



POLICY RECOMMENDATIONS

For EU Sustainable Mobility Concepts
based on CIVITAS Experience

ISBN-978-80-86502-77-9

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ABOUT THIS PUBLICATION

This publication presents the main findings arising from the evaluation of the CIVITAS Plus Collaborative Projects (CPs), which ran from 2008-2012. It seeks to identify factors that can boost the effectiveness and consistency of future strategies, thereby securing greater sustainability in urban mobility patterns. Policy makers are provided with contemporary facts for debating purposes, and a number of conclusions and recommendations based on lessons learnt from CIVITAS Plus are put forward.

ABOUT CIVITAS POINTER

Running from 2008 to 2013, CIVITAS POINTER was a 54-month grant-based project of the European Commission's Directorate-General for Mobility and Transport (DG-MOVE), as part of the CIVITAS Initiative.

Funded under the Seventh Framework Programme for Research and Technological Development, CIVITAS POINTER focused on the evaluation and monitoring of results and experiences from the 25 cities and five projects participating in CIVITAS Plus.

PUBLISHERS

ICLEI – Local Governments for Sustainability, Freiburg, Germany. Executive Director Wolfgang Teubner (responsible) / Centrum dopravního výzkumu, v.v.i. (Transport Research Center), Brno, Czech Republic. Director Karel Pospíšil (responsible)

AUTHORS

Simone Bosetti, Caterina Di Bartolo, Patrizia Malgieri, Alessio Sitran (TRT Trasporti e Territorio, Italy), Hana Brůhová-Foltýnová, Radomíra Jordová, Petr Kurfürst, Danuše Smutková, (CDV Centrum dopravního výzkumu, Czech Republic)

EDITOR

Ciara Leonard (ICLEI Europe)

LAYOUT

Stephan Köhler (ICLEI Europe)

ACKNOWLEDGEMENT

This publication is produced under the auspices of CIVITAS VANGUARD and CIVITAS POINTER, which are respectively support actions for coordination and dissemination and evaluation and monitoring funded through the EC's Seventh Framework Programme for Research and Technological Development.

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LIST OF ABBREVIATIONS

BaP	Benzo(a)pyrene
CBA	Cost-benefit analysis
CH ₄	Methane
CIVITAS PAC	CIVITAS Political Advisory Committee
CIVINET	CIVITAS National Networks
CIVITAS	City-Vitality-Sustainability
CNG	Compressed natural gas
CO	Carbon oxide
CO ₂	Carbon dioxide
CPs	Collaborative Projects
dB	Decibel
EC	European Commission
EEA	European Environment Agency
EEV	Enhanced Environmentally Friendly Vehicles
EU	European Union
EU-12	Member States that joined the EU in 2004 and 2007
EU-15	Member States of the EU prior to EU enlargement in 2004 and 2007
EU-27	European Union of 27 Member States (prior to Croatia's accession in 2013)
FQP	Freight Quality Partnership
GDP	Gross domestic product
GHG	Greenhouse gas emissions
GPS	Global positioning system
ICTs	Information and communication technologies
ITS	Intelligent transport system
LNG	Liquefied natural gas
L _{night}	Night-time noise indicator
LPG	Liquefied petroleum gas
LTZ	Limited traffic zone
MS	Member State
N ₂ O	Nitrous oxide
NH ₃	Ammonia
NMS	New Member State
NMVOs	Non-methane volatile organic compounds
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxide
O ₃	Ozone
P+R	Park-and-Ride
P2W	Powered two-wheelers
Pkm	Passenger kilometre
PM	Particulate matter
PM ₁₀	Particulate matter with particles with a diameter of 10 micrometres or less
PM _{2.5}	Particulate matter with particles with a diameter of 2.5 micrometres or less
PT	Public transport
R&D	Research and development
RTPI	Real-Time passenger information
SMS	Short messaging service
SO _x	Sulphur oxide
Tkm	Tonne kilometre
UK	United Kingdom
WHO	World Health Organization
Wi-Fi	Wireless fidelity

1. INTRODUCTION

Transport has become one of the major issues affecting sustainability in European cities. While cities are powerhouses for economic growth and development, generating around 85 percent of the EU's GDP, in more and more cities transport systems have been strained to the breaking point. More than 72 percent of Europe's population lives in urban areas and urban road traffic is responsible for 40 percent of total CO₂ emissions and 70 percent of emissions of other pollutants. It is estimated that traffic congestion costs reach about 1 percent of EU GDP. In terms of the human cost, one of three fatal accidents occurs in urban areas, mostly affecting vulnerable road users, such as pedestrians and cyclists.

Over the last 10 years, the focus of the CIVITAS Initiative has been to enhance the sustainability of transport activities in urban areas, while coping with the emergence of new mobility needs and requirements. As an initiative, CIVITAS aims to achieve a breakthrough by helping European cities to create clean and energy-efficient urban transport systems, and at the same time encourage citizens to make more sustainable modal choices. What makes CIVITAS unique is its flexibility and cooperative approach, which facilitates knowledge acquisition and transferability.

This publication was written under the auspices of the CIVITAS POINTER project, which supported five collaborative projects (CPs) implemented within the framework of CIVITAS in the years between 2008 and 2012.

Evaluation and monitoring were the keystones of CIVITAS POINTER. Drawing from first-hand, corroborated statistical evidence gathered from participating cities, this publication presents the results of the CIVITAS Plus cross-site evaluation and policy assessment. These findings support the development of clear

European-level policy recommendations that have the potential for being embraced by all European cities — not just those which make up the CIVITAS community.

1.1 Guiding questions

These policy recommendations seek to build a solid conceptual framework that allows for a thorough analysis of the elements needed to drive a successful shift towards sustainable urban mobility.

This conceptual framework consists of three main components:

- An investigation of **current mobility patterns** in European cities and key drivers for future development of the transport sector;
- **Results** that have been achieved through CIVITAS Plus actions; and
- **Recommendations** that, if implemented, can create a good policy environment and encourage sustainable mobility measures.

These steps can be translated into a number of questions, such as:

- “Bearing in mind that the demand for urban transport is expected to grow, which policy actions are best for supporting cleaner and better transport in cities?”
- What can cities do to support a shift towards sustainable mobility?”
- “At which levels - local, national, EU - should such measures be planned?”
- “How can the EU contribute to these measures?”

Based on the research undertaken in the compilation of this report and the results arrived at, recommendations are presented that can be used by policy makers keen to take independent action. It is equally important that

these recommendations address the need to develop a mix of policies and measures that operate at different levels and are capable of creating synergies that enhance positive impacts while mitigating negative ones.

1.2 Chapter guide

Following this introduction, the report is divided into five chapters.

Chapter 2 introduces key aspects and perspectives that characterise current and future mobility patterns in Europe.

Chapter 3 briefly summarises the keystones of the CIVITAS Initiative since its first phase (CIVITAS I) was launched. It also describes the evolution that has taken place with respect to the thematic categories of measures for sustainable urban mobility that have been implemented within the CIVITAS Initiative.

Chapter 4 recaps the experiences of CIVITAS Plus, which is the most comprehensive and thematically broad phase of CIVITAS. This chapter details the results of the evaluation process carried out in each demonstration city with further support from the CIVITAS POINTER project.

The evaluation results lend support to a number of recommendations, which are set out in Chapter 5 and structured according to the most relevant policy aspects.

Chapter 6 summarises conclusions on the main aspects, including the main lessons learnt in CIVITAS Plus policy making and the roles of policy actors at different levels.

The last section lists all the references upon which this report is based. For the sake of brevity, only references different from CIVITAS Plus deliverables (the main sources used for the analysis) are also mentioned in the text.

2. MOBILITY PATTERNS IN EUROPEAN CITIES: CHARACTERISTICS AND PERSPECTIVES

With approximately 74 percent of its population of 350 million living and working in cities of more than 50,000 inhabitants, Europe is one of the world's most densely urbanised areas, according to the United Nations (UN World Urbanization Prospects, 2011). The share of urban population is expected to increase even further, up to 82 percent, by 2050.

Generating about 85 percent of the EU's GDP, cities undoubtedly are powerhouses of economic growth and development. They are also places of connectivity, creativity and innovation, acting as cultural, business and service centres (EC, 2011c). But urban development presents many territorial challenges on different levels - notably on the relationship between cities and peripheral areas, and the relationship between cities and territorial development of the EU as a whole (EC, 2011c).

Transport mobility reflects this duality of advantages and disadvantages. While population growth increases pressure on supply of transport services, transport services tend to be particularly well developed and widespread where population density is high.

Bearing this in mind, Chapter 2 starts with an overview of the current state of transport and mobility in Europe, particularly in European (CIVITAS Plus) cities. The chapter describes main trends in the modal split and motorisation rate, and explains the major impacts of transport activities. The chapter makes an important contribution to recent debates about the future development of mobility, and provides insights into

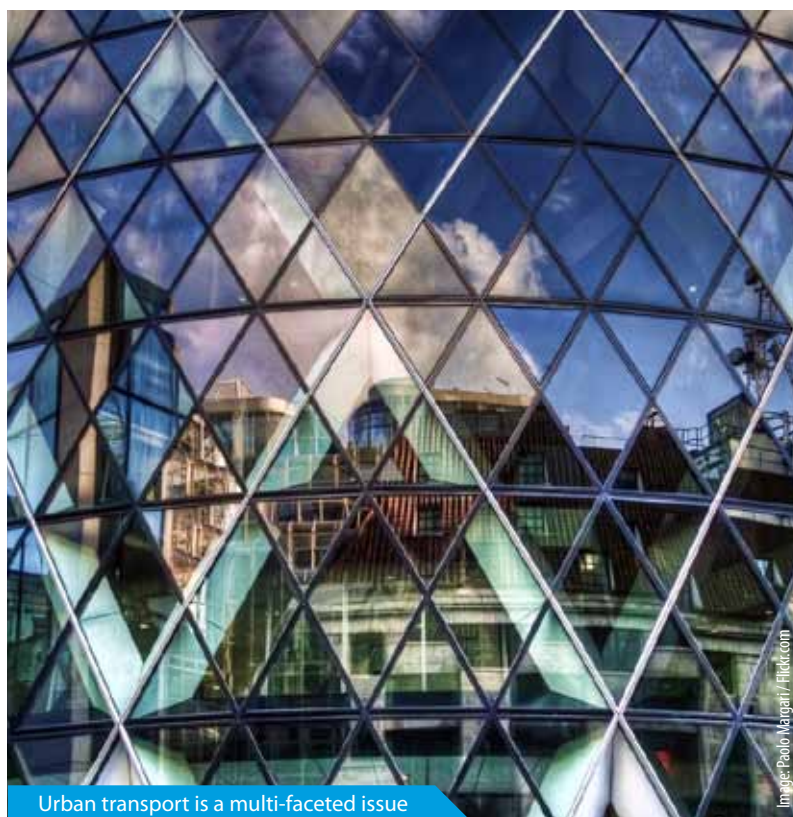
those factors and drivers which are likely to shape mobility patterns in future.

2.1 Characteristics of transport demand

Transport is a core component of the European economy. Since 1995 this sector has been experiencing continuous growth (measured in tonnes and passenger kilometres) in line with developments in GDP (EU, 2013a). Freight transport reached its peak (a 40 percent increase in comparison with 1995) in the two-year period of 2007-2008,

before falling again as a consequence of the economic downturn. As for passenger transport, this has been rising continuously since 1995, with only a small slowdown after 2007.

Globally, passenger cars remain the predominant mode of transport by far, as the evidence presented in this report on modal splits and motorisation rates bears out. Public transport still accounts for a rather small proportion of the overall modal split, but still appears to be more popular in countries of Central and Eastern Europe (CEE) than in the western EU Member States.



Urban transport is a multi-faceted issue

Image: Paolo Magari / Flickr.com

Modal split

Passenger cars dominate the modal split of all inland transport modes, accounting for approximately 84 percent of passenger kilometres (Pkm) for 2011. Powered two-wheelers, buses and coaches follow with a total share of 9 percent, while the percentage for rail transport is just 7 percent (EU, 2013a).

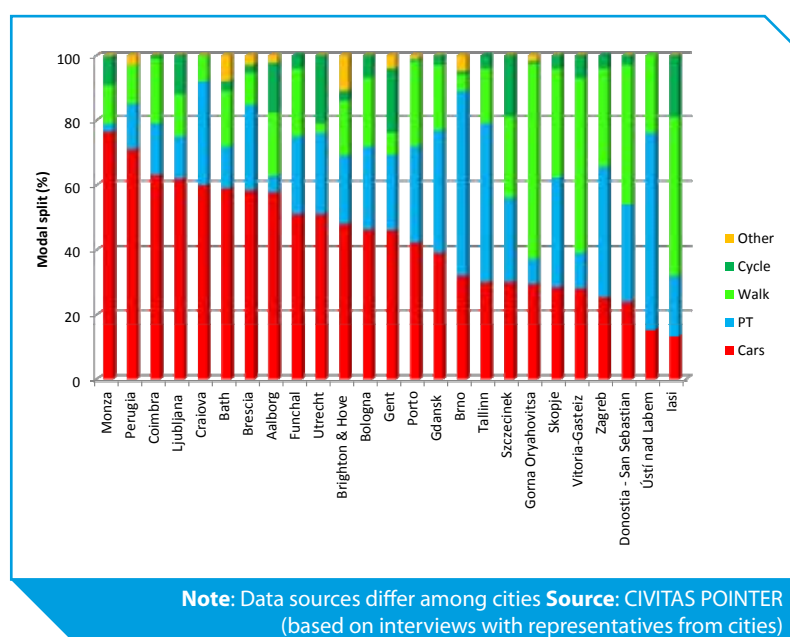
On average, the share of passenger cars in the modal split has never fallen below 60 percent in any EU-27 country¹ during the period 2000-2010. This holds true for both the EU-15 and EU-12 Member States; although, in 2000, the share of passenger cars in EU-15 countries (with the exceptions of Austria, Denmark and Greece) was higher than 80 percent, which was not the case for the EU-12 Member States. Ten years later, in 2010, the scenario has changed considerably, and EU-12 Member States are represented at both ends of the spectrum: Lithuania, Poland and Slovenia rank highest, whereas the proportion of Pkm for passenger cars is lowest in Hungary and the Czech Republic (EU, 2013a).

Automobiles are also dominant at city level (see Figure 1). As for CIVITAS Plus cities, the share of cars ranges from 13 percent in Iasi to 76 percent in Monza. Cars also represent more than 40 percent of the modal split in 14 of 25 CIVITAS Plus cities.

Public transport shares of greater than 40 percent have been reported in Brno, Gdansk, Tallinn, Zagreb and Usti nad Labem. This finding corresponds to the general trend that the share of public transport is higher in post-communist countries than in western EU Member States.

The highest shares of cycling in the modal split are in Utrecht (21 percent), Ghent (20 percent), Szczecinek (19 percent), Iasi (19 percent) and Aalborg (15 percent). The highest shares of walking in the modal split are found in Gorna Oryahovitsa (60 percent), Vitoria-Gasteiz (54 percent), Iasi (49 percent), Donostia-San Sebastian (43

Figure 1: Share of passenger transport in CIVITAS Plus cities



percent), Skopje (33 percent) and Zagreb (30 percent).

Motorisation rate

A high level of passenger car ownership (the motorisation rate equals the number of cars per thousand inhabitants) is generally indicative of widespread use of individual motor transport. Among the EU-27 Member States², the countries with the highest motorisation rates are Luxembourg (658 passenger cars/1,000 inhabitants in 2011) and Italy (610 in 2011). Seven more EU Member States (Austria, Cyprus, Finland, Germany, Lithuania, Malta, Slovenia and Lithuania) had rates of over 500 (at least one car per two inhabitants) in 2011. The lowest rate in 2011 (203) was in Romania - just over one car per five inhabitants.

Motorisation rates have been increasing since 1990, especially in the EU-12. The highest increase has been in Poland, where the number of passenger cars per 1,000 inhabitants grew from 261 in 2000 to 470 in 2011 (an 80 percent increase). Romania followed with a 64 percent increase, from 124 (in 2000) to

203 (in 2011). Despite these increases, motorisation rates in the EU-12 remain significantly lower compared to the EU-15.

However, motorisation rates in urban areas are usually higher than the national average because of high concentrations of people and cars. CIVITAS Plus cities with car ownership rates above the EU-15 average are Perugia, Brescia, Monza, Bologna and Ljubljana. Rates higher than the EU-27 average were also recorded in Funchal, Gorna Oryahovitsa and Donostia-San Sebastian. Most of the cities reported motorisation rates higher than the EU-12 average: Porto, Craiova, Skopje and Iasi were the exceptions.

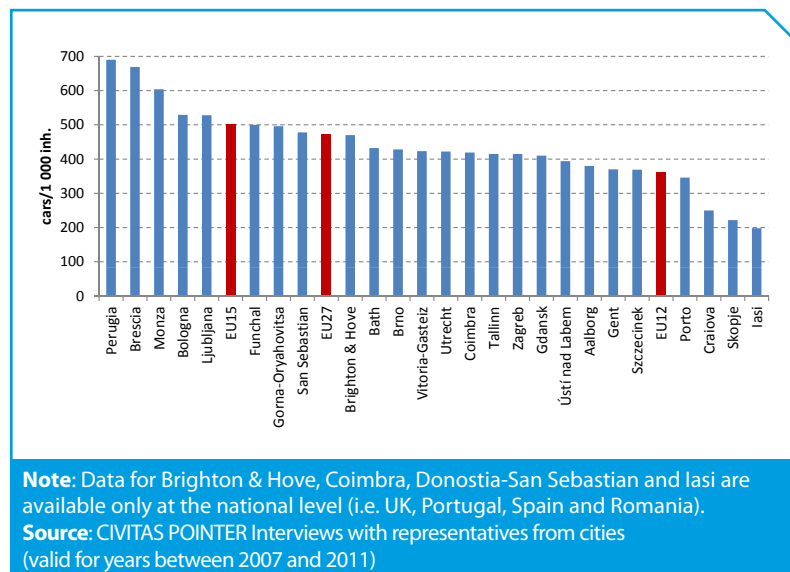
¹ Data for Cyprus, Malta, Estonia, Latvia and Lithuania are not available for 2000.

2.2 Transport sector impacts

The transport sector has a clear and direct impact on sustainability because:

- transport (excluding maritime transport and pipelines) absorbs approximately one-third of total energy consumption in the EU, and transport energy consumption grew continuously between 1990 and 2007;
- transport modes are still heavily dependent (97 percent) on fossil fuels such as gasoline and diesel for their energy needs, while only a minor proportion relies on biofuels and electrical energy (1 percent and 2 percent respectively); 84 percent of fossil fuels are imported, and the energy bill for fossil fuels amounted to EUR 1 billion per day in 2011 (EC, 2013a);
- passenger and freight transport accounts for about 70 percent of the final demand for oil and oil-derived products in the EU;
- a significant proportion of total greenhouse gas (GHG) emissions in the EU-27 originates from the transport sector: transport is responsible for up to 24 percent of total GHG emissions (CO_2 , CH_4 , NO_2), including international aviation and maritime transport and excluding land-use change and forestry activities, which can eliminate or reduce GHG emissions; and
- the road transport sector is the largest energy consumer, accounting for 82 percent of total energy consumed by transport in 2009; energy used for air, rail and inland navigation accounts for 18 percent.

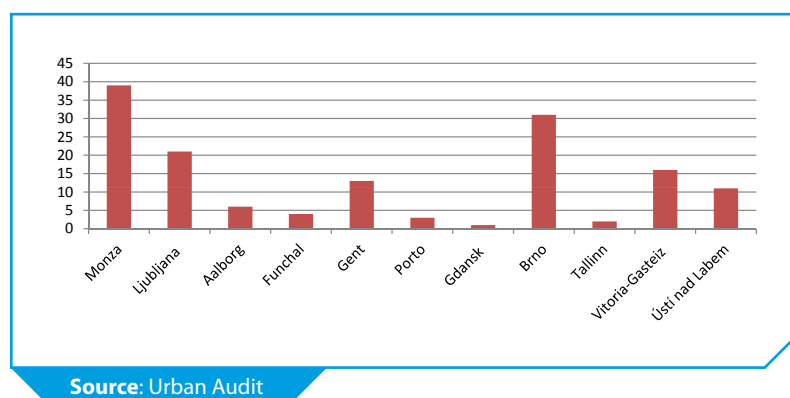
Figure 2: Car ownership rates in CIVITAS Plus cities



It therefore comes as no surprise that the decarbonisation of transport activities and subsequent reduction in their adverse environmental impacts has attracted growing interest and is now a top-ranking political priority. The ultimate goal of policy makers is to mitigate the negative impacts of motorised transport without decreasing overall mobility in the face of growing demand.

The European Commission's White Paper 2011 also stresses the importance of addressing oil dependence while securing competitiveness of the EU economy. Although transport has become cleaner in the last few years, oil consumption has increased because of greater transport volumes.

Figure 3: Number of days when ozone (O_3) exceeds $120\mu\text{g}/\text{m}^3$ in CIVITAS Plus cities



2.2.1 Environmental and health impacts

Climate change, GHG emissions, air pollution, noise, energy supply security and oil dependence are regarded as the most crucial areas of environmental intervention. Climate change and GHG emissions together with increasing oil dependence and energy consumption, threaten the world's natural environment on different levels and on a large scale. The health of the world's population is affected as well. At the local level, rising levels of pollutants are damaging air quality, giving rise to health concerns in urban areas.

Climate change

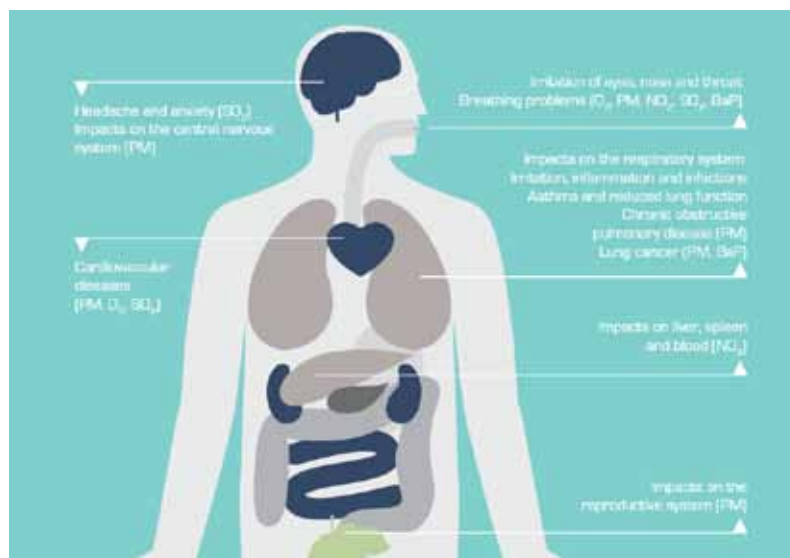
In compliance with the Kyoto Protocol on climate change, the EU agreed to reduce its GHG emissions by 8 percent from 1990 levels by 2012. Comparing the base year set by the Kyoto Protocol and the year 2010, GHG emissions in the EU-15 have fallen by approximately 15 percent in all sectors except transport over these 10 years. Transport emissions increased by 20 percent and accounted for more than 20 percent of all GHG emissions. This means that transport is the second biggest GHG-emitting sector (after energy) and the only major sector from which GHG emissions are still rising.

Urban transport is responsible for one-quarter of all GHG emissions from transport. Only in the last few years has the amount of transport GHGs stagnated.

Air pollution

Motorised traffic is responsible for emitting various harmful substances, such as particulate matter (PM_{10} , $PM_{2.5}$), acidifying substances (NO_x and NMVOCs) and ozone precursors (NO_2 , SO_x , and NH_3). In Europe, particulate matter (PM), ground-level ozone (O_3), benzo(a) pyrene (BaP) and nitrogen dioxide (NO_2) are of particular concern. Transport is a dominant source of urban emissions that contribute to negative health impacts, which are summarised in Figure 4 below.

Figure 4: Health impacts of air pollution

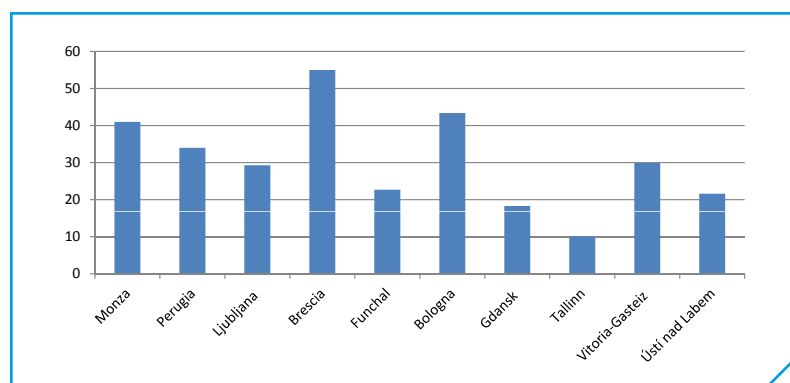


Source: EEA, 2013a

Alongside the negative effects on human health, air pollution also damages ecosystems. It is estimated that two-thirds of the protected sites in the EU Natura 2000 network are currently under severe threat from air pollution (EEA, 2013).

The impacts of air pollution on the environment depend not only on air pollutant emission rates but also on the location and conditions of such emissions.

Figure 5: Annual average concentrations of NO_2 in CIVITAS Plus cities



Source: Urban Audit

European emissions of PM_{10} and $PM_{2.5}$ dropped by 14 percent and 16 percent respectively between 2002 and 2011. Figure 5 shows the most polluted European cities, which are located in Bulgaria, Poland, Romania and Italy.

Analogously, a downward trend is visible over the same period for emissions of SO_x and NO_x , which have declined by 50 percent and 27 percent respectively. Emissions of NH_3 have fallen at a slower pace, decreasing by only 7 percent. Technological advances, improved exhaust gas treatment of road vehicles (brought about by the introduction of EU standards) and improved fuel quality - reduced sulphur concentration in particular - are the main reasons for substantial reductions in air pollutants.

Most of the cities where ozone (O_3) emission limits are exceeded are located in Italy. The highest annual mean concentrations of NO_2 have been observed in Italy, Romania and Greece. Among the CIVITAS Plus cities, Porto, Coimbra and Brescia are the most polluted in terms of PM_{10} , while Monza, Brno and Ljubljana have the highest ozone emission values.

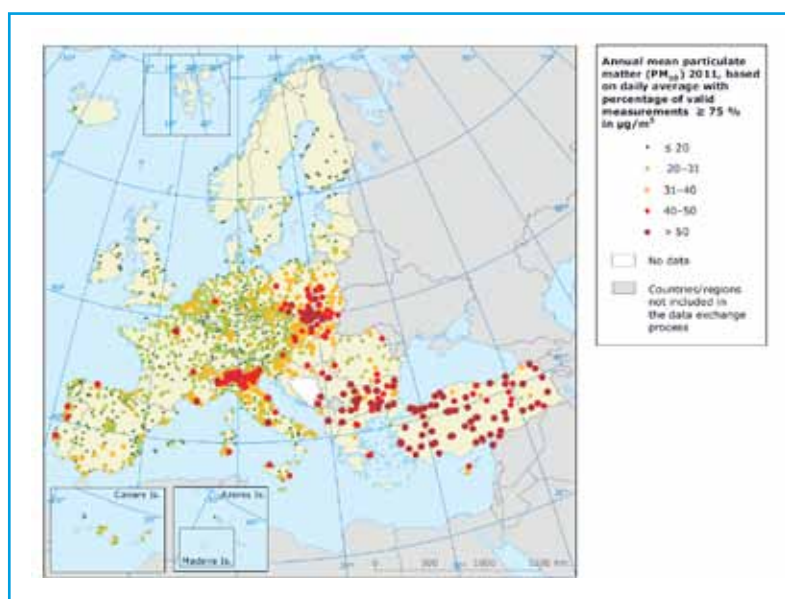
Among CIVITAS Plus cities, annual average concentrations of NO_2 are highest in the Italian cities (Brescia, Bologna and Monza).

THE AIR QUALITY DIRECTIVES

The Air Quality Directives 2008/50/EC and 2004/107/EC set legally binding limits for ground-level concentrations of outdoor air pollutants. Key elements of the EU air quality legislation are described below.

- EU limit values are legally binding concentration thresholds that must not be exceeded. Limit values are set for individual pollutants and comprise: a concentration limit, an 'averaging' time over which a pollutant is to be measured or estimated, the number of times (if any) per year that a limit may be exceeded, and a date by which the limit value must be achieved. Some pollutants have more than one limit value covering different endpoints or averaging times. Limit values are legally binding in EU Member States.
- Target values are to be attained where possible by taking all necessary measures not entailing disproportionate costs. Target values are not legally binding.
- Exposure reduction obligation: concentrations are to be reduced by a given percentage depending on the mean triennial $PM_{2.5}$ urban background concentrations from 2008-2010 to 2018-2020.

Figure 6: PM_{10} annual average (2011)



Source: European Environment Agency
www.eea.europa.eu/legal/copyright

Noise

Motorised traffic (together with airports) is the most significant source of noise pollution that affects people living in urban and metropolitan areas. Almost 70 million people living in agglomerations with more than 250,000 inhabitants are exposed to road traffic noise levels in excess of 55 dB during the daytime, while approximately 50 million people are exposed to road traffic noise above 50 dB L_{night} during night time.

The World Health Organization’s ‘Night Noise Guidelines for Europe’ (WHO, 2009) describes levels above 55 dB at night as “increasingly dangerous for public health. Adverse health effects occur frequently.” Higher noise levels can impede performance, disturb sleep, lead to stress, cause cardiovascular and psycho-physiological problems, and provoke anti-social behaviour.

2.2.2 Social and economic impacts

Road safety

In 2012, 27,700 people died and nearly 313,000 were seriously injured in the EU-27 Member States as a consequence of road accidents. Statistical evidence collected by the European Commission

and released in March 2013 indicates that road deaths in 2012 fell by 9 percent (equivalent to 2,661 deaths) compared to 2011. In 2011, road fatalities were down 2 percent from 2010.

The steepest drop in the number of aggregate road deaths in the EU-12 Member States came after 2004 (-11 percent), while there was a 9 percent decrease in the number of road fatalities in the EU-15 (ETSC, 2013).

Looking more closely at urban areas, road safety depends on a combination of factors, including growing transport demand, the integration of transport into residential areas, and space crowding in city centres (TRIP, 2013a). Almost 50 percent of all fatal accidents involve pedestrians or cyclists.

The number of fatalities due to road accidents per million of inhabitants differs substantially from city to city. Six CIVITAS Plus cities have numbers of fatalities per million inhabitants that are higher than the EU-27 average. These are Craiova, Bath, Brescia, Coimbra, Usti nad Labem and Skopje. In contrast, the lowest numbers of fatalities per million inhabitants are reported by Porto, Tallinn, Brighton & Hove, Utrecht and Aalborg.



To improve the safety of pedestrians and cyclists, the EU is taking the following actions: 1) promoting regulative measures aimed at defining compulsory safety standards for vehicles; 2) supporting research projects to test innovative road designs to improve safety; and 3) increasing awareness through information campaigns.

Congestion costs

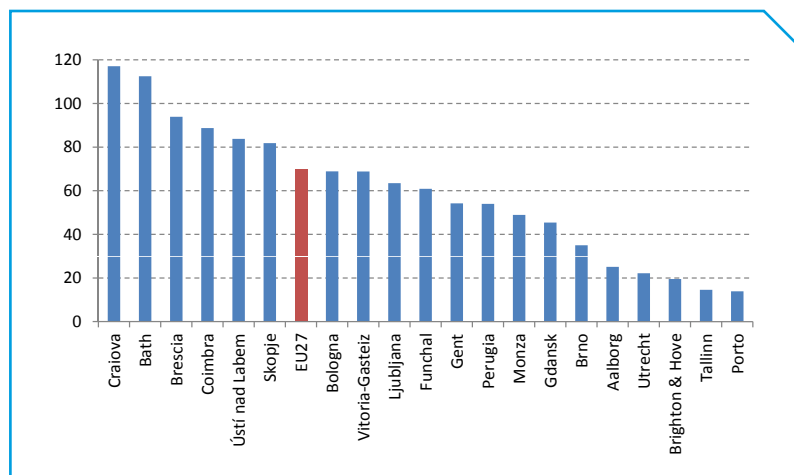
From an economic perspective, the main negative impact of transport lies in the costs caused by congestion. Congestion is the principal transport concern in urban areas because:

- it contributes to GHG emissions, local air pollution, noise and traffic accidents;
- it hampers accessibility; and
- it adversely affects economic competitiveness, social cohesion and sustainable growth.

While urban congestion is closely related to car ownership levels, urban sprawl, the availability of PT alternatives and interurban network congestion, each of these phenomena results from growing freight demand across specific corridors at points of intersection with links serving local traffic.

At present, congestion is now responsible for a loss of 1 percent of European GDP. If effective countervailing measures, such as road pricing, are not taken, congestion costs are projected to increase by about 50 percent by 2050 (to nearly EUR 200 billion annually).

Figure 7: Road fatalities



Note: Data for Donostia-San Sebastian, Szczecinek, Iasi, Zagreb and Gorna Oryahovitsa are not available.

Source: CIVITAS POINTER (valid for the period 2008-2010)

Energy supply security and oil dependence

Motorised transport has negative impacts not only on climate, public health and the environment, but also on the economy. This is because EU transport relies on oil for 94 percent of its energy needs. According to COM(2013)17, 'Clean Power for Transport: A European alternative fuels strategy', Europe imported 84 percent of its oil in 2011, paying up to EUR 1 billion per day and resulting in an EU trade balance deficit of around 2.5 percent of GDP.

As is stated in the 'Roadmap to a Single European Transport Area: Towards a competitive and resource-efficient transport system', the failure to address oil dependence will have a severe impact on people's ability to travel, which would in turn reap dire consequences on inflation, the trade balance and overall competitiveness of the EU economy. Although technology is improving and transport has become cleaner, oil consumption is also on the rise because of swelling transport volumes — i.e. increased car ownership and vehicle kilometres (EC, 2011c).

2.3 Perspectives on future development

Several factors combine to determine transport behaviour and choice of transport modes. These factors evolve over time, and both influence and reflect significant changes in lifestyles and working patterns, as well as profound demographic shifts and their subsequent impact on mobility behaviour. Changes in mobility behaviour will largely shape the emergence of new mobility needs and requirements, while generating a need for adequate and accessible policies that offer equal mobility opportunities to all citizens.

There is a substantial body of academic literature on these issues, and in this section we present an overview of the most important points — namely,



demographic changes, spatial structure and behavioural developments.

2.3.1 Demographic aspects

Future projections of demographic trends form the basis for any realistic forecasts of future transport demand. The most important trends on which to focus are: age, migration flows, gender, household composition and the labour market.

Europe's ageing population is the result of different demographic factors: decreasing birth rates, increased life expectancy due to medical progress, and also migration dynamics and related policies. The overall size of the population is projected to be only slightly larger in 50 years' time, but will be much older than it is now. By 2060, the median age of Europeans is projected to be more than seven years higher than it is today, and the number of people aged 65 or more is expected to comprise 30 percent of the population, as opposed to 17 percent today³.

Where mobility is concerned, transport supply will need to be adapted to meet the needs of elderly people, especially in terms of accessibility, availability of public transport, user-friendliness of payment systems, safety and security.

Gender and household composition are other demographic components that will play prominent roles in shaping mobility

needs in the coming decades. According to available statistics, women lead men in terms of adopting mobility patterns that are more sustainable, such as taking shorter journeys, and making more frequent use of public transport, cycling and walking. This does not, however, imply that women prefer to travel in more sustainable ways. Differences in mobility choices are more likely the consequence of gender differences in the labour market and in the division of household tasks. Women are still over-represented in lower-paid sectors and under-represented in decision-making positions. Parenthood keeps down female employment rates, and women continue to work more unpaid hours at home than men.

According to an Edinburgh study (Ryley, 2005), households with children exhibit distinct travel behaviours: they are highly dependent on cars as the primary means of travel; they own but do not often use bicycles; and they favour, by a fair margin, cycling for leisure rather than for travelling to work. Households consisting of students, unemployed people and part-timers without children are most likely to use non-motorised forms of transport. Conversely, families consisting of retirees and high earners are least likely to use non-motorised forms of transport.

³ EC, 2008

With so many demographic changes afoot — shifting household and parenting models, new developments on the labour market, increased labour market participation on the part of women, as well as an ageing population and new technologies — the variety of mobility patterns is likely to increase. Looking forward, what is required are appropriate transport policies that are capable of meeting changing needs while staying focused on sustainability.

2.3.2 Spatial structure

Another key development behind current mobility trends is spatial distribution of housing. Urban sprawl is the main challenge for urban transport, as it entails a greater need for individual transport modes and thereby generates congestion, causes environmental problems and increases land-take for roads and parking areas (EEA, 2010).

In the past, the growth of European cities reflected general increases in urban population. Nowadays, even where

there is little or no population pressure in EU Member States, a variety of other factors are driving the development of the modern city, such as individual housing preferences, increased mobility, commercial investment decisions, and the coherence and effectiveness of land-use policies at all levels (EEA, 2006).

Recent studies show that urban sprawl, a dominant trend in the post-war era, is not likely to disappear in the coming years. However, land scarcity, rising costs and increased appreciation of city life could cause rates of urban sprawl to drop. As inner city areas are becoming more attractive to new target groups (e.g. high-income households, small families and the elderly), urban sprawl may have already peaked in some cities.

Inhabitants of urban areas that are generally congested and have well-developed PT services are able to re-think their mobility behaviour and abandon car use. It is therefore expected that urbanisation might be a driver for a reduction in car ownership levels.

2.3.3 Values and lifestyles

Mobility patterns are also heavily affected by changes in values and lifestyle, but it is difficult to make predictions about future levels and distribution of demand.

Rates of everyday mobility might fall, as more people now work from home and new technologies provide more options for home-based entertainment. Technological developments in general are affecting almost every aspect of our life (labour, travel, leisure, health etc.), and have started to change our daily habits in significant ways. The leading role is played by information and communication technologies (ICTs). ICTs, in fact, have a great potential to weaken, or even eliminate, the conventional constraints of time and space, which are the two physical dimensions that give rise to the need for travel.

Today, many different kinds of activities can be undertaken via the World Wide Web, such as e shopping, e-banking, e-booking of different services etc. These



Image: Harry Schiffer / elitis.org

options are likely to become more and more common in future and attract an ever-increasing number of users as digital illiteracy rates continue to fall. The diffusion of immersive networking technology, especially among young people, could lead to the development of different sets of mobility preferences of future generations who are likely to spend more time in virtual spaces. Beyond this, further potential impacts of ICTs on lifestyles and travel demands are hard to predict.

The younger generation is also undergoing some more subtle cultural and lifestyle changes. Not long ago, the private car was the paramount symbol of youth culture, and was viewed as the ultimate passport to freedom and independence. While they remain important among young people today, cars are respected more for their utility as appliances and less so in terms of symbolic prestige.

Factors like the high cost of fuel and insurance premiums, youth unemployment and increasing job insecurity certainly play roles in making cars less attractive to young people, or forcing young people to postpone the use or purchase of cars. Nevertheless, the changes are profound, and social media is providing young people with access to new lifestyles and identities that are simply inaccessible by car.

Strong arguments are being made that more widespread use of new ICTs is both initiating and accompanying the emergence of new leisure and working lifestyles.

To sum up, this chapter has explored some of the variables that could influence the future development of urban mobility trends and travel patterns. New transport environments will be highly complex and more demanding, and a wide range of mobility needs will have to be

balanced with the increased importance of sustainability.

Analysis of these variables has revealed that all of them could play an important role in reframing future mobility. Every domain has relevant driving forces, either on its own or in combination with others. Predicting the intensity and timing of such impacts is challenging, and this in turn makes it difficult to plan and develop future transport systems.

Managing these paradigm changes will require taking a more holistic approach - one which should be broad enough in scope to consider system complexity and all possible interactions within the domain of human activities.



Image: Tornhøjskolen

3.2. CIVITAS thematic categories

From its early stages, the CIVITAS Initiative has structured and promoted its actions around eight thematic categories, as illustrated below. The table summarises programme evolution from 2002 when CIVITAS I became operational.

While thematic content remained mostly constant over the first two CIVITAS editions, CIVITAS PLUS placed a greater emphasis on the issue of energy saving while still upholding the general CIVITAS framework. Energy saving spans all eight CIVITAS themes, including in particular: clean vehicles and alternative fuels, energy-efficient collective transport, car-independent lifestyles, and efficient goods distribution.

In the first CIVITAS edition, measures largely focused on the development and improvement of public transport, as well as on the promotion of clean vehicles. In CIVITAS II, most measures concentrated on the development of innovative soft measures aimed at managing transport

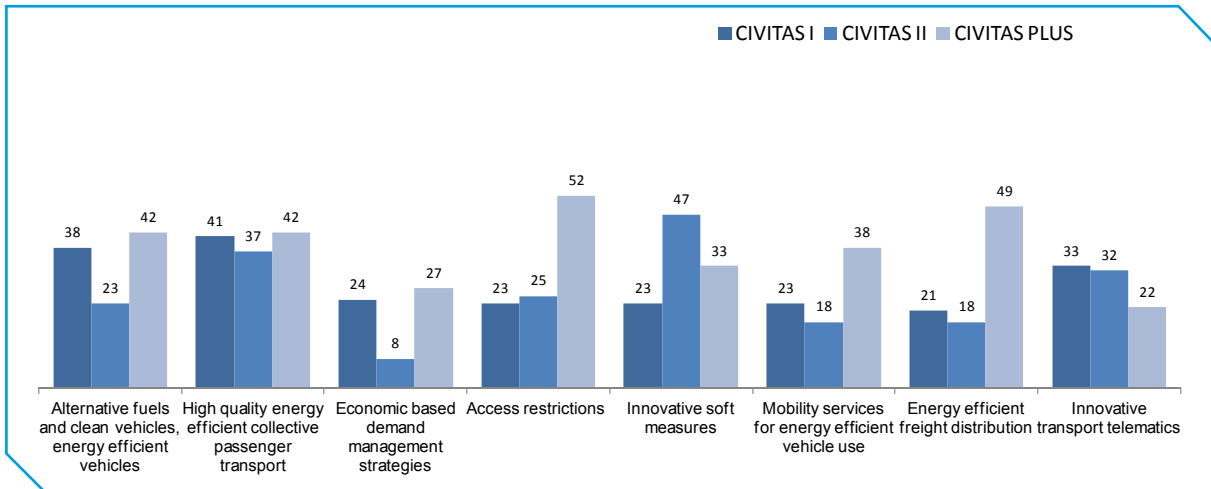
Table 1: Overview of the CIVITAS Programme

CIVITAS Edition	Projects	Cities
CIVITAS I 2002-2006	MIRACLES	Barcelona, Cork, Winchester, Roma
	TELLUS	Berlin, Gdynia, Gothenburg, Rotterdam
	TRENDSETTER	Lille, Prague, Graz, Stockholm, Pecs
	VIVALDI	Nantes, Bristol, Bremen, Kaunas, Aalborg
CIVITAS II 2005-2009	CARAVEL	Genoa, Cracow, Burgos, Stuttgart
	MOBILIS	Toulouse, Debrecen, Venice, Odense, Ljubljana
	SMILE	Norwich, Suceava, Potenza, Malmo, Tallinn
CIVITAS PLUS 2008-2012	SUCCESS	Preston, La Rochelle, Ploiesti
	ARCHIMEDES	Aalborg, Brighton & Hove, Donostia-San Sebastian, Iasi, Monza, Usti nad Labem
	ELAN	Ljubljana, Ghent, Zagreb, Porto, Brno
	MIMOSA	Bologna, Funchal, Utrecht, Gdansk, Tallinn
	MODERN	Craiova, Brescia, Coimbra, Vitoria-Gasteiz
CIVITAS PLUS II 2012-2016	RENAISSANCE	Perugia, Bath, Gorna Oryahovitsa, Szczecinek, Skopje
	DYN@MO	Aachen, Gdynia, Koprivnica, Palma
	2MOVE2	Stuttgart, Brno, Malaga, Tel Aviv-Yafo

Table 2: Comparison of thematic categories from CIVITAS I, II and Plus programmes

CIVITAS I	CIVITAS II	CIVITAS Plus
Clean private and public fleets	Clean vehicles and alternative fuels	Alternative fuels and clean vehicles, energy-efficient vehicles (Clean fuels and vehicles)
Stimulation of PT modes	Stimulation of PT modes	High quality energy-efficient collective passenger transport (Collective passenger transport)
Integrated pricing strategies	Integrated pricing strategies	
Access restriction	Access management	Demand management strategies based on economic (dis-)incentives (Demand management strategies)
Innovative soft measures	Innovative soft measures	Mobility management, communication and education (Mobility management)
		Safety and security
New forms of vehicle use and ownership	New forms of vehicle use and ownership	Mobility services for energy-efficient vehicle use (Car-independent lifestyles)
New concepts of goods distribution	New concepts of goods distribution	Energy-efficient freight distribution (Urban freight logistics)
Integration of traffic management systems	Telematics	Innovative transport telematics systems (Transport telematics)

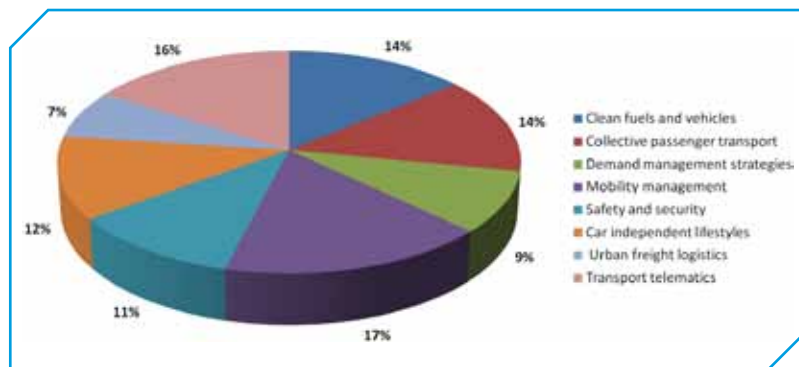
Figure 9: Number of measures implemented in CIVITAS I, II and Plus programmes (by thematic category)



demand through the introduction of integrated planning strategies. CIVITAS Plus includes a large share of measures relating to access restrictions and energy-efficient freight distribution (see Figure below).

The collected data point to a declining trend for Intelligent Transport System (ITS) measures, shares of which have diminished over the course of the three successive editions. Finally, it is worth mentioning public transport in that it broadly remains the main focus of intervention in all participating cities, including the smaller ones.

Figure 10: CIVITAS Plus measures across the eight thematic categories

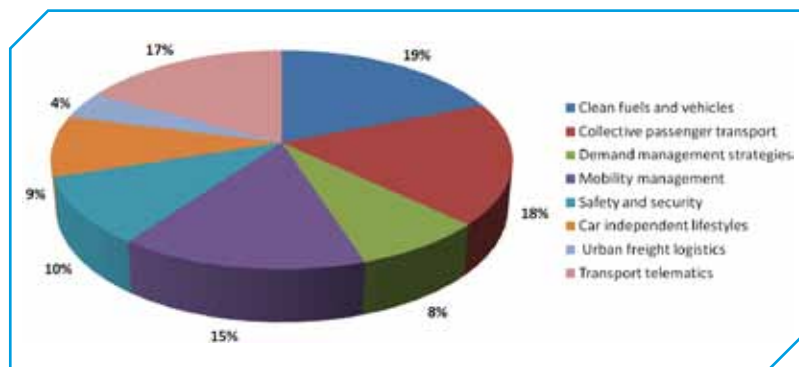


Source: CIVITAS Pointer

3.3 Exploring measures in CIVITAS Plus

With regard to the CIVITAS Plus edition, Figure 10 below shows that the vast majority of measures focus on mobility management by paying special attention to information and awareness campaigns (52 measures). These are followed by three horizontal measures that are dedicated to the promotion of clean vehicles and alternative fuels (42 measures), efficient passenger transport (42 measures) and, finally, efficient goods distribution (49 measures). Note that all of them have 'energy efficiency' as their main target.

Figure 11: CIVITAS Plus distribution of financial resources by thematic category



Source: CIVITAS Pointer

Also of interest is the distribution of resources spent per thematic category. As illustrated in Figure 11, the implementation of measures related to alternative fuels and clean vehicles — together with high-quality, energy-efficient passenger transport — is quite expensive.

This is due chiefly to two factors: the high costs of exploring new technologies in relation to vehicles and fuels, and the high level of investment required to introduce innovation into urban PT networks. These two factors are widely applicable and increasingly interrelated.

Over 300 innovative measures were introduced in 25 cities during CIVITAS Plus in the four years spanning 2008-2012. They are briefly presented and outlined in this section with reference to the CIVITAS thematic categories, while the main results and achievements following their implementation are analysed in the following chapter.



4. EVALUATING FOR POLICY DEVELOPMENT: THE CIVITAS PLUS EXPERIENCE

Within the CIVITAS Initiative, the CIVITAS Plus edition is the most broad and comprehensive. Over 300 measures have been implemented and evaluated by 25 cities, with the aim of achieving vibrant, sustainable urban environments while curbing the negative effects of motorised transport.

Evaluations conducted by local teams in the demonstration cities, with support from CIVITAS POINTER over five years of intense activity, are the basis of the results presented here. CIVITAS Plus measures were evaluated in terms of their overall effectiveness, and the common consolidated framework approach on

which both the impact and process evaluations were built has ensured a consistently high quality of cross-site outputs.

In this chapter, main findings of the evaluation process for each of the eight CIVITAS thematic categories (and related policy measures demonstrated within CIVITAS Plus, see Table 3) have been identified and presented in line with the following considerations:

Table 3: CIVITAS Plus thematic categories and policy measures

CIVITAS thematic categories	CIVITAS Plus policy measures
Clean fuels and vehicles	Vehicle modification or replacement
	Alternative fuels
Collective passenger transport	Information, ticketing and tariffs
	Accessibility, infrastructure and network
	Public transport fleet management
Demand management strategies	Parking and park-and-ride
	Regulative measures (access and LTZs)
	Pricing (road charging, rewarding mechanisms and R&D)
	Cycling infrastructure enhancements
Mobility management	Mobility services
	Mobility plans
	Mobility marketing
	Eco-driving
Safety and security	Pedestrians and cyclists
	Public transport
	Traffic management
Car-independent lifestyles	Car-sharing
	Carpooling
	Cycling services (bike-sharing, integration cycles and buses)
Urban freight logistics	New distribution schemes
	Access restrictions and control
	Freight partnership schemes and driver support
Transport telematics	Traffic management and control
	PT fleet management
	Parking guidance systems

1. The evaluation of results and success factors aims to identify the contribution of each policy measure, classified by thematic category, in promoting a model of sustainable mobility in urban areas.
2. The identification of major drivers and barriers that have occurred at various phases of a measure's implementation helps to explain more clearly why measures succeed or fail.
3. Reflection on further up-scaling and transferability potentials helps with identifying key requirements and opportunities for further local exploitation and cross-site dissemination.

The outcome of this analysis forms the basis for policy reflections and recommendations.

4.1 Clean fuels and vehicles

CIVITAS Plus has implemented 37 measures under this thematic category. The majority of measures concern the replacement or modification of PT fleet vehicles and/or municipal fleet vehicles, while those remaining deal with research on future provision of alternative fuels, focusing on strategy and process optimisation, or on changing user attitudes towards alternative fuels.

Table 4: Clean fuels and vehicles

CIVITAS thematic category	Policy measures	Cities	No. of measures
Clean fuels and vehicles	Vehicle modification or replacement	Ghent, Ljubljana, Zagreb, Porto, Aalborg, Donostia-San Sebastian, Iasi, Monza, Bologna, Funchal, Bath, Gorna Oryahovitsa, Perugia, Skopje, Szczecinek, Craiova, Coimbra, Brescia, Craiova	24
	Alternative fuels	Ghent, Gdansk, Tallinn, Brighton & Hove, Bologna, Funchal, Vitoria, Brno, Skopje, Coimbra, Brescia	13
Total			37

4.1.1 Vehicle modification or replacement

Results and success factors

Tests conducted on public fleets using new vehicles are shown to have had largely positive impacts on the environment, though the results differ greatly, depending on the technology being tested. An assessment of CNG use in buses, for example, revealed a significant reduction in particulate emissions and slight decreases in CO₂ and NO_x emissions, but increased CO emissions. Results were slightly different for buses using LPG: there was a marked increase in CO₂ emissions, but lower emissions of CO, NO_x and PM.

The results support conclusions from previous CIVITAS editions that the use of alternative fuels has great potential to reduce vehicle emissions and is an attractive option for PT operators. However, investment costs are generally high, especially for those fuel types which require the building of new refuelling stations. The successful introduction of alternative fuels depends on tax rates, legislation and regulation, supply reliability, and general technical and operational competency.

From an economic perspective, further efforts are needed to reap greater benefits while curbing expenditure

levels, and significant investment is required. The costs to introduce and operate clean vehicles (hybrid in particular) are significantly higher than those for traditional vehicle types; and clean vehicles (CNG vehicles, for example) are only rarely found to justify the investment. In this context, hybrid vehicles are of particular interest, as they have great potential to reduce fossil fuel consumption and environmental emissions in the long term. In terms of cost, the retrofitting of buses to use dual-fuel was found to be a cost-effective way of extending the life of buses currently in service while, at the same time, lowering emissions.

Drivers and barriers

Strong political will to support and implement these measures is a major driver, together with a set of organisational factors aimed at smoothing the entire process. Barriers are more diverse and are concentrated especially in the planning and preparation phase, namely: technological gaps, absence of legislation, lack of political support and insufficient planning.

From the technical side, much depends on staff knowledge and experience (or lack thereof). The success of these measures essentially boils down to



Image: Pascaline Chombart

the general technical and operational competency of the people implementing them.

Up-scaling and transferability

For those applications which have proven more effective in terms of results (retrofitting and use of some specific biofuel blends), up-scaling is crucial. Apart from testing a small number of innovative vehicles, the real challenge lies in providing cities with a vehicle roll-out for the entire PT fleet. This is the best way to achieve tangible results in terms of emissions and fuel consumption savings. Political will remains the key factor in determining such decisions.

As a rule, measures regarding the modification or replacement of vehicles are transferable to other cities, especially where the PT fleet counts for a large part of city transport infrastructure and the fleet is in need of major maintenance efforts and/or replacement. There are, however, two key issues that need to be addressed in this respect. First, experience with the technology is essential, and it is therefore of particular importance to engage appropriate participants. Second, significant financial investment is needed for vehicle modification and/or replacement.

4.1.2 Alternative fuels

Results and success factors

This category covers non-vehicle-related measures, including: research studies aimed at investigating possibilities and the feasibility of using alternative fuels; measures aimed at influencing user attitudes towards alternative fuels; measures for the development of optimised techniques; and strategies for the future provision and use of alternative fuels.

The most relevant impacts of this category, however, are social. Measures developed to increase awareness of clean fuels and vehicles have contributed widely to increased sales, both public and



private, of cleaner vehicles. This has some minor, long-term economic effects, and the results confirm that these measures could have some influence on public attitudes towards alternative fuels, which in turn can stimulate the regional market for these vehicles.

Drivers and barriers

The set of barriers encountered here (lack of political interest, scarcity of financial resources, lack of transport operator involvement), while varied in nature, proved to present such significant impediments that none of the measures achieved their targets in the end.

For measures dealing with awareness-raising, the most significant barriers are technological. These are combined with financial, cultural, spatial, political and organisational obstacles, both at the preparation and implementation stages.

Political drivers (support, interest and timing) play key roles in all these measures, particularly during the implementation phase. Other drivers are related to the availability of technology and, generally, to institutional and planning aspects.

Up-scaling and transferability

It is possible in most situations to up-scale to fuels that are more environmentally sustainable. However, operating conditions, costs involved in implementation, operational and performance characteristics, fuel availability and the extent to which a fuel meets environmental objectives present certain limits. Other factors that play a role include legacy systems, training, and public or political acceptance. Cities that have achieved impressive results have already taken the initiative to assess up-scaling potential. Decisions on some measures, however, will depend on the impacts of the global economic downturn on regional economies.

On the other hand, it is not easy to transfer measures promoting alternative fuels to other cities because a number of conditions need to be met. National legislation can also hamper attempts to switch to clean fuels. The relative attractiveness of fuel alternatives depends on tax rates, legislation and regulation, supply reliability, and general technical and operational competency.

4.2 Collective passenger transport

The 52 measures that have been implemented under this category address a variety of applications and issues related to public transport. They are equally distributed between information, ticketing and tariffs and accessibility, infrastructure and network. A small number of measures are related to PT fleet management.

Table 5: Collective passenger transport

CIVITAS thematic category	Policy measures	Cities	No. of measures
Collective passenger transport	Information, ticketing and tariffs	Aalborg, Bologna, Brescia, Brighton, Brno, Coimbra, Craiova, Donostia-San Sebastian, Iasi, Ljubljana, Skopje, Tallinn, Usti Nad Labem, Utrecht, Zagreb	22
	Accessibility, infrastructure and network	Bath, Brescia, Brno, Donostia-San Sebastian, Ghent, Iasi, Ljubljana, Monza, Perugia, Szczecinek, Tallinn, Utrecht, Vitoria-Gasteiz, Zagreb	22
	PT fleet management	Craiova, Donostia-San Sebastian, Funchal, Iasi, Monza, Tallinn, Utrecht	8
Total			52

4.2.1 Information, ticketing and tariffs

Results and success factors

Cities that implemented information measures monitored their impacts on behaviour, society and economy, while measures on ticketing and tariffs have been mainly evaluated in terms of user awareness, user acceptance and transport quality.

The public responded well generally to PT information measures. Most respondents liked the information provided at PT stops and in vehicles and the two measures on which cost-benefit analysis was carried out yielded positive results.

PT users were generally accepting of and satisfied with ticketing measures - especially passengers having no previous experience with vending machines and e-ticketing systems. While, from an economic standpoint, transport ticketing usually involves substantial financial outlay, each of these measures demonstrated that the benefits outweighed the costs.

Drivers and barriers

The main barriers are technological in nature. Integration and homogenisation

of ticketing systems, hardware and software issues, and real-time data problems can hamper overall ticket integration. Another barrier presents itself when multiple operators are involved, as various co-operative arrangements between operators and authorities need to be made. The drivers are diverse, but are mainly organisational in nature. Multiple stakeholder involvement sessions and good planning of interactive stages are crucial factors for success.

Up-scaling and transferability

The up-scaling of these measures is both desirable and feasible. Most of the CIVITAS

Plus cities plan to up-scale information measures to all PT vehicles and stops. The up-scaling of integrated ticketing and use of modern technology is not only technically possible, but appreciated by users as well. The general trend is to expand territories that feature integrated ticketing.

While there is high transferability potential for these kinds of measures, the main condition for success is for ticketing systems to be integrated. This requires thorough research, co-operation between stakeholders, realistic financial planning and a reasonable time schedule.



Image: CIVITAS

4.2.2 Accessibility, infrastructure and network measures

Results and success factors

Public transport accessibility measures are principally intended for disabled and elderly people. While this target group is relatively small and the impact on overall ridership is minimal, these measures tend to be greatly appreciated. In addition, cost-benefit analysis indicates that benefits substantially outweigh costs.

Public transport infrastructure measures (modernisation, improvement or reconstruction of bus stops or stations) increase the quality of public transport service. PT users have responded with high levels of satisfaction regarding the improved quality of PT services.

Public transport network measures (new bus lines, new on-demand services, creation of intermodal nodes or corridors etc.) aim to strengthen all transport modes, and involve promotional activities as well. These measures are usually well received, and generally lead to the public adopting a favourable view of PT service quality. All the cities that have studied the impact of these measures based on the number of PT passengers or modal split show such improvements in perception. The effect of these measures on PT uptake appears to be significant (a 4 to 10 percent increase in PT use between 2009 and 2011, for example). Similar results have been recorded regarding satisfaction with PT services, with the share of satisfied PT users measured at over 70 percent). Most of the measures demonstrate valuable core improvements to the transport systems, and lead to energy savings as well.



Drivers and barriers

Public transport measures often face institutional, financial and spatial barriers, and these generally become apparent in the initial phases of implementation. No such obstacles appear during the operational phase. Extra investments and/or institutional adjustments are often required for implementation, and it is usual for political drivers to play an important role in all phases of implementation.

Up-scaling and transferability

Typically, the reorganisation and redesign of a PT network and its infrastructure can

be carried out on any scale, including demand-responsive transport systems in low-service areas during off-peak times. Most of the cities that have implemented such a measure are planning to extend the scheme to encompass the whole city. As PT infrastructure measures are usually quite costly, further up-scaling can be facilitated through the involvement and support of the relevant public authority.

The assessment of PT accessibility, infrastructure and network measures reveals that spatial adjustments are not particularly transferable, as it becomes necessary to overcome a wide range of institutional, organisational and financial hurdles.

4.2.3 Public transport fleet management

Results and success factors

These policy measures focus on the improvement of PT services in terms of quality and economic efficiency, and have only an indirect effect on PT passengers - i.e. in terms of social acceptance. The measures aim to improve PT fleet management systems, information systems and working conditions for drivers.

The results of these measures are largely positive. Indirectly, better PT services raise levels of public acceptance, provided that relevant communication and information systems are chosen that take into account the characteristics of targeted passenger groups. Transport quality indicators show improved punctuality rates of 20-25 percent, decreases in drivers' time losses (reducing operating costs by 2.5 percent), and increased accessibility of targeted

areas (as high as 30 percent in some cities). Also, PT employees appreciate their improved working conditions. The cost-benefit analysis also showed positive results.

Drivers and barriers

The most frequently mentioned barriers during the preparation period (in descending order of frequency) are: technological, institutional and organisational. Financial barriers during implementation were cited for half of the measures. During the operational phase, only technological and organisational barriers were mentioned more than once. Various cities also referred to a 'lack of political commitment, urgency and drive'.

Up-scaling and transferability

Users and stakeholders are usually quite accepting of measures relating to PT fleet management, and the usual intent is to up-scale such measures.



4.3 Demand management strategies

Four groups of policy measures have been piloted within this thematic category. Some of these relate to parking regulations and park-and-ride schemes, some are based on access management and LTZ schemes, while others are feasibility studies or test beds regarding new charging schemes or rewarding mechanisms. Cycling infrastructure enhancement measures are also included within this category.

Table 6: Demand management strategies

CIVITAS thematic category	Policy measures	Cities	No. of measures
Demand management strategies	Parking and park-and-ride	Bologna, Brescia, Donostia-San Sebastian, Funchal, Ghent, Perugia, Utrecht	10
	Regulative measure (access and LTZs)	Bologna, Brighton, Craiova, Funchal, Gent, Gorna, Iasi, Perugia, Vitoria-Gasteiz	9
	Pricing (road charging, rewarding mechanisms and R&D)	Donostia-San Sebastian, Usti Nad Labem	4
	Cycling infrastructure enhancements	Aalborg, Donostia-San Sebastian, Ghent, Iasi, Monza, Szczecinek, Usti nad Labem, Vitoria-Gasteiz	8
Total			31

4.3.1 Parking and park-and-ride

Results and success factors

Parking measures have achieved positive results by significantly redistributing parking supply and demand. This has resulted in fewer drivers seeking parking opportunities in congested areas. Time-based tariffs, meanwhile, have proven effective by reducing demand for parking in congested areas and by discouraging illegal parking.

Park-and-ride measures also show positive results. The percentage of users, and of awareness, increased after the implementation of these measures. Where applied, these measures have obtained overall positive results in terms of relieving pressures from traffic and pollutants in central areas.

Drivers and barriers

Barriers mainly occur in the preparation phase. Finding political support for potentially unpopular measures, such as parking charges, has proved to be difficult. Securing the right location for park-and-ride facilities is a frequently encountered spatial barrier. Planning barriers generally

consisted of delays, due both to higher levels of government being involved, as well as mandatory tendering procedures. In addition, cultural barriers (increased parking fees, negative past experiences with similar facilities) played quite a prominent role and were mentioned in relation to almost all of the measures.

Drivers were mentioned most frequently in relation to the preparation phase, but were also said to influence the other implementation phases. Political support and commitment, the availability of funds, and sharing objectives with stakeholders were the most frequently cited drivers.

Up-scaling and transferability

Whenever a measure proposes to introduce a payment system to change parking behaviour, considerable opposition from politicians and the general public is to be expected. What is needed for success in these cases is to obtain public support and to engage in clear dialogue with the public.

It is often difficult to find a suitable location for the delivery of new park-and-ride facilities, and this can lead to delays and planning problems.



4.3.2 Regulative measures (access and LTZs)

Results and success factors

As a rule, access restrictions and LTZs have positive effects by significantly reducing the percentage of vehicles entering a limited area. This changes driver behaviour (for the better) and increases pedestrian modal shares. Where environmental data have been measured, pollutant emissions have decreased significantly.

These measures have been successful overall. This is due not only to innovations in policy and delivery, but to new technologies. Success, however, depends a great deal upon consultation and engagement. It is crucial not to decide upon initial approval of a measure solely on the level of citizen support: public support can, in fact, increase after implementation when citizens experience the benefits. The most important conditions for success are

political support and open dialogue with the public or key target group.

Drivers and barriers

Access management and LTZ measures are often unpopular with the public, both in financial and spatial terms. As a result, political support and excellent communication with the public are powerful drivers. Accurate measurement, up-to-date technology and good-quality data are important drivers at the operational stage.

Up-scaling and transferability

With just a few exceptions, the piloted policy measures are complete in themselves and not likely to be up-scaled.

As for transferability, if a measure proposes the introduction of a payment system to enforce access limitations, there will be strong political and public opposition. Moreover, the feasibility of such a measure

depends to a large extent on local and national legal norms, such as privacy legislation regarding the use of cameras and data. European legislation must also be taken into account at this stage.

4.3.3 Pricing (road charging, rewarding mechanisms and R&D)

Results and success factors

In many CIVITAS Plus cities, especially the smaller ones, there is little or no tradition of traffic management. Thus, it has often been necessary to start with studies and reviews so that policy makers can reach reasoned decisions as to which policies and measures can best tackle such problems as increasing transport demand and related congestion, environmental damage, noise and delays. The principal conclusion to be drawn is that parking and access management studies are inherently similar throughout different cities, and that there are therefore many opportunities for sharing knowledge.



Image: Chris Sampson / Flickr.com

Drivers and barriers

Despite being a very important issue and a powerful tool, road pricing is not normally expected to command public or political support. Citizens and stakeholders must be informed and considered as 'part of the solution and not part of the problem'. It is crucial not to base approval of a measure solely on citizen support, at least not initially. Citizen support can grow after implementation once people experience the benefits of reduced congestion and pollution. On the whole, large-scale trials are preferable to small technology demonstrations.

Up-scaling and transferability

Research and development measures have strong transferability potential. However, it is worth noting that expertise in conducting research is of utmost importance, e.g. in the development and use of computer models. Involvement of the right partners with appropriate expertise is crucial. Ex-ante studies require significant effort in data gathering in order to ensure that models are able to produce sound and consistent outcomes.

4.3.4 Cycling infrastructure enhancement

Results and success factors

The aim of these policy measures is to encourage bicycle use by improving the overall quality of cycling infrastructure. In general, the provision of new cycling facilities led to an increase in the number of cyclists, improved safety and very high levels of support, even though rates varied greatly between different sites. Some of the infrastructure interventions were shown to be beneficial from a long-term economic perspective.

Due to a generally positive image of cycling, these measures have achieved high levels of success.

Drivers and barriers

The enhancement of cycling infrastructure is hampered by several barriers, and at various stages. Cultural aspects present the greatest difficulties during the preparation phase. First, there is a perceived lack of safety associated with cycling; second, cycling is often viewed as solely a leisure activity and not taken seriously as a means of transport. Financial and planning barriers are highest during the implementation stage, while cultural factors are more influential at the operational phase.

Considering the above, it is not surprising that political and cultural drivers are most frequently mentioned in the preparation phase. Stable political support, resulting in tailor-made legislation and combined with very early workshops, encourages potential stakeholder involvement and contributes to the generation of new ideas.

Up-scaling and transferability

The wider improvement and provision of cycle and pedestrian infrastructure has been deemed a feasible component of future city-wide transport policies in most cities that have implemented such measures. Such measures will bring

greater benefits to active travellers by way of well-connected networks, a safe cycling environment and improved security.

In general, measures aimed at creating or improving existing cycling infrastructure are suitably transferable to other cities. However, three aspects must be taken into account:

- **City topography:** Hilly terrain will require extra investment, e.g. synergies with vertical transport might be necessary. Gain detailed insight beforehand into costs and feasibility to avoid any unpleasant surprises.
- **Support levels:** Political leadership is vital in places that lack public and legislative support for cycling and pedestrian infrastructure. It is also needed in order to approve extra investments and to ensure meaningful stakeholder involvement.
- **Multimodal possibilities:** It is helpful if cycling and walking are embedded in the mobility system and are seen as part of a multimodal system. This does not mean that a whole network has to be created at once (little steps are always helpful), but a multimodal perspective should always be borne in mind.



Image: CIVITAS

4.4 Mobility management

Mobility management measures continue to be a growing area in planning for sustainable transport in cities, with 69 measures in total having been implemented during CIVITAS Plus. These can be classified into four groups: mobility services, mobility plans, mobility marketing and eco-driving.

Table 7: Mobility management

CIVITAS thematic category	Policy measures	Cities	No. of measures
Mobility Management	Mobility services	Aalborg, Bath, Brighton & Hove, Iasi, Monza, Ustinad Labem, Ljubljana, Brno, Porto, Ghent, Funchal, Gdansk, Tallinn, Utrecht, Vitoria-Gasteiz	25
	Mobility plans	Aalborg, Brighton & Hove, Donostia-San Sebastian, Iasi, Monza, Ljubljana, Ghent, Ljubljana, Zagreb, Porto, Bologna, Coimbra, Craiova, Gorna Oryahovitsa, Perugia, Szczecinek	23
	Mobility marketing	Iasi, Ghent, Ljubljana, Zagreb, Brno, Bologna, Gdansk, Tallinn, Brescia, Coimbra, Brescia, Perugia	15
	Eco-driving	Vitoria-Gasteiz, Tallinn	6
Total			69

4.4.1 Mobility services

Results and success factors

Mobility services are aimed at encouraging travel by public transport through ICTs. This involves real-time passenger information (RTPI) communicated through mobile phones or at bus stops, personalised traffic information, improved traveller information, and traffic information provided on websites or through SMS and email messaging.

The major effects are those related to transport systems, i.e. increases in PT users and society (as measured by levels of acceptance and appreciation). Overall, the 25 mobility services measures were found to have achieved substantial increases in awareness of sustainable transport issues and in associated behavioural changes.

Drivers and barriers

Barriers encountered during the implementation phase of mobility services were institutional (hierarchical structures and time-consuming procedures), technological (websites and software functionality, lack of extensive technology adaptation, Wi-Fi supply, etc.) and organisational.

While political barriers were rarely mentioned, political support was perceived as a driver at all stages. Organisational factors at the latter stage are important drivers, such as local government provision of extra funding, cooperation between various measure partners, etc.

Up-scaling and transferability

Some cities feel that up-scaling is not applicable. Other cities in favour of up-scaling are planning to extend measures to other types of users or add new features. In some cases, up-scaling has been postponed due to the current economic situation.

In theory, mobility services can be established and transferred everywhere, but this is not always easy because of the need for investment (not only financial, but also in terms of personnel, time, awareness raising and technology). In such cases, there is great need for political and stakeholder support.



4.4.2 Mobility plans

Results and success factors

Mobility planning activities can trigger the development of new organisational entities and arrangements, such as mobility work groups or mobility centres. Mobility plans tend to be implemented in four different ways:

- Company or organisational travel plans to **influence commuters**;
- School or work travel plans to **influence students and workers**;
- Personalised **travel planning for individuals**; and
- City-wide mobility plans with the objective of identifying and implementing strategies to **shift travel behaviour** towards more sustainable modes.

A general shift towards sustainable modes of travel does appear to be taking place. Workers are using cars less than before, but this could potentially be a result of the recession. A number of projects found that drivers and passengers are often reluctant to change their behaviour due to social factors, such as independence, social status or transport behaviour; however, they may be willing to adopt more eco-friendly attitudes, e.g. car sharing or switching to less-polluting vehicles.

Some of the key conditions for success are the inclusion of key stakeholders, reaching a common understanding of the need to solve traffic and environmental problems, and a well-planned implementation process. Measures should also be built into a city's planning strategy, and funds should be spent wisely and efficiently.

Drivers and barriers

Mobility plans and their implementation are hampered by political, financial and involvement-related barriers. Involvement is the most dominant barrier at the implementation and operational stages. Success, on the other hand, is based on a bundle of drivers, which reflects both the complexity of these measures and

positive synergies among different factors. Organisational drivers are mentioned less frequently with regard to the later measuring stages, while political barriers, e.g. lack of previous local decision-maker consultation for political approval, lack of matching visions between politicians and technicians regarding the sustainable development agenda are mentioned more frequently.

Up-scaling and transferability

Some cities believe that travel plans need to be tailored to specific local circumstances and cannot be up-scaled in general terms. Nonetheless, the general

experience gained in the undertaking has proven useful. Other cities broadly agree that travel plans are replicable for any trip-generator centres, i.e. not just for educational and business establishments, but also for shopping centres and hospitals.

It should be recognised that transport plans should not focus solely on switching from cars to other modes. An equally valid objective is to get drivers to change to less-polluting vehicles, such as hybrid cars.

To a large extent, these measures can be transferred easily to other cities.



4.4.3 Mobility marketing

Results and success factors

The objectives of mobility marketing are to encourage a shift towards more environmentally friendly modes (cycling in particular), improve air quality, reduce pollution and promote new travel ideas or projects.

Fifteen marketing campaigns have been implemented, often in collaboration with a marketing company and/or local PT company. The measures specifically target the general public, key groups or individual travellers. The schemes involve the coordination of promotional activities and information campaigns to increase awareness, stress the environmental benefits of sustainable and collective modes of transport, and discourage the use of cars — especially single-occupancy vehicles.

In general, these objectives have been met. The data on modal shift and user perceptions are positive, but car abandonment remains an unattainable step in some contexts.

Drivers and barriers

The main barriers to mobility marketing at the preparation stage are institutional, organisational, cultural and involvement-related. The latter is the most frequently mentioned at the implementation stage.

On the other hand, there is a stable pattern of drivers, with involvement and organisational drivers influencing all the stages. At the operational stage, a well-established involvement of stakeholders was regarded as a driver for almost half of the measures. At the implementation stage, political support was mentioned as a driver for about a quarter of the measures.

Up-scaling and transferability

As with mobility plans, these measures can be easily transferred to other cities. It is important to note that awareness

campaigns, target group approaches and involvement of actors, amongst others, are closely linked to marketing and require appropriate expertise. Also, the provision of information must be simple and easy to understand.

4.4.4 Eco-driving

Results and success factors

The objective of eco-driving is to reduce average speed levels and minimise acceleration and deceleration, thereby reducing fuel consumption, polluting emissions, noise and costs — not only of fuel, but also in terms of reduced maintenance and fewer accidents. On the environmental side, eco-driving training was found to be effective in reducing fuel consumption in the short term, although longer-term analyses indicate that the impact is reduced over time. A follow-up study should be conducted to see how long skills persist amongst trained drivers and whether they continue to be used.

Six projects, targeting both fleet drivers and citizens, have promoted more responsible and efficient driving. This, in certain circumstances, can be more effective than trying to induce a modal shift.

Fuel saving and speed reduction are the two targets achieved by these measures, with accident numbers and noise levels decreasing as a consequence. In both cases, cost-benefit analyses show that the measure is effective, both socio-economically and financially.

Drivers and barriers

Culture and communication-related problems combine to form the main barrier for eco-driving programmes. Course attendance is low, but as far drivers are concerned, well-established training programmes, equipment and communication are proven success factors.

Up-scaling and transferability

Eco-driving, if it is to be transferred to other cities, requires strong support at a strategic level, either within companies and/or municipalities. Front-runners are needed and the car drivers involved require full technical support.

Options for up-scaling might include training courses for electric vehicles, which would provide comparative evidence against standard cars.



Image: CIVITAS

4.5 Safety and security

This thematic category cuts across all eight CIVITAS themes, as safety and security are closely related to all modes of transport. However, from a sustainability perspective, PT and soft modes (cycling and walking) are the main fields of intervention. The true aim is to improve the safety and security of these eco-friendly modes in order to attract more users, while progressively reducing car dependency.

Thirteen measures have been implemented to provide safer environments for pedestrians and cyclists; others concern security for passengers at stations and in vehicles, and the remaining measures deal with traffic management.

Table 8: Safety and security

CIVITAS thematic category	Policy measures	Cities	No. of measures
Safety and security	Pedestrian and cyclists	Aalborg, Bath, Brighton & Hove, Brescia, Ghent, Ljubljana, Szczecinek, Tallinn, Vitoria-Gasteiz, Zagreb	13
	Public transport	Ghent, Ljubljana, Zagreb, Gdansk, Craiova	7
	Traffic management	Aalborg, Brighton & Hove, Donostia-San Sebastian, Usti nad Labem, Ljubljana, Bologna, Utrecht, Coimbra, Perugia	13
Total			33

4.5.1 Pedestrians and cyclists

Results and success factors

Safety improvement measures are generally targeted at pedestrians and cyclists, but also encourage active journeys. Proper use of traffic signals, signage and street furniture can prevent potential pedestrian accidents and promote safer driving behaviour. Soft interventions not requiring infrastructure construction can be quite effective in encouraging modal changes. However, the most effective way to reduce accidents in a given area is to carry out a safety campaign.

Drivers and barriers

Several barriers at various stages of activity hamper efforts to improve safety for pedestrians and cyclists. Financial obstacles were mentioned in about the half of the measures during the preparation stage; institutional and organisational barriers emerged during the implementation stage; and a wide range of barriers were encountered during the operational stage, although technological barriers seemed to be more important than the others. Political and organisational drivers were mentioned

most frequently as being conducive to reaching the goals of these measures.

Up-scaling and transferability

Cycling and walking measures can be up-scaled. Also, similar cycling campaigns can be conducted in all schools in the city, new public space designs can be applied at several junctions throughout the city, new LED lighting systems can be rolled out citywide, and innovative cycling priority measures can be extended to other areas. Other innovative solutions

aimed at improving pedestrian and cyclist safety at crossings show potential for further implementation.

Easily transferable measures for safety improvement aimed at increasing awareness include educational programmes in schools, safety workshops, and a cyclists' platform for exchanging experiences. While it seems fair to assume that no one objects on principle to improving the safety of pedestrians and cyclists, efforts to assign public space for purposes often do provoke controversy.



Image: Yoav Lerman / Flickr.com

4.5.2 Public transport

Results and success factors

Measures in this category concern security improvements for PT passengers at stations and stops and in vehicles (e.g. video surveillance systems), and information campaigns focusing on safety. Different target groups are addressed: cyclists, youngsters, the elderly, and people with disabilities or limited mobility.

On the whole, these measures have a high level of success. They do, however, require cooperation between authorities and operators. Often legislative changes are also needed in order to address the issues of protection of privacy and personal data. It has been observed that surveillance systems have not resulted in radically reducing costs arising from vandalism.

Drivers and barriers

The main obstacles for measures to improve public transport safety and security are mainly institutional and financial barriers, especially during the preparation and implementation phases. Technological barriers typically occur during the operational phase. The use of camera technology frequently entails legal issues.

The organisational driver is most influential on the progress of these measures, followed by that of involvement. Safety measures often target specific groups, such as schoolchildren, the elderly, people with disabilities, etc. Failure to identify the right target group, or to target a group poorly, presents a significant barrier to success.

Up-scaling and transferability

PT safety and security measures can be up-scaled quite easily. Regarding transferability, many PT security measures rely on camera technology and are theoretically transferable; however, their transferability potential depends to a



large extent on local and national laws, such as privacy legislation regarding the use of cameras and data.

4.5.3 Traffic management

Results and success factors

This wide range of safety measures includes speed reductions, educational campaigns, safety-related services for residents, training to improve driving skills, and infrastructural evaluations.

Other than the development of a 'safe district', the most effective way to reduce accidents in a given area is to carry out a safety campaign. The installation of monitoring systems at pedestrian crossings close to schools is another effective way of reducing traffic accidents. Furthermore, functional transport infrastructure and good road markings play an important role in improving pedestrian safety (especially of schoolchildren), as does effective traffic regulation.

Drivers and barriers

Technological, planning, positional and other barriers were not very significant during the preparation stages, but political and institutional barriers emerged in one-third of all measures. The number of obstacles fell mainly to two during the implementation stage - namely, organisational and involvement

barriers. The operational stage revealed a significant increase in cultural barriers.

Political aspects were mentioned most frequently as a driver. In some cases the enthusiastic approach of institutional parties and stakeholders resulted in successful implementation. Organisational aspects were mentioned most often as a driver at the operational stage.

Up-scaling and transferability

In theory, measures concerning the improvement and proper maintenance of existing provisions like traffic signals and zebra crossings can be transferred with relative ease. In practice, however, funding for maintenance plans is needed, and city departments and/or the private sector have to take several strategic decisions.

Safety measures targeted at road users usually address specific groups, such as schoolchildren, the elderly and the disabled. These measures have strong transferability potential, provided that the right groups are targeted in the right way. Nonetheless, there is always the potential for strong opposition to measures aimed at speed restrictions. Thus, citizen involvement, the use of 'local champions' and education on the dangers of high speed are all very important. Driving and safety courses have strong transferability potential, although they need to be very target-group-specific.

4.6 Car-independent lifestyles

The provision of alternatives to car ownership is an essential component of any comprehensive strategy for transport in and around European cities. Among these, car-sharing and carpooling are the two groups of policy measures considered. Parallel to this, bike-sharing schemes are emerging in urban areas as a valid alternative for the promotion of this behavioural shift. These measures aim to attract not only more people to cycling but also to public transport, as enhanced cycling options improve overall inter-modality.

Table 9: Car-independent lifestyles

CIVITAS thematic category	Policy measures	Cities	No. of measures
Car-independent lifestyles	Car-sharing	Aalborg, Bath, Bologna, Brescia, Coimbra, Donostia-San Sebastián, Gent, Monza, Perugia, Utrecht	11
	Carpooling	Craiova, Perugia	2
	Cycling services (bike-sharing, integration cycles and buses)	Aalborg, Bath, Donostia-San Sebastian, Funchal, Szczecinek, Utrecht	8
Total			21

4.6.1 Car-sharing

Results and success factors

Schemes to establish or promote car-sharing are generally partly new and partly upgrades/re-marketing of existing car-sharing schemes.

The core objective of establishing/assessing and expanding/promoting a car-sharing service was fully or partly achieved in every scheme conducted during CIVITAS Plus. These measures produced added value in helping to raise general awareness of the importance of sustainable transport.

The outcomes of these schemes suggest that new car-sharing schemes can be successfully implemented to reduce private car use and deliver other economic and environmental benefits. Successful car-sharing schemes require changes in attitude towards mobility and car ownership. Opposing traits are so deeply rooted in some areas, however, and can be very difficult to overcome. It requires a huge effort to get citizens to change their daily routine, not only in terms of planning of trips, but also in terms of organising family schedules. As such, pervasive awareness and marketing campaigns are essential if such measures are to stand any chance of success. The other main element

deemed relevant for success is to target users in specific ways by first identifying their habits, needs and preferences.

Another specific action was highlighted as a prerequisite for a successful car-sharing scheme: stakeholder engagement and support in all political, legal and financial aspects.

Drivers and barriers

Driving factors during the implementation of these measures included high congestion levels, parking costs, shortage of parking spaces and high costs of owning a car. But even if these particular conditions are not present, positive results are equally achievable by

pulling other levers, such as introducing financial incentives and offering free use of services on a trial basis.

Up-scaling and transferability

A paradigm shift is needed to make a move away from car use and car ownership to alternative mobility services. Such a shift involves not only changing people's minds, but changing legislation and forms of social organisation. In theory, this type of measure is transferable to other cities, as every city likes to come up with new ideas and new programmes. But a number of important conditions need to be taken into account if these ideas and programmes are to be put in motion.



Image: CIVITAS

4.6.2 Carpooling

Results and success factors

Carpooling measures encountered more problems during the implementation phase than the other measures, which is quite remarkable. Despite the fact that there were institutional, organisational and financial barriers along the way, both measures were implemented successfully.

Drivers and barriers

Carpooling software technology proved to be a driver at the implementation stage, together with the involvement of key stakeholders, i.e. the municipality and the company in charge of running the carpooling service.

Up-scaling and transferability

The success of the two carpooling schemes suggests that there is further interest in expanding these services to other locations, e.g. companies or universities where the availability of on-site parking is limited or needs to be reduced. Other areas that are interesting are those that are not conducive to walking and cycling and/or where access to public transport is limited.

Carpooling measures are transferable to other cities. The key success factor is to recognise target-group demand for the service.

4.6.3 Cycling services (bike-sharing, integration cycles and buses)

Results and success factors

Bicycle rental points are a highly visible, low-cost means to encourage more citizens to take up cycling, while at the same time helping to promote the city's 'green' image. Users of rental cycle tended to show high levels of acceptance and satisfaction with the provided services. Also, bike racks, decorated buses and targeted information campaigns grabbed

people's attention and were an integral part of the measures' success.

Drivers and barriers

Political and institutional barriers were encountered during the preparation stage, institutional barriers became less important during the implementation and operational phases, and political barriers were not encountered at all during the implementation and operational stages. Organisational barriers were most common during the implementation phase, but technological and involvement barriers were significant as well. Organisational barriers were no longer mentioned during the operational stage, but cultural barriers were encountered frequently.

Involvement was seen as a driver in one-third of the measures at the preparation stage. At the implementation stage, involvement played a much smaller role, but at the operational stage it was again

regarded as a relevant driver. Political drivers were deemed less important, and were not amongst the three most mentioned at the implementation stage.

Up-scaling and transferability

All of these policy measures have up-scaling potential: new target groups can be addressed and more cycles and stations can be installed.

In theory, measures to set up bike-rental schemes can be transferred to every city. In practice, however, this is not so easy because of the number of conditions that have to be met: it has to be safe to cycle, there have to be enough rental sites, there should be a variety of bikes (for men, women, children, sport etc.), the bikes have to be well maintained, and the payment system must be simple and easy to understand. All of this requires substantial investments of time, money, space and organisational commitment. A thorough feasibility study is therefore necessary.



4.7 Urban freight logistics

More than twenty measures have been introduced in various cities to improve sustainable freight delivery. These measures can be grouped into three main categories: new distribution schemes, access restrictions and control, and freight partnership schemes and driver support.

Table 10: Urban freight logistics

CIVITAS thematic category	Policy measures	Cities	No. of measures
Urban freight logistics	New distribution schemes	Bath, Bologna, Donostia-San Sebastian, Ljubljana, Perugia, Utrecht, Vitoria-Gasteiz	11
	Access restrictions and control	Aalborg, Bath, Brescia, Brighton & Hove, Craiova, Gent, Zagreb	7
	Freight partnership schemes and driver support	Iasi, Tallinn, Utrecht	3
Total			21

4.7.1 New distribution schemes

Results and success factors

Eight of the eleven measures focused on the concepts of bundling or consolidating deliveries, e.g. consolidation centres, merchandise pick-up points, central buffer zones, virtual logistics platforms, proximity areas. The other measures promoted the development and utilisation of cleaner vehicles for freight distribution.

An analysis of data supplied by logistics providers showed that using more energy-efficient freight distribution methods, including the use of electric vehicles, resulted in reduced fuel consumption by half and predicted reductions in emissions of pollutants. Even the purely environmental methodologies do not take into account other potential benefits. For instance, back-loading recycling on the return leg of journeys reduces the number of waste collection trips. While reduced freight movements were observed, no measure reported any actual savings in delivery time.

The schemes were well received in general, and in some instances both by stakeholders and residents. In other cases, public support waned during the implementation phase, which could indicate that the public does not perceive

freight delivery transport as much of a problem.

Costs, especially for clean vehicles, are likely to be too high to attract private investment, making these measures viable only for public ownership. Operational costs could be optimised by subcontracting operations to established logistics providers that already have suitably located depots and/or fleets of clean vehicles.

Drivers and barriers

Measures encouraging the implementation of new freight operating modes or distribution schemes were hampered by several barriers at various stages. Lack of stakeholder involvement was identified as the main barrier during the preparation stage, followed by organisational and political barriers. At the implementation and operational stages, organisational barriers were deemed the most influential. The same conclusions were drawn with regard to drivers: involvement, good organisation and different kinds of political support were identified as important for half of the measures.

Up-scaling and transferability

New distribution schemes have good up-scaling potential, and in general there

are always possibilities for other cities to develop new distribution schemes. However, local constraints in the urban structure can have negative impacts.

Regardless of the level of implementation, these measures have provided valuable insights into the importance of planning, communication, research, testing and, especially, meaningful collaboration between stakeholders. The results and experiences from these projects can provide valuable guidance for future logistics and freight distribution schemes.

The bundling concepts used in distribution models can be adapted for non-traditional goods, which might include construction materials, fresh goods and perishable goods. However, further piloting is required to evaluate potential demand and benefits. Integration with pre-existing services could be beneficial. An analysis of success factors highlights the fact that cities should seize the opportunity to combine measures and maximise benefits.

4.7.2 Access restriction and control

Results and success factors

Changing the patterns of freight activity and reducing levels of through-traffic into city centres involve different solutions, the main ones being either to physically alter



Image: CIVITAS

the road network by reconfiguring streets and access, or by creating pedestrian zones. Other options include blocking access permanently (if the access points are not shared by PT) or regulating a zone through the installation of bollards. Delivery corridors or loading bays can be placed at the rim of pedestrian zones and accessed through secondary streets with lower traffic loads. Introducing speed limits can assist with calming traffic flow.

Access restrictions need to be regulated in order to maximise their impact and enforced to ensure that freight operators and drivers modify their behaviour. Regulating freight access in restricted areas based on vehicle emission standards or weight can, in fact, encourage freight operators to reconfigure their fleets in order to optimise access and meet customer demands. Vehicles can be granted different access rights into a pedestrian zone, and permits can be issued based on determined usage categories.

The actual and predicted impacts on transport were well documented, and it is evident that the restrictive measures

reviewed contributed to localised reductions in traffic flow. Only three of the measures reported environmental impacts, with slight improvements in local air quality and CO₂ reduction.

Surveys of local businesses indicated that there was a slight jump in acceptance levels following changes to the traffic network. On the other hand, commercial operators in many cities complained that perceived negative impacts associated with the measures would reduce their overall effectiveness. Lack of acceptance and concern associated with vehicle access restrictions impacted the development of two schemes.

Drivers and barriers

Stakeholder involvement during the implementation phase was mentioned as the main barrier, leading us to conclude that a high instance of cited involvement barriers will often coincide with a relatively high score in terms of problem-related barriers.

As the implementation of measures involving access restrictions is funded on

the basis of political decisions taken by the local administration, it is obvious that political support is absolutely necessary. Political context is the most frequently mentioned driver at the preparation stage, together with organisational aspects, e.g. frequent and well-organised meetings.

Up-scaling and transferability

Access restrictions of freight vehicles have no significant up-scaling potential, as restrictions are usually applied to entire LTZs. Any further future up-scaling might focus on extending the area of managed deliveries beyond city boundaries; this might also entail the promotion and image improvement of clean vehicles in urban freight fleets through more restrictive environmental regulations.

With regard to transferability, political support is vital for the implementation of this type of measure. In addition, time-window restrictions and zoning often play a role, as do access charges and vehicle standards.

4.7.3 Freight partnership schemes and driver support

Results and success factors

One scheme under this heading attempted to initiate new logistic partnerships in conjunction with hard measures; others were concerned with the development of technologies as part of city-wide re-routing strategies to support vehicle and drivers.

The provision of incentives (i.e. tax exemptions or additional parking spaces) to improve freight operations can encourage stakeholders to sign Freight Quality Partnerships⁵ aimed at helping to make the measure more successful.

Although it can be argued that the development of in-vehicle and roadside support technologies for freight drivers and vehicles could contribute to city-wide re-routing strategies, new innovative technologies (including real-time data) take a long time to be developed. Moreover, there are no guarantees that drivers will use them.

The associated set-up costs were not quantified, although it was suggested that the development of navigational software and storage of GPS files on a server might be relatively inexpensive in comparison with signage installation. A freight partnership measure could have an economic impact on companies performing supply and distribution activities.

The social impacts of freight partnerships were identified from a survey of stakeholders, including drivers, freight operators and shopkeepers. The survey

showed growing levels of acceptance after the measures were implemented. Vehicle and driver-support measures showed that, overall, drivers are aware of the possibilities of new navigation systems: thus lack of awareness was not a key factor in relation to the number of downloads. However, results highlighted the complexity of implementing navigational tools and the unpredictability associated with personal preferences.

Drivers and barriers

The most relevant barrier for the organisation of freight distribution schemes was insufficient partnership arrangements, which made it difficult to develop strategies to improve goods distribution throughout the city before and during implementation of the measure. Location drivers were cited as being the most influential, particularly at the preparation stage. An important driver

for vehicle and driver-support measures, in all implementation phases, is good planning. Technology is also a relevant driver for these measures because it is important to have access to real-time data available and solid IT support.

Up-scaling and transferability

Any up-scaling of measures would focus primarily on maximising the engagement and commitment of stakeholders to signing a Freight Quality Partnership, either city-wide or within other designated corridors.

There is good potential for transferability, but there are a number of factors involved. These can be addressed by way of improved communication via websites, workshops, posters, the media, etc. Measures aimed at driver support are transferable, but it is important to have access to real-time data and solid IT support.



Image: CIVITAS

⁵ Freight Quality Partnerships aim to bring together public and private sector parties involved in freight transport and logistics to discuss problems, identify and implement solutions with the intention of improving the sustainability of freight transport activities in an economic, social and environmental sense (Allen, 2010).

4.8 Transport telematics

A variety of policy measures are combined under this thematic category. Despite their different targets and objectives, they are all heavily reliant on technology. The measures can be sub-divided into three groups: traffic management and control, including signal-control systems to optimise traffic flow and the implementation of RTPI services; PT management, including development of priority lanes for PT, design of priority signals for PT at intersections, and implementation of passenger information systems for PT; and parking guidance systems.

Table 11: Transport telematics

CIVITAS thematic category	Policy measures	Cities	No. of measures
Transport telematics	Traffic management and control	Aalborg, Bath, Bologna, Brescia, Coimbra, Funchal, Gdansk, Monza, Perugia, Skopje, Szczecinek, Tallinn, Usti nad Labem, Utrecht, Vitoria-Gasteiz	20
	PT fleet management	Craiova, Iasi, Ljubljana, Monza	5
	Parking guidance systems	Aalborg, Bologna, Donostia-San Sebastian, Monza, Utrecht	6
Total			31

4.8.1 Traffic management and control

Results and success factors

Traffic management and control plays an essential role in urban transport systems. Its purpose is to maximise road network potential to meet current and future mobility needs in cities. These policy measures consist of the installation of traffic-monitoring devices and the implementation of traffic-control systems to interconnect those devices in order to optimise traffic flows and conditions.

A wide range of impacts result from traffic management and control measures, and positive results have been generally achieved for almost all measures. Most of the traffic management and control measures were designed to improve traffic operations and transport services. These measures have effectively improved transport performance by reducing travel time, accidents and fuel consumption. The provision of priority lanes for PT vehicles was effective in reducing journey times and improving service reliability.

The success rate of these measures is very satisfactory. In all cases, the measures were focused on specific items of traffic

information and control services, such as traffic surveillance, traffic-light control, PT priority or public safety awareness. Evaluation shows that a comprehensive traffic management and control system could be developed if these measures were combined, and that integrated implementation of these measures remains a valid option.

Drivers and barriers

At the preparation stage, technological aspects were cited as a major problem. One example of this includes, e.g. the Galileo satellite navigation system was not available, and GPS/GPRS needed to be

implemented using standard technology. Political and financial barriers, as well as the complexity of the problem itself, were also mentioned as important barriers. The implementation phase showed that barriers related to technological aspects were still present in about half of the measures. Organisational and technological barriers also affected the operational phase.

During the preparation stage, political aspects were the drivers cited most frequently. At the operational stage, important drivers mainly related to organisational aspects and, to a lesser extent, technological aspects.



Up-scaling and transferability

Up-scaling for traffic monitoring and control measures, particularly regarding extensions in area coverage, are possible for measures that have been applied only at limited locations.

This kind of measure has potential for transferability, but this depends to a large extent on local and national circumstances. First, there are legal aspects, such as privacy legislation regarding the use of cameras and data, and European legislation has to be taken into account. Second, it is important that technical applications function properly, and that experienced companies are involved in related work.



Image: Max Lerouge

4.8.2 PT fleet management

Results and success factors

Measures under this heading involve the development of priority lanes for public transportation and the design of priority signals for public transportation at intersections.

PT priority measures generally improved the efficiency of a given transportation system. Moreover, PT has proved to be more effective when information is provided to travellers. The use of information technology in transport monitoring and control, such as adaptive traffic light control for PT priority or dynamic traffic information displays, is proving effective.

Average vehicle speeds varied quite a bit depending on different contexts. The evaluation results show that the establishment of a traffic monitoring control centre is effective in improving service reliability of public transport, while the sole application of a vehicle tracking system is less effective by comparison. These measures had generally positive effects on transport efficiency in terms of fuel consumption reduction, transport safety and social awareness.

Drivers and barriers

The number and frequency of drivers and barriers fell as measures progressed from the preparation stage to the implementation and operational stages. At the preparation stage, a spatial barrier

was mentioned for two of the five measures. Both measures, which were moderately successful, encountered difficulties in fitting priority lanes for public transport. At the implementation stage, technological barriers were the most common, such as traffic-light synchronisation to create 'green intervals' for PT buses. At the operational stage, three of the five measures faced barriers related to technical difficulties, which led to a shortening of the operational period.

Organisational drivers and deep political commitment from the municipality to the improvement of traffic conditions in general, and public transport in particular, were mentioned for some measures at the preparation stage. At the implementation stage, involvement and political aspects were mentioned, while just a few drivers, i.e. political, institutional and technological, were mentioned during the operational stage.

Up-scaling and transferability

Up-scaling of PT priority measures may be considered, and indeed looks promising. However, specific traffic conditions and infrastructure in proposed extension areas, together with other contextual factors, demand careful consideration. The transferability potential of these measures is limited whenever cities



Image: CIVITAS

lack space, or if institutional barriers or planning regulations prevent the creation of such space. By contrast, the transferability potential is larger when technical solutions are involved, such as traffic-light synchronisation. However, as mentioned earlier, the quality of the technical applications involved plays an important role, and the involvement of experienced companies is essential.

4.8.3 Parking guidance systems

Results and success factors

Significant results have been achieved by decreasing the number of vehicles entering inner city centre areas and shortening vehicle queues searching for parking. In some contexts, despite low numbers of car-park occupancy, public awareness is satisfactory. The few relevant calculations that have been conducted on environmental aspects show remarkable reductions in CO₂ emissions.

Drivers and barriers

Cities faced a variety of barriers. Among these were the need for external expertise (due to the complexity of innovative parking systems), tendering procedures requiring contact with an external party, and other delays. During the operational phase, barriers were also related to financial issues, as extra actions were needed to link parking owners within the same scheme.

During the preparation phase, political drivers were cited for four measures, such as the political will to study and investigate sustainable mobility issues, or a strong commitment to developing a 'progressive' city.

Technological drivers were observed during the preparation phase, while for some measures the same drivers were also present during the implementation and operational phases. Other cities, by contrast, experienced different drivers, such as those relating to planning and stakeholder involvement.



Image: Horia Varlan / Flickr.com

Up-scaling and transferability

Most of these measures are complete in themselves and not likely to be up-scaled. The only exceptions are some measures that, due to high parking pressures in adjacent zones to the centre, have led to plans to create additional zones to discourage long-term parking.

These measures have reasonable transferability potential, but they present a wide range of barriers very specific to local circumstances. Nonetheless, political support and technology are power drivers that present clear prospects for transferability.



Image: Ingy the Wingy / Flickr.com

5. RECOMMENDATIONS FOR SUSTAINABLE URBAN MOBILITY

With CIVITAS Plus now complete, and the experiences of two previous phases of the CIVITAS Initiative also available, a number of recommendations for the promotion of sustainable mobility in Europe emerge.

5.1 CIVITAS Plus policy measures: main dimensions

Drawing on the conclusions arrived at in the previous chapter, the potential of policy measures in achieving more sustainable mobility emerges. Four major fields of analysis are of particular importance with regard to the implementation of public policies, namely:

- the extent of the contribution that the thematic policy measures can make towards achieving the objectives of environmental, social and economic sustainability;
- the timeframe during which the measures generate their impacts;
- the territorial scale (local, urban or metropolitan) on which the most significant impacts are most likely to occur; and
- the principal stakeholders that need to be involved in the policy measures.

5.1.1 Sustainability

The notion of sustainability in its environmental, social and economic components (according to the definition agreed in 1987 by the Brundtland Commission) can be used not only as a benchmark against which to measure the contribution that the CIVITAS Initiative has made to the promotion of a higher



Image: CIVITAS

degree of sustainability in urban mobility, but it also acts as the core principle that has guided the implementation of single policy measures that, as part of a broader and complex implementation process, have collectively led to more sustainable urban mobility.

The three dimensions of sustainability (environment, society and economy) have been fully embedded into the policy measures that were implemented under the CIVITAS Plus edition, and have respectively been linked to the following overarching objectives:

- improving air quality, reducing oil consumption and GHG emissions, and increasing the liveability of urban environments (environmental dimension);
- raising citizen and stakeholder acceptance of the implemented policy measures (social dimension); and
- improving the capacity of public authorities to control management and investment costs of the implemented measures (economic dimension).

A comprehensive and comparative overview of the impacts produced by the CIVITAS Plus policy measures for each dimension of sustainability is shown in the table below.

Table 12: CIVITAS Plus policy measure impacts on sustainability

CIVITAS thematic category	Policy measures	Impact on sustainability		
		Environment	Society	Economy
Fuel alternatives and clean-fuel vehicles	Vehicle modification or replacement	●	●	●
	Alternative fuels	●	●	●
Collective passenger transport	Information, ticketing and tariffs	●	●	●
	Accessibility, infrastructure and network	●	●	●
	PT fleet management	●	●	●
Demand management strategies	Parking and park-and-ride	●	●	●
	Regulative measures (access and LTZs)	●	●	●
	Pricing (road charging, rewarding mechanisms and R&D)	●	●	●
	Cycling infrastructure enhancements	●	●	●
Mobility management	Mobility services	●	●	●
	Mobility plans	●	●	●
	Mobility marketing	●	●	●
	Eco-driving	●	●	●
Safety and security	Pedestrians and cyclists	●	●	●
	Public transport	●	●	●
	Traffic management	●	●	●
Car-independent lifestyles	Car-sharing	●	●	●
	Carpooling	●	●	●
	Cycling services (bike-sharing, integration cycles and buses)	●	●	●
City logistics	New distribution schemes	●	●	●
	Access restrictions and control	●	●	●
	Freight partnership schemes and driver support	●	●	●
Transport telematics	Traffic management and control	●	●	●
	PT fleet management	●	●	●
	Parking guidance systems	●	●	●

Key: ● Positive ● Negative ● Neutral

Environment

As illustrated above, the environment is a dimension where all policy measures implemented have yielded positive results. This applies, for example, to clean vehicles whose increased deployment, combined with greater use of alternative fuels, has resulted in significant reductions in pollutant emissions. Having said this, further steps to make these clean technologies more profitable still need to be taken.

Policy measures targeting collective passenger transport have also resulted in significant environmental improvements, while other important gains in this domain have been attained through the implementation of demand management strategies, such as park-and-ride, LTZs and access restrictions.

Further environmental advances have been achieved through policy measures that have encouraged cycling as a modal choice, either by improving cycling infrastructure or increasing the availability of bike-sharing systems and their integration with collective passenger transport.

Logistics and freight distribution and transport telematics are further groups of policy measures that have shown significant eco-friendly potential. In most cases, the impact of these measures has been small, though up-scaling might help to maximise their potential benefits.

The assessment of environmental indicators has proved to be problematic only when evaluating the impact of those measures aimed at changing travel behaviour, such as mobility management measures (mobility plans, mobility services etc.) and car-independent lifestyle measures (car-sharing and carpooling).

Social

Concerning the social dimension, it is important to further consider and pursue the factor of public acceptance. Looking

at the CIVITAS Plus experience, and considering that behavioural changes take time to happen — and only work if they are adequately backed by awareness and acceptance — this component has produced satisfactory and convincing results. Citizens living in CIVITAS Plus cities have indeed demonstrated a positive attitude towards innovations in urban mobility, which has in turn facilitated an easier shift in favour of more sustainable travel behaviour. Nevertheless, some policy measures still require additional efforts in terms of marketing and dissemination in order to effectively and pervasively raise the level of public acceptance of any proposed interventions.

Economy

Lastly, results concerning the economic dimension are promising. Although just a few groups of measures have been evaluated fully in terms of their economic impacts, the majority of the measures

have shown a positive cost-benefit ratio for the municipalities and public entities that have implemented them.

Moreover, pricing policies, which are usually quite sensitive in terms of public acceptance, have generated positive reactions, if not at the planning stages then certainly after the positive effects have become evident. This confirms that even measures that are traditionally considered controversial can be implemented successfully, if these are adequately supported by marketing actions and promotion, and if all stakeholders are involved from the initial phase of the planning process.

In terms of economic sustainability, the most critical situations emerge when measures involve significant infrastructural development. This is clearly the case with measures that: (i) have tested and promoted clean vehicles and fuels, (ii) have increased accessibility by expanding the PT infrastructure and



Image: Stephan Köhler

network, and (iii) have been concerned, at least to some extent, with the construction and improvement of cycling and walking networks and facilities.

Looking back, CIVITAS Plus appears to have achieved promising results through the implementation of policies that correctly address the main problems affecting the participating cities. Analysis of the results of implementation also provides useful information about major shortcomings and areas where improvements are needed.

While communication and stakeholder involvement are keys to the success of all policies, they are absolute prerequisites for the implementation of others. Additional steps can be taken to improve marketing efforts, and more work is needed to assess the costs of monitoring such efforts and identifying the right indicators for each policy. While this poses a challenge, such efforts would produce reliable and comprehensive evidence on costs and benefits, which in turn can be useful for facilitating up-scaling and transferability, and for winning acceptance.

5.1.2 Timescale

The given timescale of a measure is a major determinant in securing its successful implementation. In this respect, the analysis distinguishes between two major types of impacts:

- the **time required to implement** the measure. This depends greatly on the nature of the measure to be established ('hard' or 'soft') and on how smoothly the implementation is carried out, which is determined by the number and types of barriers that emerge during the process; and
- the **time required before the effects of implementation become evident** and tangible. It is often the case, for example, that technology innovation measures involving the use of clean fuels and clean vehicles take only a short time to implement, while their impacts become apparent only in the medium term.



Image: CIVITAS

For policy measures that are characterised by short-term implementation, but are associated with medium to long-term effects, three more factors need to be taken into account:

- **Maturity of the technology** being used, which can lower the chances of encountering unexpected impacts;
- **Complexity of the decision-making process** for setting up regulatory actions (institutional levels involved, number of stakeholders, public acceptance and barriers), where a higher number of decision makers involved proportionally increases the difficulty of reaching an agreement on a specific measure; and
- **Flexibility of solutions** and the possibility of adjusting a measure in the course of the implementation phase according to new needs or unexpected changes.

Other short-term implementation measures have proven to be time consuming in achieving their expected impacts. This applies, for instance, to pricing-policy measures in which a number of problems have been identified during the implementation stage, namely:

- incomplete harmonisation of European Member States fiscal policies regarding road vehicles, and the long process involved in the adoption of economic regulations (marginal-cost road pricing, public services, freight-transport pricing etc.), both in European institutions and in Member States; and
- difficulties in winning acceptance of these types of measures.

Given these preliminary considerations, experience under CIVITAS Plus has confirmed that a thorough assessment of the timescale, both for implementing a policy measure and for achieving real impacts, is a crucial step towards the successful planning of sustainable mobility actions.

CIVITAS Plus experience demonstrates that policy planners and decision makers have to carefully consider not only the time needed to implement a measure (including preparatory studies and stakeholder consultations), but also the time needed to develop a measure to a full fruition.

5.1.3 Territorial area

Evaluating the scope of a measure and its territorial area of implementation helps us to analyse its overall territorial impact. While all of the policy measures discussed here essentially address the urban dimension, some of these proposed within CIVITAS Plus have performed better than others, depending on their scope and area of implementation.

Policy measures with the strongest immediate local connection are those related to the improvement of cycling and walking infrastructure (including those aimed to increase safety levels), and those related to access regulation. The vast majority of the remaining measures

apply to entire urban areas. Some of these measures have greater impact when implemented on a wider scale.

Larger-scale implementation is required not only for measures that have a direct or indirect influence on long-distance and/or interurban demand, but also for those measures which involve decision-making and investment levels that transcend the boundaries of local authorities. This is especially true for measures addressing inter-modality and integration between different modes and those aimed at modifying travel habits. It is worth mentioning in this context that measures targeting city logistics have been deployed on a metropolitan scale.

5.1.4 Stakeholders

A stakeholder is any individual, group or organisation affected by, or able to affect, a proposed project and its implementation (GUIDEMAPS 2004). This includes the general public, as well as businesses, public authorities, experts and special interest groups.

Transport policies can have significant impacts on people’s attitudes and lifestyles, industrial production and public services. For this reason they generate much attention, both from public and private stakeholders.

The table below provides a comprehensive list of potential stakeholders.

Table 13: Typical stakeholders involved in transport projects

Government/Authorities	Businesses/Operators	Communities/ Local neighbourhoods	Others
European Union	National business associations	National environmental NGOs	Research institutions
Ministry of Transport	Major employers	Motorist associations	Universities
Other national ministries	Private financiers	Trade unions	Training institutions
Regional government	International/national businesses	Media	Experts from other cities
Local authorities	Regional/local businesses	Local authority forums	Foundations
Neighbouring cities	Local business associations	Local community organisations	
Local transport authority	Small businesses	Local interest groups	
Traffic police	Retailers	Cycling/walking groups	
Other local transport bodies	Utility services (e.g. electricity, telecommunications)	Public transport user groups	
Other local authority bodies	Engineers/Contractors	Transport users	
Politicians	Transport operators/providers	Citizens	
Other decision makers	Transport consultants	Visitors	
Partnership bodies	Car-sharing companies	Citizens in neighbouring cities	
Project managers	Bicycle rental operators	Disabled people	
Professional staff	Other mobility providers	Landowners	
Emergency services		Transport staff	
Health & safety executives		Parents/Children	
		Older people	

Source: GUIDEMAPS, 2004

As most cases have demonstrated, stakeholder involvement and communication play key roles in the successful implementation of a measure. Stakeholders can act as important drivers in many ways: they bring experience, insight and knowledge to the types of action concerned; they provide financial resources; they lend capability and support to existing administrative, legal and planning authorities; and they help to establish priorities. Furthermore, political stakeholders are able to promote, enhance and enforce an initiative.

The personal involvement of key politicians has, in some cases, been an engine for the implementation of specific CIVITAS measures. For example, the mayors of Skopje, Macedonia, and of Tallinn, Estonia, were both strong supporters of ICTs in transportation. As such, they paid special attention to these measures, which contributed to their success. Some politicians step forward by setting a good example: a new mobility councillor in Bologna, for instance, revoked permits for all councillors to access the municipality headquarters located in the historical centre, a limited traffic zone.

In the majority of cases, the involvement of political stakeholders has been limited to the municipal level, but there are some countries in which regional administration is quite strong and has substantial influence on decision-making processes. In such cases, municipal and regional politicians have communicated through ad hoc meetings; in others, regional politicians have presented CIVITAS activities to the media.

Exchanges and communication between CIVITAS Plus cities and their respective national governments were found to be few and far between. While this might be due to limited CIVITAS Plus experience, more active communication between national governments and decision makers could increase visibility, create stronger awareness and generate momentum for changes in national transport policies that are also important for the success of local measures.

One of the lessons learnt from CIVITAS Plus cities is the importance of involving all main groups of local stakeholders as early as possible, i.e. the planning phase, in order to address potential barriers at the outset and obtain higher levels of acceptance. This is particularly relevant in cases where it is clear from the earliest stage that the stakeholders involved have different or conflicting objectives. Conflicting interests, if not managed and resolved, can lead to serious problems during implementation later on.

Even though the early involvement of stakeholders cannot completely rule out conflicts, it makes a positive contribution to a smoother implementation process and should be a prerequisite for the proposal of new policies.

DOWNLOAD

the CIVITAS Initiative Guide to Stakeholder Participation
www.civitas.eu/Knowledge-Base



Image: CIVITAS

5.2 Policy areas

The CIVITAS Initiative experience has highlighted each policy measure's contribution to the promotion of urban-scale models of sustainable mobility. Evaluation of the results has also pointed out the existing interplay between implementation processes and other factors, such as timing (short, medium and long term), territorial scale (local vs. metropolitan) and the involvement of all

relevant stakeholders as a success factor (drivers), in rendering policy measures operational and effective.

The following conclusions are drawn on the basis both of the results obtained under the CIVITAS measures implemented (as described in Chapter 4) and the progress made in the context of the EU Common Transport Policy. The latter places particular emphasis on the three actions that the 2011 White Paper

identifies as top-priority urban-scale actions: developing SUMPs at a wider EU level, setting up a framework for charging road users, and further promotion of urban logistics.

5.2.1 Lessons learnt from the CIVITAS Plus experience

The CIVITAS Plus edition confirmed the effectiveness of many of the policy measures implemented, while at the same time highlighting the need for future research.

Some policy measures seem to be more established in their practical implementation, while others still require further and more in-depth technical and scientific investigation. Walking and cycling measures, or measures supporting public transport, for example, are encountered widely, while measures linked to clean fuels and vehicles or to ITS are less prevalent. Other measures need to be adapted to new mobility models and lifestyles, or they provide a new perspective on urban mobility services, as has been the case with carpooling and car-sharing.

The development of strategic planning tools and paying close attention to participation, sharing and acceptance of policies implemented are not only of paramount importance, but are prerequisites for successful policy implementation. Read on to discover some general suggestions, based on the CIVITAS Plus experience, regarding future plans and developments aimed at achieving higher levels of sustainability in mobility and transport.

WHITE PAPER 2011 LIST OF INITIATIVES: INTEGRATED URBAN MOBILITY

1. Urban Mobility Plans

- Establish procedures and financial support mechanisms at European level for preparing Urban Mobility Audits as well as Urban Mobility Plans, and set up a European Urban Mobility Scoreboard based on common targets. Examine the possibility of a mandatory approach for cities of a certain size, according to national standards based on EU guidelines.
- Link regional development and cohesion funds to cities and regions that have submitted a current and independently validated Urban Mobility Performance and Sustainability Audit certificate.
- Examine the possibility of a European support framework for a progressive implementation of Urban Mobility Plans in European cities.
- Advance integrated urban mobility through a possible Smart Cities Innovation Partnership.
- Encourage large employers to develop Corporate/Mobility Management Plans.

2. An EU framework for urban road-user charging

- Develop a validated framework for urban road-user charging and access restriction schemes and their applications, including a legal and validated operational and technical framework covering vehicle and infrastructure applications.

3. A strategy for near zero-emission urban logistics by 2030

- Produce best practice guidelines to better monitor and manage urban freight flows (e.g. consolidation centres, vehicles size in historic centres, regulatory limitations, delivery windows, unused potential of river transport).
- Define a strategy for moving towards zero-emission urban logistics, bringing together aspects of land planning, rail and river access, business practices and information, charging and vehicle technology standards.
- Promote joint public procurement for low-emission vehicles in commercial fleets (delivery vans, taxis, buses etc.).

Soft transport modes: cycling and walking

Urban and metropolitan areas suffer from high levels of pollution, but alternatives to private transport are already available. Cycling in particular offers considerable potential for replacing car trips and, compared to other transport modes, brings significant personal and social benefits. An additional advantage lies in the fact that cycling involves much lower investment costs than for any other mode of transport.

**CIVITAS PLUS SUGGESTIONS
ON CYCLING AND WALKING**

- Cycling and walking are not to be seen as stand-alone activities, but as part of the whole city's infrastructure. Multimodal connections with bus stations, train stations, residential areas, and shopping and business districts are crucial. When several cycling and walking interventions are implemented at the same time, or at brief intervals, the synergistic impacts can be far greater.
- A long-term city plan for sustainable transport with a specific focus on cycling and walking is strongly recommended. The plan should include both hard and soft measures. Such a city plan can act as an official framework for all cycling and walking measures.
- Public engagement is needed to support a change in modal shift from private car use to cycling and walking. Political support is vital for the implementation of successful cycling and walking measures. Strong involvement of and communication between different partners and stakeholders, in addition to value-guided leadership, are essential for the success of cycling and walking measures.
- Increasing the number of people cycling in a city requires strong political conviction and resolution. This conviction must be present at the highest political and management levels in order to set concrete and quantitative objectives towards boosting cycling uptake. To be successful, politicians must clearly express their vision regarding cycling and its benefits, while at the same time offering solutions that deal with possible disadvantages.
- Cycling policy is not just a 'transportation' issue: it is an issue connected to many different policy fields and most political party programmes. With commitment from the relevant departments, cycling initiatives can more easily be integrated into long-term political ambitions to improve air quality, cut carbon emissions, improve public health and boost the quality of life and general feeling of security. Strong support from various levels of the administration also helps to maintain beneficial relationships with stakeholders, including police departments, cycling communities, car owner associations, PT companies and organisations involved with retail and shopping.
- A shift in traffic policy to one that is more bike-friendly will very likely pose new challenges to administrative personnel, which can either entail changes of attitude and professional values or highlight the need to acquire new competencies.

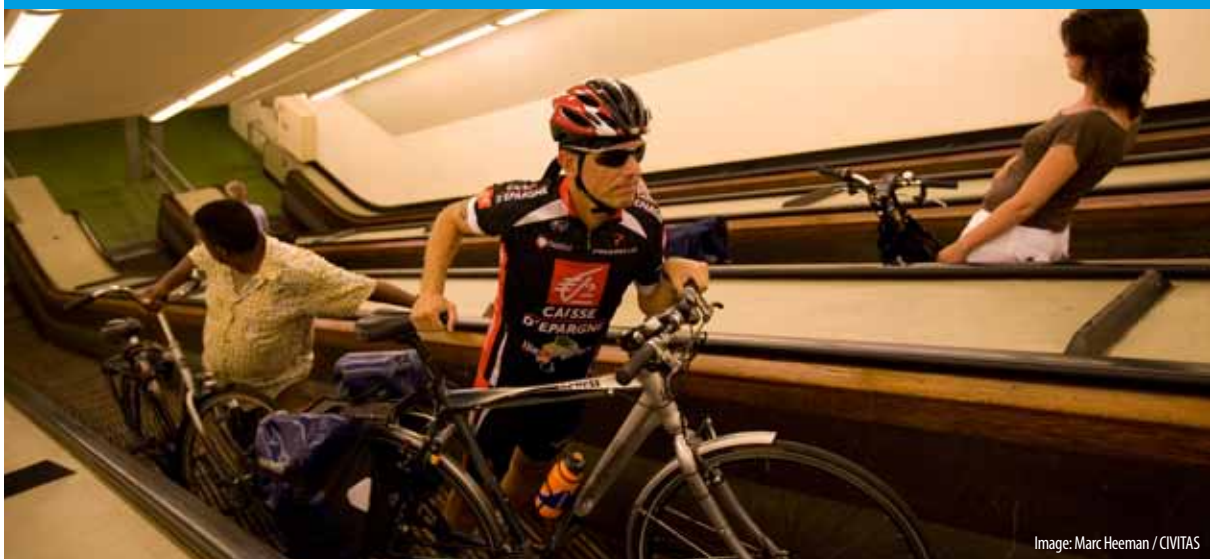


Image: Marc Heeman / CIVITAS

Public transport

Improving public transport requires a delicate balance. Economic measures on the supply side need to be supported by adequate policies that manage transport demand in a sustainable way. Special attention is needed for those measures which are most capable of reducing car use.

CIVITAS PLUS SUGGESTIONS ON PUBLIC TRANSPORT

- A positive attitude from public authorities towards public transport is a precondition for success, as is the involvement of key stakeholders.
- The funding of measures is an important issue for agreements between PT operators and public authorities. Despite the fact that some measures offer great prospects of success, also from an economic perspective, substantial subsidies are usually needed for these kinds of measures. Good financial planning is therefore necessary to determine the feasibility of a measure.
- Some European countries have very little experience with the latest technologies in PT services. Sharing experiences with other cities can be a great help. It is highly recommended that exchanges of experience between cities are supported and that relevant databases are established. This also applies to sharing experiences and methodologies regarding evaluation.
- Increase travel comfort for passengers with specific mobility requirements through the use of technology, such as talking bus stops. Be sure to involve these groups in preparation and implementation. The technology introduced also needs to be compatible with other systems in use elsewhere (GPS data output, communications, ticketing, etc.).
- The R&D stage is important, and should include a survey of PT users needs in order to avoid setting up a service that does not address the real situation.
- When implementing dial-and-ride systems, undertake a demographic study of the target group(s). For example, if there is a high share of people with low computer literacy and internet skills, it is necessary to adjust the booking system and offer telephone services, as opposed internet-based services only.



Image: Hannah Anthonyisz / CIVITAS

Clean vehicles, clean fuels and eco-driving

There is general agreement that technology is the most promising and effective tool to reduce pollution and GHGs emitted by transport activities. Nevertheless, technological progress *per se* is not sufficient to reach this goal, and the severity of pollution-related problems also requires implementing policies that can secure positive results in the short term, including incremental improvements of currently available technologies. Such measures include the use of electric and hybrid vehicles or the development of eco-driving models both for private and public fleets.



CIVITAS PLUS SUGGESTIONS CLEAN VEHICLES, CLEAN FUELS AND ECO-DRIVING

- National and international standards for biofuels are needed to instil confidence in users and providers. Without such standards, the difficulties encountered in the implementation of some measures to ensure consistent fuel supplies will be replicated elsewhere. Contractual conditions were found to be necessary to overcome barriers associated with fuel provision.
- The promotion of alternative fuels for a more sustainable operation requires a thorough understanding of taxation and legislative policies for different fuel types at regional and international levels, as well as local political and management support.
- Policies tend to be more acceptable, if the public is aware of the negative impacts associated with car use, and if they understand the need to address these. This is relevant for technology and fuel solutions also. Car owners are more willing to pay extra for biofuels, if they believe that biofuels are an effective solution to climate change (OECD, 2011).
- Retrofitting older municipal and public vehicles to use alternative fuels can offer a cost-effective short- to medium-term solution to allow fleets to be used beyond their current lifespan (based on EURO standards).
- Policies, incentives and technologies should be developed to encourage eco-driving, including refresher courses to ensure that short-term benefits continue into the longer term.
- Cities wishing to implement more sustainable vehicle fleets should have access to relevant technical and operational expertise to help specify, implement and maintain the fleets. Such expertise is often outside the scope and traditional competences of staff. Additional expertise is needed to develop effective awareness campaigns and to help overcome barriers to low or slow up-take.
- Whilst the costs of hybrid vehicles remain higher than those of most modern-equivalent conventionally powered vehicles, the sustainability benefits are valuable and need to be promoted.
- Eco-driving is effective and should be included in national driver training standards, as well as in training programmes.

Image: Hannah Anthonysz / CIVITAS

Develop ICT and transport telematics

Advanced ICT can contribute greatly to eco-mobility by improving infrastructure, traffic fleet management, facilitating better tracking and tracing of goods across transport networks, and better linking of transit points and intermodal services. Emerging technologies, such as the Galileo satellite positioning system will make this more practical and affordable.

CIVITAS PLUS SUGGESTIONS ON THE INTELLIGENT TRANSPORT SYSTEM

- In terms of access and parking management, the first concern is to choose appropriate ITS applications: IT systems should be tailor-made, and will be effective only if they respond to a city's specific needs.
- When choosing, decide for an established and tested approach if possible, rather than a completely new approach. The past provides too many examples of failure.
- Choosing proven systems also helps efforts when lobbying to get bylaws passed successfully to allow for the enforcement or use of particular schemes. New systems also require lengthy equipment trials.
- Finally, it should be ensured that users clearly understand the scope and use of the ITS. Communication and information are keys to success.

Alternative car use: car-sharing and carpooling

Actions in this field encompass the development of eco-drive procedures in

the road transport sector, i.e. freight and passenger traffic, to reduce emissions and fuel consumption. De-marketing of cars, supporting car-sharing and carpooling initiatives, encouraging green logistics,

promoting eco-driving and ITS are all soft measures that can strengthen the positive impacts of other hard measures and, in some cases, mitigate their drawbacks.

CIVITAS PLUS SUGGESTIONS ON ALTERNATIVE CAR USE: CAR-SHARING AND CARPOOLING

- Feasibility studies are essential before starting measures in the field of alternative car use. Topics should include possible target groups and their culture, possible participants (frontrunners) and their interests, spatial requirements, equipment needed, business models, and possible positive and negative effects.
- Where congestion, space constraints and other urban driving factors are absent, the administrators or operators of alternative car-use schemes should provide financial incentives or other motivations to attract additional users. Promotion and endorsement alone may be insufficient in these cases.
- Car-sharing schemes should target business users, as well as private individuals. This increases vehicle utilisation across different time periods and boosts the number of subscribers. However, these schemes will need improved business offers according to user needs, providing a corporate 'pool' card, for example. Similarly, city or municipal authorities should target potential carpooling schemes at businesses located in suburban areas with limited parking or lack of public transport, as such locations pre-empt high demand for such services.
- Car-sharing schemes should deploy more environmentally friendly vehicles where possible. These help reduce pollution and emissions and also curb demand for private cars. The higher leasing costs of these vehicles can be offset by lower fuel consumption costs.
- City or municipal authorities should ensure that they are proactive in promoting (or continuing to promote) alternative car-use schemes. Marketing and promotion are prerequisites for attracting private users and businesses to these services.
- Word-of-mouth promotions and strong community engagement, including the use of local 'client ambassadors' or 'nudgers', are more effective in sustaining car-sharing schemes over the long term. Administrators of such schemes should consider involving the local community in introducing people to these services and determining car-sharing locations. This can deliver sustained benefits compared to traditional top-down promotional campaigns. Findings across all editions of CIVITAS indicate that scheme administrators or developers should ensure that all project stakeholders are engaged and committed to the deployment of alternative car-use schemes.

City logistics

City logistics is increasingly becoming a key issue in maintaining sustainable cities. Just-in-time delivery, combined with the elimination of warehousing and the growth of home-delivery services, has led to an increase in the number and flow of vehicles on the streets. City-wide mobility plans, therefore, need to consider freight mobility as part of the bigger picture.

In fact, freight transport logistics has an essential urban dimension. Distribution in urban conurbations requires efficient interfaces between trunk deliveries over longer distances and distribution to final destinations over shorter distances. The distribution process between production centres and customers within an urban area needs to be crisp and efficient.

A holistic vision should cover freight transport and pay attention to aspects of land-use planning, environmental impacts and traffic management.

Green logistics measures, such as ICT for loading and journey management, regulation and restriction of access to urban areas, low-emission vehicles and toll systems for light-duty and heavy-duty vehicles, could optimise logistics chains for long and short journeys.

CIVITAS PLUS SUGGESTIONS CITY LOGISTICS

- Urban freight transport should be seen as a complex system and network of activities involving stakeholders with different, often conflicting, interests. This requires a participative approach, including all the key stakeholders - and citizens are key stakeholders! Using this approach, stakeholders will conduct feasibility studies that include city-specific circumstances, identify shared problems, explore alternative solutions, and then proceed to implementation, monitoring and evaluation of measures.
- Stakeholder involvement should be maximised from the planning stage, as partnerships underpin the success of sustainable logistics measures. Stakeholder collaboration can be stimulated through the acknowledgement of 'real' issues and through the provision of incentives, which could include the ability to negotiate for improved delivery access. Time needs to be invested to build collaborative partnerships (Freight Quality Partnerships), but this ensures that information can be shared and potential problems identified.
- Successful collaborative partnerships between appropriate stakeholders can lead to the formulation of high-impact freight strategies that consider logistical needs for the city, businesses, transport operators and local residents.
- Strategies need to be implemented gradually and communicated widely, using a range of media outlets and channels. Any changes made to the local road network need to be communicated through the use of clear signage to ensure that freight is redirected along the appropriate routes.
- Regulatory measures need to be enforced to ensure that the planned benefits can be achieved.
- More collaboration is required between different transport solutions operating within cities to optimise the consolidation and bundling of deliveries.



Image: CIVITAS

5.2.2 Future research

The evaluation process has pointed towards two types of planning that should be further researched and better understood, namely, integrated planning, and sustainable urban mobility planning.

A new planning approach capable of linking together and integrating holistically the domains of land use, environment and transport will be needed if cities are to surmount the challenges of the future. Demographic, environmental, social and economic pressures will all need to be addressed.

The pivotal role of urban mobility, as currently reflected in EU policy documents and in the financial support instruments currently in place (or in those to be established in the future framework of EU research programmes) — White Paper, Smart City: Regional development and cohesion funds to cities and regions, Horizon 2020, etc. — requires that local authorities adopt tools for integrated planning.

Spatial planning at urban and regional level can play an important role in the medium and long term, both in slowing down increases in distance travelled both by goods and passengers, and in increasing the attractiveness of alternative modes by concentrating on new rail or metro-system developments.

Integrated and strategic planning will play a crucial role in overcoming these weaknesses. Local and national government units interested in building a sustainable mobility model will also be very important in supporting innovation, allocating resources and promoting the spread of best practices.

In the field of mobility, planning methodologies have improved and been progressively fine-tuned, leading to the establishment of an urban mobility planning approach that is strongly inspired by sustainability criteria. Mobility has become an important factor in urban development. It is an aspect through

which sustainable and integrated planning can foster and maintain a good quality of life. Several cities have produced plans to integrate related fields, such as transport, land use and energy, however guidance and cooperation is needed between local, regional and national authorities.

At the European level, Sustainable Urban Mobility Plans (SUMPs) have been proposed through several policy actions,

and best practices across EU are being collected.

The development of SUMPs represents one of the principal actions where, at EU level, the technical and scientific community of researchers and professionals can, with local communities, play a central role and make a significant contribution to promoting widespread awareness of new models of urban mobility.

SUSTAINABLE URBAN MOBILITY PLANS (SUMPS)

An 'SUMP' is a strategic plan that builds on existing planning practices and takes due consideration of integration, participation and evaluation principles to satisfy the mobility needs of people for a better quality of life in cities and their surroundings.

What is the purpose?

- Ensure the accessibility of jobs and services to all;
- Improve safety and security;
- Reduce pollution, greenhouse gas emissions and energy consumption;
- Increase the efficiency and cost-effectiveness of the transportation of persons and goods; and
- Enhance the quality and attractiveness of the urban environment.

How does it work?

An SUMP is a more efficient way of tackling transport-related problems in urban areas. Building on the existing practices and regulatory frameworks in Member States, its basic characteristics are:

- Participatory and integrated approach;
- Commitment to sustainability;
- Clearly defined objectives;
- Measurable targets; and
- Review of transport costs and benefits.

Source: www.mobilityplans.eu



Image: CIVITAS

6. POLICY MAKING FOR BETTER MOBILITY: SOME CONCLUSIONS

6.1 The CIVITAS legacy: lessons for future editions

The cities that co-operated in the five CIVITAS Plus Collaborative Projects⁶ have drawn valuable lessons from the implementation of sustainable mobility measures and from their wider involvement in the Initiative. Results for each policy measure were presented in

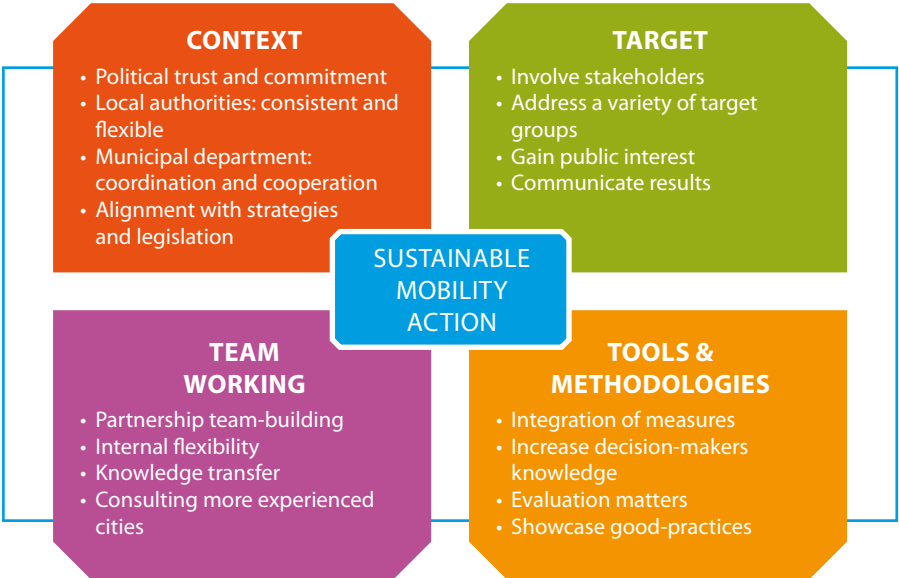
Chapter 4, and in this chapter our focus turns to general lessons learnt from participation in the programme.

CIVITAS Plus cities generally share the view that participation in large-scale European demonstration projects is quite challenging. However, involvement in these projects has also been a great opportunity to implement large and

innovative solutions in the field of sustainable mobility, and it is clear that CIVITAS Project participation can open the door for future funding.

The figure below summarises the issues that should be taken into consideration in order to benefit from their experience.

Figure 12: Framework of key features for implementing a sustainable mobility action



⁶ The Collaborative Projects involve groups of people from CIVITAS demonstration cities that gather together and share objectives and methods to achieve real, sustainable changes in urban mobility

6.1.1 Context

Context plays a relevant role in the successful implementation of sustainable mobility actions.

Political representatives must believe in a project and work towards its conclusion throughout their mandate. Political support for the measures must be clear and well defined in advance. Measures must be viewed in a long-term context and adopted as part of a much larger planning process, not in isolation. A feasibility study for implementation of the proposed project should be made available to the public. It has been proved that if a stable and strong transport strategy for a city is in place, changes of city administration personnel are less disruptive in terms of a measure implementation.

Although there is not yet a tried and true success formula for local authorities, consistency, persistence and flexibility are all certainly vital ingredients. A city should send out consistent messages concerning what it wants to achieve so that other parties can anticipate its actions (consistency); the city should not lose heart when it experiences setbacks (persistence); and the city should be able to respond to developments and changing needs in the market and from other stakeholders (flexibility).

Another relevant aspect is coordination between municipal departments. Internal cooperation between different departments and cooperation with other government bodies are key aspects in ensuring the successful implementation of measures and encouraging the involvement of other partners. Alignment with existing regional and national strategies guarantees further development of the measures implemented.

6.1.2 Teamwork

One of the most relevant elements in the implementation and evaluation process of a measure is for the team in charge

of activities to be capable of developing its skills and working in partnership with others. Process evaluation tools, such as Focus Groups and Learning Histories workshops have proved to be valuable catalysts for partnership. Most of the measures require a strong, flexible team with different capacities and responsibilities. A team's ability to change its tasks and leadership style is a quality that helps a project to succeed.

Within CIVITAS, cities have gained many new European contacts through forums and workshops, resulting in dissemination and higher availability of knowledge. In terms of the future, horizontal communication is something that should be better organised at the initiative level.

6.1.3 Target groups

Measures address different targets either directly or indirectly — that is, via specific users or through stakeholders. As for the latter, one of the most effective ways to successfully address objectives is to include all the relevant partners and stakeholders from the very outset of a project. The benefits of the involvement of key stakeholders are widely recognised.

Some successful measures include a strong participative element that encourages citizens and stakeholders to take part in planning and decision-making processes.

Another valuable project asset is the ability to address the needs of a wide range of target groups. Although mobility patterns are the sum of a number of individual wants and needs that express different values, motivations, perceptions and requirements, common trends should be identified for certain target groups who share similar backgrounds and needs. An effective categorisation and analysis of target groups allows a project team to develop a tailored approach, thus maximising the impacts of the overall strategy.

Public approval should be sought from the very beginning, and gradually, especially where controversial topics are concerned. Moreover, steps of citizen engagement need to be planned carefully: start with the basics — for example, with a brochure that addresses the general public — then move towards specific actions. The most direct type of action (face-to-face discussions) requires carefully considered communication tactics.



Image: CIVITAS

At the final stage, an investment should be made in efforts to communicate results. Strong awareness-raising and communication campaigns are important parts of sustainable mobility efforts. During implementation periods, clear information about the aims of the proposed actions and their progress should be provided to the population and any other interested parties. The communication of results highlights the effectiveness of actions and thereby paves the way for future developments. Best practise recommends the creation of multiple channels for communication with all relevant actors. These communication channels include innovative technologies and social networks, but also traditional means of communication.

6.1.4 Tools and methodologies

More-effective tools and methodologies have emerged from measures carried out by the cities involved in CIVITAS Plus.

Integrating measures have proved to be of utmost importance. Among the main lessons learnt is the importance of implementing a set of measures covering extremely heterogeneous projects, all linked by a strong common strategy. This approach is useful in creating synergies across all of the measures. This has to be understood as something more than just the integration of different policy fields into one comprehensive urban policy concept, although this is one of the major CIVITAS innovations. An efficient strategy includes a balanced mix of push-and-pull measures that result in significant positive impacts at city level.

In the past, little practical use has been made of analytical knowledge in taking urban planning decisions. This is especially true in most of the EU-12. There is a general need to empower transportation planners by providing them with useful tools and frameworks with which to analyse complex transport-related issues. Optimal circumstances have proved to be those where the people in charge of the measures carried out research and studies

to understand available state-of-the-art solutions, and choosing the best ones for their respective cities.

Another important lesson pertains to evaluation itself. Evaluation used to be fairly uncommon for traffic and transport measures, but thanks to the hard work conducted in performing evaluations, some key results have emerged. Evaluation provides relevant information about best practices, gives clear guidance on project up-scaling, and prevents future failures. It is therefore crucial to make evaluation a part of project planning.

Evaluation results are worth nothing if they are not disseminated. Results need to be circulated to colleagues, other cities and other governments. The process-evaluation approach has finally convinced politicians and decision makers that lessons can be extracted, even if the results are not particularly satisfactory. It has to be borne in mind that showcasing good practice is essential, even if some of the measures have yet to be fully realised.

6.2 The way forward

Relying on the lessons learnt from the CIVITAS Plus experience, as summarised in the previous section, this section peers into the future and provides a contribution to the understanding of which determinants are most likely to play a key role in shaping the planning and implementation of urban sustainable mobility in the years to come.

In particular, this section concentrates on issues of cultural innovation, smart planning and roles played by decision makers at different institutional levels. It also provides a close look at those priority areas of intervention which urban decision makers will necessarily have to consider.

6.2.1 Cultural innovation

With the end of the third CIVITAS edition, and in the light of reflections on urban sustainable mobility measures that have been implemented, it seems that the



Image: Christian Wilke / Flickr.com



Image: CIVITAS

more urgent and relevant question for cities in Europe is not “Which changes are needed and what has to be done?” but rather “How should the changes required to achieve sustainable urban mobility be successfully implemented?”

Push-and-pull measures, as well as the ASI paradigm (avoid/shift/improve), to lessen car dependency and attract more users towards sustainable modes are well known in almost all European countries. There is a shared understanding about what has to be avoided, shifted and improved. The means of achieving this, however, are less clear.

The reluctance to introduce methodological changes is by far the most influential negative aspect in trying to initiate an innovative shift in mobility culture. This applies both to gaining capacities and being open to new dialogue, tools and partnerships. Nowadays, city administrations face tough challenges, such as shrinking resources and multiple responsibilities. This can lead to a ‘bunker’ mentality

where people are afraid for their jobs and closed to new ideas and reluctant to take risks. When one’s workload seems unmanageable there is little eagerness to try out new approaches.

This is precisely the opposite of what cities need if they are to face and meet current challenges. Cities lose out on possible resources when their administrative staff members resist engaging in new debates and initiatives. Successful capacity building has to be engaging, accessible, inspiring, relevant and well organised. New challenges have to be faced by building new capacities and expertise. Transnational exchange and capacity building can help open minds, convince stakeholders to take those first steps, and anchor the changes within the local administration.

New mobility schemes require being receptive to a new vision of the city, and to new ways of working and consensus building. This means involving city stakeholder groups and being open to new business models and partnerships

with the private sector, where risks and returns are shared. Green and sustainable solutions can be developed and explored with and by city inhabitants and the business community as they are best suited to mediate the right solutions. What is essential is that the appropriate background knowledge is provided and a robust cooperation framework is agreed.

Multi-stakeholder involvement might involve a certain ‘fear factor’ at the beginning, but this diminishes once stakeholders start talking. It is sound advice to start dialogue early in the process, when the trenches have not yet been dug. It is important to keep the debate and issues open, so as not to send participants running for cover before they have a chance to hear the viewpoints of others.

6.2.2 Smart planning

The overarching condition for this cultural innovation is the development of a new concept of transport planning. There needs to be heightened awareness of the intense and dynamic connection between mobility — including logistics — and the quality of urban spaces. The underlying logic is twofold:

- Place mobility mind-sets at the heart of planning; and
- View mobility as a connector.

The complexity of mobility-related decisions, either for creating new infrastructure or for designing new strategies to optimise existing infrastructure, requires a new policy-making process that is underpinned by a developed and shared understanding of mobility.

Placing the human dimension at the heart of a mobility-related concept creates the best basis for developing such strategies and informing decisions on investment. But a real change in mind-set is needed amongst politicians, civil servants, special interest groups and citizens. Inevitably, such change rarely happens of its own accord. The best way

to drive change forward is to encourage participation processes. Cities need long-term strategies that extend beyond political term limits and provide public servants with the confidence and stability to develop and implement plans.

At the same time, mobility issues are linked to many of today’s urban challenges, such as unemployment, land use, public space, segregation, lack of social cohesion and deteriorating health.

One new concept is to use mobility as a tool to link to other elements of the city and develop shared solutions. This approach leads to positive effects by developing solutions that can also foster growth, jobs and social cohesion. All cities are looking for smarter solutions that provide their inhabitants with mobility options that are cleaner and more affordable.

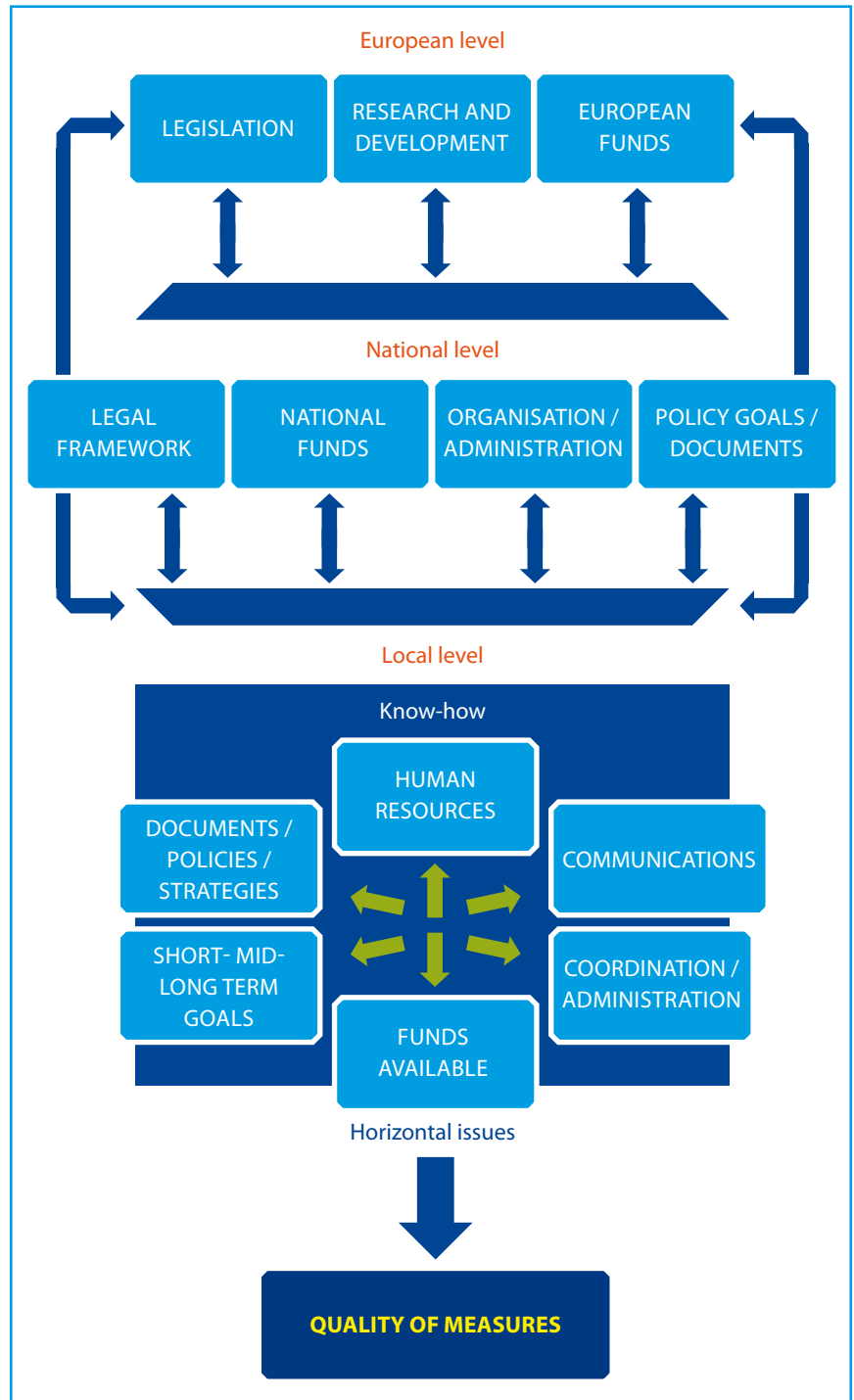
New mobility schemes can indeed contribute to green economic growth. Employing mobility mediators who engage citizens, businesses and schools could be a valuable step forward. In the near future, cities will need to plan for the emergence of new jobs, for instance, in customer services, public consultation or marketing.

6.2.3 Roles of decision makers

CIVITAS measures do not generally require high-level government intervention, but experience gained has demonstrated that the harmonisation of regulatory frameworks or funding activities is crucial for certain kinds of policy measures. Building the normative apparatus and obtaining the financial resources available for the implementation of such measures will typically require support from higher levels of government. The R&D component is also relevant for several policies.

The following scheme shows the main factors influencing decision-making and recommendation-making processes at different institutional levels.

Figure 13: Factors influencing decision-making processes for urban mobility



Source: CIVITAS POINTER

EU legislation and EU-provided funds can have an influence on city-driven measures. National governments might be involved in a number of ways; through national legislation and administrative procedures; through setting nationwide goals and preparing policies on how to reach goals; and by providing finances for investment in transport infrastructure and the operation of PT services.

City-level decision-making processes must then reflect local conditions, while taking national and European factors into consideration. Local conditions depend on goals and policies determined by local politicians, financial and human resources, administrative functions and communication with key stakeholders. CIVITAS has the potential to influence local, regional and national decision-making processes. The following table illustrates how and in which ways different authorities can contribute to the implementation of policy measures.

6.2.4 Intervention priorities

The challenges that cities will have to cope with over the next decade and the role that urban mobility will play in shaping the attractiveness and liveability of European cities require decision makers at different levels to consider the following objectives:

- **Develop** policy packages of integrated measures aimed at achieving common and shared objectives, such as improvement in air-quality levels, reduced CO₂ emissions, and lower levels of congestion and car dependency;
- **Intervene** in major populated cities, where transport-related impacts pose critical threats to the health of Europeans. These negative impacts will become more evident over time. Densely populated areas have an innate

Table 14: Typical stakeholders involved in transport projects

Level	Roles
Local, regional authorities	<ul style="list-style-type: none"> • Key role in the implementation of transport measures at city level • Involve stakeholders and promoting a culture of sustainable urban mobility • Planning processes and integration of urban policies • Monitor progress of implementation and providing feedback on the planning process
National government	<ul style="list-style-type: none"> • Legislation and harmonising rules and regulations (e.g. ITS) • Promote and fostering new approaches, methods and evaluation tools for innovation in the transport sector • Funding selection and prioritisation • Strategic decisions concerning the use of national and European financial resources and opportunities
European Union	<ul style="list-style-type: none"> • Promote EU-wide best practises • Promote integrated approaches to planning (SUMP) • Promote ex-ante and ex-post evaluation methods and tools • Promote innovation (e.g. Horizon 2020 research programme) • Harmonisation of rules and regulations • Focused financing according to urban and metropolitan areas, critical areas, vulnerable historical sites and environmental areas

tendency towards innovation and also provide the best grounds for testing new measures;

- Carefully **consider** each territorial peculiarity, particularly those of regions most affected by transport problems as a result of high population density and high trip rates. Regions with unsustainable levels of transport demand also have to be kept in focus as these are particularly vulnerable; and

- **Make a commitment** to develop policy actions in cooperation with local entities and representatives in order to bring real results in changing mobility patterns. Most importantly, plans and measures should be developed and implemented that can have long-lasting, far-reaching positive impacts.

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ISBN-978-80-86502-77-9

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