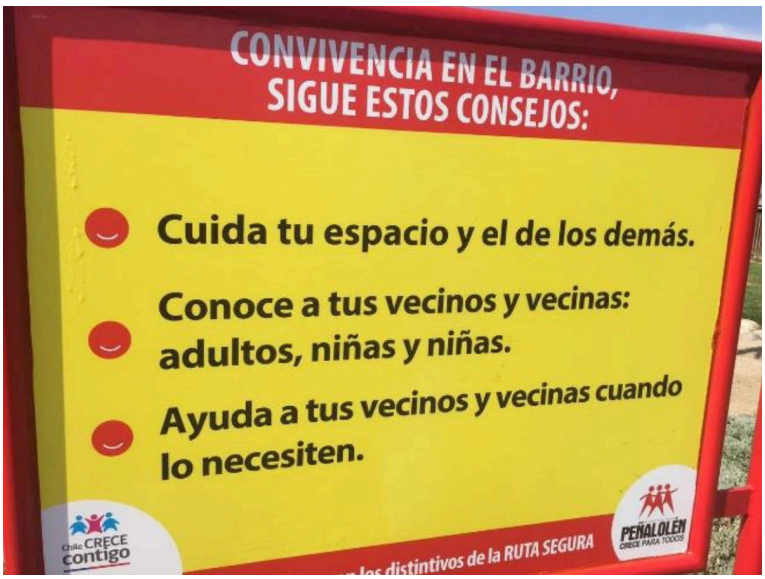

Figure 25. Disclosure of the project.

Source: Peñalolén Municipality, Safe Friendly Road.

Municipalities also contributed with workshops and talks on road education, and circuit practice plus road education for girls and boys.

Figure 26. Road Education School (Road education measures).

Source: Transit Office of Peñalolén Municipality, September 2017.

Toolkit Summary

1. Context Assessment: Preventive approach was used at this stage.
2. Education, Community and Communication (ECC): The school and neighborhood community were integrated through meetings, workshops and the godmothers and godfathers' program.
3. Road design: A variety of low-cost strategies were used, such as marking, signaling and speed reducers.
4. Regulation, Policy and Institutions (PRI): Not applicable.
5. Monitoring and evaluation: Evaluation was key to its extension and financial sustainability.
6. Financing and Sustainability (FS): Funding was initially available, and monitoring made it possible to turn into the sustainable program.

Case 4 Safe Route to School in Oberá, Misiones Province, Argentina

The Safe School Road project in the Municipality of Oberá has the intention of reducing the risk of road traffic collisions and generating mobility autonomy for students of the schools in the area. For this purpose, six educational institutions to work with were defined: two public and four private schools located in the center of Oberá, including two day-care centers. The goal was to establish a route of three blocks around the entrance of the schools by which the students could walk safely and independently, while avoiding the implementation of traffic controls to motorized vehicles due to crowding in the peak hour.

Different institutions worked on the project in a complementary way (**RPI**). The Municipality of Oberá was the promoter and financier of the program, The National Road Safety Agency (ANSV) from the Ministry of Interior and Transportation facilitated the methodology, supported implementation and monitoring, and financed the dissemination campaign. The Office of General Inspection and Transit of Oberá played the part of executor and supervisor, while the Deliberative Council of Oberá formalized, legalized, approved and regulated the project. In 2014 the ANSV developed the Safe School Road project. In 2016 the program was inaugurated in the municipality, and the implementation began in 2017.

The municipality **developed a methodology to understand the particularity of school trips** based on surveys for the total population of students, which considered the origin, route and difficulties of the journey, road behavior of users, their perceptions of risk and mobility habits. **An objective observational study was also developed** on mobility behaviors of the school community, with the purpose of contrasting with surveys and a study of the conditions of road safety and infrastructure (**Context Assessment**). The main problems identified were the following:

- Even though the municipality is safe to walk, fathers and mothers do not allow their sons and daughters to walk to school.
- Topography of the city is very uneven.
- Fathers and mothers from private institutions use cars as main mode of transportation.
- Cars are used daily for very short distances to cover a service or need.
- Mobility patterns of motor vehicles in the microcenter are high-speed and risk the safety of students.
- Bicycle use is considered as a luxury or recreation, not as a mode of transportation.

Actions taken to improve the conditions of road safety in school environments include **the definition of circulation areas with speed limits of 30, 20 and 10 km/h** (**RPI**), setting of traffic lights, attention to the conditions of the streets, creation of a pedestrian path at curb level, placement of containment fences in the schools' doors, road marking and lighting.

A presentation on the school network as well as a face-to-face communication program was held to disseminate this project, similar to Safe Route to School, in which people made suggestions for the improvement and understanding of the project. In order to strengthen road culture between fathers and mothers, traffic agents conducted road safety courses and compliance inspections of traffic rules in the school environment, sanctioning behaviors such as inadequate parking and non-compliance with speed limits. **Cultural and artistic activities were also developed for students, such as competitions, video presentations, theatre and story readings** (**ECC**). The project is currently under an evaluation process to measure the success of its implementation and will be monitored annually for reviewing of the results on 10 years.

Toolkit Summary

1. Context Assessment: After choosing the schools with the preventive approach, surveys and mobility studies were carried out.
2. Education, Community and Communication (ECC): Various activities took place to disseminate the project and to promote road culture.
3. Road Design: adjustments were made for pedestrian and motorized mobility.
4. Regulation, Policy and Institutions (RPI): Interinstitutional collaboration took place and the speed limit was changed in specific areas.
5. Monitoring and evaluation: It is considered annually.
6. Financing and sustainability (FS): The project was originally funded.

Case 5 Brazil's BRT Perimetral Leste corridor NGO-government partnership

In 2017, Institute for Transportation and Development Policy (ITDP) Brazil and São Paulo Metropolitan Urban Transport Agency (EMTU-SP), along with Apê Studies in Mobility, engaged in a partnership in order to improve their capacity for sustainable transport planning.

This **collaboration between civil society organizations and government** (**RPI**) aimed at contributing to the improvement of road safety, integration and participatory policies by proposing a framework that incorporates the urban mobility needs of vulnerable groups around the 300 km BRT network, consistent of 13 corridors, in São Paulo's metropolitan area.

One of these corridors, Perimetral Leste, was selected as the pilot project focusing on an educational facility nearby where the analysis of the current safety and accessibility conditions is fundamental.

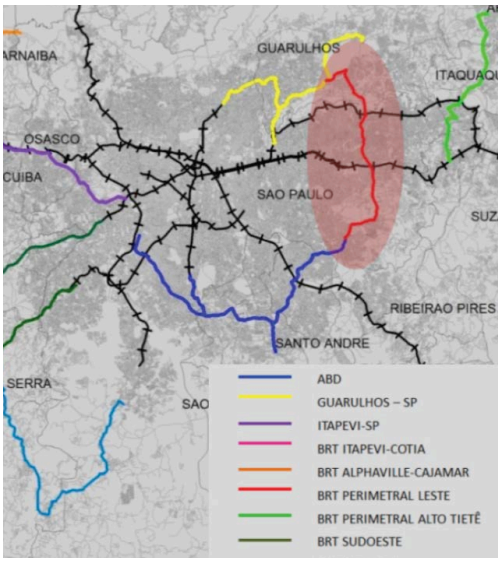

Figure 27. Location of BRT Perimetral Leste in the metropolitan region of São Paulo.

Source: EMTU-SP.

First, as part of the **analysis of current practices** (**Context Assessment**), ITDP conducted face-to-face meetings using structured questionnaires with managers and technicians from EMTU-SP, which allowed to observe that:

1. The agency generally plans corridors on arterial roads where traffic calming devices are hard to implement;
2. The agency tends to prioritize traffic flow;
3. There is no standard framework for the projects and their scope and breakdown may vary from one to another;
4. The engagement of the municipal traffic engineering company is critical, as the installation of traffic calming devices depends on them.

Second, the **pilot assessment** (**Context Assessment**) revealed that the plans for Perimetral Leste corridor already had a basic engineering design, environmental licensing and were prospecting for funds to initiate the Executive Project.

Elevated pedestrian bridges were also largely favored in the project (the 10 new crossings included 6 of them), an equipment that considerably lengthens the crossing distance for pedestrians and prompts them to cross in dangerous parts of the avenue. As a general rule, at-grade pedestrian crossings (street-level cross walks) are the most convenient way for pedestrians—and people with disabilities—to access a BRT station.

Figure 28. Conceptual renders of BRT Perimetral Leste (from the Basic Engineering Design).

Source: EMTU-SP.

In São Paulo, the corridor is located along Jacu-Pêssego Avenue and had characteristics that were considered highly inhospitable for pedestrians, such as:

- An arterial street with 4 lanes in each direction, that follows a river on its course.
- In the year of 2017, the avenue was ranked 6th and 8th in the city respectively in terms of deaths and injuries caused by road traffic collisions.
- The BRT corridor project will not alter the street's arterial function since it will maintain 3 lanes for mixed traffic in each way.
- The 536m average distance between crosswalks is considerably high and represents a clear barrier effect for pedestrian mobility.

The educational facility Unified Educational Complex (CEU) Azul da Cor do Mar was chosen based on a set of criteria including the location of São Paulo's municipal public education network, traffic and collision data, as well as density and income distribution along the corridor's planned stations.

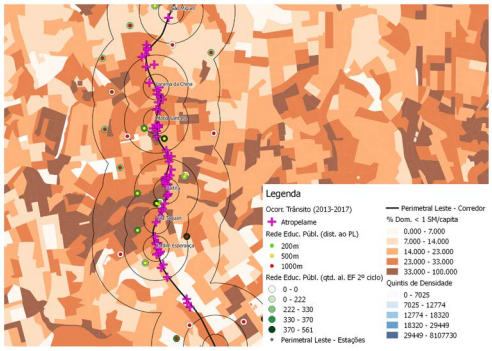

Figure 29. Analysis of planned stations with urban locations.

Source: ITDP with data from IBGE, CET-SP.

Finally, **policy recommendations** (**Road Design**) were formulated, based on the pilot assessment made with the interest group defined with the educational facility. This was made possible through the **engagement with academic staff, the identification of the interest group and a two-day workshop** (**ECC and FS**), and can be summarized in six points:

1. The adjustment of the stations' location to connect them to existing and projected pedestrian networks.
2. Increase the number of pedestrian crossings along the transit corridor and improve walking conditions in the main accesses. In areas where there is continuous activity on both sides of the corridor, the BRT Standard suggests that safe crossings should be provided every 200 meters.
3. Redesigning intersections deploying speed reduction devices for vehicles exiting the express roadway where the BRT will be located.
4. Improve cycling accessibility by improving connection to existing and proposed cycleways and offering adequate bike parking at every station.
5. Promote higher density and mixed land use around the stations.
6. Conduct participatory processes with users focused on vulnerable groups.

Toolkit Summary

1. Context Assessment – research and definition through macro analysis, identification of current practices questionnaires with EMTU-SP and pilot assessment with the school.
2. Education, Community and Communication (ECC) - engagement with the school's academic staff, identification of challenges, and a two-day workshop with interest group.
3. Road Design – policy recommendations.
4. Regulation, Policy and Institutions (RPI) – the partnership between ITDP Brazil, EMTU-SP and Apê Studies in Mobility.
5. Monitoring and Evaluation – the diagnostic provides a base line, from which future evaluations can be applied.
6. Financing and Sustainability (FS) – Policy recommendations were made through the partnership.

For more information, read the complete case study at https://itdpbrasil.org/rotas-seguras-para-a-educacao-relatorio-de-recomendacoes-para-brt-metropolitano-perimetral-leste/

Case 6 Mexico City's Moisés Sáenz Middle School

At the beginning of the 2017-2018 school year, Mexico City's Moisés Sáenz Middle School and its surrounding area was selected to be part of the Vision Zero for Youth project led by the Institute for Transportation and Development Policy (ITDP) with the support of the FIA Foundation. T**he selection was based on the following criteria** (**Context Assessment**):

1. The school has two different shifts and could therefore positively impact a greater number of students.
2. It is mainly accessible through a primary road with high vehicle speeds, heavy traffic flow and numerous points of conflict for the students.
3. The enthusiasm shown by the students and faculty for the project was considered paramount for its success.
4. It is a renowned public middle school giving the project the potential to stand out as a model to be replicated in other schools.

As a preliminary step, ITDP led open sessions of discussion with parents, to explain to them the goal and importance of working on road safety with their children. Then, in order to encourage the full commitment of the school teachers to the project, ITDP worked with them through a series of meetings where **they were taught basic road safety concepts and were asked how these could be adapted to the school's year curriculum** (**ECC**).

Figure 30. Road Safety session with the faculty, October 2017.

Picture by: Marie-Ève Assunção.

Third, ITDP and the teachers led workshops with the students every week on road safety issues in Mexico City. The aim was to raise awareness on safe behaviors, for example, attitudes that pedestrians should adopt when traveling throughout the city and the risks that other road users (mainly automobile drivers) generate in the streets. The exercises helped them understand the diverse challenges of improving road safety in their school area while promoting creativity and project-based learning. They also expressed their opinions on how to prepare for the street intervention in which they would later on play an active role. The students were able to analyze their school zone and identified conflict spots and unsafe areas. The workshops subjects were:

- Architectural design
- Arts & crafts workshop
- Graphic design

Figure 31. Students taking the architectural design workshop.

Picture by: Brenda Martínez.

Following the reflections of the students on road safety, on November 2017, ITDP implemented a temporary tactical urbanism intervention with the goal of demonstrating the need for a safe street design, that should ideally be permanently implemented by the authorities. It was comprised by three elements derived from the workshops with the students:

1. Bucket installation representing bollards to delineate the new geometry of the street.
2. Road painting and increasing of the pedestrian surface, based on a new and safe street geometry.
3. Placement of posters with messages by students that related to three of the four pillars of Vision Zero: law enforcement, culture of mobility, and road design and infrastructure.

Figure 32. Traffic barriers made by the school students.

Picture by: Brenda Martínez.

A road safety inspection was applied before and after the intervention to assess road risk. The ex-post analysis brought evidence that some of the problems were solved through specific measures including reduced crossing distance by the corner extension, smaller corner radius reducing drivers' turning speed, improved road users' visibility with lesser parking space at intersections and increased pedestrian space by curve extensions.

In the weeks that followed the tactical urbanism intervention, the director of the school was worried that the paint would not suffice to ensure safety in the area and that momentum for public intervention would be lost. She therefore urged public authorities to turn the school area project permanent and installed the temporary traffic barriers made by students in the street every day while waiting for the construction. Later on, retractable bollards were installed by the Urban Management Agency of Mexico City's government in Jaime Torres Bodet street, making the temporary intervention permanent by extending pedestrian space at the crossing between the sidewalks.

Toolkit Summary

1. Context Assessment: the area was analyzed before r the school selection.
2. Education, Community and Communication (ECC): working with the school community was an essential part of this case study, with parents, teachers and students.
3. Road Design: tactical urbanism was used by the school community and the NGO with the objective of drawing the authority's attention.
4. Regulation, Policy and Institutions (RPI): institutions were involved by the persistence of the school's authority.
5. Monitoring and Evaluation: post intervention assessments were made after both the tactical urbanism and the authority's interventions.
6. Financing and Sustainability (FS): Sustainability was strong considering the school community's and city authority's involvement.

Safe Routes to School: International examples

City and/or country	Name of the project or program	Collaborators	Tools and actions
Australia	Safe Routes to School	· Smart Travel · State Road Infrastructure Authority · Local governments · School community · Police force	Diagnosis, plan, feedback, implementation, monitoring and evaluation.
Ontario, Canada	Active School Travel Program	· NGOs · Schools	Removal of barriers on routes to school.
United Kingdom	Safe Routes to School	· Local NGO · School authorities · Parents	School travel plan, bicycle parking, training/ formation, school crossing patrols, Pedibuses and Bicibuses..
County of Marin, California, United States of America	Safe Routes to School	· Transportation Authority of Marin · Cyclist coalitions · School community	Education, dissemination, engineering, reinforcement and long-term vision.
United States of America	No information available..	· Safe Routes to School National Partnership · School community · Municipal government · Police force · Local shops	Infrastructure and changes in public policies and programs.
Bogota, Colombia	Bike-to-School Program	· District Secretary of Education · District Secretary oh Habitat · Institute of Sports, Mobility and Recreation · Ministry of Education	Participatory route planning and provision of bicycles for low-income girls and boys.
Lo Hermida, Peñalolén, Chile	Safe Route Program	· Peñalolén Office for the Protection of Rights · School community · Community meetings	The community was sensitized and there was a participatory plan, from a rights perspective with godmothers and godfathers, as well as an impact and user satisfaction assessment.
Rafaela, Argentina	First Safe Route to School in Argentina (pilot program carried out at the 1247 Centenary of Rafaela Primary School).	· Ministry of Culture and Education · Ministry of Management and Participation	Improvements to walking and cycling experience by activating and signaling a safe route.
South Korea	School Zones	· Ministry of Infrastructure · Ministry of Education · Ministry of Transport	Improvement of school zones, regulation and safe operation of school buses. Support to civil society organizations in the promotion of road safety, education programs and law improvement.
Dar Es Salaam, Tanzania	School Area Road Safety Assessment and Improvements (SARSAI)	· School Area Road Safety Assessment and Improvements (SARSAI)	Improvements in road safety, training of girls and boys to ask for street-crossing assistance and the establishment of crossing patrols.
Victoria, Australia	VicRoads Safe to School	· Ministry of Works · School community	Incentive, training and engineering.
Ho Chi Minh, Vietnam	Pedestrian School Safety Plan	· Ho Chi Minh City Government · World Resources Institute · AIP Foundation	Security measures for primary and secondary schools along the corridor and feeder lanes to the new Bus Rapid Transit (BRT).

Impact assessment/indicators	Strengths	Shortcomings
No data available.	It is a nationwide program. Resources are guaranteed. There are multiple institutions involved.	No participatory process was reported.
46 schools participate in the program and 47% of them have been implemented for five years.	Community participation.	No data available.
Healthier lifestyles, safer streets and highways, less pollution, mobility independence for boys and girls, less traffic congestion, academic performance, freedom of mobility.	Activities at multiple levels.	Change focused on girls and boys and left the environment unchanged.
Reduction of the percentage of girls and boys who are driven to school alone in a private vehicle and increase in the number who walk, ride a bicycle, use school transport or car-sharing.	Active participation of the school community. Strong local support from project-related authorities.	Training programs should be carried out in coordination with local police departments.
Reduction of road congestion, improvement of road safety and increase on physical activity.	The NGO has extensive experience and a network of over 750 partner organizations.	The program lacks local leaders. There is a need to hire leadership for program coordination.
A safe, fun and sustainable way to access the school is being provided for more than 3,000 public school students. Participation of pupils by sex is 19% female and 81% male.	Execution took place in a short period of time. Monitoring allows following up girls and boys who use bicycles to go to school.	There is a lack of knowledge of program details and a need for coordination at multiple levels.
540 girls and boys walk to Santa María school daily. Fifteen godmothers and godfathers are vigilant of their safety on the way, and 15 girls and boys report irregular road safety changes in the conditions of their home-school-home route.	Road safety is improved/improves along with social security. Community participation was enormous.	It is not enough for the school community to participate; it must be the protagonist of the project.
Improved sidewalks, creation of safe crossings, appearance of pedestrian crossings and placement of signs around schools.	The common desire of solving traffic congestion and road safety problems.	Lack of evidence to monitor change.
A 95% reduction in fatal road traffic injuries among girls and boys under the age of 14, and 60% reduction in road traffic deaths in general during the period.	Coordination and funding have strengthened the project.	No data available.
Currently under impact assessment.	No data available.	No data available.
The data provided by parents showed a significant increase in active transportation of girls and boys to school, which increased to once a week, but the data reported by students indicated no statistically significant changes.	Program is easier to implement within a designated small school, with an enthusiastic attitude towards active transportation and within an area of higher density and less car use.	No data available.
Road design measures.	Evidence-based recommendations.	No data available.

Acronyms

LAC	Latin America and the Caribbean
ANSV	Argentina's National Agency of Road Safety
CET-SP	São Paulo's Traffic Engineering Company
CONASET	Chile's National Commission of Road Safety
IADB	Inter-American Development Bank
BRT	Bus Rapid Transit
EMTU-SP	São Paulo's Agency of Metropolitan Urban Transit
FIA	Federation Internationale de l'Automobile
GCBA	Buenos Aires' Autonomous City Government
GHG	Green House Gases
IBGE	Brazilian Institute of Geography and Statistics
ITDP	Institute for Transportation and Development Policy
MOP	Chile's Ministry of Public Works
WHO	World Health Organization
NGO	Non Governmental Organization
UN	United Nations
UNEP	United Nations Environment Programme
UNICEF	United Nations International Children's Emergency Fund
UOCT	Chile's Operational Unit of Transit Control
WRI	World Resources Institute

Sources

IADB (2016). *Delitos violentos en ciudades de América Latina.*

US Physical Advisory Committee (2018). Physical Activity Guidelines Advisory Committee Scientific Report.

Chillon, P., Panter, J., Corder, K., Jones, A. & Van Sluijs, E. (2015). A longitudinal study of the distances that young people walk to school. *Health & Place*, 31, 133-137.

CROW (2007). *Design manual for bicycle traffic.* Netherlands: CROW.

FIA Foundation (2018). *Unfinished Journey, The Global Health Response to Children and Road Traffic.*

Global Road Safety Facility, The World Bank, Institute for Health Metrics and Evaluation (2014). *Transport for health.* The global burden of disease from motorized road transport. Seattle: IHME, Banco Mundial. Obtained from https://openknowledge.worldbank.org/bitstream/handle/10986/17613/863040IHME0T4H0ORLD0BANK0compressed.pdf?sequence=1

Mexico City's Government (2015). *Reglamento de Tránsito del Distrito Federal.*

Hernández, R. E., & Torres Jaramillo, E. (2018). *Andando a la escuela.* Spain.

Hidalgo, D., Miranda, L., Lleras, N., & Rios, J. (2016). Al colegio en bici: Bogota's bike to school program. *TRB 95th Annual Meeting, At Washington.* Washington, DC: TRB.

ITDP (2018). *Informe Visión Cero CDMX.* Institute for Transportation and Development Policy. Mexico: ITDP. Obtained from http://mexico.itdp.org/noticias/informe-vision-cero-cdmx/

Laflamme & Diderichson (2000). *Social differences in traffic injury risks in childhood and youth—a literature review and a research.*

Litman, T. (2016). *Parking Management. Strategies, Evaluation and Planning.* Obtained http://www.vtpi.org/park_man.pdf

Mammen, G. (2016). *Phd Dissertation: School travel planning in Canada: A Holistic Examination of Program Impact on Active School Travel.* Toronto: University of Toronto. Obtained from http://www.saferoutestoschool.ca/wp-content/uploads/2017/08/Mammen-PhD-Thesis-2016.pdf

McDonald, N., & Aalborg, A. (2009). Why parents drive children to school. *Journal of the American Planning Association, 75* (3).

UN (2016). Obtained from http://www.sela.org/media/2262361/agenda-2030-y-los-objetivos-de-desarrollo-sostenible.pdf

Oficina de Protección de Derechos de Peñalolén (2010). *Programa Ruta Segura-Chile.* Santiago, Chile: Instituto de Asuntos Públicos, Centro de Estudios de Seguridad Ciudadana, Universidad de Chile.

WHO (2009). *Global Health Risks: mortality and burden of disease attributable to selected major risks.* Switzerland: World Health Organization.

WHO (2014). *World Health Statistics.* Obtained from http://www.who.int/gho/publications/world_health_statistics/2014/en/

WHO (2015). *Global Status Report on Road Safety*. Obtained from http://www.who.int/violence_injury_prevention/road_safety_status/2015/en/

WHO (2015). *Diez estrategias para preservar la seguridad de los niños en las carreteras.* Obtained from http://apps.who.int/iris/bitstream/handle/10665/162336/WHO_NMH_NVI_15.3_spa.pdf?sequence=1&isAllowed=y

Peden, M., Oyegbite, K., Ozanne-Smith, J., Hyder, A., Branche, C., Rahman, F., Bartolomeos, K. (2008). *World report on child injury prevention.* Switzerland: World Health Organization.
Planzer, R. (2005). La seguridad vial en la región de América Latina y el Caribe. Situación actual y desafíos. *Serie Recursos Naturales e Infraestructura.* Chile: CEPAL.

Rathund, K. (2010). Adolescents' quality of attention and affect after morning nature walks: findings from a study of nature and education at five Montessori schools. *Namta Journal, 35*, 211-251.

Samimi, A., & Ermagun, A. (2013). Student's tendency to walk to school: case study of Tehran. *Journal of Urban Planning and Development*, 144-151.

Save the Children (2017). *Fighting for breath.* London. Obtained from https://www.savethechildren.org.uk/content/dam/global/reports/health-and-nutrition/fighting-for-breath-final-low-res.pdf

Schettino, M. P. (2007). *Ciudades para un futuro más sostenible.* Obtained from http://habitat.aq.upm.es/temas/a-transporte-publico-urbano.html

Shaw, B., Bicket, M., Elliott, B., Fagan-Watson, B., Mocca, E., & Hillman, M. (2015). *Children's independent mobility: an international comparison and recommendation for action.* London: Policy Studies Institute.

Silverman, A., & Billingsley, S. (n.d.). *Safe to Learn. Safe journeys to school are a child's right.* Obtained from www.fiafoundation.org

Silver, A., Billingsley, S. (n.d.). Rights of way. *Child poverty and road traffic injury in the SDGS.* Obtained from www.childhealthinitiative.org

STARS Madrid (2015). *Qué es un bicibús.* Obtained from http://eustarsmadrid.blogspot.com/2015/04/que-es-un-bicibus.html

UNICEF (2008). *Informe Mundial sobre la prevención de lesiones infantiles.* Washington, D.C.: UNICEF.

United Nations Road Safety Collaboration (2014). *Improving global road safety.* Obtained from http://www.who.int/roadsafety/news/2014/Final_draft_UN_General_Assembly_resolution_improving_global_road_safety.pdf?ua=1

WRI (2015). *Cities Safer by Design.* Washington D.C.: World Resources Institute.

Glossary

1. Accessibility: Quality and characteristics of the path to have easy access, treatment, understanding and intelligibility to move around and forward.

2. Run over: From a vehicle, violently reach people or animals, colliding with them and usually causing them damage.

3. Car: Vehicle intended for the transport of people and with a certain capacity, which can be guided to march on an ordinary route without the need for lanes. They carry a motor, generally of internal or electrical combustion, that propels them, in addition to an interior (cabin) and exterior structure.

4. Sidewalk/Pavement: Shore of the street or other public road, usually slightly elevated and tiled, located next to the facades of the houses and particularly reserved for pedestrian traffic. On a road, reserved margin on one side and another of the road for pedestrians, non-car traffic, etc. It must comply with conditions such as accessibility, security, visibility, comfort and functionality for mobility.

5. BiciBus: Route that picks up children near their house forming a cyclist squad on the way to school. For this, it is necessary to have several adult volunteers, both to pedal with the group and to coordinate its execution, stops and schedules.

6. Bicycle: Two-wheeled vehicle, usually of equal size, whose pedals transmit the movement to the rear wheel by means of a plate, a sprocket and a chain. Mode of transport used for one or more people who may or may not bring an electric motor that drives it.

7. Bollard: Obstacle of iron, stone or other material placed on the ground of a public road and intended primarily to prevent the passage or parking of vehicles. In addition, it fulfills a function to guide drivers through a path and avoid certain trajectories. They also fulfill a function of delimiting spaces.

8. Curb/Garnish: Sash or ribbon of stone or other solid structure that forms the edge of a sidewalk or pavement.

9. Calmed traffic street: Low-speed road with elements in its design that reduce speeds in a defined area to improve the safety of pedestrians, cyclists, transport users and other drivers.

10. Cyclist: Person or user of the road that is mobilized by bicycle.

11. Collision: Situation in which two or more objects, vehicle bodies, collide violently by encountering each other on the same path.

12. Street trade: Commerce that does not have a fixed place of sale, since it moves from one place to another looking for the largest influx of public.

13. Pedestrian crossing: Area over the vehicular stream assigned for pedestrian traffic, may be at the level of the sidewalk or road surface.

14. Truncated dome: circular button shape of one of the pieces of tactile pavement used to indicate prevention or change of direction.

15. Element of confinement: physical device that allows to delimit the perimeter of a lane or area for the exclusive use of certain users, the forms may vary according to the purpose of the user who seeks to serve, but should not be an element that inflicts greater risk .

16. Parking: Place or enclosure destined to park vehicles. It can be inside an enclosed space (property or building) or in the open space (street). It can be public or private property.

17. Stencils/Road Markings/Demarcation: These are indications in the form of stripes, symbols and letters that are painted on the pavement, garnishes and structures, within or adjacent to the roads, as well as the objects that are placed on the bearing surface in order to regulate or channel traffic and indicate the presence of obstacles, without distracting the attention of road users.

18. Climate factor: Element or meteorological cause that act together with other elements of the environment and cause a modification to it and to the operation of the street. Examples: rain or precipitation, decreases or increases in temperature, winds, among others.

19. Geographical factor: Element or cause of the location of the study site, which acts on the modification of the operation of the street, due to time issues and has a relationship with the weather and traffic. Examples: conditions of latitude and longitude.

20. Topographic factor: Element or cause of the soil conditions, in terms of its relief, slopes, curvature, altitudes and dimensions of the land on which the study sites are positioned.

21. Road traffic collision: Multicausal event that results in damage to vehicles and people. It manifests itself as a negative externality of people's mobility due to a lack of control or integration of causes in mobility management.

22. Temporary intervention: Modification of the street environment that occurs from a few hours to a year, maximum, through low-cost materials and objects. This process will allow studying and measuring the difference between before and after the operational context of the street and the modification of the behavior of road users.

23. Permanent intervention: Modification or redesign of the street environment that entails a duration of more than one year and culminates with the project life time. It occurs through materials and objects of greater duration with medium and high costs and culminates a process of planning, evaluation and construction, to give way to an intervention that gives solution in medium and long terms.

24. Traffic injury: Physical or psychological damage to a user of the road caused by a traffic accident.

25. Insecure environment: Areas of the road that lack conditions that reduce the risk of both a traffic accident and a crime.

26. Active mode of transport: Ways of moving people, goods or services, through the use of human body force, either directly (on foot) or indirectly, propelling another non-motor vehicle, such as the bicycle.

27. Public transport stop: Urban element of the public space that has the function of indicating the location of intermodal meeting between users (pedestrians) and buses.

28. PediBus: Organized group of child students who make the journey between home and school walking, usually accompanied by adults following established routes and schedules.

29. High frequency spot/Black spot: Distribution of registered traffic events showing a section of the network of streets and roads with high frequency records of road collisions, deaths or injuries.

30. Speed reducer: They are artificial elevations on the road in relation to the ground, usually made of pavement, that can reduce speeds depending on the height and length of the structure. It is often designed as part of a circle, a trapeze or a sinusoidal curve, without being limited to low traffic streets. Ideally, the level change will indicate drivers traveling at a consistent target speed along a road, instead of stopping before and accelerating after each hump.

31. Pedestrian shelter: Area or space intended to facilitate the crossing of pedestrians through a road, protected from vehicular traffic by means of solid physical elements, telling drivers not to enter this space.

32. Route: Direction taken by a user of the road for a purpose such as completing displacements of origin and destination. This route is determined by a decision making based on road conditions and other factors.

33. Traffic light: Electric apparatus of light signals that regulates the movement of road users and gives order and indications of maneuvers allowed through time programming.

34. Traffic light programming: It is the action of ordering and regulating the traffic of vehicles and road users through the programming of times and actions through traffic lights.

35. Signaling: Signs, markings, traffic lights and any other device that is placed by an authority on or adjacent to streets and highways to prevent, regulate and guide users.

36. Horizontal signaling: Traffic control devices that, due to their position through or adjacent to the road, give a complimentary message to the signaling system through marks, stripes and physical devices such as buttons and vibrators.

37. Vertical signaling: Traffic control devices that, by their position adjacent to the road give a direct message to road users. They also have a subclassification of low elements (less than 4.0 meters high) or high elements (greater than 4.0 meters high or that meet the gauges - free heights - of the allowed vehicles).

38. Shock: It is a change in the height or profile of the street which through accelerations of forces and masses road users receive a message of attention, commonly to reduce and regulate speed. They must always be accompanied by vertical signs and an adaptation of paint that catches the user's attention.

39. Surface treatment: Adaptations on the street that involve the increase in the level or vertical section of the road to make each of the users visible, decrease and regulate the speed and put the users on the same level for interaction.

40. Motorized trip: Trip that is made from one part to another through a mode that uses either combustion or electric motors, in which a vehicle uses mechanical assistance.

41. Overturn: Movement of a vehicle that is tilted until it is inverted or on one side through the energy generated by the encounter of two forces in different directions, related to speeds and masses.

Annex 1

Material developed by ITDP Mexico

Survey

Mobility and transportation to and from school
to apply to elementary and middle school students

NOTICE: This questionnaire and its informed consent sheet were developed by ITDP Mexico as an input that school communities, governments and organizations may adapt to their needs. In particular, we recommend modifying the underlined sections and, if applicable to very young girls and boys, to adapt the questions so that they can be answered by their parents, mothers or guardians.

Consent of origin and destination survey

The **Institute for Transportation and Development Policy (ITDP)** is an international organization that works to achieve sustainability and equity in different cities around the world, using its world-class technical expertise and experience in the development of public transport projects, active mobility (pedestrian and cyclist), car use management, sustainable development, public policy and climate change.

ITDP is carrying out a methodology to analyze the different types of conflicts that may arise in the street between pedestrians, cyclists and motor vehicle drivers around the school environment. This aims to improve the road safety of the school surroundings and that students can safely arrive to the school.

Part of the methodology includes a survey of origin and destination answered by the students to know the characteristics of their trips to and from school. This survey will be used to identify the number of students who arrive walking or by other modes of transportation, and the distances they travel each day.

With this document we ask your consent that this survey will be performed to your daughter or son during their computer class. To whom:

Me, Sr. o Madam _____, father,

mother or child guardian of _____
authorize that my son/daughter participate in the survey of origin and destination and understand that the information will be used only for the research previously explained.

Name and signature _____

Date _____

Questionnaire

Survey origin and destination to apply in Primary and Secondary schools,
from Tuesday to Thursday only.

Hello! The **Institute for Transportation and Development Policy** (ITDP) is conducting research on the modes of transportation with which you arrive at school. The information you provide to us is confidential and will be used only for statistical purposes. Your opinion is very important for us.

The questionnaire consists of **three sections: A. Sociodemographic data, B1. Trip characteristics: Towards school and B2. Trip characteristics**: **Returning home** and answering it will take you about 20 minutes.

Thank you!

A. Sociodemographic data

1. What is the name of your school?

   _____

2. What is your school grade?

   _____

3. What is your school shift?
   - Morning (1)
   - Evening (2)
   - Not applicable: I go to school from morning to afternoon (3)
   - I don't know (4)

4. What is your gender?
   - Female (1)
   - Male (2)
   - NA / Other (3)

5. How old are you?

   _____

6. Do you have bicycles at home?
   - Yes (1)
   - No (go to q. 8) (2)
   - I don't know (3)

7. Are any of those bikes yours?

Yes (1)
No (2)
I don't know (3)

8. Does your family have a car?

Yes (1)
No (2)
I don't know (3)

A. Trip characteristics

B.1 Towards school

9. What is the neighborhood where your currently live in? _____

10. What is the zip code of your current address? _____

11. Do you regularly stop at another place before you get to school?

Yes (1)
No (go to q.13) (2)

12. Where do you stop? First read all of the options and then cross the numbers in the order in which you make the stops at each place.

B. At a relative's home	(1)	(2)	(3)	(4)
C. At a physical workout space (gym…)	(1)	(2)	(3)	(4)
D. At mom's, dad's or a relative's workplace	(1)	(2)	(3)	(4)
E. At the school of my brother or sister	(1)	(2)	(3)	(4)
F. Other: _____	(1)	(2)	(3)	(4)
G. Other: _____	(1)	(2)	(3)	(4)

13. Indicate all modes of transportation you use regularly to get to school.

- First read all the options and then cross out the numbers in the order in which you use the transport modes.
- If you walked on the street to get to another mode of transportation, consider it as one mode.

a. Walk	(1)	(2)	(3)	(4)	(5)	(6)
b. Bicycle	(1)	(2)	(3)	(4)	(5)	(6)

c. Bicycle rickshaw	(1)	(2)	(3)	(4)	(5)	(6)
c. Rickshaw (motorized)	(1)	(2)	(3)	(4)	(5)	(6)
d. Subway	(1)	(2)	(3)	(4)	(5)	(6)
e. Light Rail	(1)	(2)	(3)	(4)	(5)	(6)
f. Metrobús o Mexibús	(1)	(2)	(3)	(4)	(5)	(6)
g. Trolebús	(1)	(2)	(3)	(4)	(5)	(6)
h. Autobús RTP o M1	(1)	(2)	(3)	(4)	(5)	(6)
i. Bus/Suburban bus	(1)	(2)	(3)	(4)	(5)	(6)
j. Colectivo/Micro	(1)	(2)	(3)	(4)	(5)	(6)
k. Common taxi	(1)	(2)	(3)	(4)	(5)	(6)
l. Digital app taxi	(1)	(2)	(3)	(4)	(5)	(6)
m. Automobile	(1)	(2)	(3)	(4)	(5)	(6)
n. Motorcycle	(1)	(2)	(3)	(4)	(5)	(6)
o. Suburban Train	(1)	(2)	(3)	(4)	(5)	(6)
p. Mexicable	(1)	(2)	(3)	(4)	(5)	(6)
q. School bus	(1)	(2)	(3)	(4)	(5)	(6)
r. Other (specify) _____	(1)	(2)	(3)	(4)	(5)	(6)

14. At what time do you leave your house?

____ ____ : ____ ____ (HH:MM)

15. Approximately, at what time do you arrive at school?

____ ____ : ____ ____ (HH:MM)

16. Normally, who do you travel to school with?

Alone	(1)
With my mom	(2)
With my dad	(3)
With a relative	(4)
On the school bus	(5)
With friends	(6)
I don't know	(7)

B.2 Returning home

17. After school, do you stop at or visit a place before getting home?

Yes		(1)
No	(go to q.19)	(2)

18. Where do you stop? First read all of the options and then cross the numbers in the order yo make the stops at each place.

a. At a relative's home	(1)	(2)	(3)	(4)
b. At a physical workout space (gym…)	(1)	(2)	(3)	(4)
c. At mom's, dad's or a relative's workplace	(1)	(2)	(3)	(4)
d. At the school of my brother or sister	(1)	(2)	(3)	(4)
e. Other: _____	(1)	(2)	(3)	(4)
f. Other: _____	(1)	(2)	(3)	(4)

19. Indicate all modes of transportation you use regularly to get home.

- First read all the options and then cross out the numbers in the order in which you use the transport modes.
- If you walked on the street to get to another mode of transportation, consider it as one mode.

a. Walk	(1)	(2)	(3)	(4)	(5)	(6)
b. Bicycle	(1)	(2)	(3)	(4)	(5)	(6)
c. Bicycle rickshaw	(1)	(2)	(3)	(4)	(5)	(6)
c. Rickshaw (motorized)	(1)	(2)	(3)	(4)	(5)	(6)
d. Subway	(1)	(2)	(3)	(4)	(5)	(6)

e. Light Rail	(1)	(2)	(3)	(4)	(5)	(6)
f. Metrobús o Mexibús	(1)	(2)	(3)	(4)	(5)	(6)
g. Trolebús	(1)	(2)	(3)	(4)	(5)	(6)
h. Autobús RTP o M1	(1)	(2)	(3)	(4)	(5)	(6)
i. Bus/Suburban bus	(1)	(2)	(3)	(4)	(5)	(6)
j. Colectivo/Micro	(1)	(2)	(3)	(4)	(5)	(6)
k. Common taxi	(1)	(2)	(3)	(4)	(5)	(6)
l. Digital app taxi	(1)	(2)	(3)	(4)	(5)	(6)
m. Automobile	(1)	(2)	(3)	(4)	(5)	(6)
n. Motorcycle	(1)	(2)	(3)	(4)	(5)	(6)
o. Suburban Train	(1)	(2)	(3)	(4)	(5)	(6)
p. Mexicable	(1)	(2)	(3)	(4)	(5)	(6)
q. School bus	(1)	(2)	(3)	(4)	(5)	(6)
r. Other (specify) _____	(1)	(2)	(3)	(4)	(5)	(6)

20. At what time do you leave school?

____ ____ : ____ ____ (HH:MM)

21. Approximately, at what time do you arrive at home?

____ ____ : ____ ____ (HH:MM)

22. Normally, who do you travel home with?

Alone	(1)
With mom	(2)
With dad	(3)
With a relative	(4)
On the school bus	(5)
With friends	(6)
I don't know	(7)


COLEGIO