



CiViTAS

Cleaner and better transport in cities



07

POLICY ADVICE NOTES

Prioritisation of public transport in cities



The CIVITAS Initiative is a European action that supports cities in the implementation of an integrated sustainable, clean and energy efficient transport policy. Lessons learned during the planning, implementation and operation phases of the activities are summarised in twelve Policy Advice Notes and give an idea on how to cope with urban transport problems which cities of the European Union have to face in the future.



Prioritisation of public transport in cities

Establishing a fast and reliable environmentally-friendly mode of transport



Different measures were implemented within CIVITAS II (2005–2009) with the purpose of prioritising public transport within traffic and the urban transport system. The European cities, which introduced these innovative tools, had different experiences both in the planning and implementation phases; these experiences form the basis for the useful know-how that is summarised in this Policy Advice Note.

Overview

DESCRIPTION OF THE MEASURES

Public transport may not be attractive for citizens in comparison with private cars. Public transport is less flexible and often journeys take longer because it does not always go directly to the traveller's destination. Several stops are made for transfers to other routes or modes, or for other passengers on the way. As a result, buses and trams are often not seen as a real alternative to the car.

Cities can counteract these problems by creating priority systems for public transport at traffic lights. They are installed in order to detect a bus or a tram approaching a traffic light, ensuring that the vehicles get a green light, if possible, when they arrive at a junction. These priority systems can provide substantial benefits in terms of travel times and reliability and can reduce the loss of time, especially during peak hours making public transport even faster. These priority systems should be an important element of intelligent transport systems in all European cities. In cities in central and eastern European countries especially they should be fostered in order to maintain the previously high levels of public transport.



Reserved lanes for public transport vehicles can be created. These are segregated lanes exclusively for trams and/or buses before an intersection or along entire sections of the road network enabling public transport vehicles to bypass congestion. It is also possible to open the lanes for other specific vehicles, such as taxis. To achieve an efficient use of the lanes, it is crucial to establish a specific monitoring and enforcement system and define particular categories of users (e.g. public transport vehicles, taxis, cyclists, etc.). Sometimes it might be appropriate to make separate tram lanes accessible for buses on crucial sections (if there is no possibility of creating a new separate lane).

TARGET GROUPS

The measures are mainly aimed at current public transport users, but may also attract new passengers by improving the reliability, travel time and the image of public transport. Implementation of the measures described is an important element of a marketing campaign which should be addressed to individual car users also. The message should be based on real advantages such as the reduction of time and higher reliability, especially during peak hours.

IMPACTS AND BENEFITS

For the public

The public can benefit from the measures because

- The emissions of public transport vehicles can be reduced due to less time spent in congestion and higher fluidity of the traffic stream
- The modal share of public transport increases and the use of motorised private vehicles declines causing a reduction of noise and air pollution in the long term
- Public funds are spent in a more effective way, concentrating on improvements of existing infrastructure and rolling stock

For individuals

The public transport user benefits from the measure because less time is needed to travel by bus or tram. The public transport services become more reliable (schedule adherence and enhanced regularity). The times needed for fault clearing in the case of a break down or accident are shortened. Due to the improved public transport service, car ownership may be decreased as a car (or a second car in a family) may not be needed anymore and related acquisition and operation costs might be avoided.

For companies

If the competitiveness of public transport is enhanced, this should lead to increased ticket revenues. Public transport operators benefit from the measures as the work efficiency and comfort of drivers and dispatchers are increased. The average speed of the vehicles rises as well. Experiences in the city of Toulouse (France) have shown that in particular sections an increase in the average speed from 13 km/h up to 23 km/h is possible giving travel time savings between 5 and 10 minutes and making public transport competitive in comparison with the private car. There, two bus corridors



Schiffer



with a length of 18 km and 22 bus stops were developed as high quality corridors (HQC) to improve the public transport offer. Furthermore, the improvements should have a strong impact on the image of public transport when the service is more punctual, reliable and frequent. Commercial and retail companies can save money as well, because less investment and lower running costs will be needed for offering parking spaces for private cars.

FRAMEWORK CONDITIONS FOR SUCCESS

The measures are likely to be implemented most successfully if the city already has severe transport problems, such as congestion, scarce parking and a lack of proper infrastructure for walking and cycling. Prioritisation of public transport vehicles is an affordable option to enhance the accessibility of areas with a medium population density, which currently can be reached only by using highly congested roads. There, a tram or a metro line would not be justified because of the high costs but priority systems would be an appropriate solution as the investments are relatively low compared to the benefits in terms of running time and comfort. For the introduction of reserved lanes for public transport it is crucial to have enough space available and to implement a monitoring system to achieve a good control of the lanes in order to increase their efficiency (e.g. with fixed optical gates to control access). When new road infrastructure is planned, it is advisable to implement prioritising solutions at the stage of planning and technical design. It has to be taken into account that the introduction of priority lanes is likely to take space from other road users. At the planning stage it will be important to use models in order to assess the conditions under which the same throughput of travellers can be achieved.

A shift from car to bus would need to result in at least the same or preferably greater mobility of all the road users. Otherwise, the congestion and pollution will hardly improve; but will just be shifted elsewhere. Therefore, modelling should be carried out to determine projected throughputs, and impacts on emissions based on bus and car occupancy scenarios.

Implementation steps and timeline

For a successful introduction of measures designed to prioritise public transport, the following working steps, supporting measures and timeframes need to be considered.

WORKING STEPS

1. Collection of required data

- Analysis of the current traffic situation, rolling stock and infrastructure to make sure that the measures are appropriate
- Measurement of current public transport quality for a true evaluation once the measure is realised (based on regular marketing research)
- Launching of a mobility survey to detect the needs and opinions of the public transport users and citizens
- Identification of the most problematic streets (or sections) and junctions as well as the duration of peak time delays to define the areas where the measures could be introduced
- Checking if the legal and regulatory frameworks allow the introduction of the measures and examining the national laws which



protect people's privacy to make sure that the enforcement system is compatible (e.g. if photos can be made of vehicles illegally using the segregated lanes)

- Collecting state of the art studies as well as case studies of cities of similar size and common transport problems so as to be informed about new flexible concepts for public transport priority and the technology to enable it

2. Initiate the formal decisions required

- Approvals for choosing a corridor for the segregated bus lanes
- Approval for the type of the priority system
- Approval for the enforcement system
- Agreement on the share of the penalty revenues

3. Definition of the concept

- Designing the system in terms of technology applications and software specification by the project team (e.g. local administration, police, public transport operator)

4. Implementing the measure

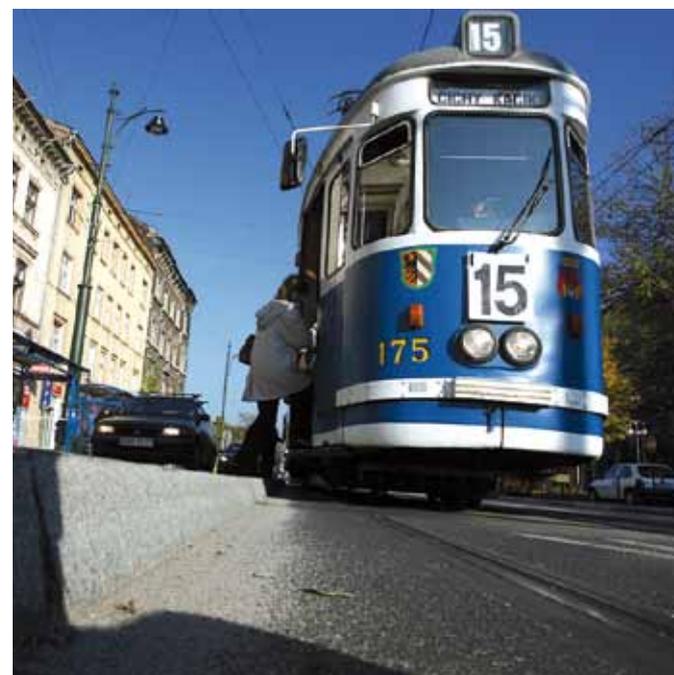
- Bus priority systems
 - Call for tender for software needed for prioritisation at traffic signals
 - If necessary, appointing a consultant for the traffic technical planning of intersections
 - Development of the protocol for programming the controller and the bus database for the priority system at intersections
 - Installation and operation of the new equipment at the selected locations
- Reserved lanes
 - Acquiring space for segregated public transport lanes (e.g. by converting parking lanes)
 - If necessary, appointing a consultant for the traffic planning

- Building the infrastructure needed
- Setting up a control system to avoid the illegal use of reserved lanes
- Calculating a new public transport timetable following the implementation of the new bus priority systems

5. Launching an information campaign to inform car and public transport users about the system and enforcement aspects.

6. Development of an enforcement strategy. This can be, for example, the control of dedicated lanes by cameras, CCTV systems (closed-circuit television) or by police patrols.

7. Evaluation of the measure. Dedicated market research among the passengers of the public transport vehicles operating on the separated lanes will be helpful in order to know how many passengers were car users before the implementation of the measure. Evaluation should be ongoing and include comprehensive monitoring of passenger numbers, bus and car average speeds, and impact on numbers and occupancy of private cars.





ACCOMPANYING MEASURES TO AMPLIFY POSITIVE EFFECTS

The following accompanying measures can enhance the success of public transport prioritisation activities:

- Enhancement of the attractiveness of public transport, such the introduction of integrated ticketing systems, real-time information systems (e.g. with GPS and traveller information online and at bus stops), the modernisation of public transport shelters, improvement of the connection between different public transport lines, improvement of the accessibility of bus stations by foot and by bicycle, the fitment of cycle racks as well as the use of barrier-free (e.g. low floor) vehicles
- The introduction of segregated public transport lanes in connection with a revised underground network in a city (e.g. a new metro line). If the feeders (public transport lanes from the peripheral areas) for this fast transport system are improved and the connection between bus and underground network is optimised, the peripheral areas can also benefit from it.
- Introduction of clean, low noise vehicles which might be effectively used on separated lanes. Prioritisation and introduction of clean vehicles enhances the attractiveness of the public transport package, facilitating marketing of the implemented measure.
- Introduction of access restriction zones (e.g. low emission zones), managing availability of central parking spaces, and introduction or increase of parking fees. In parallel, park and ride services should be offered at stations on the prioritised public transport lines outside the city centre.
- Marketing of sustainable modes of transport – introduction of measures might be combined with events promoting sustainable mobility (i.e. Car Free Day, open days for public transport, etc.)

TIMEFRAME

Priority systems

Experiences within CIVITAS II show that the implementation of a small-sized public transport priority system takes between 42 and 48 months depending on the complexity of the measure planned. First of all, a study on current concepts and management tools has to be compiled, which may take about 12 months. The creation of a concept (planning phase) and the tendering procedures can last up to one year. Another year is needed to equip vehicles and traffic lights and to establish the system parameters.

Reserved lane

The planning of a segregated bus or tram lane takes about 12 months. The construction of the lanes depends on the length of the lane and is about one year for almost 10 kilometres.

Since the measures are usually phased over time, changes in the demand can only be seen successively. Small short-term impacts can be noticed when existing public transport users change their routes in order to travel on a faster line. The attraction of car users to public transport, due to time-savings and reliability improvements, can be seen as a longer-term impact. This impact can be particularly high on heavily congested sections of the road network.





What are the investments involved?

Depending on the type of system implemented and the number of junctions on the bus network as well as the number of vehicles to be equipped with new technologies costs can vary greatly. However, the following costs categories need to be considered:

- Construction costs of segregated public transport lanes
- Costs for upgrading existing infrastructure
- Costs for the on-board equipment for the vehicles
- Costs for implementing a priority systems at traffic lights

Some experiences made within CIVITAS II:

- EUR 26,000 for implementing a priority system at 42 junctions including expenses for modems, installations and traffic technical planning and running for the system (Malmo, Sweden)
- EUR 100,000 for a loop-based priority system on two bus lanes (with a total length of 16,5 km) and a radio priority system applied at two main junctions, plus EUR 2,000 per bus for the on-board equipment (Toulouse, France)
- EUR 1,165,000 for priority equipment on 26 intersections, on 150 vehicles and 7 managing and observing centres (Tallinn, Estonia)

It has to be taken into account that the costs can vary considerably in different cities and countries. For setting up segregated lanes it is important to know if space was just taken over from parking facilities or if a new lane was constructed especially for this aim.

Main drivers that serve as precursors to success

The success of measures accomplished within CIVITAS II cities, which had the goal of prioritising public transport, was due to many different factors, which are listed below:

- Public transport users that strongly supported the activities
- Good cooperation between the partners of the measure (police, transport operator, public transport authority, municipality, taxi companies if allowed to use lanes, etc.)
- Support by local politicians which helped to overcome different barriers
- A balanced engagement strategy as well as visionary and qualitative management of the city
- A driver for the implementation of priority systems is the technical insight of engineers that prove that the system can significantly increase the reliability and frequency of the public transport services
- On-going cooperation with the local media to make visible the needs of public transport users and the advantages they can gain from the measures
- Using coloured asphalt or physical devices and clear signage to distinguish and separate special bus lanes (if the shape of the streets, the law and economic resources allow it)



Strategies for a successful implementation

The following factors, listed below, are the main drivers for the initiation as well as for an efficient and successful implementation of the measures described above:

Spatial planning

In old city centres particularly, the streets are narrow and space is limited and therefore parking restrictions may need to be implemented in order to provide space for the public transport vehicles. If space is too limited traffic lights can be installed in order to keep private motorised vehicles out of the area when a public transport vehicle is approaching.

Strategy

Measure(s) should be present in the transport policy or strategy of the city with a specified timeframe of implementation and a designated department responsible for it.

Institution & Organisation

It is important to adjust the different priorities of various departments of a city. For all working steps, it is important to report on the works which have been completed, which steps and decisions are still missing and which problems occurred, so as to allow a fast reaction to possible deviations. It has to be clear which part of the measure or which department's supporting activities have to be tackled with priority.

Acceptance

It is advisable to work together with the media in order to inform the inhabitants about the advantages of the measures for public transport users as well as for the whole transport system. This can help to disseminate information and to raise awareness of advantages in order to convince car drivers, in particular, and car drivers' associations, who are afraid of negative impacts on car use.

If monitoring systems are installed, which record the illegal use of public transport lanes by cars, large visible information panels can be installed to inform drivers. The acceptance of fines can be enhanced by information (e.g. warnings) instead of real penalties (at least for the initial period of the measure). This can help people to understand their responsibilities and therefore to change behaviour, recognising that the target of the measure is not to punish car drivers but to improve the public transport service and thereby positively influence the whole transport system.

Financial management

It is important not to underestimate the expenditure at the beginning of the measure by commissioning a comprehensive study of the technical equipment and their costs before beginning with the detailed planning process. If implementation of the measure is planned for a time frame longer than one year it is important to secure financing via political support of the majority in the city council.

It is important to prepare a business plan, to use different funding streams (e.g. from the European Commission, European Investment Bank – EIB) as well as to develop and to keep within a financial management structure.



Technical Aspects

It is very important to have a good technical knowledge of the potential solutions to be implemented before the planning and implementation processes begin. In particular, in-house knowledge by the contracting organisation (e.g. the city council, public transport authority) is needed, to ensure the appropriate level of technical specification within the tender documentation, project scheduling and contract management. Furthermore, it is important that the companies invited to the tender procedure have comprehensive technical expertise. Therefore, it might be advantageous, to involve international experts who could advise on the technical specification, management and selection of contractors as well as gather experiences of similar cities which implemented and are now operating measures so as to learn about investment and operating costs.

Public transport vehicle priority systems have to be flexible. It is advisable to have a set of solutions which can be applied according to the context of the intersection and not to apply the same single solution for the entire lane. However, it is possible that in the case of uncoordinated traffic light equipment, each junction is treated individually, but this makes it very complicated for traffic engineers to implement a priority system for public transport. Consequently, updating the situation (e.g. modification of traffic conditions, installation of new traffic lights) requires considerable time and is expensive. This decentralised solution is appropriate at single intersections. If more junctions can be managed together a centralised priority system is recommended as they are very effective, albeit expensive and complex to manage. If financial resources are low it is advisable to identify the critical junctions and sections of roads to implement the measure. The measure should be planned as an “open system”, that is easy to enlarge and develop.

Legal framework condition

National legal provisions for environmental protection policies may justify the implementation of the priority systems and segregated lanes in the whole country. However, in new EU member states in particular, this may have to be proven as sometimes enabling legislation may be lacking or may not be harmonized.

The tools for enforcement (e.g. violations of fixed gates for bus lanes) have to be certificated by the relevant ministry in order to ensure that the system is in line with national data protection law. Furthermore, it is advisable to incorporate the measures into the wider transport strategies endorsed by local or regional politicians.

KEY ELEMENTS TO BE CONSIDERED

- Prioritisation of public transport vehicles is especially successful in areas with a medium population density, which currently can be reached only by using highly congested roads
- For the introduction of reserved bus lanes enough space has to be available as well as a monitoring system to control the lanes
- It is beneficial to introduce access or parking restriction zones in the cities in parallel to the measures. Furthermore, park and ride services should be offered at the stations of improved public transport lines.
- Awareness raising activities are important to inform the inhabitants (especially car-drivers who are afraid of constrictions) about the advantages of the measure for public transport users and for the transport system as a whole



Who are the key people to be involved?

STAKEHOLDERS

The following stakeholder organisations / individuals should be involved as advisors or supporters:

- Persons affected by the measures directly (car users, public transport users, car driver associations, commuters, etc.)
- Special user groups, who may be granted the permission to use the segregated lanes as well (e.g. disabled people, taxis, cyclists)

MAIN PROJECT PARTNERS

The involvement of the following partners is critical to the successful implementation of the measures:

Decision makers

- Local administrations, like the municipality, local council, the street and parking department or the public transport department of a city or the public transport authority

Operators

- The operator of the measures (usually the municipality)
- The operators of the public transport fleet or public transport authority

Financers

- The municipality, provincial or national government responsible for financing the construction of segregated lanes and the introduction of priority systems
- The public transport operator committed to paying for the improvements of the buses and the equipment on the vehicles for the transmission of data

Other partners

- The police or other traffic control body responsible for the enforcement
- Public or private enterprise for the technical support
- Research institutes for the evaluation of impacts, traffic flows and analysis compared to the base case
- Other organisations like ecological NGOs, cyclist organisations, car driver associations, organisations of disabled people





Enumeration of practical examples from CIVITAS II

Within CIVITAS II 7 cities implemented measures dealing with public transport priority:

Genoa (Italy): Bus lane control system in Genoa

Krakow (Poland): Clean high mobility corridor; Public transport priority system

Toulouse (France): High-quality bus corridors and development of public transport segregated and secured lanes in the city centre; Implementation of bus priority scheme

Malmö (Sweden): Bus priority system

Suceava (Romania): Bus priority measures and other bus improvements

Tallinn (Estonia): Public transport priority system

La Rochelle (France): Implementation of dedicated bus lanes



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www.civitas.eu

The CIVITAS website contains information about CIVITAS-related **news and events**. It provides an overview of all **CIVITAS projects, CIVITAS cities** and maintains **contact details** of over 600 people working within CIVITAS.

In addition, you get in-depth knowledge of **more than 650 innovative showcases** from the CIVITAS demonstration cities.

Visit the CIVITAS website and search for **prime examples of experiences** in sustainable urban transport currently being undertaken in cities. If any of the ideas suit your city, or you are just interested in learning more, you may then contact the relevant person responsible for this measure.



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