Sustainable Urban Mobility Measures that may be applicable in Hanoi.

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Abstract

The Ha Noi metropolitan area has a population of 6.5 million with densities as high as 30,000 inhabitants per km² in the city center. Vehicle ownership has increased sharply and 84% of all households own a motorcycle. Roads represent only a 1.9% of the total land area, which is low when compared to other major cities, and while bus services have expanded quickly, public transportation's share in the total urban transportation demand is still only 5%. Without measures to restrain the growth in overall vehicle traffic, particularly that of individual vehicles, fuel use and emissions will grow along with enormous congestion problems, because of the lack of street space in much of Hanoi City (Schipper et al., 2008).

This paper draws on the extensive content of the Global Transport Knowledge Partnership (gTKP) Knowledge Centre to describe how urban mobility measures may help Ha Noi manage mobility in a sustainable manner and avoid congestion in the future.

About the Author

Peter Midgley is the Urban Transport Theme Champion with the global Transport Knowledge Partnership (gTKP), a partnership of global organizations, policy-makers, experts and interested users working to make effective use of international transport knowledge. He is responsible for reviewing, disseminating and publishing examples of best practices in urban transport. Mr. Midgley has over 40 years of experience in urban transport. He was a staff member of the World Bank for 25 years. He drafted the Bank's first regional urban transport strategy paper ("Urban Transport in Asia: An Operational Agenda for the 1990s") and was a member of the core team that designed and put into operation the World Bank's knowledge management strategy. He has supported the needs of non-motorized transport and sustainable mobility throughout his career.

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1. Introduction

Traditional urban transport planning aims to improve conditions for vehicles, especially motorized vehicles, be they private cars, trucks or public transport vehicles. This has generated more and more infrastructure (roads and parking spaces) and equipment (traffic signals and safety devices) to satisfy motorized demand. This has stimulated growth in car ownership and usage and resulted in ever-increasing congestion, economic inefficiencies, pollution and other forms of environmental degradation. It has also generated suburban sprawl throughout many regions of the world. It is now recognized as unsustainable, but what is the alternative?

As long ago as 1963, in the report "Traffic in Towns" Colin Buchanan offered two main ideas for planning urban transport. First, main traffic should be canalized into a 'primary road network'. Here traffic takes precedence. Second, towns and cities should be organized into 'environmental areas'. Here the quality of living comes first. Some cities did begin to adopt these ideas in the UK and Europe but it took until the 21st century for such concepts to be adopted seriously.

Figure 1: Environmental Areas

Figure 2: EU Commission Green Paper on Urban Mobility

In 2007, the European Commission published a draft policy on urban mobility (this was to be the first comprehensive policy document to address urban transport issues in a new way since the Buchanan report in 1963). The challenges were expressed as follows:

> Cities all over Europe face similar problems (congestion, road safety, security, pollution, climate change due to CO2 emissions etc.) and these problems are increasing constantly. Inaction would result in Europe having to pay an even higher price both in economic and environmental terms, as well as for the health and quality of life of European citizens.

To meet these challenges, the EU suggested it was time to shift gears and move away from building road infrastructure to changing the way people use road infrastructure. This means focusing on urban mobility – the movement of people and goods (rather than the movement of vehicles) - and consulting with citizens on how to do this:

> It is time to put urban mobility on the European agenda and open a new chapter in European transport policy. This is the reason why the Commission wishes to open a debate with citizens and all relevant stakeholders at the local, regional, national and European levels. This should result in concrete proposals to achieve a sustainable urban mobility in Europe.

Urban mobility means making a fundamental shift in thinking away from traditional urban transport planning toward changing behavior:

> There is a need to create a new urban mobility culture in Europe. Citizens and decision makers have to think in terms of behavioural change. Only through a shift in mentality we can maintain our cities as attractive places to be and to go, and can ensure that they can continue to function as successful engines of the European economy.

This was a radical change in approach that has begun to transform cities in Europe but has yet to take hold in North America.

Urban mobility policies and plans promote transportation systems that are more benign in terms of their impact of the environment, such as non-motorized means (walking and cycling) and public transportation, as well as reduce the use of private motor vehicles. The measures implemented are a mixture of physical changes and user information systems that are designed to reduce traffic volumes and emissions, increase accessibility and improve safety, change travel habits and provide a better quality of life for all citizens.

The objective of urban mobility planning is to enable the participation of the population in individual activities and of goods in the supply chain. At the same time the use of resources and negative effects have to be minimized. The goal is to achieve highest mobility with the least amount of traffic and effort.

This paper will describe how these policies and measures are making a difference in many cities in Europe and elsewhere and how they may help Hanoi tackle its traffic problems. Reference is made throughout the paper to material that is available in the gTKP Knowledge Centre.

2. Urban Mobility Policies

Efficient and effective urban mobility can significantly contribute to overall socio-economic objectives, energy dependency, or concerns over climate change. Urban mobility policies are designed to achieve sustainability and have been implemented in some countries at the national level but more frequently at the city level. In the case of Europe, the European Commission has established a Europe-wide policy and action plan to implement mobility measures in all member states of the European Community.

Europe

The European Commission's first policy proposals in the area of urban mobility, the "Citizens' Network", date back to 1995 and 1998. They resulted in the launch of a series of initiatives based upon a "best practice" approach. Since 2002, through its CIVITAS Initiative, the European Union made available € 180 million to cities across Europe to implement and evaluate a wide range of innovative measures to promote sustainable urban mobility. \[1] As a result of this initiative, the European Commission adopted the Green Paper "Towards a new culture for urban mobility" on 25 September 2007. This consultation document opened a

broad debate on the key issues of urban mobility: free-flowing and greener towns and cities, smarter urban mobility and urban transport, which is accessible, safe and secure for all European citizens. Based upon the results of the consultation, the European Commission adopted the Action Plan on urban mobility on 30 September 2009. The Action Plan proposes twenty measures to encourage and help local, regional and national authorities in achieving their goals for sustainable urban mobility. With the Action Plan, the European Commission presents for the first time a comprehensive support package in the field of urban mobility.\[2]

The actions foreseen will:

- Promote integrated policies to deal with the complexity of urban transport systems,
- Focus on citizens' needs by promoting reliable travel information and a high level of protection of passenger rights.
- Help to green urban transport by introducing new, clean vehicle technologies and alternative fuels and promoting smart charging to encourage transport users to change travel behavior.
- Address funding by exploring existing funding opportunities, innovative public-private partnership schemes and possible new funding solutions.
- Support sharing experience and knowledge to enable better access to this information and help stakeholders to capitalize on these experiences and on relevant data and statistics.
- Optimize urban mobility to encourage effective integration, interoperability and interconnection between different transport networks.
- Improve road safety to achieve a high level of road safety, especially for vulnerable road users such as young people and the elderly.

Brazil

The Brazilian national urban mobility policy (National Policy on Sustainable Urban Mobility) requires that each city with over 500,000 inhabitants establish a Master Plan of Transport and Mobility (PlanMob). \[3] The basic concepts of the mobility plan are:

- Transportation must be part of a wider context, that of urban mobility, which considers quality of life, social inclusion and access to the opportunities of the cities;
- The mobility policy must be ever more associated with urban policies, and subjected to the directives of urban planning as expressed in the Master Plans;
- Mobility planning, treated in a wider fashion and in particular considering the sustainability of cities, must dedicate special attention to mass transit and non-motorized modes and offer universal accessibility;
- Mobility planning must be carried out with maximum participation of the society in the elaboration of its plans and projects, so as to guarantee support and political legitimacy in its implementation and continuity. This new concept of mobility planning, with a wider scope, needs to be incorporated by municipalities.

France

The French national urban mobility policy aims at coordinating the initiatives of the different agencies concerned with public transport, roads, parking and urban planning in collaboration with the commercial sector and the general public. The objective is to reconcile apparently contradictory requirements: ensuring mobility and access for all, while protecting the

environment, and satisfying personal needs but not at the expense of the community or of present and future generations. In this respect, the urban mobility policy is designed to achieve sustainability. Since mobility is a factor of personal fulfillment and greater social cohesion, it is less a question of reducing travel than of encouraging alternatives to the car, alternatives that use less fuel and cause less pollution – such as public transport, walking and the bicycle. \[4]

Each city in France is required to have an Urban Travel Plan that is compatible with the national sustainable development objectives (the effect on air quality, noise, climate, the landscape, human health). Preparing the Urban Travel Plan involves assessing the situation, then evolving a number of scenarios and deciding on a strategy leading to specific actions that are fundable and programmed over the long term. These actions are submitted for approval to the regional, provincial and municipal councils concerned. Each plan defines the travel policy to be followed to improve urban mobility in the context of safety, health, social cohesion and urban development, parking, goods deliveries, fares, etc. and it is reviewed every five years. Cities that adopt an Urban Travel Plan are allowed to collect public transport fees from companies (Versement Transport).

The plan should be designed such that the public is made aware of the importance of the issues involved (travel, life style, public space, urban planning, local planning and development). It should change mindsets – an essential prerequisite if behavior is to improve. In this sense, it is an essential tool of national French sustainable mobility policy.

India

The objective of the National Urban Transport Policy (NUTP) for India is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education and recreation. The salient features of this policy include incorporating urban transportation as an important parameter at the urban planning stage, rather than being a consequential requirement.

Apart from this, NUTP will encourage integrated land use and transport planning in all cities, so that travel distances are minimized, and access to livelihood, education and other social needs, especially for the marginal segments of the urban population, is improved. \[5]

The national policy stresses the importance of public consultation:

> Urban transport policies cannot succeed without the fullest co-operation of all the city residents. Such cooperation can be best secured if the objective of any initiative is made clearly known to them. It is, therefore, necessary to launch intensive awareness campaigns that educate people on the ill effects of the growing transport problems in urban areas - especially on their health and well-being. The campaigns would seek their support for initiatives like greater use of public transport and non-motorized vehicles, the proper maintenance of their vehicles, safer driving practices, etc. Such campaigns would also encourage individuals, families and communities to adopt “Green Travel Habits” that would make travel less polluting and damaging.

In addition, it emphasizes the need to learn by doing through pilot projects:

> In order to demonstrate the potential benefits from the policy measures suggested herein, the Central Government would take up pilot projects in a sample set of cities drawn from

different regions and different city types so that tested models of best practices can be established for replication in other cities.

3. Urban Mobility Plans

Prompted by legislation and policies at the national level, the practice of adopting Urban Mobility Plans has emerged in the past ten years as a comprehensive road map for developing sustainable mobility solutions within cities to support economic activity and reinforce social cohesion. Urban Mobility Plans have also emerged as a local response to inacceptable levels of pollution and congestion, of unnecessary damaging consumption of energy and also as a response to the economic and social inefficiency of fragmented management and decision making among agencies responsible for transport (public transport authorities, public works departments, traffic police, and so on).

The elaboration of an Urban Mobility Plan is a process, which involves citizens and stakeholders at all, stages and which takes full advantage of available knowledge and good practice. The elaboration and implementation strive to integrate and coordinate actions and policies between different sectors, while involving all relevant authorities. Most successful Urban Mobility Plans combine a clear vision and political leadership with effective implementation.

Examples:

- Bordeaux (France)

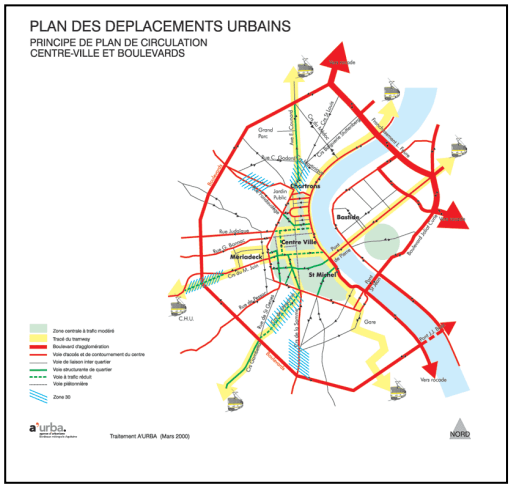


Figure 3: Bordeaux Urban Mobility Plan: Strategy

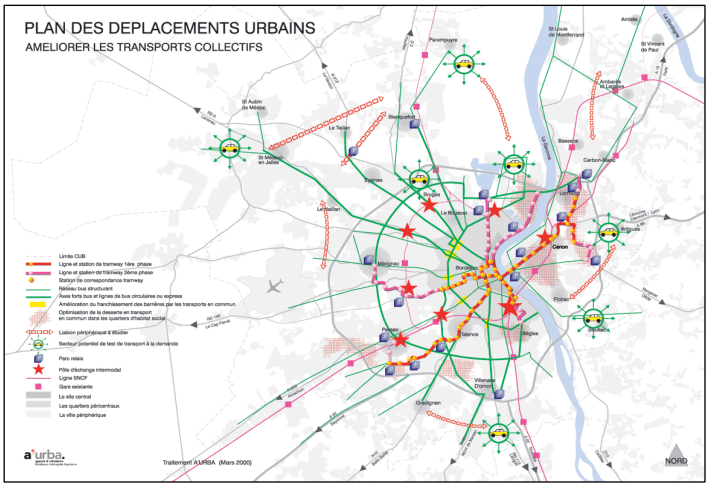


Figure 4: Bordeaux Urban Mobility Plan: Public Transport

The Urban Mobility Plan implemented in Bordeaux has created an extensive network of pedestrian shopping streets and a car-restricted zone in the center coupled the construction of a modern tramway network serving residential areas and sub-centers. The city has developed a comprehensive cycle path network throughout the city and is experimenting with “car-on-demand” services to link outlying residential areas with the tram stations. \[6]

- Lyon (France)

In 1997, the Urban Community of Lyon was the first French group to adopt an Urban Mobility Master Plan in its region. The objective of the plan was to re-harmonize the distribution of means of travel, to create the conditions for a pleasant town containing

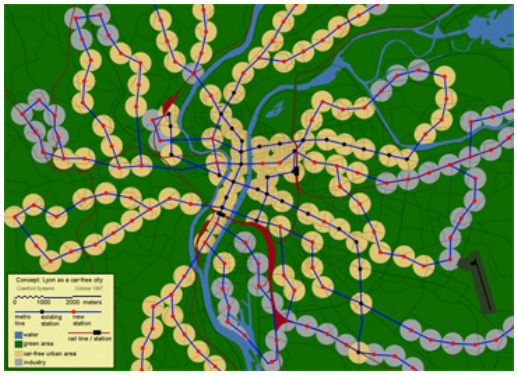
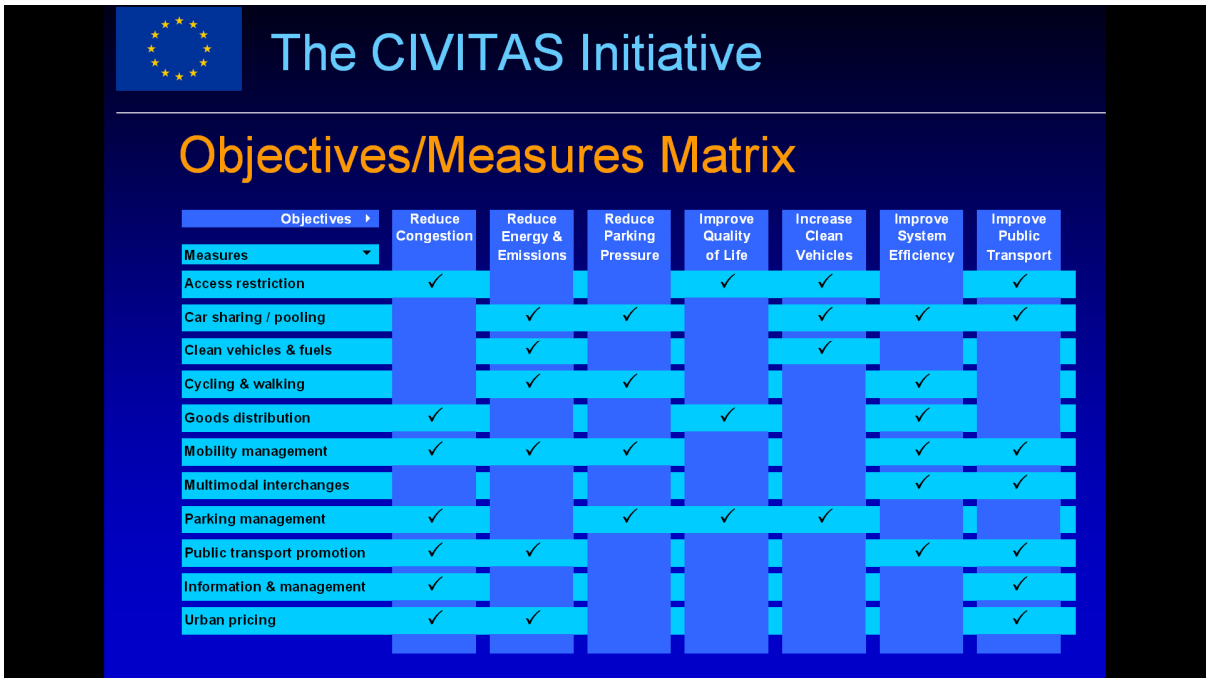


Figure 5: Lyon Urban Mobility Strategy

solidarity and thereby, in turn, favor sustainable mobility. Planners recognized that high usage of private cars did not correspond well with sustainable city development. To solve the far-reaching problems related to transport, the city has come up with an overall plan to deal with mobility as a whole. The Urban Mobility Master Plan (UMMP) combines a whole series of objectives, including reduction of motor traffic, development of public transport, cycling and walking, reducing the number of accidents, reducing pollution and disturbance, promoting social fairness, and the reallocation of urban space.

4. Measures

Rather than applying a "one size fits all" approach, urban mobility planning relies on a mix of measures that will vary according to city specific objectives. The following table shows the distribution of urban mobility measures applied to meet such objectives with the EU funded CIVITAS program.\[7]



Measures \ Objectives	Reduce Congestion	Reduce Energy & Emissions	Reduce Parking Pressure	Improve Quality of Life	Increase Clean Vehicles	Improve System Efficiency	Improve Public Transport
Access restriction	✓			✓	✓		✓
Car sharing / pooling		✓	✓		✓	✓	✓
Clean vehicles & fuels		✓			✓		
Cycling & walking		✓	✓			✓	
Goods distribution	✓			✓		✓	
Mobility management	✓	✓	✓			✓	✓
Multimodal interchanges						✓	✓
Parking management	✓		✓	✓	✓		
Public transport promotion	✓	✓				✓	✓
Information & management	✓						✓
Urban pricing	✓	✓					✓

Figure 6: CIVITAS measures related to city specific mobility objectives

Available evidence and experience from the CIVITAS program and other initiatives in Europe and elsewhere show that there is a need in most cases for a set of consistent “push” and “pull” measures from within the following ten groups:

- Coordinating land use and transport planning
- Promoting and improving public transport
- Encouraging cycling and walking
- Urban freight management
- Parking management
- Urban road pricing

- Traffic calming and reallocation of road space to most environmentally friendly vehicles and modes of transport
- Restricting access for the most polluting road vehicles (low emission zones)
- Fostering the use of cleaner, quieter and lower CO2 road vehicles
- Soft and smart measures (car-sharing, business and school travel plans, mobility management centers, awareness raising campaigns)

Examples

Coordinating land use and transport planning.

- Curitiba (Brazil)

One of the earliest and most successful examples of coordinated land use and transport planning is Curitiba, in Brazil. High-density development was planned to take place along high capacity bus rapid transit corridors very early in its history (1972). \[8]

Figure 7: Curitiba: Typical High Density BRT Corridor

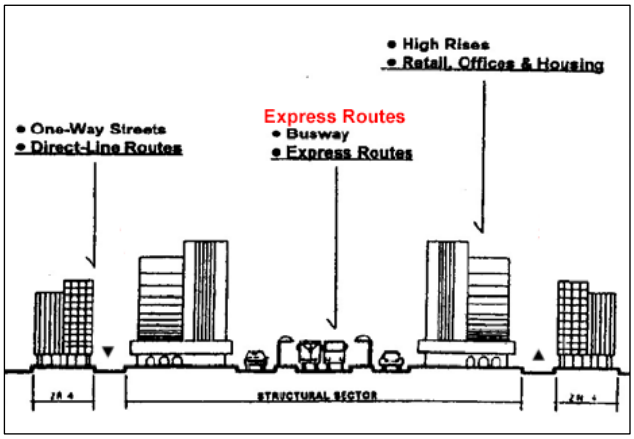


Figure 8: Curitiba: High Density Corridor Cross Section

Promoting and improving public transport:

- Bus Rapid Transit

Bus Rapid Transit (BRT) is a high-quality bus-based transit system that delivers fast, comfortable, and cost-effective urban mobility. It is one of the most important transportation

Figure 7: Bus Rapid Transit in Curitiba (Brazil)

Figure 8: Bus Rapid Transit in Brisbane (Australia)

initiatives today and is increasingly being used by cities looking for cost-effective mass transport solutions. There are currently 47 BRT systems operating worldwide, with the most extensive systems being in Latin America. BRT systems can enhance bus efficiency through segregated bus lanes, designs that make boarding and exiting buses quick, bus priority at intersections, and effective coordination at stations and terminals. \[9]

- Integrated Ticketing

With the "pass partout" card, La Rochelle (France) is offering a multimodal urban transport card with a wide range of options: urban bus, regional trains, boats, taxis, park and ride, public bicycles, and car sharing. The idea is to offer one ticketing solution for all sustainable transport modes in the La Rochelle area. \[10] Similar systems have been introduced in Freiburg (Germany) and Toulouse (France).

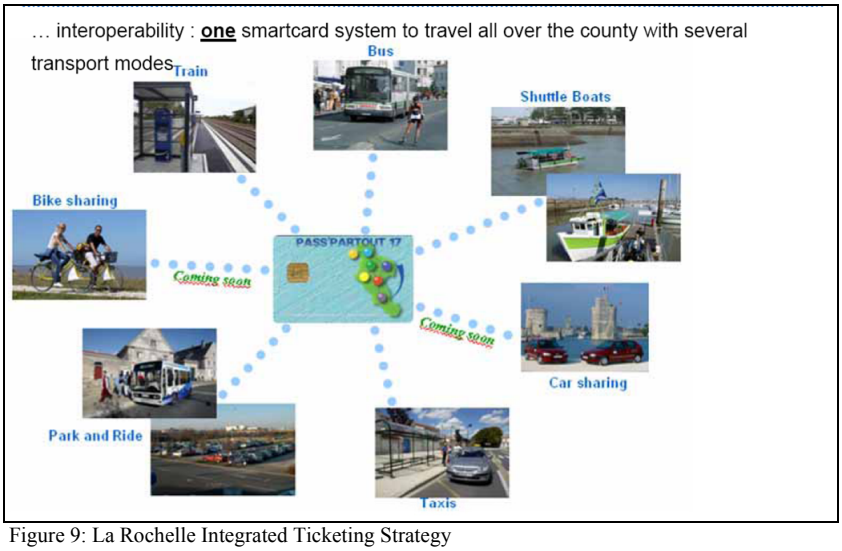


Figure 9: La Rochelle Integrated Ticketing Strategy
Source: The transport and mobility strategy in La Rochelle, 2008, Sébastien DAVY, Urban Community of La Rochelle

Encouraging cycling and walking

- Shared Bikes

Figure 10: Bike-sharing system in Toulouse (France)

Following the success of the smart bike-sharing system in Paris, these systems are rapidly being introduced in many cities for daily mobility. The basic premise of the smart bike-sharing concept is sustainable transportation. Such systems often operate as part of the city's public transport system. They provide fast and easy access, have diverse business models and make use of applied technology (smart cards and/or mobile phones). Bike-sharing systems are currently operating in 143 cities in 28 countries using around 104,000 bikes. \[11]

Urban road pricing

Road pricing means charging for the use of roads in a way that reflects the costs of using them - paying more when roads are congested and less when traffic is light. Congestion charging is a form of road pricing that aims to reduce motor vehicle travel into congested urban areas. It works because it changes behavior. Motorists are encouraged to change their habits, travelling at different times or by different routes, possibly to alternative destinations, or making their journey by public transport and/or non-motorized transport (on foot or by cycle). Road pricing works best when applied in parallel with other measures, such as public transport improvements and provisions for cyclists and pedestrians. The most famous examples are the Singapore Electronic Road Pricing (ERP) scheme \[12] and the London Congestion Charge \[13].

Figure 11: Electronic Road Pricing (Singapore)


Figure 12: Congestion Charging (London)

Traffic calming

Traffic calming strategies aim to reduce the speed and volume of traffic to improve safety for pedestrians and cyclists, as well as improve the environment. This involves more than just physical changes; it represents a process of social change requiring extensive community participation. Traffic calming measures comprise volume control measures (that reduce through traffic by blocking certain movements and diverting traffic to other streets) and speed control measures (that slow down traffic by changing vertical or horizontal alignment, or narrowing the roadway).\[14]

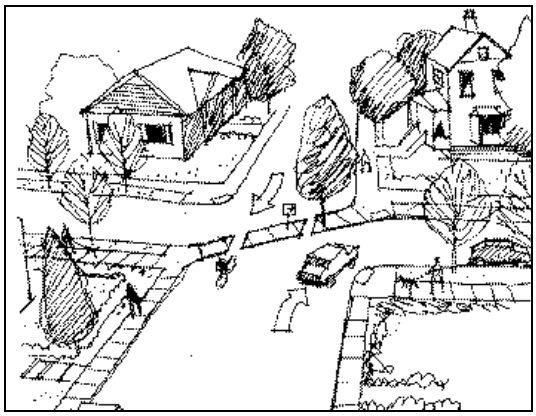


Figure 13: Traffic Calming: blocking through traffic

Figure 14: Traffic Calming: speed bumps and chicanes (reduce speed)

5. Results and Impacts

Most cities that have implemented sustainable urban mobility plans and measures have experienced the following types of benefits:

- Decrease of traffic jams and congestion followed by a diminution of noise, atmospheric contamination, contribution to the greenhouse effect and accidents.
- Lower energy consumption.
- Reduction of travel time.
- Improvement of the public transport services.
- More public spaces available.
- A general improvement of accessibility, included for disabled.
- Reduction of external costs.
- Increased health among the inhabitants because of less contamination and increased use of bicycle and walking.
- Increased quality of the urban environment and quality of life among the citizens.

An important ingredient in sustainable mobility planning is the willingness of cities to try out new ideas and learn from each other. Equally important is the willingness of city authorities to consult with citizens on problems and solutions and to involve them in the design, implementation and monitoring of results.

Finally, developing sustainable urban mobility involves knowledge sharing (good and not so good experiences) and the willingness to admit "I don't know…" and to ask for help.

For more information on urban mobility, visit the following pages on the gTKP website:

Urban Mobility	http://www.gtkp.com/theme.php?themepgid=12
Mobility Management	http://www.gtkp.com/theme.php?themepgid=32
Mobility Plans	http://www.gtkp.com/theme.php?themepgid=214
Mobility Policies	http://www.gtkp.com/theme.php?themepgid=280

References

These references are available in the gTKP Knowledge Centre (www.gtkp.com)

[1] **Promoting Sustainable Urban Mobility with CIVITAS**
[2] **Towards a new culture for urban mobility: Green Paper and Action Plan (EU)**
[3] **The Implementation of Brazil Sustainable Urban Mobility Policy**
[4] **Urban transport in France**
[5] **National Urban Transport Policy (India)**
[6] **Evolution of Travel Modes in Bordeaux: Sustainable Guidelines and Technological Choices**
[7] **Sustainable Urban Mobility in Europe: Key Ingredients for Success**
[8] **Curitiba's BRT: Inspired Bus Rapid Transit Around the World**
[9] **Urban Mobility Topic Information Sheet on Bus Rapid Transit**
[10] **The transport and mobility strategy in La Rochelle**
[11] **The Role of Smart Bike-sharing Systems in Urban Mobility**
[12] **Road Pricing: Singapore's Experience**
[13] **Central London Congestion Charging: Impacts monitoring Sixth Annual Report**
[14] **Urban Mobility Topic Information Sheet on Traffic Calming**.