



Supervised Implementation of  
Sustainable Urban Transport  
Concepts



## Imprint

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## Foreword



Michael Jupe,  
Head of Division, MIR

Many years ago the Federal state of Brandenburg, together with partners from all over the world, decided to take up the issue of "sustainable urban transport" in greater detail and, on the basis of discussion and shared experiences, formulate proposals on the interplay between traffic planning and urban development. In doing so we consciously placed particular emphasis on the specific concerns of smaller and medium-sized towns and cities.

The bigger cities have been the focus of discussion on the question of sustainable urban mobility for many years now, a preoccupation which arguably reached its peak in the discussions surrounding the European Commission's green book "Towards a New Culture of Urban Mobility". With TRANSPOWER we were looking to

create an analogical forum for smaller and medium-sized towns and cities so that we might address the specific problems they face and, on the basis thereof, elaborate upon and generalise positive experiences.

The results, featuring detailed information, good ideas and numerous proposals, are impressive. This brochure, in order to demonstrate the successful development and completion of the project, contains those proposals considered to be the most significant from the perspective of the project partners. This is, nevertheless, just the beginning of an ongoing discussion on these issues. Brandenburg intends not only to maintain an interest in this process, but also to get involved and actively participate in any further relevant discussions. TRANSPOWER has provided important impetus towards this goal.



TRANSPOWER team 2009



## Introduction



Julika Jesson,  
Coordinator, GTZ GmbH

Cities are the centres of our faster and rapidly changing world. They are driven by curiosity, diversity, progress, and by knowledge. Cities attract the brightest brains and the biggest investments. They are places of innovation, offering high quality living areas, outstanding educational facilities, green spaces and countless cultural events.

A very important aspect of the quality of life in urban areas is the quality of mobility provision. Urban mobility on the other hand brings about a number of negative side-effects such as congestion, air pollution, higher accident rates and longer travel times for commuters. In order to minimise these negative aspects every city is trying to develop and implement innovative, efficient and sustainable mobility solutions.

Generally speaking, these strategies consist of attempts to improve vehicle fuel efficiency, generate a shift towards more environmentally-friendly modes of transport, reduce the overall need for travel and encourage the use of renewable energies. However, even well-developed strategies often prove difficult to implement since they might be regarded as a hindrance to economic development and the population's wish to use private cars as status symbols in every-day life.



Groningen 2009

This was the starting point of the international project TRANSPOWER: Discussing the effects of sustainable mobility solutions and achieving a change of paradigm in urban mobility by assisting nine cities in seven countries in implementing their already existent transport plans in an efficient, cost-effective, and environmentally-friendly way.

TRANSPOWER was coordinated by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH on behalf of the Ministry of Infrastructure and Urban Planning of the Federal state of Brandenburg. The project worked on five technical work packages: Public Transport, Integrated Planning, Traffic Management, Non-motorised Transport and Mobility Management. These five technical work packages represent the core issues in the field of urban transport. Each of these work packages was supported by professional experts who in each case formed a so-called competence team. In international workshops cities, experts and decision-makers presented their concepts and developed possible solutions to their own, specific problems. For instance, in Skopje, the "Perspectives of Dynamic Traffic Management" were elaborated upon. Sibiu on the other hand implemented long hoped-for cycling paths throughout the city. Finally, internships in Groningen and Graz provided participants with unique opportunities to learn "on-site".

TRANSPOWER was funded by the European Union (Framework Research Programme 6).

The present brochure provides information about the manifold project results in the targeted cities. Each city carried out a "Municipal Case Study" in order to assess the current local urban traffic situation. Groningen and Graz, both pioneers in developing sustainable transport policies, allowed the other cities to profit from their expertise. Furthermore the Municipal Case Studies opened possibilities for a transnational exchange of knowledge.

Additionally, each partner informed on several "City Solutions", (such as a network of new biking paths, new parking solutions etc.) that have contributed towards the goal of an improved quality of urban mobility.



# TRANSPOWER Approach

**Transpower** seeks to tackle urban transport challenges within a network of 16 small and medium-sized partner cities from six EU countries and two associated countries. The project brings together municipal and regional stakeholders from the fields of politics, academia and business in order to link innovative experiences in urban transport.

Financed by the 6th Framework Programme of the European Union, **Transpower** provides the scientific basis for authorities in cities and municipalities to efficiently and swiftly implement new or existing good practices of sustainable urban transport.

## Purpose and Impact

The objective of **Transpower** is to assist major actors in the field of urban transport – municipal and regional authorities – in implementing concepts for an environmentally friendly, resource-efficient, safe and clean urban mobility.

**Transpower** paves the way for small, innovative, manageable and tailor-made transport projects that solve current problems and integrate experiences from different European cities. The inhabitants of the target cities benefit from the project as **Transpower** reduces air pollution, transport noise and transit traffic while securing accessibility and liveability.



## Project Structure

**Transpower** has defined five technical work packages for its activities and will work on topics relating to the following issues:

1. **Public transport**
2. **Integrated planning**
3. **Traffic management**
4. **Non-motorised transport**
5. **Mobility management**



TRANSPOWER Cake

## TRANSPOWER CITIES



### Groningen, The Netherlands

#### City Facts

The city of Groningen is the most important city in the north of the Netherlands and capital of the province. The two provinces of Groningen and Drenthe with 12 municipalities form the Region Groningen-Assen. Groningen is a very young (185,000 inhabitants, 47,000 students) and lively city. The quality of life is increased by the organisation of the transport sector.



#### Transport background of the city

Groningen is a pioneer in developing sustainable transport policy. Since 1977 the city has pursued a policy of integrated town and traffic planning. Its travel management policy aims to reduce car traffic while maintaining a good level of accessibility related to concepts of compact and mixed urban developments („Compact City Approach“). With a 50-60% share of bicycle use, Groningen has become one of the world's leading cities for bicycle use, while maintaining the right conditions for commercial activities. Town planning and transportation policy led to spatial plans favouring the compactness of the city, access restrictions for cars to the city centre, parking management, management of the car flow, an extensive cycling network, and public participation and consultation of stakeholders.



#### City Solutions **Traffic-safe school environments in Groningen**

Altogether, there are 54 primary school locations in Groningen. In cooperation with the schools, pupils, parents and police, traffic safety in the direct surroundings of the schools have been improved. Plans have been made for safe routes to schools per individual school, also indicating the most child-friendly routes. This has led to a situation where a so-called KANS plan (Different Ways to Go to School) has been made, involving agreements on traffic education and maintenance of the infrastructure.

#### **GSM Parking in Groningen**

GSM parking has several advantages. Anyone with a mobile phone can use the system. After registration, all users of the GSM parking system receive a transponder card that is placed behind the windscreen. This card serves as a digital parking ticket. By dialling up, one can report to the system when parking, and check out again on departure. Traffic wardens can simply read off the card with the help of a hand scanner and check if the customer has actually reported in. At the end of the month the municipality charges the total amount of the parking fees by direct debit.

## Municipal Case Study

Since Groningen is a pioneer in developing sustainable transport policy, the city contributed to the project mainly as an advisor for other cities that still have a longer way to go, for example by presenting the city's transport policy which aims at keeping travel distances as short as possible to as many destinations as possible ("Compact City Approach"). Nevertheless, in the course of the project a „Municipal Case Study“ was launched with the aim of planning two tramlines (investment of approx. 300 Mio EUR) which mainly connects the central train station with the university campus and P+R Karding. The operating costs are estimated to increase by 2,2 Mio per year. Project start is planned for 2011. Decisions on this will be made by the city together with the regions. Groningen receives partial finance from the national budget for this project, the rest of the costs will be paid by the municipality, the province and the Region Groningen-Assen.



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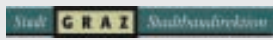
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# TRANSPower CITIES



## Graz, Austria



### City Facts

With 250,000 inhabitants, Graz is the second largest city in Austria. Almost 360,000 people live in the greater Graz area. The ratio of men to women is about 120,000 to 130,000. The share of foreigners is 12.4%. The city is the cultural, economic and, numbering over 40,000 students, educational centre of Styria province. As such, Graz is widely regarded as one of the focal points of South-East Europe.

In 1996 Graz was the first city to receive the European Sustainable City Award. In 1999 the medieval city centre of Graz became a UNESCO Cultural World Heritage site.

The city was „Cultural Capital of Europe“ in 2003 and “CMTAS City of the Year“ in 2008.

### Transport background of the city

As early as the seventies, strategies were conceived with the aim of catering for the urban need of mobility and, at the same time, minimising the negative effects thereof on the inhabitants and environmental quality of the city. City inhabitants are on average on the move for just one hour per day. For the other 23 hours they are then subjected to the consequences of other people’s mobility. In urban areas it is thus a question of finding a balance between the demand for fast, reliable accessibility to popular destinations and the need to provide a high quality of life. In this spirit Graz created the slogan of “Gentle Mobility”.

In general Graz has a slightly positive modal share concerning the use of environmentally friendly modes of transport. It demonstrates a very stable share for public transport (19%). The share of pedestrians has decreased rapidly (by 1/3 within the last 20 years) to 19%. The share of bicycle use has increased from 8% in 1982 to 16% in 2008. In the city centre the share of bicycle use is already at 22%. The proportion of car drivers has decreased for the first time in more than 20 years and now stands at around 36%.

One of the biggest problems Graz faces concerning vehicle congestion are the approximately 70,000 commuters who travel to Graz every day. Although public transport has recently improved via the implementation of a brand-new S-Bahn system and a very innovative parking management system (see below), the connection with the surrounding area still needs to be improved. Large shopping centres on the outskirts of the city are also big traffic generators and as such, also take responsibility for the high levels of traffic congestion.



### City Solutions **Blue and green parking zones - Further extension of the parking zones**

Graz City Council has taken a stand against congestion charges and has chosen an alternative to this in the introduction of a comprehensive city-wide parking management system. The core of the system is a paid parking scheme for the entire inner city with a maximum stay of 3 hours (13,000 parking spaces) and a green zone around the city centre with paid long-term parking (7,000 spaces).

### City Solutions **City-wide 30 km/h speed limit**

In 1992 Graz was the first city in Europe to introduce a speed limit for the whole city: 30 km/h in all residential areas / side roads (amounts to ca. 800 km) and 50 km/h for all priority roads (ca. 200 km)–, with the aim of increasing road safety, and reducing air and noise pollution.

### **Bicycle training for children in real traffic conditions**

Transport education and the preparation for the bicycle examination are usually carried out in a protected area. Children do not learn how to behave in real transport situations. The “Bicycle Training for Children in Real Traffic Conditions” programme in Graz prepares them for such dangerous situations. Children learn to cycle not only in their school surroundings but also in genuine traffic in small groups guided by cycle instructors. Over 15,000 children have taken part in this initiative over the past twelve years and all activities have been accident-free since the programme was introduced in 1995.

### **The first Austrian Mobility Centre in Graz**

In Graz the first Austrian Mobility Centre “Mobil Zentral”(MZ) was established in 1997. The MZ offers mainly information on various aspects of public transport such as prices and timetables, but also offers visitors the possibility to buy and reserve tickets. A number of sustainable forms of transport are also included amongst the range of services offered by the MZ. In April 2007 four tourist information offices in Styria were upgraded and expanded and are now called mobility centres. They are all supported by the MZ from Graz and represent the first network of its kind.



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# TRANSPower CITIES



## L'Aquila\*, Italy

\*The City Profile as well as solutions and municipal case study reflect the situation of the city before the earthquake 2009.



### City Facts

L'Aquila is a medieval city in Central Italy; located on a hill, within medieval walls. It lies on the Aterno River, at the foot of the highest peaks of the Appennines. It is the capital of the Abruzzo region, and has a population of about 73,000 inhabitants. L'Aquila has been a university town since the end of XIX century.

### Transport background of the city

This historic city is characterised by short walking distances and its typical narrow streets in which finding a parking space is always extremely difficult. The city centre is densely populated and features numerous public offices and shops, and so there remain thousands of citizens who are obliged to commute every day. In recent years the municipal administration established some „Limited Traffic Zones“ in order to encourage inhabitants to use alternative modes of transport when travelling to the city centre. The urban transport service consists of about fifty bus lines linked to and from the central bus station, the university, the hospital and all the other smaller urban centres in the city outskirts. The city is also served by a small taxi service managed by a private company and has an ongoing electric “tyre tramway” project.

### City Solutions National Day of Urban Trekking

Urban Trekking is an initiative promoted by the Municipality of Siena, in which L'Aquila recently participated for the first time. The event is dedicated to efforts at retracing paths backwards in time. It is no coincidence that the theme of the first day of October 2006 was: „Walking backwards: Looking for places, crafts, tastes and sounds lost in time.“ L'Aquila has studied, in cooperation with the National Association of Tourist Guides, easy walking trails and streets in the heart of the old city.

### Barriers and social services for citizens

The municipal administration decided in 2005 to divide the city centre into six „limited Traffic Zones“, adopting as a solution the installation of electronic toll lanes and barriers with autonomous electronic gates able to identify a transponder in order to permit access to each zone. The electronic gate, monitored continuously by operators of the control centre, was also designed to play a social function for citizens in case of an emergency.

### Bus Terminal and Parking Garage “Lorenzo Natali”

Outside the urban walls of the city a structure built by the city administration, with more than 670 parking places and a bus terminal, allows visitors to reach the main square of the historic centre via a 500 meter pedestrian underground tunnel fitted with travelling carpets, of varying lengths and slope grades. Finished in 2003, the terminal structure is at the moment managed by an Italian Mobility and Parking Company.





**Municipal  
Case Study**

**Safe on the streets, safe in the city**

Three provincial cities (L'Aquila, Chieti and Teramo) have come together in order to cooperate on the project „Safe on the Streets, Safe in the City“. The project objectives are to improve street circulation, raise awareness among citizens of urban traffic issues and to increase road safety standards through actions carried out in tandem with all three participating provinces. The measures planned are to design and implement necessary road works, carry out information campaigns in order to increase awareness of road safety issues, conduct road safety lessons in schools, and in general to analyse the latest information available and draft further plans on the basis thereof when necessary.

**Pedestrianisation and rationalisation of traffic flows in the areas around the Fontana Luminosa and the Spanish Fortress in L'Aquila**

In 2004 the Municipality of L'Aquila entrusted a group of technicians with the planning of the above-mentioned project. They came to the decision that it had become fundamental to revise the structure of the street node around the Fontana Luminosa, in order to separate the urban traffic flow from the non-urban one and give the entire area the role of a square that it had once enjoyed. The case-study raised the city's attention to the problems that historical city administrators generally face, and in particular the need to find a balance between the historical identity of a city and the demands of modern urban mobility. Regardless of the project solutions adopted, it quickly became evident that a consideration of the architectural, urban and historical needs of this part of the city had been long overdue and as such, partly due to a lack of funding, there remains work to be done on this specific case.



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## TRANSPower CITIES



### Niš, Serbia



#### City Facts

With more than 250,000 inhabitants Niš is the largest city of Southern Serbia and the administrative centre of the Nišava District of Serbia. Situated at the crossroads of the Balkan and Central European highways, Niš is one of the oldest cities in the Balkans. Niš is a university centre with about 30,000 university students. Niš is also one of the most important industrial centres in Serbia.

#### Transport background of the city

In the city of Niš, car traffic in particular has developed rather rapidly of late. While the car ownership rate in 2002 was approximately 200 cars per 1000 inhabitants it is today predicted to be about 350 cars per 1000 inhabitants. This has led to several side-effects which the city has to cope with: rising demands on transport capacities, high traffic volume in the city centre, overcrowded parking areas and negative impacts on traffic safety. The administration of the city of Niš has attempted to meet these effects via means of different measures such as the reorganisation of parking in the city centre, the centralised management of public urban and suburban transport and the automation of traffic control and management systems.

#### City Solutions **PUC „Parking service Niš“**

PUC „Parking service Niš“ is a private company established with the aim of regulating parking in the City of Niš. Previously the parking situation in the City of Niš was very chaotic which in turn had negative impacts on both traffic flow and traffic safety.

Based on a detailed study, the central city area was divided into a green zone (wider centre of the city, 1000 parking lots) and a red zone (core of the city, 2100 parking lots). The time limit for parking in the red zone is 60 minutes and in the green zone 180 minutes. People can pay for parking either by a parking ticket or via SMS. Residents can buy season tickets at a reduced price and are allowed to park their cars in their zone of residence without a time limit. Additionally a big marketing campaign (leaflets, TV and radio) took place in order to provide citizens with all the necessary information they might need in order to comply with the new regulations. So far, the system is functioning perfectly and user approval is on the rise. The parking situation today has improved significantly.

#### **Street Design of Dimitrija Tucovica Street**

Dimitrija Tucovica Street is an important junction point. Because of safety problems at the access and exit points of Dimitrija Tucovica Street it was necessary to reconstruct these crossings. It was decided to build several roundabouts.

Retrospectively, several problems have appeared: Firstly, one of the main advantages of roundabouts is that they can cope with high traffic loads from different directions. In this case, there exists a clear-cut mainstream so that roundabouts are not the optimal solution. Secondly, the radius of some roundabouts is so big that it does not satisfy given traffic regulations. In this case road users do not see the need to decelerate while approaching the roundabout and to date several accidents have occurred. Furthermore, there is hardly any separation of the different traffic streams in the roundabouts – this leads to the fact that, even though the circular lanes are very broad, they are almost exclusively used as single lanes.



## Municipal Case Study

### Traffic flow and traffic safety along Boulevard 12 February

Boulevard 12 February is an important approach road for the City of Niš. The boulevard passes through the industrial zone and links some outlying residential areas to the city. Although it passes through the city, it is a second category state road. Because of problems of traffic flow and traffic safety, it is necessary to redesign the road and improve traffic management in this area. Corresponding to the solution in Dimitrija Tucovica Street (see City Solution) the state authority proposed a solution with several roundabouts and a collector road on at least one side of the boulevard. Because of the experiences with the redesign of Dimitrija Tucovica Street, it has become evident that a diligent analysis of the situation is of major importance for the success of the planning. Therefore, the aim of this case study is to conduct a traffic analysis and to make an optimised proposal for the redesign of the boulevard.

The following aspects of the current situation have to be analysed:

- Characteristics of traffic flows on the boulevard and at the intersection points
- Travel time of cars along the basic boulevard
- Capacity of the signal intersections
- Characteristics of pedestrian flows
- Technical analysis of the traffic light system
- Stationary traffic

Additionally, a microscopic traffic flow simulation of the whole area is to be developed in order to show that the system is able to cope with the traffic flow. The microscopic simulation allows a precise evaluation of differing approaches to this particular case study.



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# TRANSPOWER CITIES



## Sibiu, Romania

### City Facts

Sibiu, with a university, airport and its recent economic growth, is one of the largest and most important cities in Transylvania (160,000 inhabitants). It is a town with a rich cultural and architectural legacy. The original town, built in the 15th century, was protected by walls and brick towers. Its buildings, historic sites, narrow streets and public squares have been well preserved over time.



### Transport background of the city

Before 1989, traffic volumes in Sibiu were low. Cycling and public transport were popular means of transport. However, after 1989 buying cars became more affordable and public transport, once cheap and predominant, came to be considered under-financed, old, crowded, slow and inefficient. Bicycles became more expensive. This, and the fact that the car offered a higher level of comfort, led people to switch to private motor vehicles as a regular means of transport. Thus traffic conditions worsened, while air pollution, noise and car accidents soared. Another important factor contributing to worsening traffic conditions is the road system that was not built for such high traffic volumes.

### City Solutions **Parking in the historical centre of Sibiu**

Sibiu has a densely populated historical centre with narrow streets and main public squares. Increasing numbers of private cars have put great pressure on the urban fabric, reducing the quality of the area considerably. As a result, in 2003 the municipality elaborated a traffic study in cooperation with GTZ (Gesellschaft für Technische Zusammenarbeit GmbH). The basic idea was to restrict parking in the historical centre, mainly to residential and short-term parking, and to encourage visitors to park at the edge of the city centre. The area was thus divided into different parking zones based on the idea that the closer one parks to the centre, the more expensive parking becomes and the shorter time one is allowed to stay. Two years after implementing the study, the number of cars has been reduced, 1 000 parking spaces built and 50% of invested value has been amortised.



### **Cycling in the historical city**

In 2007 Sibiu was to become the European Capital of Culture, i.e. numbers of tourists and cyclists were expected to rise significantly. As the population of Sibiu is continuously growing, motorised traffic volumes are expected to increase too. Conflicts between pedestrians and cyclists caused by narrow streets, the lack of cycling infrastructure typically included in urban construction, and the logistics involved in constructing such a bicycle transport system, became important issues for the municipality. International organisations began to share their experience with Sibiu and in 2006 the municipality started collaboration with the TRANSPOWER network with the purpose of implementing an improved cycling infrastructure. By the beginning of 2009 the municipality was able to implement the following: a bicycle lane of approx. 1,500 metres, a one-way street system, speed limits for cars in the historical city centre and bicycle storage facilities in the city centre.



## TRANSPOWER CITIES



### Skopje, Former Yugoslav Republic of Macedonia (FYROM)



#### City Facts

Skopje is the capital of the FYR of Macedonia. Including the wider city area Skopje has about 600,000 inhabitants. Skopje is the political, cultural, economic and academic centre of the country. The city developed rapidly after World War II, although this trend was interrupted in 1963 when it was hit by a disastrous earthquake. Today Skopje is a modern city with a wide range of cultural facilities.

#### Transport background of the city

The city of Skopje consists of 10 administrative municipalities and the Skopje City Government with equal power sharing between the authorities, with the exception of traffic matters. Traffic organisation and regulation is the exclusive responsibility of the Skopje City Government. The major road network has a total length of 211 km. There are 90 intersections equipped with traffic lights. A bicycle network is established along all primary streets, but uninterrupted bicycle traffic is rarely possible because of illegally parked vehicles on the bicycle lanes. Other traffic problems are a low quality of service of public transport, congestion and air pollution. The city's transportation model is based on the 1998 traffic survey and refers to the master development plan from 2003. No traffic survey has been conducted since then.

#### City Solutions **Traffic Safety**

The standard of road safety in the City of Skopje is very low. Important aspects thereof are the relatively run down technical level of private and public traffic facilities and the low level of discipline of road users.

To improve this situation broad and comprehensive measures are planned by the City of Skopje and the National road safety council. An important aspect of improving traffic safety would appear to be improved instruction of traffic law and safety in pre-school and school institutions in order to induce better traffic behaviour. Of nearly equal importance is the implementation and surveillance of a new traffic penalty policy. Accompanying these measures the traffic behaviour of adults is hoped to be positively influenced by regular radio and newspaper reports. Furthermore, special attention shall be devoted to problems related to the technical standard of roads and motor vehicles as one of the most relevant preconditions for a safe and normal traffic flow.



#### **Implementation of the „Bicycle Master Plan“ for Skopje**

In 2003, the City of Skopje developed a bicycle master plan. The city's activities for implementing the plan are focused on the improvement of the existent infrastructure and on the general promotion of cycling. For this reason, the City of Skopje works together with the NGO PROAKTIVA. The long-term goal of the project is to reduce emissions of greenhouse gases and to assist citizens in changing their primary mode of transport from cars to bicycles.

The focus of the project is

- Implementation of a pilot line
- Raising the citizens' awareness of responsible and environmentally friendly traffic behaviour
- Construction of new parking facilities
- Construction of physical barriers to protect the bicycle lanes

It has become evident that the state of the transport infrastructure, personal life-style choices and an understanding of environmental issues are the most important factors when choosing a mode of transport.



**Municipal  
Case Study**

**Perspectives of dynamic traffic management in the City of Skopje**

The City of Skopje is particularly burdened with traffic congestion and pollution. Traditional urban traffic control systems are not able to cope with heavily congested conditions because they cannot anticipate reductions in capacity due to congestion running upstream from one intersection to another. At the same time, public transport vehicles are jammed on overloaded traffic lanes, thus operating at low commercial speed and providing a low level of service.

Traffic control techniques and information systems are needed to increase capacity and to improve traffic flow and traffic safety. A lot of new traffic technologies such as communication facilities, electronics, sensor technology, and computers belong to traffic systems; the traffic light does not stand-alone. Advanced technologies for monitoring, communicating and coordinating are considered to be the most important functions of the system.

If congestion occurs, advanced traffic management systems, consisting of computer-controlled traffic signals and message displays, direct drivers. To meet the objectives, one has to:

1. identify and assess the most promising technologies and systems for improving traffic flow and capacity, and for reducing traffic accidents and environmental pollution and
2. set the conceptual framework for realising the traffic management system.



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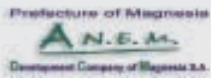


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## TRANSPower CITIES



### Volos, Greece



#### City Facts

Magnesia Prefecture has 206,995 inhabitants. The majority are concentrated in Volos City (55.3%) with an increase of 7.7% according to the 1991-2001 census results. Volos is located on the shores of the Gulf of Pagasitikos and dominated by Mount Pelion. It is a large city, with the third largest port in Greece, and attracts many tourists.

#### Transport background of the city

Traffic volumes in City of Volos City are growing faster than infrastructure development can sustain, particularly the main road network and the city centre. This has led to congestion and contributed to road accidents. The city government and stakeholders recognise that trying to provide for continuous growth is both unwarranted and unsustainable. Any efficient and equitable transport network requires legitimate travel alternatives. Current travel behaviour in Greece is strongly linked to a "car culture". The public transport network cannot serve every area of the city, and the poor condition of cycle lanes gives no alternative to passengers beyond private car use. The main problem occurs in the city centre, and the main reason is illegal car parking due to insufficient parking space.

#### City Solutions **Coleseed buses**

The City Coach Company of Volos is taking part in a pilot project carried out as part of a programme by the University of Thessaly and is operating a bus using coleseed oil as fuel, used directly without refining into biodiesel, reducing processing and disposal networks. The process of conversion from a conventional bus is fairly simple and cost-effective. Combustion of the coleseed oil takes place with the assistance of a specific catalyst. The bus has an attachment which heats the oil and thus improves viscosity. The pilot project started in November 2007 and will last for one year. Initial results are promising. The bus travels every day in the streets of City of Volos City. At the end of 2009 derived outcomes from efforts to introduce and encourage the use of alternative fuels instead of diesel in public transport so as to reduce carbon dioxide emission in the transport sector will be available.



#### **Parking**

As the city grows rapidly and organised parking spaces prove increasingly unable to meet citizens' needs, people often park cars illegally, reducing traffic flow and preventing movement of cyclists and pedestrians. Recently, local stakeholders adopted a measure for plastic bollards which act like barriers along the street edge and separate traffic lanes. This action seems to produce benefits in the form of preventing illegal parking and normalising flows of traffic along the main routes. The measure was implemented in 2007 and has achieved its purpose insofar as it is a flexible, quick and cost-effective way to reduce traffic congestion and illegal parking. Taking into consideration lower vehicle speeds because of the barriers' existence, the measure also plays a significant role in road safety and in reducing emissions. For this reason local stakeholders are thinking of expanding the measure across the whole city.

**Municipal  
Case Study**

**Mobility Planning**

Studies show that increasing road capacity generates more traffic and note that road building is ultimately unsustainable. Rather than road building, current thinking towards tackling congestion problems involves transport demand management, providing realistic alternatives to the car, and encouraging public transport use, walking and cycling. The only solution is to prevent or contain the use of cars by providing attractive alternatives. Local stakeholders have planned some supportive measures to accompany efforts for mobility planning in the city. The plan will consist of a city model, which re-associates the city centre with the outskirts, connecting them by means of pedestrian and cycle routes, so as to enable car/bicycle 'cohabitation'. The plan will reflect strong emphasis on public transport and on intermodality with inter-urban transport. The first step to achieve mobility is to focus on public information in order to increase awareness, promote sustainable transport and manage present demand for car use by changing drivers' attitudes and behaviour, not just at the launch of the new measure, but continuously, to guarantee its use over the long term. It is also conceivable that a consultative local mobility centre together with an internet platform will be established. The mobility centre would offer personalised travel assistance and information to citizens and tourists. The internet platform would inform users and suggest optimised routes that avoid traffic jams in the city centre, roads which suffer from traffic congestion, as well as provide information on alternative routes, the bicycle network, bus routes and bus timetables.



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# TRANSPower CITIES



## Municipality of Halandri, Greece



### City Facts

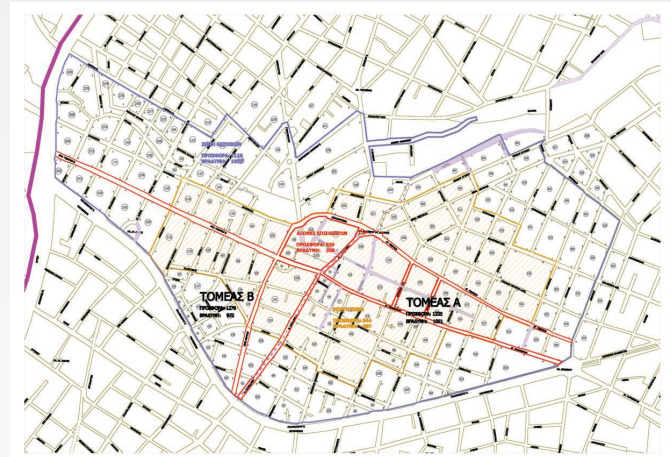
The Municipality of Halandri is one of the biggest in terms of area and population size in the wider Athens area. Situated in the north-eastern part of the Attica Basin, it covers an area of approx. 11 km<sup>2</sup> and is home to ca. 75,000 inhabitants (2001 census). It is a city that successfully combines a mainly residential face and rich environmental inheritance with a prominent commercial centre and strong entrepreneurial axes.

### Transport background of the city

The city is served by an extensive road network and a diverse transportation system, including public and municipal bus lines as well as two (+ two underground) metro lines and two suburban railway stations. It was the first municipality to implement a comprehensive municipal transport system (an initial five municipal lines, with the prospect of extending them to seven) and is now putting into practice a system of intercity transportation with adjacent municipalities.

The latest traffic study of the city focuses on the two major mobility problems: the limited number of parking spaces and the high traffic load throughout the extended centre of the city. A significant number of public transportation lines pass through the city, eight of which originate at the city's borders and two in the city centre.

**City Solutions** **An extensive pedestrianisation of the commercial district** (historical city centre) together with the implementation of off-street parking facilities and the introduction of an on-street parking management system is being formulated.



For the strictly residential neighbourhoods a new approach has been promoted recently through the new traffic study. A system of one-way streets, traffic calming measures such as the pedestrianisation of particularly busy stretches of road, the improvement of street furniture and landscaping and the creation of cycling facilities together with parking management measures are some of the implementation phases of the traffic study. To complement these activities, improvements in horizontal and vertical signalling, new traffic signs, construction of new roads as envisaged by the city master plan and finally reconstruction and maintenance of pavements have already been launched.

The upgrade and reorganisation of the public transport service system, the geographical coverage of all municipality areas by bus lines, the improvement of the operational character of the bus services and optimal utilisation of the metro constituted integral elements of the pedestrianisation plans.

### New bus lines

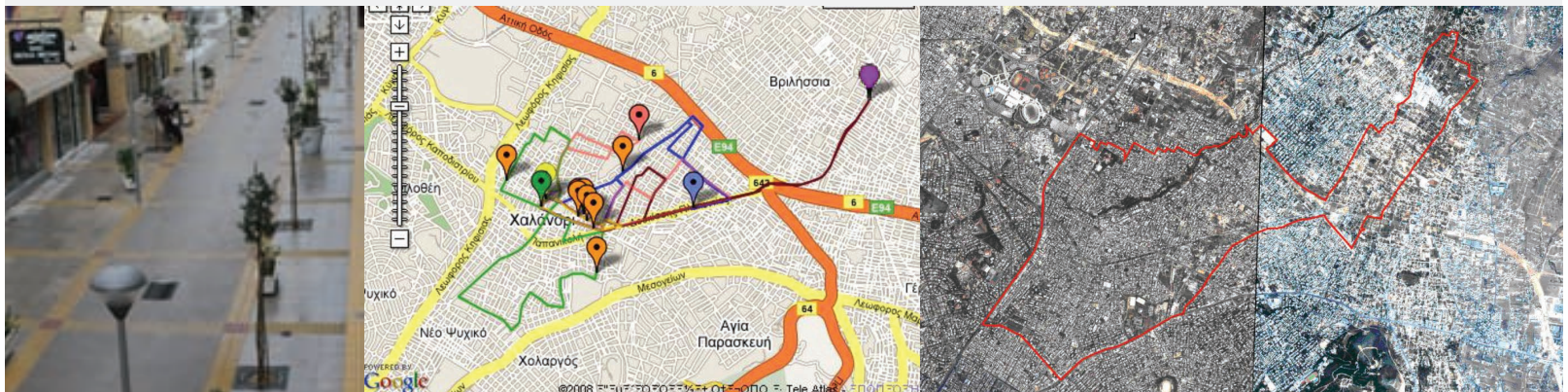
The redesign of the municipal bus lines and the creation of a network within the limits of the municipality in order to upgrade mobility for citizens in regions hitherto not sufficiently served by public transport, as well as a decrease in the use of motorised vehicles within the shopping centre are some of the elements of the traffic study.



## Municipal Case Study

### Controlled parking system: The implementation area is the commercial and historic centre of the city

It is separated into distinctive zones allocating separate parking areas for residents and visitors. The residents' demand has been estimated at 2,000 spaces, whilst visitors are to be allocated 3,200 spaces. To try and cover this demand an extra 2,400 spaces are to be created with the implementation of the new controlled parking system. Residents will be supplied with parking permits and will be allowed to park for free in the specially designated areas. The number of these parking spaces will be determined on the basis of the number of resident's vehicles normally parked in the area, in an effort to cover the residents parking needs. The visitors will only be allowed to park in the designated places for a limited period of time, for which they will pay a fee, yet to be determined. Visitors will prepay the fare for the duration of their stay by the method of their choice (prepaid cards, sms, etc.). Parking spaces for both visitors and residents will be clearly marked as such. The beginning and end of a controlled parking road segment will be appropriately highlighted with the use of road signs stating whether it is a resident or visitor parking zone. The successful implementation of this study is reliant upon the efficiency of the control mechanisms assigned to enforce the abovementioned measures.



## Contact

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## TRANSPower CITIES



### City Facts

Inhabited by almost 320,000 citizens and spread over an area of 130 km<sup>2</sup>, Timisoara is widely considered to be the second most important city in Romania. Located in the west of the country, its geographic position has a strong and positive influence upon city relations with other important European metropolises. The City of Timisoara is situated less than 700km from thirteen different European capitals, thus stimulating the economic and social development of the city.

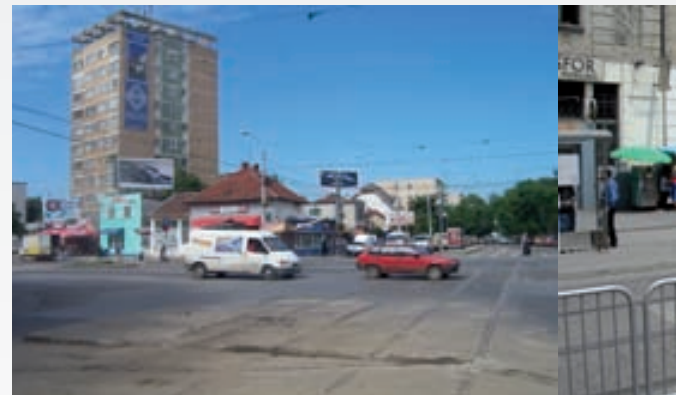


### Transport background of the city

A key problem for the city in terms of traffic and transport is the ever-increasing development of residential areas, underestimated since the beginning of the 1990s, and the associated effects thereof. Restricted space within the city has led to persistent suburbanisation, in particular to the north and along the arterial roads immediately beyond the city boundaries where infrastructure is either completely lacking or inadequate. Uncontrolled suburbanisation and densification has resulted in very heavy increases in private traffic. The lack of measures to ensure a balanced spatial development has led to a number of disfunctionalities in the workings of the city traffic system. Not only links between the city and suburban residential areas but also between the northern and southern districts of the city are insufficient and in a bad condition.

### City Solutions **Rehabilitation of the Tram Line**

The most frequently used form of public transport in Timisoara is the tram. It covers 57,78% of the urban public transport network. The tram infrastructure however found itself until recently in severe need of repair after several years in neglect. So the tram line was restored between 2002 and 2006. All in all 40,12 km of tram line, 38,9 km of contact network, 48 km of electric cable and 23,5 km of supply cable were modernised. The same applies to certain stretches of road between the tram line platform and adjacent buildings. Road lighting, power supply networks, rehabilitation work of the underground pipeline system and the traffic lighting system also benefited from the restoration works. The main part of the rehabilitation works took place between 2004 and 2005. As a result noise pollution levels are now considerably lower than beforehand. The modernisation works on the tram network were the first of their kind in Romania.



### Cycling paths

As an alternative solution to the constant growth of traffic in Timisoara, cycling as a cheap and environmentally friendly way of transportation over short distances has been promoted by the municipality. The establishment and interlinking of cycle lanes was the goal of the municipality. The strategy is to build up cycling paths along the Bega river on both sides (from east to west) as part of a master plan to connect every district of the city via cycle path. All the cycle paths will be interconnected and also connected with the Green Forest to the north of the city, the largest natural green area in the region.

Only a few cycle lane sections have as yet been implemented and, as such, one problem is that what has been built so far is isolated.

**Municipal  
Case Study**

**Integrated master plan process**

Urban traffic planning in the City of Timisoara and its surrounding area continues to be subject to sweeping developments. The rises in population and prosperity levels observed in the city are due largely to its favourable geographic location and subsequent appeal as a business centre. In 2008 the Municipality of Timisoara initiated an integrated master plan process with particular focus on the questions of increased urbanisation and mobility improvement. The approach is two-sided: On the one hand an informal strategic plan for the metropolitan area, including an action plan describing the core urban development projects implemented with the help of structural funds; on the other hand, a detailed municipal district plan. In parallel, individual sector-based plans will be drawn up. Until now only an isolated number of plans related to transport and infrastructural issues (e.g. water system, roads, railway system etc.) have been drawn up. For the city district and the surrounding areas the process of the integrated master plan is ongoing, in particular considering the combined challenges of increased urban population and traffic volumes. The master plan will be the basis for planning future cooperation in the region, yet one key problem faced is a lack of experience in the field of integrated planning. The main results expected are: the development of a sustainable urban and traffic policy for the city and the surrounding areas, identification and preparation of the key measures for sustainable urban and transport development and also a raised awareness of metropolitan development and marketing.



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## PARTNERS

For all five work packages project leaders were nominated, who together formed the project's "competence team". Their task was to lead and coordinate the activities of a team of local experts. The Competence Team members supervised the implementation of the Municipal Case Studies. They collected the needed information and steered and evaluated the work of their respective thematic working groups, and prepared the technical part of the reports.

The selected leaders come from different private transport institutions and research centers:

### GTZ - Deutsche Gesellschaft für Technische Zusammenarbeit GmbH, Germany

**gtz** The GTZ is a worldwide operating company for international cooperation owned by the German Government. It is a limited liability company under public law, which works towards the public good.

As a leading agency in many projects, GTZ has over time developed best-practice tools and methods that are of great value for the implementation of urban transport projects. In the field of urban transport GTZ has 25 years of experience that covers all continents and almost every type of city. From the very beginning GTZ focused on participatory approaches and innovative solutions which are both sustainable in terms of financing and replicability.

An illustrating example is the GTZ Sustainable Urban Transport Project (SUTP) that has developed an effective approach towards raising the awareness and understanding of mobility issues as well as improving the capacity of policy makers, planners, engineers and academia in selected cities of the developing world. [www.sutp.org](http://www.sutp.org)

Since 1998, the GTZ Office German Public Sector Clients in Berlin has been involved in the Twinning programme scheme initiated by the European Commission as a pre-accession tool for Central and Eastern European countries. For more than 100 projects in 12 countries the GTZ Office German Public Sector Clients has been providing successively services such as assistance and support with financial and administration issues to all partners.



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### PTV AG, Germany



PTV AG is an independent enterprise founded in 1979. It provides software, consulting and research for travel, traffic and transportation planning. The three business fields Traffic, Mobility and Logistics secure the long-term future of mobility with new concepts and innovative technologies.

Intelligent consulting and planning designed to optimise the implementation of traffic and transportation systems world-wide is the key focus of PTV's activities within the Traffic business field, the area in which the enterprise contributed to the TRANSPOWER project. In this field PTV works primarily with local authorities, private and public transport operators, public transport companies and transport consortia as well as with engineering offices involved in the industry.



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**Dr.-Ing. Rainer Schwarzmann**  
Transport Consulting,  
Vice President



## Ernst Basler + Partner Ltd., Germany

**Ernst Basler + Partner** GmbH Ernst Basler + Partner is an independent engineering, planning and consulting company with a successful track record in Switzerland and Germany.

The Clients of Ernst Basler + Partner are private companies and public organisations as well as representatives from the fields of politics, education and research. Interdisciplinary project teams are carefully composed for each specific task and headed by experienced project managers.

In the field of mobility, transport and urban development our services range from the development of a concept to its implementation and from the solution of specific technical



**Stephan Kathke**

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## European Academy of the Urban Environment, Germany (EAUE)



EAUE, jointly founded in 1991 by the Senate of Berlin and the European Parliament, has assisted Central Eastern European cities in their efforts to design and implement a more sustainable urban development. This has been achieved through such activities as workshops, seminars, conferences, research studies and other publications, as well as by means of consultation and networking. The academy supports the Central European Metropolises Network (CEM) and maintains excellent working relationships with numerous municipalities, in some cases extending to the relevant national ministries.

From a legal perspective EAUE is regarded as part of the European Academy Berlin, but is in fact managed and budgeted independently.



**Professor Hanns-Uve Schwedler**

Managing Director EAUE  
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## Austrian Mobility Research, Austria (AMOR)



AMOR is an independent non-profit organisation. As one of Europe's leading companies in the field of mobility research, it has extensive experience in cooperating with various EU research promotion institutions.

Austrian Mobility Research works for sustainable, environmentally friendly and customer-friendly traffic development. The range of activities AMOR is involved in includes research, consulting, training, and project implementation in the field of mobility management. Among other things AMOR co-ordinates ELTIS (European Local Transport Information Service), Europe's N° 1 information platform for urban transport. [www.eltis.org](http://www.eltis.org).

Customers of AMOR profit from flexible and interdisciplinary project teams, offering years of domestic and international experience.

AMOR possesses state of the art know-how and access to the latest European research findings as well as the results from recent projects in the field of mobility management.



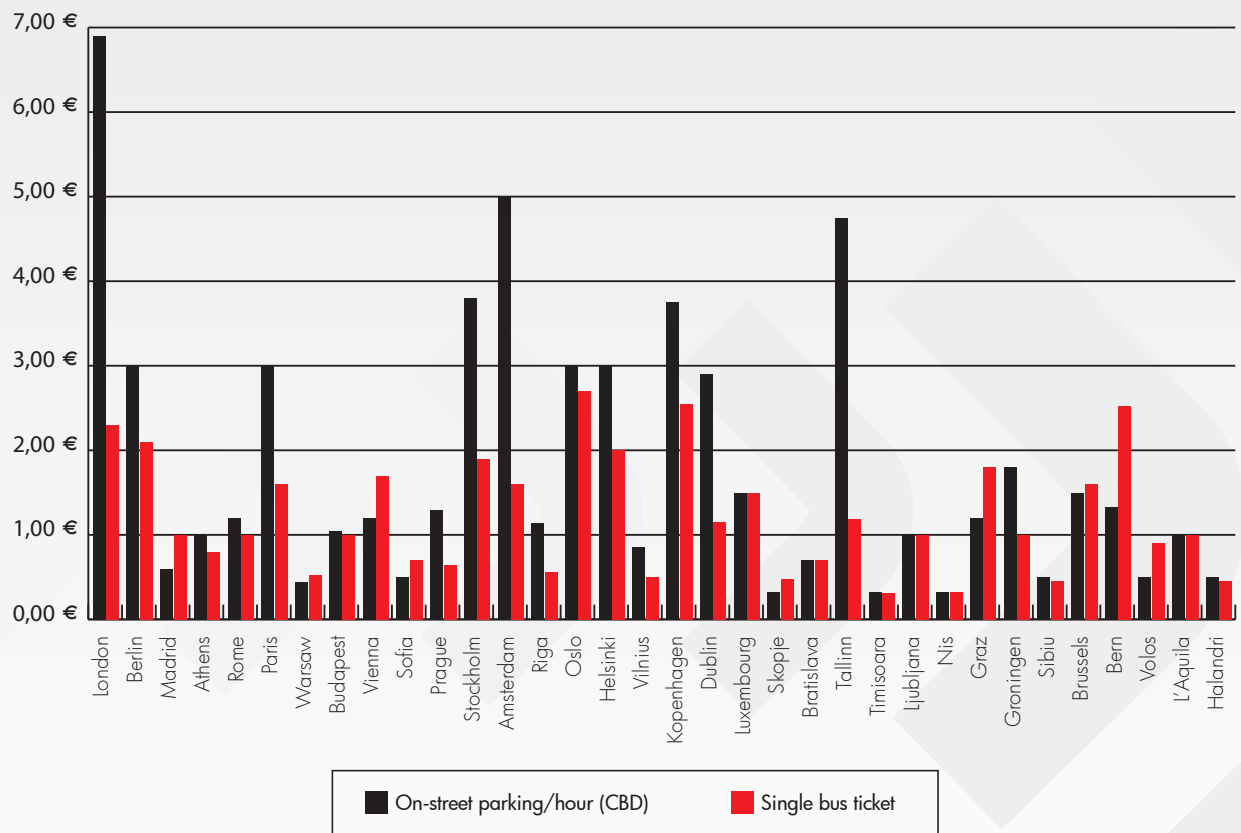
**Robert Pressl**

Geographer, AMOR  
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## European Survey on Parking Fees and Bus Fares

The project cities collaborated to compile a database in order to assess the status of transport infrastructures, services and policies in TRANSPOWER-cities. As parking fees are a topic of interest in many cities, TRANSPOWER widened the scope of this survey by compiling parking fees and single bus fares from European capitals. The survey highlighted substantial differences in the application of parking fees as a demand management tool: differences in scope, level and in price relative to bus fares.

Comparison of parking fees in European cities (On-street per hour, CBD) with costs of single bus fare



# TRANSPOWER Press Review



Groningen Internet Courant, 10.03.2009

## Groningen is an example city in European programme for sustainable development.

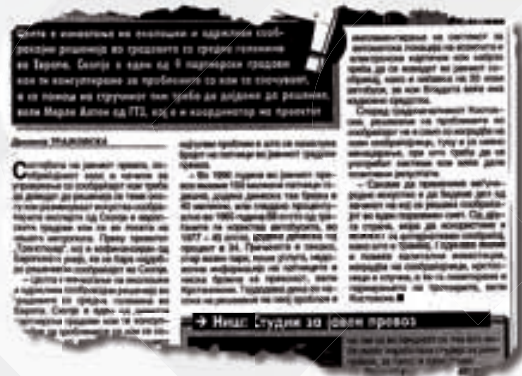
Thirty traffic experts from Romania, Greece, Italy, Macedonia and Serbia are visiting Groningen for a 3-day conference on sustainable mobility. The conference is part of the European programme Transpower that is meant to improve knowledge in the area of sustainable mobility in the new EU Member States. Groningen together with Graz are example cities within the project.



www.monitorulsb.ro, 27.11.2007

## Hopes for cyclists

From one single bicycle lane to a whole network that will cover every area of the city. This is one of the plans of the municipality, regarding the promotion of two-wheel transport. At the Workshop "Cycling in Sibiu – Safe and Clean Transport in the Historical Centre" a series of projects were presented yesterday at the City Hall of Sibiu. This solution has been welcomed by the European authorities who participated in the development of the "Traffic Calming" concept.



Dvenik, 05.06.08

## International project for new transport concepts. There is no modern public transport without new technologies. Representatives of eleven European cities are going to exchange experiences regarding improved urban mobility.

The mayor of Skopje Trifun Kostovski, stated that streets have to be built and well maintained in order to solve traffic problems in Skopje. New concepts and technologies in order to maintain new streets have to be applied. Nikola Krstanovski, professor of public city transport from the University of Bitola, explained that the current problem in terms of bus traffic were a result of deregulation in 1990, which had allowed private companies to enter the market. Representatives from other cities including Nis explained that their problems were very similar to those in Skopje.



Land Brandenburg/ Germany / MIR Aktuell, Vierteljahreszeitschrift, 2/2007

## TRANSPOWER – Supervised Implementation of Sustainable Urban and Transport Concepts

In big cities, safe, clean, effective and efficient mobility is very important to sustainable, economical and social development. But apart from positive side effects such as improved regional integration and increased productivity, city traffic poses huge challenges: Traffic jams hinder economic growth; traffic noise and emission pollute our cities; greenhouse gas emissions contribute to global warming. A brave step of an overall approach, based on European Best-Practice examples of mobility management, is to be made in order to ensure the quality of life in our cities.



[www.transpower-rp6.org](http://www.transpower-rp6.org)

