C3 HORIZON: NEAR ZERO CITIES

Fundación MAPFRE

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Content

1. FOREWORD

Important advances, yet a lot of ground still to cover to reach Goal Zero in cities

In 2014, Fundación MAPFRE proposed Goal Zero as the ethically defensible objective for serious victims and fatalities of traffic accidents in Spanish cities by 2030, and the whole of Spain, including all roads, by 2050. In the last few years we have witnessed how "bits and pieces" of this Goal Zero have been materializing in different areas: zero road deaths in April 2018 in Galicia, zero bus fatalities on interurban roads in 2019 for the first time ever, and 37 days with zero road fatalities in that same year. But it seems that it is in our cities that this goal could be closest to being achieved, as in fact several Spanish cities every year are able to proudly state that they have had zero fatalities as a result of traffic accidents.

This study tries to examine in depth the characteristics of "almost zero cities" (*Ciudades Casi Cero*, or C3 in Spanish), these being defined as those with a fatality or serious injury accident rate lower than the Swedish city of Stockholm, chosen as the benchmark in this respect. Secondly, it also tries to understand how the efforts made over the last few decades by certain Spanish cities to advance the sustainability of their urban mobility systems have affected road safety. Indeed, another of the cities held up as an international benchmark – Oslo in Norway – has also posted excellent results and should be referenced as another of the more recent success stories: in 2019, not one single pedestrian, cyclist or minor died as a result of a traffic accident in the city.

One of the main conclusions of this study is that the relationship between sustainability and the fatality and serious injury accident rate is not always a direct one. To put it another way, there is a paradox whereby the cities that are held up as exemplars of sustainable mobility are not necessarily those with the lowest rates of serious injuries and fatalities, although it must be said that they have managed to reduce the number of fatalities between 1999 and 2019 somewhat more than other cities. Our interpretation of this finding is that "risk arises in the cracks in the system". For example, a city that has been successful in promoting active modes of transport, also known as "unprotected", with large numbers of pedestrians and cyclists moving around its streets, where at any given time a disruptive element such as a high-speed motorized vehicle might "erupt" into the scenario.

Whatever the case, the information reflected in this report should not be used in a competitive sense to establish who is better than whom. This would be a big mistake. The efforts, and the improvements, must be collective: "without leaving anyone behind" according to the UN Sustainable Development Goals. All the cities featured in this study deserve heartfelt recognition for the efforts they have made to improve road safety in their areas. None of them is free from the chance of an unfortunate accident happening at any time, although everyone is responsible – citizens and municipal authorities alike – for "making it increasingly difficult for fate to play a part".

The data we have used to classify the cities in terms of their accident rates is sourced from the official statistics of the Directorate-General for Traffic, and it is possible that in some cases there may be minor differences with municipal statistics. This is due to differences in data collection

methods and the ways information is quantified: for example, we chose to include fatalities within a particular municipality regardless of whether the roads were managed by that same municipality or another one, as our focus is not jurisdictional but geographical. We have made every possible effort to understand, and justify, any possible differences when these have arisen.

Meanwhile, unlike other initiatives that recognize those cities with zero fatalities in a specific year, we have opted for a multiannual perspective that is much more exacting and includes the effects of the ever-present statistical variation in the number of fatalities and serious injuries. This may be a more exacting approach, but it is also fairer, since it allows for a less hasty and more reliable analysis of the evolution of accident rates.

Having noted all of the above, I would now like to highlight some of the main conclusions of this study, or at least those that in my opinion are the most important:

a. In line with the Goal Zero principles, "human life and health must take priority over mere commercial aspects of travel, with the result of a new balance between mobility and safety".

b. "The accident rate on urban roads has tended to decrease throughout this century in Spain, but the numbers of deaths and injuries continue to result in an incalculable social tragedy every year. **The drop in the number of victims is too slow**".

c. Some 81% of fatalities in 2018 on urban roads were pedestrians and users of two-wheeled vehicles, so it is imperative to strengthen their safety in future mobility and road safety plans.

d. The urban accident rate is accounting for an increasingly larger relative weight in Spain's general accident rates, which suggests the need to redouble efforts and investments in road safety in cities.

e. Internationally, the global benchmark used for this report is Stockholm, which is the city with the lowest fatality rate per 100,000 inhabitants: 0.7. At the other extreme, the rates of cities such as San Salvador in El Salvador are one hundred times higher.

f. Regrettably, there are no truly large cities on the list of those with the lowest mortality rates. The largest city in the group of Spanish cities with comparable rates to those of Stockholm is Elche (in Alicante province), which has a population of 229,000 people. It is obvious that mobility tends to pose a greater challenge in big cities, but ALL cities must aspire to become Zero Cities in the short term. Stockholm, incidentally, has around 975,000 inhabitants.

g. The "metropolitan" element is obviously a factor, and helps to give some of the satellite cities of major capitals a lower accident rate: 19 of the 25 cities with lower mortality rates form part of large metropolitan areas. To overstate this fact somewhat, this effect implies that the satellite cities are "emptied" during the day, when a large proportion of their inhabitants go to workplaces in the big city. If these people are involved in an accident, it is usually in the city to which they commute every day rather than in their own municipality. We might well also ask the question, although this study does not shed any light in this respect, whether we drive in the same way on the streets on which we live and where our children play as the ones we are simply passing through on our way to and from work.

h. Our study thus confirms that the accident rate in large cities is between 1.8 and 4.5 times higher than the accident rate in the smaller metropolitan municipalities clustered around them.

i. Only one of the cities with a low record of fatal accidents also records the widespread use of motorcycles. To put this another way, it seems that the use of this mode of transport correlates directly with the accident rate, even if this effect is moderate.

j. The good news is that every city, as indicated in this study, "can chart its own accident reduction rates, regardless of its structural factors or the characteristics of its road network", though, by the same token, "every city can and should establish ambitious goals in terms of accidents, aligned with equally ambitious goals in terms of sustainable mobility".

To summarize the foregoing, it seems that there are certain types of guidelines or actions that can help cities (and other types of jurisdictions) to move forward towards Goal Zero:

1. Political support at the highest level to move forward with regard to safe, healthy and sustainable mobility. A good example is Vitoria-Gasteiz: "a model that crosses the different political mandates; a society that drives change".

2. Preparation of a medium- or long-term strategy, coordinated with other state or regional (European) institutions and agreed between all stakeholders, taking advantage of synergies with other policies or initiatives such as the UN Sustainable Development Goals and noise, air quality, public safety policies, etc. and closely linking sustainable mobility and road safety.

3. Continuity in technical services to maintain talent management and continuance of actions, combined with the necessary ongoing refreshment of knowledge and a capacity for innovation.

4. Establishment of coordination mechanisms between different municipal departments, with a special role for local police (as, for example, in Talavera de la Reina). These mechanisms can be formal or informal provided that they are efficient and effective. Good examples can be found in Donostia-San Sebastián: "cross-cutting coordination and determination" and San Cristóbal de la Laguna: "all as one; understanding between departments".

5. Accident research program, to include the preparation of recommendations to improve road safety and, obviously, their implementation. A good example can be found in Elche: "analyze on a micro scale to take action on a macro scale".

6. Program to promote a road safety culture that involves political leaders, municipal technicians, citizens and the local media.

7. Universal, lifelong road safety education, in particular for children and the elderly, including walking routes to school, the safe use of protection systems and bicycles, in the case of the youngest, and first aid. However, we are not talking here about the same type of education that was given ten or twenty years ago, but rather identifying "new approaches to road safety education and training that involve different social groups throughout their different road usage stages". Fundación MAPFRE is actively working along these lines based on the perspective of the Sustainable Development Goals and the vulnerability of the planet

(environmental risk) and our own bodies (injury risk), as well as working on prevention, self-protection and the protection of others in an innovative and effective way.

8. Establishment of citizen participation mechanisms, avoiding the risk that new participation technologies, for example the social media, may be associated with the superficial treatment of queries, complaints, etc.: an example of this is automatic messages such as "your query has been received and transferred to the relevant department" without any proper follow-up or ultimate net improvement.
9. Speed management: establishing a default limit of 30 km/h or lower on all pacified city streets, implementing adequate speed controls (both fixed and mobile) and requiring automatic speed management tools in publicly-owned vehicle fleets or those that require municipal authorization to operate (such as driver-operated transport vehicles, shared vehicles, public tenders, etc. An example can be found in Torrent: "A 30 km city; from the law to compliance".
10. Specific plans to encourage people to travel on foot and by bicycle. Implementation of an urban road legibility program that reconciles perceived risks with objective risks.
11. Update of urban mobility ordinances to the new times, uses and modes of travel.

The above points were discussed, and enriched, with most of the cities taking part in the working meetings during a webinar held on 22 September 2020. From this interesting exchange of experiences and knowledge, I would like to highlight these brief "headlines" (a more comprehensive summary of this webinar is included in the Annex section):

- The construction of a **mobility infrastructure** calls for a global concept that integrates political leadership and courage, coordination between municipal departments and the municipal police, and urban planning, mobility, citizen safety and road safety policies, among others.
- The different plans and instruments for planning city life must be integrated; they should all consider road safety aspects and **their management must be coordinated**. It is important to train all technical personnel in the different areas involved in safe, healthy and sustainable mobility.
- In order to be implemented, and for their results to be collected and processed, comprehensive safe, healthy and sustainable mobility policies require sufficiently long periods of time that are often longer than electoral cycles. It is essential that alliances are established with the general public and that citizens themselves adopt these measures as their own; that they feel **proud of their city**, which is strongly related to participation and communication, thus "anchoring" them in community life and protecting them from the fluctuations caused by successive changes of government. As and when these measures are consolidated and people start benefiting from their achievements, the changes will start to become standardized and even demanded.
- It is imperative to establish channels whereby the general public can ask for changes in their neighborhoods. This participation should also be streamlined so as not to hinder the implementation of the measures committed to in the working program voted in by local citizens at the polls: situations change, and plans whose approval is delayed over a

certain amount of time no longer address the initial situations. Social participation does not infer carte blanche, but must be **sustained by an explicit political project that has been legitimized at the polls.**

- **Vulnerable users and victims' associations** must be given a greater role in municipal policymaking. It is also important to refocus road safety awareness and education efforts towards the drivers of motor vehicles.

Both personally and on behalf of Fundación MAPFRE, I would like to thank the dozens of municipal technicians and managers who have collaborated in this project, lending their time and knowledge in the intensive workshops held in each city and, of course, our fellow travelers from GEA21, who worked tirelessly and with outstanding self-motivation on this research. Incidentally, the existence of municipal technicians "who are genuinely concerned about road safety and mobility" is one of the keys to achieving good outcomes, as indicated in this report. I should also like to thank the managers and technicians at the National Road Safety Observatory of the Directorate-General for Traffic for providing the official statistics and for answering numerous questions and queries over the last few months.

Finally, I would like to convey my gratitude to all the colleagues working at MAPFRE, both in Spain and worldwide, as well as all its clients, as it is their hard work and belief that make projects like this a possibility. We are confident that, step by step, we will move ever closer to achieving that Goal Zero.

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2. SUMMARY AND CONCLUSIONS

RATIONALE OF THE RESEARCH: learning about success stories to facilitate their replication

In the last decade, a relatively large group of Spanish cities has achieved encouraging results in terms of reducing urban road accidents; these have become known as the CIUDADES CASI CERO, or C3 (Almost-Zero Cities) – cities in which the number of serious injuries and fatalities is dropping towards zero.

At the same time, another group of Spanish cities, not always coinciding with the previous one, are transforming their mobility and public space models, also with growing success, to the point of winning international prizes and being used as a benchmark for many other places around the world when it comes to implementing sustainable mobility policies.

In view of this phenomenon of double success in the areas of road safety and mobility, Fundación MAPFRE set itself the task of gaining in-depth knowledge of the processes that led to these results, the synergies between the two, the policies and measures that were implemented in each case, and the difficulties encountered along the way, all with a view to being able to replicate these processes in other cities and also to evaluate their prospects of continuing to improve until finally reaching GOAL ZERO, or the absence of serious injuries and deaths on urban roads.

THE STARTING POINT: promising results and social tragedy

- » URBAN ACCIDENT RATES THAT ARE DROPPING, BUT TOO SLOWLY
- » AN ACCIDENT RATE INFLATED BY PEDESTRIANS AND RIDERS OF TWO-WHEELED VEHICLES

Over the last twenty years, the accident rate on urban roads has tended to decline, but the actual numbers of deaths and injuries continue to perpetuate an incalculable social tragedy every year. The drop in road accident victims is too slow.

The situation is characterized by the significant fact that more than 81% of fatalities on urban roads in 2018 were pedestrians (48.5%) or the riders of two-wheeled vehicles (32.7%), precisely the most vulnerable groups in the event of an accident.

RESEARCH FRAMEWORK: an increased focus on road safety

- » THE NUMBER OF ROAD ACCIDENTS IS IMPORTANT, BUT IT IS NOT ENOUGH
- » THE LINK BETWEEN ROAD SAFETY, MOBILITY AND PUBLIC SPACE

The framework of this research is an expanded vision of the concept of road safety; in other words, an approach that goes beyond the sphere of accidents to delve deeper into the field of perception and behavior.

We believe that in order to understand the accident phenomenon in depth, it is not enough to simply have the figures and circumstances of the accidents, but also to comprehend the perceptions and attitudes that determine people's behavior when it comes to road safety, which not only implies using sociological analysis tools but also concepts such as "danger" (generated by the speed of types of vehicles on the roads) and "risk" (the relationship between accident rates and vehicle flow), in both objective and subjective terms.

Consequently, it is necessary to link road safety policies and figures with the policies and figures relating to mobility and public spaces, as a result of which we can understand and specify the concepts of risk and danger, both objective and perceived, that are characteristic of the expanded vision of road safety mentioned earlier.

THE QUEST FOR ZERO: victim reduction goals and approaches

» FROM THE VISION ZERO APPROACH TO SUSTAINABLE ROAD SAFETEY AND GOAL ZERO. NEW APPROACHES TO REDUCE ACCIDENT RATES

» SAFE SYSTEMS: THE NEW BENCHMARK FOR ROAD SAFETY POLICIES

The approach known as VISION ZERO, which originated in Sweden in the mid-1990s, has managed to spread around the world and generate a new mental framework in which to imagine the future of road safety. The cornerstones of this vision can be summed up as an ethical imperative (nobody should die or sustain serious injuries in traffic), a new distribution of responsibilities with regard to accidents (in which the administration plays a more prominent role), and the adoption of measures that are able to respond to this ethical imperative and new demarcation of responsibilities.

Both Vision Zero and Sustainable Road Safety, developed in the Netherlands during the same period, are approaches that dovetail perfectly with the approach to road safety known as the Safe System, which changes the traditional approach to various key aspects, in particular the recognition that human beings make mistakes and, therefore, the system must be in some way prepared to prevent these mistakes from turning into fatalities.

In 2015, Fundación MAPFRE suggested changing the abovementioned Vision Zero to GOAL ZERO, with the fundamental difference of proposing that this Goal Zero should be achieved in urban areas by 2030 and on interurban roads by 2050.

CITIES AND ACCIDENT RATES AROUND THE WORLD: the indicative value of comparisons

» SOME RATES THAT ALLOW CAUTIOUS COMPARISONS TO BE MADE

» THE METROPOLITAN FACTOR AS AN ESSENTIAL WEIGHTING ELEMENT

In order to analyze the performance of different cities' accident rates, it is worth considering these proportions or rates in relation to the population, such as mortality rates per 100,000 inhabitants or serious injury rates per 100,000 inhabitants. The range of values in the cities of different regions of the world varies between 2.4 in Europe and 10-20 fatalities per year per 100,000 inhabitants in Latin American and African cities.

These figures should also be weighted by other urban factors, and in particular by the mobility model, which may be generating a large number of journeys from or outside the administrative areas in question. This is the case of the data corresponding to metropolitan settings where the central municipalities attract more journeys from outside their boundaries than they generate themselves.

Thus the resident population reference should not be the only parameter under consideration, mobility being a parameter that facilitates the weighting of the numbers of victims in each metropolitan urban nucleus.

ALMOST-ZERO CITIES AROUND THE WORLD: conditioning factors as opposed to determining factors

» SOME CITIES ARE APPROACHING A ZERO RATE

» THERE ARE NO DETERMIING FACTORS, BUT RATHER CONDITIONING ONES

Taking into account the precautions mentioned above, it is important to recognize that some cities are much closer to a zero rate (in terms of fatalities and serious injuries) than others. The case of some cities in northern and central Europe is particularly noteworthy, where mortality rates have fallen dramatically and it might be said they are approaching a zero rate: these are Almost-Zero Cities. A case in point is the city of Stockholm (Sweden), where the mortality rate is around 0.7 fatalities per year per 100,000 inhabitants.

In view of the existence of these almost-zero cities, it is worth asking whether there are any factors that propitiate this result, such as urban planning (density, distribution of land uses, distances between residential areas and working areas, etc.), demographic (population pyramid), socioeconomic (income, unemployment), mobility (motorization, transport mode split), etc.

However, a review of the international literature allows us to conclude that all these factors condition but do not determine certain traffic mortality figures. It is possible to implement successful road safety policies in any city, tailored to their particular context.

ROAD ACCIDENT RATES IN SPANISH CITIES: somewhere between hope and dissatisfaction

» RELATIVELY LOW, BUT VARYING, FATALITY RATES

» SERIOUS INJURY RATES ARE THE NEXT CHALLENGE

Between 2014 and 2018, the fatality rate per 100,000 inhabitants in Spanish cities with more than 80,000 inhabitants was 1.3, considerably below the European average of 2.4 which, in turn, is the lowest figure among the different continents and regions. However, this national average encompasses a considerable variety of rates in this group of cities, ranging from 0.1 to more than 3.

These figures represent a much-improved scenario compared to the situation at the beginning of this century, when the mortality rate was around 2.8 deaths per 100,000 inhabitants in all Spanish cities with more than 80,000 inhabitants. This improvement was also noted, though with a somewhat slower descent, in the 25 largest cities with more than 80,000 inhabitants with the best mortality rates.

As a complement to the mortality rate, it is worth taking into account the serious injury rate. Considering the figures for the five-year period of 2014-2018, Spanish cities with more than 80,000 inhabitants had a rate of serious injuries close to 15 which points to this figure as another major challenge in the fight to achieve Goal Zero.

ALMOST-ZERO CITIES IN SPAIN: their characteristics

- 25 CITIES WITH MORTALITY RATES EQUAL TO OR LOWER THAN STOCKHOLM
- 19 OF THE CITIES WITH THE LOWEST RATES ARE SATELLITES OF MAJOR CITIES
- RELATIVELY HIGH SERIOUS INJURY RATES

Among the Spanish cities with more than 80,000 inhabitants, 25 of them have mortality rates lower than or similar to those of Stockholm (0.7 deaths per 100,000 inhabitants).

Nineteen of these twenty-five cities form part of the metropolitan outskirts of major cities. Indeed, the presence of a major metropolitan factor is very evident, with higher fatality rates in the main municipalities of these satellite areas, partly as a result of their appeal as a commuter belt which lowers the risk in the outlying municipalities.

Of the 25 cities with low mortality rates as a whole, only half a dozen also have equally positive serious injury rates, i.e. rates lower than or equal to 3.5 serious injuries per 100,000 inhabitants, which is equivalent to five injuries requiring hospitalization per fatality.

It can thus be concluded that there are still very few Spanish cities with a comprehensive profile warranting classification as Almost-Zero Cities in terms of both serious injuries and fatalities.

SELECTION OF ALMOST-ZERO CITIES: a comparison with the leading cities in sustainable mobility

Of the 25 Spanish cities with the lowest mortality rates, eight were chosen for in-depth research. Only two cities in the metropolitan area of Madrid were selected, and certain cities with very high serious injury rates were ruled out of the study.

Given the expanded approach to road safety taken by this study, it was considered very useful to round off the research with an analysis not only of the eight selected cities with good road accident rates but also four other medium-sized cities that have been regarded as a benchmark when it comes to sustainable mobility policies: Vitoria-Gasteiz, Pontevedra, Donostia-San Sebastián and Terrassa.

The interest in analyzing these four benchmark cities is further enhanced by the fact that only one of them, Pontevedra, has a lower mortality rate than Stockholm and, therefore, is also on the list of the 25 cities with the lowest mortality rates. Consequently, the research not only tries to understand the reasons why certain cities are almost-zero, but also the reasons why cities with intensive sustainable mobility policies are not showing the same good results.

In each of these twelve cities, complemented by two cities in the Canary Islands, the policies they have implemented were analyzed by compiling data on mobility and road safety as well as holding workshops with municipal technicians from the different areas involved.

THE ALMOST-ZERO CITIES IN THE STUDY: diversity as the first key factor

- DIVERSITY OF POLICIES AND TRAJECTORIES
- DIVERSITY OF STRUCTURES AND PROCEDURES

The analysis of the fourteen cities selected yielded an initial surprise: there is tremendous diversity between these cities, although as we will see later on they also have some common features.

This refers not only to geographical diversity (the cities are located in the Community of Madrid, Catalonia, the Valencian Community, Extremadura, Castilla-La Mancha, Asturias, the Basque Country, the Canary Islands and Galicia) but also to the variety of policies, structures, procedures and urban trajectories found among the selected cities.

Policy diversity refers to the fact that approaches to road safety and mobility in the selected cities are not actually in opposition but are markedly different. Also, the timescales of developments are very varied, with some cities taking decades to act along certain lines while others have implemented very recent policies to change their model.

The diversity of organizational structures refers to the fact that in some of the cities analyzed the framework of political and technical responsibilities has already begun to adapt to the new concepts of sustainable mobility and road safety, while in others the first steps have not yet been taken. There is also diversity in internal working procedures and levels of communication and citizen participation.

THE ALMOST-ZERO CITIES IN THE STUDY: common features

- TRAFFIC CALMING
- PEDESTRIAN IMPROVEMENTS BEYOND BOTTLENECK REDUCTION AND PEDESTRIANIZED AREAS
- INTRODUCTION OF THE BICYCLE: A LEARNING CURVE
- RELIANCE ON PUBLIC TRANSPORT, AND ITS LIMITATIONS
- NEW APPROACHES TO ROAD SAFETY EDUCATION AND TRAINING
- ACTIVE, AS OPPOSED TO REACTIVE, RESEARCH

The diversity mentioned earlier does not prevent us from identifying around half a dozen common features in the road safety and sustainable mobility policies of the cities under analysis, although each has its own scale and timescales, resources and intensity.

Traffic calming as a means of reducing the number and speed of vehicles is here to stay. In one way or another, traffic calming is seen as a key strategy to obtain good road safety results, and it is also a key element in sustainable mobility.

It is worth highlighting the common determination to promote modes of transport that cause less danger (walking, cycling and public transport). In this respect, there is a growing internalization of the complexity of the measures to improve the travel conditions and safety of these modes of transport.

Thus, for example, the traditional approach to road safety that used to constrain pedestrians by means of devices and regulations that make crossing roads more difficult are starting to be viewed as restrictions and contradictions, as the walkability of cities calls for a much broader approach.

Meanwhile, establishing a strategy for standardizing bicycle use based exclusively on an incomplete cycling infrastructure design is also raising questions about its ineffective results.

Likewise, there is a growing realization of the limitations to developing an extensive network of public transport services at an affordable cost and the ability to attract people away from using private vehicles while safeguarding active mobility (pedestrians and cyclists).

Ultimately, the conclusion is being reached that pedestrianized zones, cycle lanes and public transport routes are not enough to achieve a simultaneous change of direction in terms of road safety and sustainable mobility.

Another thing that the cities under study have in common is the implementation of new approaches to road safety education and training, with the involvement of different social groups across all the different life stages.

Finally, it should be noted that a large proportion of the cities under analysis have protocols for the active research of accident rates; in other words, procedures for identifying risk factors and locations, even before any accident victims occur: active preventive research, rather than reactive research.

WHAT TO DO: the C3 Horizon

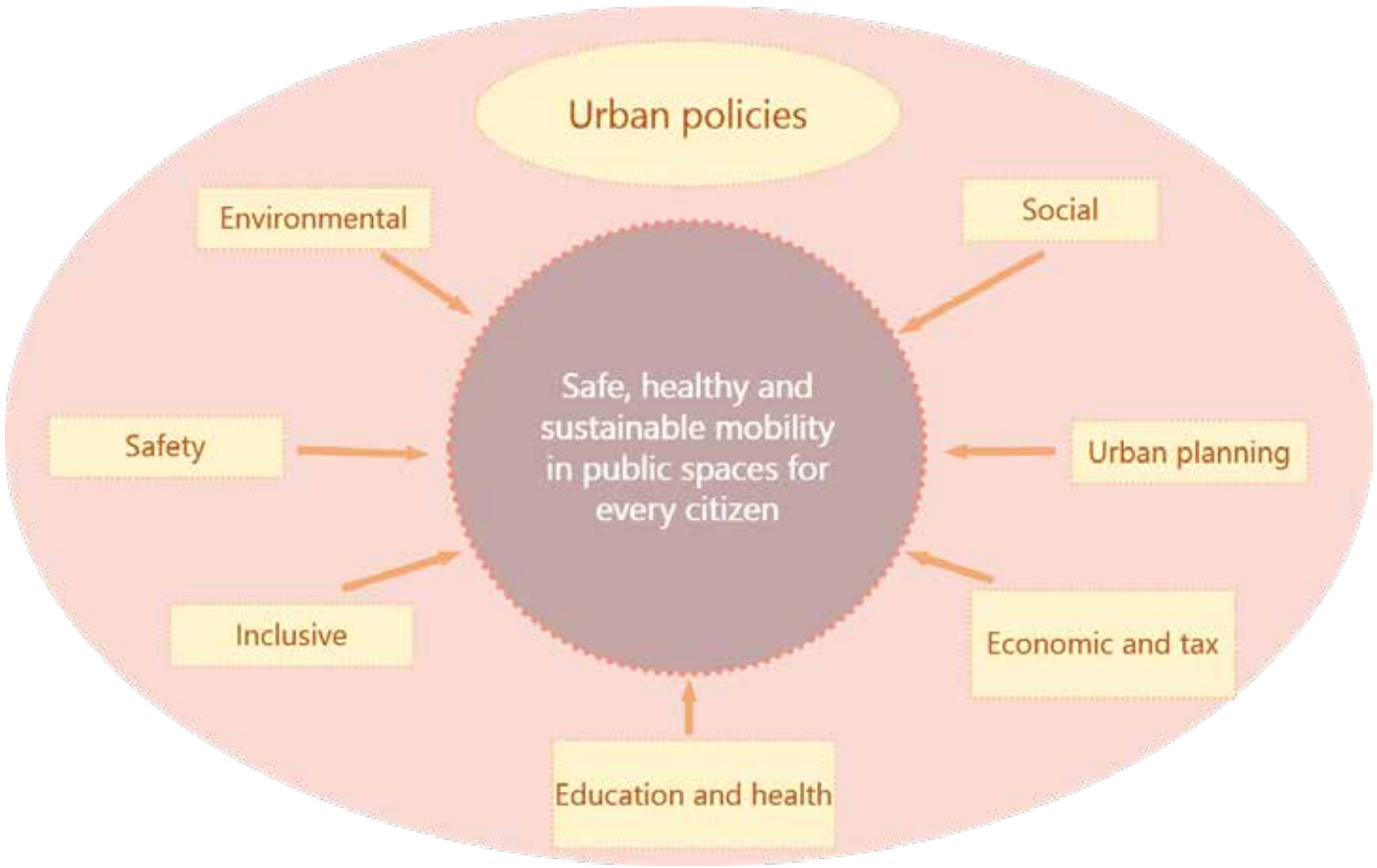
- UPDATING AND STRENGTHENING THE POSITION OF ROAD SAFETY IN SOCIAL AND POLITICAL AGENDAS
- INTEGRATING THE GOALS TO BE ACHIEVED IN ROAD SAFETY AND SUSTAINABLE MOBILITY
- CLARIFYING THE COMPLEXITY OF THE MEASURES AND THE DYNAMIC PHENOMENA INVOLVED IN THEIR IMPLEMENTATION
- UNDERTAKING OUR OWN JOURNEY WHILE LEARNING FROM OTHERS
- RECOGNIZING THE DIFFERENT INSTITUTIONAL AND SOCIAL ACTORS AND GIVING THEM A ROLE
- RECONNECTING INSTITUTIONAL STRUCTURES AND RECONCILING TECHNICAL AND POLITICAL TOOLS
- A ROAD SAFETY CULTURE AS THE CORE OF THE PROCESSES INVOLVED IN ROAD SAFETY

Adopting a C3 Horizon (almost-zero city horizon) first calls for the reinforcement of the position of road safety on the social and political agenda, as well as repositioning it by integrating its goals with those of sustainable mobility and the recovery of public space.

To do so, it is advisable to review the State regulatory framework, comprehensively incorporating the concept of mobility and clarifying the powers of the local police in order to facilitate collaborative work with other technical departments of local governments.

However, rather than waiting for these changes in the State regulatory framework to take place, local governments can move forward, as many already have done, in a new distribution of tasks between the different municipal departments, setting up a competency map in which, as shown in the illustration below, several municipal policies converge in safe, healthy and sustainable mobility policies.

ILLUSTRATION 21. MAP OF URBAN POLICIES FOR A C3 HORIZON

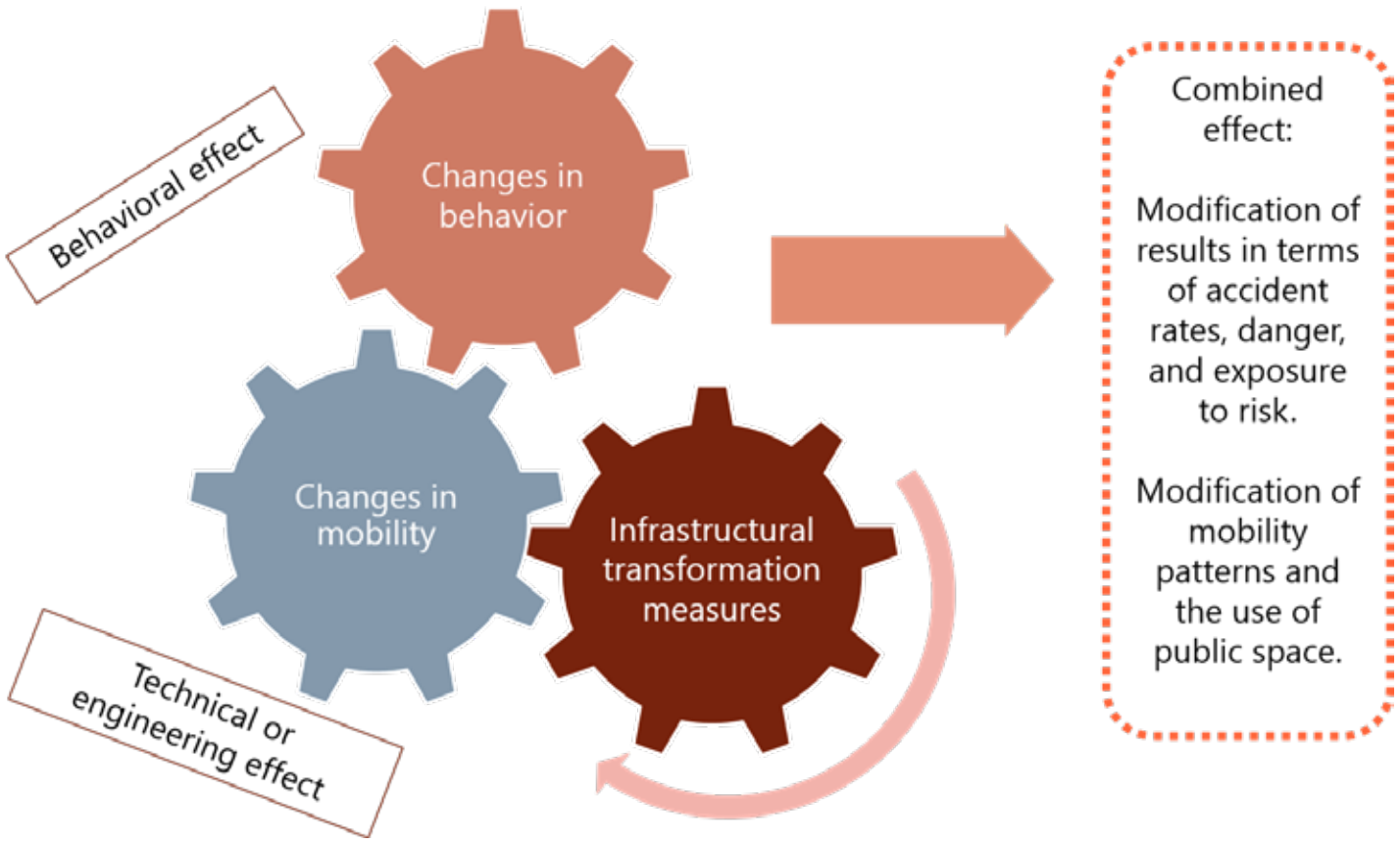


As a result of this integration, the Goal Zero of road safety is no longer isolated but integrated into the goals of mobility and the shared use of public space; an integration that has been taking place both nationally and Europe-wide. The drop in the number of traffic victims goes hand-in-hand with the reduction of air pollution caused by traffic and the decarbonization of mobility.

To head towards a C3 Horizon, it is necessary to consider the dynamic phenomena associated with road safety and sustainable mobility measures. For example, we must consider the complexity that arises from behavioral adaptation phenomena that are recorded after a measure has been implemented, as well as the disturbances resulting from being combined with other measures that are implemented at the same time, whether these are in the fields of road safety, public mobility or the use of public space.

To use a mechanical metaphor, the illustration below represents the processes that are set in motion from the introduction, for example, of a measure to transform the road infrastructure for reasons of road safety or sustainable mobility. The change to the road activates other connected 'gears': it sets off changes not only in mobility but also in people's behavior.

ILLUSTRATION 22. DIAGRAM SHOWING THE EFFECTS OF ROAD SAFETY MEASURES FOLLOWING THE IMPLEMENTATION OF A MEASURE THAT CHANGES THE ROAD INFRASTRUCTURE



The complexity arises from the fact that the measure in question not only has a direct effect on risk factors but also transforms patterns of mobility and the use of the public space at which the measure is directed. This complexity of the results obtained from the measure in the short, medium- and long-term increases when considering their simultaneous implementation.

In the same way, a mobility measure, or a measure to transform the public space, triggers a similar process of modifying road safety through a combination of technical and behavioral effects. This reinforces the need, as mentioned above, to integrate the various policies that activate the 'gears' of risk and safety.

It also follows that there is no single road safety measure that is infallible and replicable without having to be considered within its particular context of implementation. Each city has its own conditioning factors that influence the effectiveness of the measures; and each city also has its own urban, social, infrastructural or mobility transformation processes underway that affect the dynamics generated by road safety measures.

There are no determining factors but rather conditioning factors in public policies for road safety and sustainable mobility. All cities can and should set ambitious goals in terms of accident rates, aligned with equally ambitious goals in terms of sustainable mobility, even if their starting conditions appear to be unfavorable.

The differences between one city and another should not be seen as an obstacle to formulating policies with a C3 Horizon based on the implementation of the package of measures summarized in the table below.

PACKAGE OF C3 HORIZON MEASURES
Speed modulation and traffic calming
Consistent design of roads and public spaces to address both perceived and objective risks
Guarantee of conditions of universal accessibility and safety for people with disabilities
Creation of safe and convenient conditions for active modes of transport
Creation of the optimum conditions for the mobility and autonomy of children and the elderly
Prevention of driver distractions and driving with the loss of essential driving skills
Education and training on road safety and safe, healthy and sustainable mobility
Consideration of vehicle types and their safety for their occupants and the environment

Recognition of the complexity of road safety and sustainable mobility policies necessarily leads to considering the different points of view and the different disciplines that are involved in and act upon urban road space through a wide variety of municipal departments and policies.

Unfortunately, the institutional infrastructure and the tools used by different departments are not usually connected, which makes coordination between them difficult, as well as hindering the preparation of shared plans or strategies. The result is that in some cities you will find a conundrum of sector actions or plans that have nothing to do with each other and correspond to different departments that have failed to agree on either their content or approaches.

To alleviate these deficiencies, we recommend the use of the following set of planning and management tools:

TOOLS FOR DEFINING AND MANAGING A C3 HORIZON STRATEGY
Interdepartmental coordination protocol on road safety, sustainable mobility and public space
Integrated planning for safe, healthy and sustainable mobility
Comprehensive research protocol for road safety and sustainable mobility
Evaluation protocol for road safety and sustainable mobility actions.

However, apart from those institutional actors that are involved in road safety policies, it is essential to consider the needs and opinions of the general public and their huge variety of points of view: residents and visitors, people concerned about health and the environment, people who uphold a particular way of getting around, children, adolescents, adults, the elderly, women and men, people with different functional diversity, etc.

Providing opportunities for expressing this multiplicity of voices is no easy task, but the appropriate methodologies for each context do exist. It is also essential to differentiate between communication and participation, recognizing that participatory processes are tools for dialogue with the different collectives and social groups in order to define public policies.

The complexity of public policies to address road safety and sustainable mobility can be described in summary form based on a dynamic model at the center of which is the concept of road safety culture.

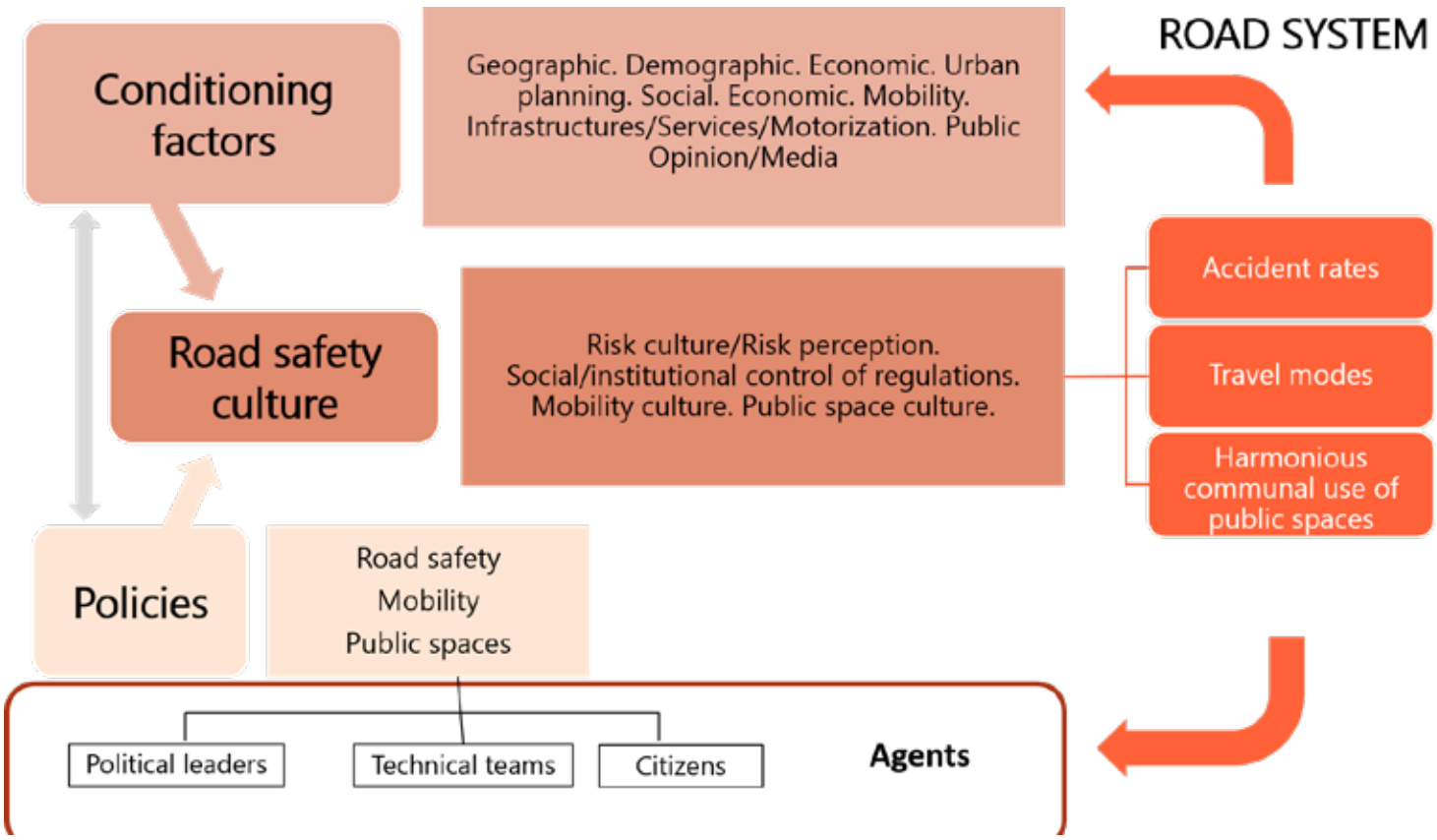
'Road safety culture' is understood to refer to a set of perceptions and behaviors that are found in a particular road space or system with regard to the way people live and move around in it. This road safety culture is fed by a combination of elements, most notably the perception of risk, the consideration of different ways of moving around, the internalized discipline of regulations, and the traditional use of public space.

Road safety culture is constantly evolving as a consequence of two main sets of factors that have a dynamic influence on its composition: the conditioning factors of the place, and public policies, especially those most directly aimed at regulating road behavior; in other words, mobility, road safety and public space policies.

Public policies are also dynamic processes which evolve with the assistance of the agents responsible for decision-making in the current political system: political leaders, technical teams, and the general public, along with the media.

Following this explanatory model of the dynamics of road safety and mobility, road safety culture results in a pattern of travel modes, a pattern of accident rates, and a pattern of harmonious communal use of public spaces. In a feedback process, the modification of these patterns replenishes the transformation dynamic by influencing the conditioning factors of the system on the one hand and the action of the agents on the other.

ILLUSTRATION 23. DIAGRAM OF CHANGE DYNAMICS IN ROAD AND MOBILITY SYSTEMS. THE ROAD SAFETY CULTURE MODEL



This explanatory model makes it possible to visualize the scope of the policies and measures to be implemented in a C3 Horizon in order to reduce accident rates and increase sustainable mobility. Against the idea of direct causality (an action results in an effect), this proposal associates the

results of the actions with a complex feedback process at the heart of a road safety culture; in other words, the set of perceptions and behaviors that crystallize in a community at a precise moment. In this way, road safety and sustainable mobility policies are viewed as processes in which the results follow non-linear logic, arising from the interaction of a large number of factors among which those related to behaviors and perceptions stand out.

What can be surmised from this model is that the results of the packages of measures recommended for cities to get closer to the C3 Horizon should not be evaluated without also taking into account these dynamic processes, or without paying due attention to the context of each individual city. All that glitters is not gold, nor should one fall into a sense of frustration due to the slowness of progress or the lack of brilliance of the results obtained.

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