The Sustainable Urban Mobility Plan of

Vitoria Gasteiz

Summary (EN)

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1 Summary of the Sustainable Urban Mobility Plan of Vitoria-Gasteiz

Fifteen years ago, at the beginning of the 21st century, Vitoria-Gasteiz’s reputation for balanced growth, careful urban planning and concern for environmental and social aspects was threatened by new challenges. The accelerated growth of the city was altering its scale and structure, and therefore making pressure on the way people moved, at that time mainly on foot. The urban mobility and accessibility system of Vitoria-Gasteiz was facing a situation which triggered growing concern regarding its status and future developments in both the society and public management bodies. Because of this, a process of reflection and action regarding the system was initiated with the aim of providing a framework of coherent objectives, strategies and actions in order to face the detected and foreseen issues.

In response to those issues, Vitoria-Gasteiz started to work on a SUMP, called "Sustainable Mobility and Public Space Plan", in March 2006. The plan aimed to reduce the environmental impact and noise from transport and increase the accessibility of public spaces. The city wanted to double its efforts to turn public spaces into pleasant environments for people to meet again; in other words, to give back the public space to people.

In this way, a consultation process began, which was initiated with the constitution of the Citizens' Forum for Sustainable Mobility of Vitoria-Gasteiz, integrating a group of social actors, politicians and technicians who would work firstly on defining a consensual scenario regarding the sustainable mobility model and desirable public space for Vitoria-Gasteiz.

As a result of this participatory process, in the spring of 2007, the Citizens' Pact for Sustainable Mobility was signed, a document which reflected this consensual scenario and which led to shape, from that moment, the route map upon which the strategy to be followed was to be coordinated for planning the transformation of the mobility system of our city.

1.1 Description

The Vitoria-Gasteiz’s SUMP ("Plan de Movilidad Sostenible y Espacio Público de Vitoria-Gasteiz"; Ayuntamiento de Vitoria-Gasteiz, 2007) is based on the conditions extracted from the participation process carried out by the Citizens’ Forum for Sustainable Mobility, which established the following 14 objectives, grouped into 3 areas:

1.1.1 Sustainability

- To recuperate the concept of sustainability for Vitoria-Gasteiz, looking beyond the environment.
1.1.2 Sustainable mobility

- To establish a new hierarchy in the use of the city, in which the pedestrian is the main character, followed by the non-motorised methods of transport and public transport and, finally, the private vehicle.
- To assure the coexistence between the different mobility modes and their interoperability, especially those which are non-motorised.
- To incentivise and promote the use of public transport and to discourage the use of private vehicle.
- To foster and promote non-motorised transport modes.
- To achieve an effective and efficient transport system in terms of energy use.
- To promote universal accessibility to the different methods of transport.
- To sensitise and inform the citizen regarding the different displacement methods.

1.1.3 City model

- To aim for a safe and accessible city.
- To achieve a city with less noise and contamination.
- To find solutions for mobility which do not involve land occupation.
- To integrate mobility into urban policies.
- To achieve ample public space for citizens and restricted space for motorised vehicles, prioritizing citizens instead of private vehicles. Good communication for pedestrians and cyclists, as well as for fast and frequent public transport with other remote spaces.
- To ensure a public space which welcomes social and economic life and integrates businesses and spaces for leisure and services. A public space which welcomes frequent collective activities for small groups.

Those objectives are related to the problems summarised in the following table:

<table>
<thead>
<tr>
<th>Objective</th>
<th>Associated problems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area: Sustainability</strong></td>
<td></td>
</tr>
<tr>
<td>1. Sustainability includes transport</td>
<td>Decrease in the level of urban habitability despite efforts aimed at environmental quality</td>
</tr>
<tr>
<td><strong>Area: Sustainable mobility</strong></td>
<td></td>
</tr>
<tr>
<td>2. New hierarchy</td>
<td></td>
</tr>
</tbody>
</table>
| 3. Coexistence and interoperability between methods | Increase in the length of journeys  
Increase in metropolitan journeys  
Increase in medium and long distance journeys  
Consolidation of the “ownership” and usage of the car  
Unbalances and negative tendencies in the modal split  
Low competitiveness of public transport |
<p>| 4. More public transport and less cars | |</p>
<table>
<thead>
<tr>
<th>5. More pedestrians and cyclists</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Energetic efficiency</td>
<td>▪ Negative impacts of the use of the car</td>
</tr>
<tr>
<td>7. Universal accessibility</td>
<td>▪ Increase in the barrier effect of the infrastructures</td>
</tr>
<tr>
<td>8. Sensitise and inform</td>
<td>▪ Unbalances and negative tendencies in the modal split</td>
</tr>
</tbody>
</table>

**Area: City model**

<table>
<thead>
<tr>
<th>9. More security</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Less noise and contamination</td>
<td>▪ Negative impacts of the use of the car</td>
</tr>
<tr>
<td>11. Without consuming land</td>
<td></td>
</tr>
<tr>
<td>12. Transport and territory integration</td>
<td>▪ Increase in the length of journeys ▪ Decrease in the level of urban habitability despite efforts aimed at environmental quality</td>
</tr>
<tr>
<td>13. More public space for sustainable methods</td>
<td>▪ Reduction in availability of public space for the citizen ▪ Low competitiveness of public transport</td>
</tr>
<tr>
<td>14. Quality and complexity of public space</td>
<td>▪ Loss of “closeness” as an urban value</td>
</tr>
</tbody>
</table>

**Table 1: Vitoria-Gasteiz SUMP’s objectives and associated problems**

The SUMP, as well as the conclusions of the participation process which serve as an inspirational base for it, **does not explicitly specify strategies** which are to be implemented. However, the Vitoria-Gasteiz’s SUMP does define measures to be implemented. The 81 specific measures in the participation process in the PMSEP were gathered together in **27 measures** and grouped into 6 topics:
<table>
<thead>
<tr>
<th>Topic</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circulation of vehicles</td>
<td>(1) The development of a new urban cell, the <em>superblocks</em>, (~ 400x400m; <em>see next chapter</em>) dedicated to motorisation and made up of a perimeter of main roads. The union of these type of cells creates a network of basic roads along which all motorisation circulates, especially passing vehicles.</td>
</tr>
<tr>
<td></td>
<td>(2) For streets within the urban cell, the circulation of passing vehicles is restricted and the circulation of the rest of the vehicles is permitted: resident’s vehicles, loading and unloading, emergencies, services, etc.</td>
</tr>
<tr>
<td></td>
<td>(3) As a general criterion, in the city roads the lanes for vehicles are to be 2.5 m wide, with the objective of reducing speed, increasing the flow capacity and taking advantage of the remaining space (today the majority of lanes are more than 3 m wide) to use, where appropriate, the cycle and bus lanes.</td>
</tr>
<tr>
<td></td>
<td>(4) A new short-cycle traffic light system</td>
</tr>
<tr>
<td></td>
<td>(5) The proposal to use the outline of the current railway between Av. Gasteiz and Los Herrán streets as a basic underground network</td>
</tr>
<tr>
<td>Parking</td>
<td>(6) Creation of the Municipal Parking Society</td>
</tr>
<tr>
<td></td>
<td>(7) To construct 13,544 underground parking spaces for residents and which are rotational, in car parks located around the whole city</td>
</tr>
<tr>
<td></td>
<td>(8) To establish, in the initial phase, a `green´ parking area (meaning free only for residents) inside the superblocks. In the basic roads, to establish the parking regulation system for rotational vehicles (OTA)</td>
</tr>
<tr>
<td></td>
<td>(9) To remove, in the second phase, the surface car parks from the interior of the superblocks and to maintain the OTA system in the basic roads, as long as this is compatible with the implantation of cycling and bus lanes</td>
</tr>
<tr>
<td></td>
<td>(10) To construct six logistics platforms of 35x35m and two of 20x25m, making use of the construction of the network of car parks</td>
</tr>
<tr>
<td></td>
<td>(11) The proposal of five peripheral car parks (Park &amp; Ride) with the aim of preventing a significant number of foreign vehicles from entering the city. These car parks are connected to the public transport network</td>
</tr>
<tr>
<td>Public transport</td>
<td>(12) To implement a new bus network to increase service frequency and to accommodate the new tramway, reducing the current lines from 18 to 7</td>
</tr>
<tr>
<td></td>
<td>(13) To create 68.3 km of segregated bus lane</td>
</tr>
<tr>
<td></td>
<td>(14) To implant two high-capacity bus lines (BRT), one of which crosses the city from East to West following the current railway track, and the other to serve the function of distributor, following the outer ring</td>
</tr>
<tr>
<td></td>
<td>(15) To connect the city’s bus network with the provincial buses, creating interchanges at the gates, in strategic points (new station, etc.) of the second urban ring</td>
</tr>
<tr>
<td></td>
<td>(16) To establish the bus-bicycle interchanges with the lending system of bicycles, especially in the industrial polygons</td>
</tr>
<tr>
<td></td>
<td>(17) To convert bus stops into functional city nodal points: enhancing the interchange of sustainable methods of transport, and providing environmental (energy collection, waste selection, etc.) and urban information with the installation of local websites</td>
</tr>
<tr>
<td>Bicycles</td>
<td>(18) To create the bicycle office with the aim of managing the new network (maintenance, infrastructures, signage, etc.), the bicycle lending service and the education, communication and participation service in order to promote this mode of transport</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>(19) To complete the existing main network of cycling lanes, therefore making it a continuous and safe network which services the whole city</td>
</tr>
<tr>
<td></td>
<td>(20) To develop a secondary network of cycling lanes which penetrates all of the neighbourhoods in a capillary manner</td>
</tr>
<tr>
<td></td>
<td>(21) To complete the bicycle lending points, with a service which runs all year round</td>
</tr>
<tr>
<td>Urban paths</td>
<td>(22) To create a network of urban paths for pedestrians, with continuity and of a high quality, which covers the whole city. Their overlap with the network of basic roads is to be avoided as much as possible in order to increase comfort and safety</td>
</tr>
<tr>
<td></td>
<td>(23) To make the interior streets of the superblocks single-section, with the aim of making accessibility universal for everybody, including those with reduced mobility and to ensure that the speed of motorised vehicles (residents, load and unload, emergencies, etc.) adapts to the speed of the people travelling on foot. The superblocks are ‘10 areas’ (speed limited to 10km/h). The general implantation of the superblocks will be done in phases <em>(see next section for further information)</em></td>
</tr>
<tr>
<td></td>
<td>(24) The proposals regarding special paths, in the first place, are the lengthening of the current path leading to Armentia park starting at the village/neighbourhood of Abetxuco, and in second place, the creation in due course of a path which unites the green belt from East to West, crossing the city, via the current railway track</td>
</tr>
<tr>
<td>Urban green spaces</td>
<td>(25) To increase the urban vegetation, expanding its volume in the streets where feasible by its section. With the transformation of the streets into single-section, inside the superblocks, it is possible to increase the number of arboreal units</td>
</tr>
<tr>
<td></td>
<td>(26) To establish pedestrian routes which are attractive in relation to the vegetation and their colour change during the different seasons. Maps of the current vegetation have been drawn up and modifications have been proposed in order to create spectacular promenades due to their colours during the different times of the year</td>
</tr>
<tr>
<td></td>
<td>(27) To create a green urban passage which unites the green belt from East to West following the current railway track</td>
</tr>
</tbody>
</table>

**Table 2:** List of measures considered by the SUMP according to topics

The main conceptual tool proposed by the PMSEP in order to meet its objectives is the **superblock**. As can be observed in the next section (Figure 1), the superblock consists, essentially, in a new prioritisation of the road and the urban blocks in which, depending on their vocation, the streets are classified into two types. On the one hand, one part of the road comes to form a network of **basic roads** and articulates the mobility of the passing motorised traffic (the circulation of public transport and private cars). On the other hand, this grid encloses the set of blocks or superblocks, the **interior streets** of which prioritise pedestrian
and cycle methods and the public space is dedicated more to social interaction rather than mobility.

Thanks to the layout of the superblocks, the movement of passing cars within the superblocks is reduced, the public transport lines are reorganised so that they are more direct and efficient, and space is obtained in order to favour more sustainable methods and to promote other different uses of the public space aside from mobility.
2 Vitoria-Gasteiz superblock scheme.

Superblocks represent an innovative urban planning scheme to restore the public space taken by private cars in the streets and give it back to the people. Superblocks foster neighbourhoods’ social life by allowing different uses, other than mobility, of the public space.

![Superblock Concept](source: Agencia de Ecología Urbana de Barcelona)

2.1 Problem description

Before the recent phase of urban growth and development that started at the beginning of the 21st century, Vitoria-Gasteiz (Basque Country, Spain) was characterised by a strong pedestrian mobility culture. The relatively small, compact and flat urban fabric offered an ideal setting for non-motorised transport. However, this culture is now threatened by the rise of the private car in the modal split as a result of the growth to a city size where the pedestrian mobility is not the most competitive one any more.

Because of this, the main part of the public space in Vitoria-Gasteiz is currently devoted to private cars (transport lanes, parking spaces, etc). When the first public space analysis was completed, as a prior step to the design of a Sustainable Urban Mobility and Public Space Plan (SUMPS), figures showed that > 70% was reserved for the exclusive use of private cars, despite nearly 70% of a typical labour day’s trips in Vitoria-Gasteiz being carried out on foot. As a result, the SUMPS was designed to drastically extend space for pedestrians.

Moreover, it was noticed that more than one third of the population experienced noise levels over those recommended by the World Health Organization (WHO), and that this was largely attributable to private cars. Apart from this, cars represented one of the main sources of the gas emissions measured within the city.
2.2 How does it work

The superblock model represents the master piece of the SUMPS of Vitoria-Gasteiz, developed in 2009. A superblock is a geographical space that covers several city blocks (Upper Figure). The superblock model reserves the space inside the superblock for pedestrians and cyclists. Private cars and public transport are restricted to the streets surrounding these blocks (the so-called main roads).

Following this scheme, Vitoria-Gasteiz identified a new mobility and urban space framework composed of 77 superblocks to be progressively implemented. This preliminary study provides the tools to assess and plan the final design and implementation of each of the superblocks, allowing to integrate the works with other measures proposed to improve the mobility in the city such as the new public transport network implementation, city centre access restrictions, new traffic lights regulation for the new public transport network, new pedestrian & bicycle lanes network implementation, urban freight logistics, etc.

In this regard, every street refurbishment carried out in the last years has followed the aforementioned framework.

![An example of an implemented superblock in Vitoria-Gasteiz; Prado Street.](image)

2.2.1 Benefits and for whom they are

The main objectives of the superblock model were the recovery of public space for pedestrians (reducing private car occupancy), the reduction of both noise pollution and harmful gas emissions, to allow a greater diversity of activities and better accessibility in the intervened area, to promote the public transport and, finally, to improve road safety.
Pedestrian surface in the pilot superblock, which required heavy public works, increased from 45% of the total surface before the action to 74% after it. Moreover, noise levels measured in the demonstration area reduced from 66.50 dBA to 61.00 dBA after the superblock implementation. These results are directly related to the reduction of the number of motorised vehicles in the zone. In this regard, there was a 42% reduction in CO₂ levels, 42% reduction in NOx ones and 38% reduction in PM₁₀ particles.

Figure 3: An example of an implemented superblock in Vitoria-Gasteiz; Sancho el Sabio Street.

2.2.2 Disadvantages, dangers

High cost of the transformations to be implemented could be a barrier to be solved. Anyway, it is feasible to work according to this scheme in several phases. In our case, after the financial crisis of 2008, and due to the local economy crisis context, the municipality adapted the plans to implement all the superblocks of the city centre without having to spend a great amount of money to make public works and face big changes in the structure of streets. This plan was based on the definition and signalling of slow-speed streets, so as to force the motorised vehicles to adapt their speed to that of pedestrians and cyclists. Likewise, the installation of several elements in the pavement (flower boxes, etc) would contribute to the desired car speed reduction. Intervention plans for a total of 47 streets were modified following those criteria.
2.2.3 Stakeholder analysis - who are drivers, who are opponents

Since September 2008 a permanent working group had a weekly meeting with technicians and politicians in order to assure a strong consensus regarding the measures to be implemented.

Development of a whole new public transport network following the superblock model raised concerns among the citizens directly affected by the change. A permanent contact with citizens’ associations was kept by the municipality.

The reduction of the number of on-street parking places and the expansion of the regulated paid parking space in the city centre was another source of concern. Citizens and some shopkeeper associations criticised such actions.

A global communication and awareness campaign for the SUMPSP was designed and launched to create a conceptual favourable perception in the citizens towards a new culture of sustainable mobility. The campaign included advertising in newspapers, bus shelters, outdoor advertising, radio and Internet, etc.

We found also some opposition to the concept among the municipality technicians and political stakeholders. However, after intensive working sessions, most of the agents involved in the urban mobility of Vitoria-Gasteiz agreed the superblocks model and signed a Pact to reinforce and support it.

Figure 4: An example of an implemented superblock in Vitoria-Gasteiz; Sancho el Sabio Street.
2.3 Legal framework

The model is the main piece of the SUMPSP of Vitoria-Gasteiz, and it will be integrated into the City's Urban master Plan, and therefore it has the full support of the local laws and regulations.

Due to the complex power distribution of the Basque Country, there are some aspects that must be agreed with other administrations. Specifically, roads and mobility outside of the city core are managed by the provincial power; tram facilities are in the hands of the regional government; and big infrastructures, such as the intercity train lines and infrastructures, are controlled by the Spanish government.

![Figure 5](image-url): Implemented superblock in Vitoria-Gasteiz; Sancho el Sabio Street. Before and after.

2.3.1 Policy options for cities

A model like this reduces the space for private cars and changes dramatically the public space structure, and represents a big budget inversion, so it is greatly influenced by political decisions.

First of all, local political power must agree with the model and get the support of other political parties, to reach a consensus about its implementation.
The model can be tailored to fit the current state: policy makers can decide to apply radical changes, but if the opposition is strong and the budget is mean, a transitional methodology can be applied to perform lighter, smaller and cheaper actions (for instance, using signalling and painting) without losing sight of the main objective.

2.3.2 Who (in the city administration) has to deal with it

The city has a permanent working group composed by technical staff from the various departments affecting the city's mobility. The working group is coordinated by the Environmental Studies Centre (CEA) of Vitoria-Gasteiz, an entity that is part of the municipal structure but has its own powers.

Participants in the working group are: Urban Planning Department, Environment Department, Traffic Service, Local Police and the local public transport company (TUVISA). Political representatives of those municipal structures also take part in the meetings.

Aspects related to powers beyond the local scope are discussed outside of the municipality, at either provincial or regional forum levels.

Figure 6: Implemented superblocks in Vitoria-Gasteiz. Before and after.

2.4 Good/bad practises (short examples)

Integration of the cycling mode into the superblock scheme (segregated bike lanes in the outer main streets, integration and traffic calming in the inner streets) boosts the use of the
bicycle and helps cyclists to leave the sidewalks. However, infrastructural changes, on their own, do not solve the pedestrian-cyclist conflict, and both regulatory (police) and educational measures are needed.

The new public transport network resulting from the superblock scheme was optimised reducing the number of lines whilst, at the same time, offering both more frequent and direct lines; as a consequence, the number of passengers is still increasing. However, currently, it doesn't solve the mobility to some of the industrial estates located in the urban periphery (where the private car remains as the preferred mode).

### 2.5 Time frame

The development of the superblock scheme is a long term effort. It must be integrated into a SUMP and its implementation will last several years. In Vitoria-Gasteiz, the implementation began in year 2008 and it will last until, at least, year 2023.

![An example of an implemented superblock in Vitoria-Gasteiz; Fermin Lasuen Street.](image)

If a radical approach is used, costs are very high because the actions affect the whole city structure. Streets must be entirely refurbished, the public transport network must be redesigned, underground parking lots must be created, etc.
In this regard, in Vitoria-Gasteiz, within the current crisis context, in the last years it has not been possible to implement these kinds of measures in the same way as those that were carried out at the onset of the city's SUMPS. Further works in the superblock framework will have to be accomplished with lighter (and cheaper) actions.

### 2.6 Open questions

As the city extends its size and average trip distances become longer, it represents a challenge to solve how to apply the superblock model in the new neighbourhoods located in the periphery.

Mobility needs are the result of accessibility issues (people need to move and choose a certain mode of transport depending on where they work, socialise, go shopping, etc), so it becomes evident that the segregation of activities acts against the desired promotion of active mobility and helps keeping the private car as a main transport mode. Therefore, urban planning represents the key factor that must be tackled when dealing with mobility.

### 2.7 Possible future developments

As the superblocks should be at the core of a SUMP, their development depends on the political will to improve the mobility in a sustainable way in the cities.

### 2.8 How and where does it fit in a SUMP

The superblock model is the main concept (the backbone) behind the SUMP of Vitoria-Gasteiz.
3 Monitoring and Evaluation

Among the tools used by the Vitoria-Gasteiz SUMP, this document describes three of them that can be valuable for any city willing to learn how to assess its SUMP:

- (1) SUMP evaluation report
- (2) CIVITAS MODERN European project evaluation
- (3) TRANSBICI panel survey

3.1 SUMP evaluation report

The main outcome that Vitoria-Gasteiz has produced regarding the monitoring and evaluation of its SUMP is the document entitled “Evaluation report of the Sustainable Mobility and Public Space Plan and the Master Plan for Cyclist Mobility of Vitoria-Gasteiz” (“Informe de Evaluación del Plan de Movilidad Sostenible y Espacio Público y del Plan Director de Movilidad Ciclista de Vitoria-Gasteiz”; Ayuntamiento de Vitoria-Gasteiz, 2017). English version will be available soon.

That document aimed to be an instrument to encourage reflection on the transformation carried out over this last decade in the mobility of Vitoria-Gasteiz. It represents an evaluation exercise in order to aid when preparing the new phase of the city’s SUMP and, in general, to improve future mobility in Vitoria-Gasteiz. On the one hand, an interim evaluation of the SUMP was carried out to identify the progress made and the readjustment requirements of its objectives and measures, in order to fuel the next planning phase up until 2023. On the other hand, an evaluation of the Bicycle Plan after the end of its validity period in order to advance towards the drafting of a new plan.

This evaluation process of the aforementioned planning tools was carried out in accordance with the methodology proposed in the recent guide: ‘CH4LLENGE Monitoring and Evaluation Manual: Assessing the impact of measures and evaluating mobility planning processes’ (Gühnemann, 2016). This guide structures information regarding the plans to be evaluated into four blocks: objectives, strategies, instruments/measures and resources, which correspond to the different aspects of the implementation of a plan, and associates a category of indicators to each block.

- **Outcome indicators**: measure the real impacts in relation to the established objectives.
- **Transport activity or intermediate result indicators**: describe changes in the transport system which may be related to the success of the strategies.
- **Output indicators**: measure the degree in which the instruments or measures have been implemented and if the services have improved.
- **Input indicators**: provide information on the quantity of resources required to carry out the plan, including the costs, therefore providing transparency in the
implementation of the Plan and enabling the evaluation of its efficiency in using resources.

Figure 8: SUMP logical framework according to CH4LLENGE project.

The data collected for evaluation purposes are of two types. On the one hand, and following the aforementioned methodology, a detailed list of indicators are used, which are grouped into categories (outcome, transport activity, output and input) according to their association with the different blocks of information, and which help to measure and evaluate the different aspects of the implementation of each plan. On the other hand, a series of interviews with different people related with the mobility within the municipality which help to define the context and to qualitatively contrast the data gathered with the different indicators as to fuel the base diagnostic for future planning stages.

The results of the quantitative analysis of the indicators are presented with the approximation technique via check-lists, comparing their evolution in time with the desired directions of change and/or with the established fulfilment thresholds. For each one of the plans, the results are presented according to ‘advances in mobility’ per objective (results of objective and transport activity indicators) and according to ‘advances in implementation’ (results of output and input indicators).

The results of the qualitative analysis based on the interviews are presented as a synthesis of the topics covered in the interviews, organised according to criteria of relevance and significance in relation to the objectives of the evaluation.
Both analyses enable to carry out a diagnosis of the current status of the mobility and accessibility system and to identify the key elements for the next SUMP phase.

### 3.1.1 The evaluation methodology

The indicators selected to assess the plans were grouped according to objectives, and the following categories were created: outcome indicators, transport activity (intermediate) indicators, input and output indicators. The selection of indicators was tailored by objectives, strategies, measures and resources.

A long list of indicators was extracted from several projects, including DISTILLATE (Marsden et al., 2005), ADVANCE / QUEST (Duportail & Meerschaert, 2013; Barham et al., 2012), PROPOLIS (Lautso et al., 2004), Cost Action 356 ‘Towards the definition of a measurable environmentally sustainable transport (EST)’ (Jourmard & Gudmundsson, 2010), CityMobil (Marsden et al., 2007), as well as from recent scholar literature (Gudmundsson & Sørenson, 2013; Haghshenas & Vaziri, 2012; Litman, 2011; Litman, 2016; Castillo & Pitfield, 2010; Marsden et al., 2006). From that basis, we chose the indicators considered more relevant for the objectives, strategies, measures and resources included in the plans. The selection was based on two main criteria: relevance/suitability and availability/calculation easiness.

The indicators numbering follows the structure proposed by the CH4LLENGE methodology. That structure was completed with some more indicators in all the categories. Eventually, each of the plan elements had a set of indicators in the following items:

- Objectives: from indicator number 0 to number 38.
- Strategies: from number 39 to number 55.
- Measures: from number 56 to number 69.
- Resources: from number 70 to number 78.

Moreover, we included specific indicators for each mobility mode and marked them with an alphabetical index included in the indicator number, according the following scheme:

- Motorised modes: ‘a’
- Public transport: ‘b’
- Bicycle: ‘c’
- Pedestrian: ‘d’

The indicators list of the SUMP was completed with some indicators taken from the Urban Sustainability Indicators Plan 2009 (Agencia de Ecología Urbana de Barcelona, 2010) and from the local Agenda 21 reports. Regarding the Bicycle Plan, we also included 26 out of the 28 indicators that were initially proposed in that Plan (2 outcome indicators, 6 transport activity indicators and 18 output indicators). Some of those were slightly modified, according to the current available data.

The outcome indicators were grouped in two subsets: key indicators and additional indicators. Some tables were produced to show each indicator's name and description, definition (or calculation method, in case it can not be measured directly), application area, data source, desired direction of its change, reference year and regularity. In second place, other tables show the transport activity indicators used to assess the effect of the implementation of strategies and to identify the potential causes that lead to the desired
results. As in the previous case, each indicator is detailed with its name and description, definition (or calculation method, in case it can not be measured directly), application area, data source, desired direction of its change, reference year and regularity. In third place, there are tables that contain output indicators that are used to monitor the progress in the implementation of the measures. These tables give a global view of the advance in that set of indicators. Last, and only for the Bicycle Plan, two tables contain input indicators related to the resources used to develop the Bicycle Plan (as that Plan had resources devoted to the development of each of the measures). The SUMP did not have specific resources associated to the actions, so we considered that it was more adequate not to include input indicators. Instead, we included the global expenditures of the measures associated to each objective.

Two SUMP objectives, namely ‘(#1) Sustainability includes transport’ and ‘(#12) Transport and territory integration’ (see present document’s chapter 1), were not included in the descriptions and/or numerical analysis because the Plan didn’t have any measure referring those objectives, therefore they don’t have any indicator associated. However, they were assessed on a qualitative basis.

To assess the indicators we used approximations based on control lists. That method compares the indicators’ temporal evolution with the desired change directions or the established accomplishment thresholds. It is useful to evaluate if the change or development is having the desired evolution. Most of the SUMP indicators had desired change directions but lacked accomplishment thresholds. Therefore, in those cases, the evaluation was not able to assess the “accomplishment” of the objective/measure, and it only produced an evaluation of the “trends” of the indicators.

The evaluation was tackled from two perspectives:

- **Advances towards the planned mobility scenario**, using the evaluation of the advance indicators in relation to the objectives, and the transport activity indicators.
- **Advances in the execution of the plans**, using the output indicators, and, if available, also the input indicators.

Each block of indicators got a global assessment value, by means of two parameters: success percentage based on trends, used in the indicators without accomplishment threshold, and success percentage based on accomplishments, used in the indicators with do have accomplishment thresholds. Regarding the input/output indicators, we also calculated the degree of implementation (percentage) of the measures.

On the other hand, the evaluation included interviews with key actors in the local mobility field. Interviewed people were local mobility technicians and other people who work in areas related to the municipality’s mobility, both in other public administrative levels and in private companies and associations. Interviews had two objectives. On the one side, the aim was to define the context and corroborate, qualitatively, the data from the indicators. That qualitative analysis leads to a better understanding and interpretation of the changes identified in the quantitative part. On the other side, interviews feed the building of a preliminary diagnosis that will be used in future planning stages.
Qualitative analysis was the basis to get evidences and traces of the “stories behind the figures and get to learn from them” (Dziekan et al., 2013, p. 80). The reality is complex and can be different for each of the mobility stakeholders. There is multitude of challenges, including cultural aspects, time limitations, lack of political support, technical problems, trouble getting important data, sceptical public, lack of communication, and so on. Talks with the key agents allowed creating a narration of the plans and their context, identifying the problems arisen during the planning and execution process and their probable causes, and proposing some possible actions to correct mismatches in future planning activities and to change the focus of objectives. Interviewed agents were selected according to their relation with the more recent dynamics that took place in the mobility system and with the vectors for future transformations. Among the possible interviewed stakeholders, we chose the ones we considered essential for the analysis, though eventually we could not meet some of them due to logistical questions.

We finally made 13 interviews. Most of the interviews were face-to-face, and were made from 20th to 22nd of July 2016. Some were made by phone or videoconference. Interviews were made following a semi-structured framework, to cover all the analysis objectives. Their duration was about 1-2 hours, depending on the amount of covered questions. In some cases there were subsequent contacts (by phone and mail) to clarify some aspects. The contents of the interviews were arranged around the following points:

1. Objectives of the sustainable mobility policies
   - From the beginning of the change process in the mobility of Vitoria-Gasteiz (2006), what lead to the SUMP in 2008 and the Bicycle Plan in 2010?
   - Which objectives have been achieved, and to what extent?
   - What objectives are still not achieved, or are not fully achieved?
   - Are your expectations fulfilled? To what extent?

2. Results of implemented policies
   - Which ones have been the benefits (if any)? (from the perspective of the citizens, the institutions and from your own perspective)
   - Did you perceive negative results?

3. Evaluation of the implementation process
   - Which was the coordination among institutions and inside the local authority, and with other planning tools, during the implementation process?
   - What barriers did you find when implementing foreseen actions?
   - What did you learn during the process?

4. Challenges and threats
   - Which are the challenges to be solved for the future planning tools?
   - Are there risks or threats that could potentially compromise the success or efficiency of the foreseen actions?

5. Global evaluation of implemented policies
   - Free comments about the sustainable mobility policies developed in the last 10 years (2006-2016).
3.2 CIVITAS MODERN European project evaluation

Vitoria-Gasteiz took part in the CIVITAS MODERN project from 2008 to 2012. Ten mobility actions were developed in that period, and one of them was directly related to the creation of several superblocks (the main piece of the city's SUMP).

The main results in this measure were the following ones:

- Detailed projects were drawn up to develop 15 superblocks in the city centre, plus the demonstrative (pilot) superblock and the central superblock. Those 17 superblocks were created and working at the end of the MODERN project.
- Elaboration of a detailed plan to develop a pilot superblock in the city centre.
- Development of the pilot superblock to its full extent; development of the central superblock.
- Pedestrian surface in the pilot superblock increased from 45% of the total surface before the action to 74% after it.
- Noise measured in the pilot superblock before the action: 66.50 dBA, and after the action: 61.00 dBA. The result is directly related to the reduction of motorised vehicles in the zone.
- 42% reduction in CO$_2$; 42% reduction in NO$_x$; 38% reduction in particles (in the pilot superblock).

The impacts of the implementation were evaluated by counting the traffic flows of vehicles, bicycles and pedestrians in the pilot superblock. Additionally, with a speedometer and a sonometer we measured the average vehicles speed and the noise level. Finally, a telephone questionnaire was carried out to evaluate the percentage of population approving the measure.

All in all, a set of indicators was established to measure the evolution of the measure. We established a baseline -an initial situation- to represent the starting temporal point of the evaluation. Situation in year 2009 was taken as the baseline, as most of the measures were still not applied. We also defined a BAU (business as usual) scenario so we could compare the expected evolution if the measure was not performed with the real evolution. In order to know the status of the indicators before implementing the measure, several types of traffic counts were conducted inside the main superblock. The motorised traffic flow was taken in several automatics counters placed on the streets. Counts were performed in different places of the street, in different directions and in different times. Regarding pedestrian and bicycle data collection, manual counts were done in one intersection during 12 hours (from 8 AM to 8 PM).

To obtain ex-post data, manual counts of cars, pedestrians and bicycles were done after the measure was developed. In addition, manual counts were repeated on May 2011 in order to obtain additional ex-post results to confirm the impact of the measure. Concerning emissions, the assumption of an average value of emissions per vehicle/km were taken from COPERT (COmputer Programme to calculate Emissions from Road Transport) Report, by the European Commission. It is considered the standard distribution of the existing type of...
vehicles circulating in the city of Madrid. We considered that the characteristics related to social and economical level in Madrid and Vitoria-Gasteiz were similar, so the distribution fleet in Vitoria-Gasteiz could be assumed as the Madrid one. CO$_2$,

NO$_x$ and small particles emission was calculated based on traffic density and noise was registered using a sonometer in several places inside the superblock.

The indicator about the acceptance level of the measure among the citizens was calculated by means of a survey after the measure was developed. There was no chance to make the ex-ante survey, so we didn't have baseline figures to compare with.

Changes in the public space distribution were measured using cartographical tools; we measured how much public space was devoted to each mobility mode (cars, bicycles, pedestrians) before and after the measure.

Finally, we also measured traffic speed in several streets of the superblocks; ex-ante and ex-post data showed speed reduced in almost all the streets.

### 3.2.1 Evaluation findings

In CIVITAS MODERN, we also evaluated the evaluation process itself. The main points about the **quality of the evaluation** were the following ones:

- It could have been interesting to analyze other minor impacts also related to the implementation of this measure, for instance freight logistics and road safety.
- Some of the indicators selected previously were rejected or substituted due to difficulties in data collection. This was the case of perception of accessibility, injuries and deaths caused by transport accidents and CO emissions. Other indicators were incorporated with the extension of the measure. This is the case of average vehicles speed.
- For acceptance level, the ex-ante data collection was not done before the implementation of the measure, so it was not possible to analyze the evolution of impact of the measure in the indicator, although ex-post data was collected twice.

We also analysed **deviations, barriers and drivers**.

The **deviations** from the original plan were:

- The pilot (demonstrative) superblock was developed earlier because some infrastructure works were founded by a Spanish investment aimed at the recovery from the financial crisis.
- There was a delay in the implementation of the rest of superblocks, which put in risk its evaluation. In order to avoid problems, public works were scheduled to begin in those same streets measured in the ex-ante data collection.

**Barriers** were related to:

- Cultural factors: impending cultural circumstances and life style patterns. The huge challenge of changing very settled and naturalised patterns in much of the population.
- Financial factors: too much dependency on public funds (including CIVITAS funding) and subsidies, unwillingness of the business community to contribute financially.
Drivers were:

- Political, strategic – Commitment of key actors based on political and strategic reasons, presence of sustainable development agenda or vision, positive impacts of a local election, coalition between key stakeholders due to converging beliefs in directions of solution.
- Institutional – Administrative structures, procedures and routines, laws, rules, regulations and their application, structure of organizations and programs, were improved to provide a better environment to ease the development of the measure.
- Financial – Availability of public funds (including CIVITAS funding).
- Positional - The superblocks are the key factor of the SUMP and a consequence of the implementation of a sustainable view.

3.3 TRANSBICI panel survey

Vitoria-Gasteiz supported the TRANSBICI project, whose objectives were the following:

- To measure the change in modal split in Vitoria-Gasteiz through periodical traffic counts.
- To identify and measure key factors influencing mobility behaviour. This objective included cultural, social, spatial, urban, economic, subjective (symbolic and affective) factors. For this goal there were two surveys: a panel survey and a general mode choice survey.
- To develop a new model for travel demand analysis capable of considering cycling trips.
- To identify relationships among different factors and to select best mobility policies to implement an efficient strategy to increase bicycle use in urban areas.

The project had a multidisciplinary approach to cope the three aspects of the problem: modelling mobility behaviour, psychological aspects of travel choice and city characteristics that facilitate cycle use. Therefore, the proposed methodology was a combination of Transport Economics, Urban Geography and Social Psychology methods and techniques.

The panel survey served as a tool to monitor behavioural changes and changes in the perception of citizens about the different mobility modes. The factor driving those changes was the implementation of a new measure to promote cycling and to reduce car speed in the streets: the application of a traffic calming scheme in 47 streets of the city centre.
Figure 9: Vitoria-Gasteiz traffic calming scheme

The measure was implemented in 2013, and three surveys were made among a group of 358 persons (always the same group): one before the measure, in year 2012; another right after the measure was implemented, and the third and last one was placed one year after.
4 References:


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