

# 1. Appendix 1: Issues Notes

A requirement of the study (task 2e) is to identify and discuss at least fifteen issues relevant for a political discussion on the future funding needs, to be reported in the form of 'issue notes'. Many of these issue notes are related to the assessment of future funding needs and it is therefore useful to list these to provide some additional context for the more detailed research and analysis that follows.

Based on the study ToR, and the consideration of other issues, the following issues have been addressed in a series of short policy notes:

1. The relevant impacts of the economic crisis in the short and longer term;
2. Differences in the needs between geographical regions;
3. Differences in the size of urban areas (at least four different sizes should be taken into account);
4. Possibilities to reduce financing needs (technological, planning, co-modality,...);
5. Impact of demographic and land use trends;
6. Impact of trends in local, regional and national taxation;
7. Financial engineering, new approaches to funding and to obtaining financial resources, for example through private sector involvement;
8. Impact of climate change (energy constraints);
9. Decarbonisation of transport;
10. City-regional context and urban-rural linkages;
11. Specific needs for deprived urban neighbourhoods; and
12. Capacity building at local level to promote integrated and sustainable solutions and to reduce financing needs.
13. The role of ITS in delivering sustainable transport solutions.
14. Project evaluation and conditions for EU funding allocations to urban mobility.
15. Creation of a new funding instrument for sustainable urban mobility.

Each of these issues notes are set out below.

## **1. THE RELEVANT IMPACTS OF THE ECONOMIC CRISIS IN THE SHORT AND LONGER TERM**

- The economic crisis led to a sharp decline in economic activity across the EU, which affected most Member States in terms of stagnating or lowering GDP and per capita incomes. This has had knock-on effects for government revenue collection and the emergence of severe budget deficits. As such, in the short-term, the economic crisis is having a significant impact on the amount of funding available to support the operation of and investment in urban transport systems.
- The drop in economic activity has also reduced the demand for transport, which further reduces funding available from fare revenue. This can be partially offset by reductions in the costs of operating transport systems. The drop in demand was not uniform across modes, with cities reporting that many people switched to more affordable public transport services.
- Evidence from the city stakeholders and case studies support the view that the economic crisis has created an increased shortfall in available funding from each of its main sources: government grants, local taxation and fares, bank loans and private finance. Current expectations are for a slow recovery from the crisis, suggesting that effects of the crisis will be felt into the medium term. A particular concern relates to the capacity for cities to properly fund the operations and maintenance of their current networks.
- A persistent sovereign debt crisis and possible debt overhang in the southern and peripheral Eurozone countries threatens to create longer term funding and financing issues in those countries. Notable countries at risk include Greece, Spain, Portugal, Italy and Ireland. This may mean an emphasis in those countries on user charges and containment of costs in order to sustain urban transport services and infrastructure.
- While the crisis presents a number of problems for transport funding, it also creates opportunities that may be overlooked or not available during better economic times. For example, tighter fiscal conditions tend to go hand-in-hand with lower labour and construction costs, presenting an opportunity to bring forward required investments if they can be funded. The crisis also creates an incentive to re-evaluate approaches to transport policy and planning to promote sustainability. There is a greater need to operate existing transport systems on more efficient basis. This could include implementing operational restructuring and efficiency measures. Longer term funding needs can also be reduced by undertaking suitable investments in new technologies and improved management of existing infrastructure (e.g. fuel efficient vehicles, signalling and fleet management systems, etc.).
- The study stakeholders have also identified the opportunity that the crisis provides for city authorities to be creative in planning and managing their transport systems, including looking at different ways of funding. Decarbonisation and improving the sustainability of urban mobility should be the foundations for future transport funding approaches. Improved project monitoring and ex post analyses could support this process.
- In this context, there is a useful role for the EU in promoting best practice in sustainable transport planning and management, and in assisting cities to access funding. This could include improving, at city level, understanding and access to traditional sources of government finance (i.e. structural grants), and assisting cities in identifying and developing projects that can take advantage of other financial instruments and private finance.

## **2. DIFFERENCES IN THE NEEDS BETWEEN GEOGRAPHICAL REGIONS**

- Differences in transport funding needs between geographical regions occur both across and within Member States. There are several of factors that can create differences in transport funding needs across the EU's regions. This includes factors such as:
  - Economic activity and personal incomes;
  - Climate and topography
  - Population trends (e.g. ageing) and the rate of urbanisation;
  - Seasonal factors (e.g. tourism);
  - Presence of major inter-regional and trans-European passenger and freight links;
  - Cross-border land use development and migration; and
  - Historical development of 'legacy' transport systems.
- At the highest level, the main driver of funding needs is the level of regional and personal incomes. Economic activity and income is a well-known driver of transport demand in terms of the frequency and duration of trips people wish to make and the modes they prefer to use. For example, the growth in car ownership and congestion in the newer, high income growth, Member States is well documented.
- While there has been a decoupling of economic growth and transport demand in recent years, it can be expected that continued growth in economic activity and incomes will require complementary growth in the capacity of urban transport systems. Analysis in this study shows that, based on patterns in many of the cities in the EU-15 countries, as incomes grow rapidly, demand will grow for more comprehensive and expensive transport systems that include capital-intensive solutions such metro and light rail systems.
- On the other hand, a feature of income growth is that it also provides an improved capacity to raise funds from taxation, fares and other user charges. However, concurrent with growth in incomes, growth in tax revenue may not be sufficient to be able to fund capital-intensive solutions that may be demanded by users. In line with experience to date, many cities are reluctant to pursue aggressive pricing policies. With the political difficulties faced in implementing road charging schemes to tackle congestion and raise additional revenue, the scope for increasing revenue from public transport fares also appears limited.
- Analysis of GDP trends across the EU shows that, while all countries are showing a capacity for continued growth, there are a number of EU-12 countries that are undergoing more rapid economic transformation, with some Member States expected to achieve more than a doubling in per capita incomes over the period 2000 to 2016.
- This rapid economic change, and associated trends in land use and car ownership creates significant challenges for transport and urban planners in those countries. This is often compounded by a lack of institutional capacity in such regions to plan and procure appropriate transport solutions that are genuinely sustainable and well integrated with local land use plans. Indeed, there may be resistance to planning compared to delivery of visible improvements or development. There are also more obstacles to accessing appropriate sources of finance. For example, in the newer Member States, the culture for developing infrastructure is dependent on traditional funding sources such as EU and national grants. The identification and development of innovative approaches to access alternative funding instruments and private finance appears to be less of a focus in those countries.

- A further consideration in a number of cities these countries is the impact of their 'legacy' transport systems. In many of these cities, operating and maintaining capital-intensive trolleybus and light rail systems is significantly increasing funding needs. The case studies provide a good example of the degree to which the light rail system in Brno increases funding needs compared to the cost-effective bus network operated in Burgas.
- A challenge for the cities in the newer Member States is in deciding how best to optimise their transport systems from a sustainability perspective. This could require, in cases where the capacity required is unnecessary or uneconomic, a move away from their legacy assets and replacing them with less capital-intensive options. In embracing new solutions and technologies, it will be important that they are provided with the technical support they need.
- Any future funding and financing assistance should take into account the specific differences between the needs of less developed regions in the EU15 (where economic and demographic patterns may be more stable, along with motor vehicle ownership and usage, and local authorities are likely to have some experience in planning and strategy development) and those of the EU12 (where there may be more dynamic structural changes, greater scope for growth in private car ownership and usage, and less institutional capacity to plan and manage urban transport strategies). The EU 12 have a specific need in terms of integrating strategies on urban transport network planning, land use planning and other infrastructure that could be facilitated at the EU level.
- In addition, there will need to be consideration of whether EU12 Member States should be assisted to transition from some capital intensive urban transport modes to less capital intensive modes to deliver similar levels of service at lower cost.
- Any additional assistance provided will also need to take into account the inherent challenges of differences in geography, transport usage patterns and levels of development in enabling measures to increase use of sustainable transport modes. For example, active modes are more suitable for locations with milder climates, flatter wider streets and closer proximities between residences and employment or education. Travel demand management measures and more sophisticated traffic management systems may be well suited for introduction in regions where motor vehicle ownership is increasing, in order to ensure that sustainable modes have a better opportunity to retain shares of trips, and to reduce the growth of congestion and vehicle emissions.

### **3. DIFFERENCES IN THE SIZE OF URBAN AREAS**

- There is a wide variety of EU cities in terms of overall size as measured by their resident populations and land area. In many cases, the catchments for a city stretch well beyond its defined borders. The population densities of cities vary as well, although many cities are characterised as having dense historic centres, with various levels of suburbanisation and varying land use patterns across the metropolitan areas.
- At a general level, it is possible to classify cities into four different sizes – mega-cities, and large, medium or small cities. However, there is no generally accepted definition of the thresholds that define each of these levels.
- Some sources define a mega-city requires as one that has a population above 10 million. Under that definition, based on UN data, Paris would be the only EU mega-city, with a population of around 10.4 million people. London is the next largest with 8.6 million, followed by Madrid with 5.8 million. However, it is also important to consider polycentric conurbations e.g. Randstad, Rhine-Ruhr etc. Also larger monocentric city regions – London’s Travel to Work Area covers much of the South East and easily gets past the 10 million barrier.
- Megacities have similar characteristics and face similar challenges in terms of transport. Transport systems in these cities tend to be highly capital-intensive (e.g. with extensive metro and heavy rail systems serving the urban population). There also tends to be very high levels of road congestion, particularly in the central areas of the city, but also in areas which have corridor bottlenecks. This can mean that use of private motor vehicles is significantly less attractive than public transport and active mode options for trips serving central areas. Further supported by high urban densities, it is the mega cities that have strong potential to develop more sustainable transport networks.
- However, such cities also develop employment and business locations outside the central areas, because high land prices and congestion effectively encourage certain business sectors to cluster around more recent developments close to major hubs such as airports and major motorways. Such centres are unlikely to have the potential to be attractive for public transport services given the disperse catchment area of commuters.
- The next group of cities in Europe (i.e. Athens, Berlin, Rome) have populations of over 3 million. They are followed by cities like Brussels, Budapest, Lisbon, Vienna and Warsaw with populations between 1.5-3 million people. Together they constitute the larger cities of Europe.
- These cities have similar characteristics and face similar challenges as the larger megacities. High urban densities both support and require the development of more capital-intensive transport systems to service radial movement of people.
- Many European cities are of mid-size, in the range of 500,000 to 1.5 million people. As a group, these cities tend to face similar transport challenges. Depending on their urban density and historical preferences that have influenced the development of their transport systems, they employ a mix of higher and lower capital-intensive transport solutions. For example, the use of light rail systems may be more prevalent, and there could a greater reliance on bus networks as the main public transport mode.
- Smaller cities of 100,000 to 500,000 inhabitants face lower demands on their transport systems, and are more likely to face issues of renewal of fixed infrastructure and investment to resolve particular bottlenecks. Uptake of emerging technologies will be difficult due to the cost and the expertise needed. However, implementation of sustainable traffic measures such as pedestrian and cyclist facilities could be easier to implement.

- As a general rule, the larger cities have a greater capacity to plan and manage complex, integrated transport systems, and to access alternative funding sources such as loans, PPPs and developer contributions. While smaller cities face challenges with planning capacity and access to funding, their needs are not as great, making city size a less useful parameter to measure the need for funding and support in developing technical capacity.
- Issues due to governance arrangements in cities can have significant impacts on transport provision. For example, large cities can enclose a large number of local government areas, creating conflicts in terms of funding and network prioritisation. They may also be more dependent on significant national and trans-European road and rail networks that also service hubs such as ports and airports. This may complicate governance issues as national priorities for intercity passenger and freight movement may have to compete with local priorities.
- Each city will face competing uses for scarce land, with cities having to balance the need for mobility with other amenities. For example, the provision of pedestrian-only areas, parks and cycle ways, may compete with corridors for motorised transport options. There is a risk in some areas, particularly larger cities, that businesses will choose to move away from central areas into dedicated shopping centres and industrial parks that increase the need for private motor vehicles. Managing these issues requires transport planning to be carefully integrated into urban land use planning and amenity development to retain value and accessibility for central areas.
- More severe congestion in the larger cities will also mean that there are more likely to be issues with emissions and air quality that need to be managed. Although, access to funding, well-established planning and management expertise, economies of scale, and reliance on public transport, can mean these cities can be more advanced in implementing solutions to these issues. The cities of London and Stockholm provide relevant examples in this context.
- Larger cities will find it highly unlikely that they can make effective progress on road traffic congestion without taking extensive demand management measures around pricing of road space and parking. Improved pricing signals, ITS and incentivising improved fuel efficiency of major transport fleets (e.g. buses, taxis) are likely to generate improved sustainability in economic and environmental terms. However, all cities are likely to benefit from measures to advance active transport modes, improve efficiency and planning of public transport services and intelligent traffic management.

#### **4. POSSIBILITIES TO REDUCE FINANCING NEEDS (TECHNOLOGICAL, PLANNING, COMODALITY,...)**

- There are different approaches to reducing financing needs for urban transport
  - Investing in technology that can improve efficiency and reduce costs
  - More effective planning and management to develop more cost effective solutions and respond better to changing demands
  - Driving operational efficiencies through improved processes and collaboration with other authorities
  - Improving contract management and asset management processes to reduce long run maintenance costs
  - Investing in travel information technology (data collection, process and dissemination) to support multi modal travel decisions
  - Adoption of modular architecture of technology enabling cost effective upgrade, if needed
- Making the right investments in new technologies, while creating higher up-front expenditure, can generate significant operational savings over the longer term. For example:
  - New ticketing systems can make the network easier to access by simplifying the user interface and better integrating payment systems across public transport modes. They also reduce boarding and queuing times and therefore journey times, and reduce longer term administration costs. It can also improve the ability to address fare evasion to help increase revenues.
  - Investments in more fuel-efficient vehicles (and more energy efficient electrical and heating systems) can significantly reduce vehicle emissions and create long-term operational cost savings.
  - Network performance can be enhanced by upgrading traffic and rail based signalling systems, using satellite-based navigational technology to manage bus operations and ITS systems to get better management of road space
  - Low cost mobile communication to support travel information services
- Better planning and management can also enhance network performance and generate operational efficiencies. For example, better timetabling and route planning to meet user demand is an effective way to increase public transport patronage. Supporting comodality in this context can yield network synergies. It is worth noting that ITS solutions often have the potential to generate new user data to better inform planning and management.
- Other efficiencies can be derived by considering alternative approaches to structure operations and leverage the private sector, for example, through outsourcing and competitive tendering/franchising. This can bring innovations to service provision and operation, and realise commercial efficiencies in operations that have commonalities with other sectors. In addition, contracting and procurement systems can derive better value from existing outsourcing arrangements, by driving contractual performance and sharing the benefits from reducing costs over time. There may also be savings to be made in local authorities collaborating in making major purchases or engaging contractors to jointly provide services. For example, there can be economies of scale in buying new systems in parallel or in contracting for road maintenance together.

- For network managers, having comprehensive long term approaches to asset management and account management processes can improve efficiency and reduce costs. This may require a significant upfront effort in establishing databases, inspection and reporting processes for asset management. For customer and account management systems, it may also require training and establishment of computerised and communications systems as interfaces. For many public bodies, budgets are developed and approved on a year by year basis, so there is little scope to capitalise maintenance and develop sustainable and efficient solutions to renewal of assets. For example, long term performance specified contracts for road network maintenance could result in investment in renewal of road assets in ways that are expensive upfront, but result in significant long run savings by reducing maintenance requirements over the life of the asset. Such contracting requires changes in budgetary and funding processes, but also training and assistance in handling the initial procurement and contract specification stages. If applied across the EU, it is possible that substantial savings could be made over the medium to longer term in road maintenance costs, improving network performance and enabling resources to be diverted to other purposes.
- For many EU cities, each of the approaches outlined above can represent a new way of developing and managing their transport systems. They require the capacity and funding to develop and implement complex, high tech solutions, along with access to appropriate funding sources. They also require guidance and support to develop strategies to determine how best to take advantage of opportunities to increase efficiencies and reduce costs.
- There is a role for the EU in providing best-practice guidance and highlighting successful case studies where these initiatives have been effective in reducing funding needs. This is recognised by stakeholders as a key issue in terms of ITS solutions, where technology providers hold stronger positions than many city authorities and can therefore influence the choice of technology. Part of this is in realising what technology can and can't do, and where it is proven to work. It is about avoiding cities either being too conservative about introducing technologies, for fear of getting it wrong, or to not put funding into technologies that are likely to have high risks and poor returns, despite marketing claims by vendors. There could also be a role in helping cities identify projects and support them through funding applications. This is partly addressed through initiatives such as JASPERS, but a wider role for the EU could create added value over time.
- The EU could also provide assistance in reforming asset management, budgetary processes, planning and procurement to enable long term asset management strategies to be developed, which may include working with private sector contractors. By providing a source of expertise and transfer of knowledge to cities, substantial savings could be generated over the medium to longer term.
- EU to provide guidance on how to better estimate demand, impact assessment, and cost benefit analysis



## **5. IMPACTS OF DEMOGRAPHIC AND LAND USE TRENDS**

- Demographic and land use trends are having a significant impact on urban transport systems and their funding needs to different degrees across EU Member States.
- Changing patterns of economic prosperity, particularly in EU12 countries that are witnessing rapidly rising personal incomes, are transforming the way that people in those countries prefer to live and travel.
- Persistent growth in car ownership and use for commuting and other personal journeys (e.g. education, shopping, etc.) presents a major challenge for many city authorities in terms of preventing the erosion of mode share for public transport, walking and cycling, and managing congestion and emissions from growing road traffic
- In addition, growing incomes and car ownership exacerbates pressures on urban planners as people demand new and more spacious housing in locations further from where they work. The impact on transport networks is often a secondary consideration, causing severe bottlenecks and congestion along key transport corridors. In many cases, transport planners may be expected to respond by providing new public transport infrastructure and services to serve low density catchments that are further from central business districts and other employment centres. This phenomenon significantly increases funding needs for urban mobility, as the cost of providing infrastructure and services in low density areas represents poorer value for money given limited capacity for generating patronage and consequent fare revenue in those areas.
- Urban sprawl is not only a problem in the newer Member States. Analysis shows that many cities along the Iberian Peninsula and Ireland have experienced a population de-concentration or urban sprawl, reflecting the recent housing and construction booms in those countries. Conversely, a larger share of cities in Belgium, the Netherlands and the UK appear to be experiencing concentrations in city populations, reflecting general trends in urbanisation and, potentially, initiatives aimed at encouraging urban infill and regeneration. While increased urban densities can provide opportunities for increasing public transport ridership and the viability of active mode travel options, providing significant new infrastructure can be expensive and high risk when being integrated with the existing infrastructure landscape. The denser the urban form, the higher the cost of land and the higher the cost for expanding or building transport corridors to cope with increased demand. This puts pressure on cities to either engage in very high cost tunnelling /underground rapid transit projects to bypass bottlenecks, or to aggressively manage transport demand through operational, regulatory and pricing instruments. In any case, saturation of demand in popular centres will encourage development to spread outwards to areas of lower land prices.
- Another important demographic trend is in relation to the changing age profiles of Member States' populations. In particular, the ageing of the population that is taking place across the EU will have a number of impacts, including a reduction in tax revenue, increased demand for governments health and social services that will compete with transport for government funding, and increased demand for concessionary public transport travel. In addition, aging populations may result in greater demand for more accessible public transport options (e.g. step free vehicle and stations) that can impose high costs, or need careful planning so that renewals take such considerations into account in the most cost effective way. This may also include demands for clearer signage, lighting and seating at stops. Public space for aging population, including pedestrian crossing signals and maintenance of footpaths and other walkways, may also become increasingly important, but also support sustainable mobility objectives. All these impacts point to growing funding needs for urban transport authorities, but also a

potential change in emphasis from simply pressure on peak commuting demand, to pressure to improve the accessibility and standards of infrastructure.

- Conversely, areas that experience significant population ageing will be able to better manage network capacity as the demand for peak services is reduced. This will also reduce the need to invest in additional capacity over the longer term and could allow for better utilisation of high capacity networks.
- The uniqueness of the EU in terms of its free movement of people creates issues for planners in terms of finding ways to accommodate rapid increases in demand on parts of their networks. A further problem is the degree of uncertainty around whether the increase in demand will be permanent and therefore require significant investment in new capacity.
- The changes in land use of cities are often not adequately monitored, and consideration of urban mobility needs may tend to focus on access to city centres, rather on trips that do not fit traditional radial commuting patterns. Non-radial trips will be far more likely to be undertaken by private car, so may need particular attention and innovative approaches to improve sustainability, such as encouragement of better traffic management, sustaining public transport options where they exist and using pricing, regulatory and planning tools to avoid developments that may exacerbate congestion where it is not economic to expand capacity. Increasingly, the sustainability of mobility in such areas may involve encouraging time-shifting of trips, car-pooling and increasing vehicle occupancy, and promotion of travel plans for major employers. The EU can assist in encouraging studies that consider ways of promoting sustainable urban mobility in such contexts, where high capacity public transport and active modes may have limited application.
- The EU can assist by monitoring and reporting on the impacts of demographic changes on transport demand, and assist authorities in considering how this should affect long term plans for transport networks. Long standing plans for major projects may no longer be as attractive as they once were, because changes in urban land use patterns could mean the problems such plans were designed to resolve have changed, and other priorities should be considered. Consideration of infrastructure design requirements to meet demographic changes in a strategic manner that enables transformation over time (e.g. progressively improving accessibility of public transport vehicles and stations) could be aided by providing capability assistance to some authorities with particularly high trends of demographic change.

## **6. IMPACTS OF TRENDS IN LOCAL, REGIONAL AND NATIONAL TAXATION**

- The period of widespread economic expansion in the lead up to the economic crisis of 2007-2008, saw Member States generally enjoying moderate to strong growth in tax receipts. Growth rates in many EU12 countries were particularly strong, reflecting the economic transformation and opening of access to the EU market that have taken place in those countries in recent times.
- The recent economic crisis saw a sharp contraction in economic activity, which had knock-on effects in terms of lowering government tax receipts and the emergence of severe budget deficits. In fact, it is only now or in the next two years that many Member States (notably with the exception of Ireland and Spain) are expecting to see tax receipts reach the levels they did in 2007.
- Looking forward to the longer term, economic activity and the tax revenue it generates are both expected to return to a more stable growth path. Growth is expected to be stronger in many of the EU12 countries, whereas Ireland may not see a return to 2007 levels until 2015. However, the economic situation is dynamic and it is difficult for Member States to have certainty about the scale of tax revenues in the medium term.
- Local taxation as a share of all taxes collected within Member States has been generally stable. However, local authority responsibility for managing and operating urban transport networks has been increasing, particularly in EU12 countries. This trend is yet to be matched by a significant change in taxation and infrastructure pricing by local authorities. However, it should be recognised that many Member States would not yet have appropriate regulatory and governance frameworks under which these changes could take place. As these are constitutional, legal issues, it may be more difficult for the EU to influence the powers that various levels of government may have to raise revenues from taxation.
- Some forms of taxation or revenue raising that are being increasingly facilitated by technology are smarter ways of charges for parking and for road use. The availability of intelligent, dynamic parking charging technology can enable local authorities to better target pricing to raise revenue, as well as generating positive externalities from reducing congestion (by reducing circulation of vehicles seeking parking places). The use of modern telecommunications technologies can also help direct motorists to parking spaces or reserve parking spaces for this purpose. With the advent of electronic tolling technologies, congestion taxes and charges can be implemented without interfering with traffic flows, which can generate potentially substantial flows of revenue, whilst reducing congestion and increasing the attractiveness of other modes. Such technology can also be targeted at revenue from vehicles with high environmental impacts. Examples of this can be seen in London, Stockholm, Znojmo and Valletta. As technology in this sector evolves, it is becoming more viable to consider more network wide options for tolling across urban areas, raising new possibilities of new revenue or ways to replace existing sources of revenue, as well as offering new tools to manage congestion and the environmental impacts of road transport.
- Associated with this, is the gradual erosion of fuel taxes as more fuel efficient passenger and freight vehicles enter the fleet. This includes the introduction of alternative fuelled vehicles (e.g. electric) that do not typically pay such taxes, and may already have other tax advantages. Over time, the ability to obtain increasing revenues from fuel taxation is declining due to these trends, and public concern over the rising retail price of fuel, making it more politically difficult to impose fuel tax increases across all regions in a Member State. In addition, the free movement of people and vehicles across borders can

limit the revenue obtainable by Member States that seek to have fuel tax rates substantially higher than their neighbours.

- Some Member States have or are considering implementing alternative road charging schemes (e.g. heavy and private vehicle tolling, etc.), however these are typically implemented at the national level, exacerbating the mismatch between revenue raising and expenditure responsibilities. If regional or local authorities are granted powers to introduce road charging systems, this may provide a potential source of revenue for them, but UK experience indicates very high reluctance on behalf of most cities to implement such systems unilaterally. London as a mega city with chronic congestion was only able to do so due to the severity of congestion and high density of public transport alternatives (and low car mode share for the area charged).
- The EU could provide assistance to local authorities and regions considering new options for taxation, in particular associated with road and parking charges, by facilitating investigation of opportunities and options for such systems. It could also help in developing capacity to discuss with vendors and stakeholders the issues around such systems, and to consider how newer forms of taxation can best be used not only for revenue, but to advance sustainable urban mobility policy objectives. On a national scale, the EU may have a useful role in considering the long term future of fuel taxation and the issues around EU wide transitions towards alternative road charging mechanisms. Its existing activities in regulating heavy goods vehicle charges and interoperability may be extended to investigate how the major barriers to a wholesale shift from fuel tax to road charging may be addressed at different levels of government.

## **7. FINANCIAL ENGINEERING, NEW APPROACHES TO FUNDING AND TO OBTAINING FINANCIAL RESOURCES, FOR EXAMPLE THROUGH PRIVATE SECTOR INVOLVEMENT**

- Innovative approaches to the development of financial instruments and obtaining financial support for projects can realise new opportunities for local and regional authorities to be able to fund projects. It can enable such authorities to move beyond annual budgetary cycles and potentially limited capacity to borrow for projects that may not generate net revenues.
- Potential options range from use of public-private partnerships (PPPs) that can include private financing and private equity, to publicly funded and financed instruments through the auspices of the EIB and EBRD. The range of potential combinations of financing options is considerable, with the key point being that public sector investment can be catalysed by private sector financing options, or the private sector can deliver certain urban mobility projects in its own right, reducing demands on public funding.
- In particular, it can be possible to unbundle projects into components that can be made to be commercially viable for private investors (e.g. property development) that can help pay for the public good, urban transport elements of the project, creating benefits for private and public sector. Even without commercially viable options, it is possible for private finance to spread the cost of larger capital projects over many years, enabling standard funding mechanisms to cover capital costs through operational budgets over many years.
- For example, the framework of financial engineering instruments developed by the EU through the EIB provides a vehicle for enhancing the use of a Member States allocation of structural grants. It also offers opportunities to attract financing for projects that may not be sufficiently attractive for private finance or for which public funding is not directly available.
- The private sector has a well established role in financing investment in urban transport systems in many EU cities. This is typically carried out via conventional loans instruments, developer contributions and, in some cases, public-private-partnerships (PPPs). Other approaches for including the private sector include the use of asset leverage (e.g. transferring land rights to the private sector for development, which enables the private sector to have equity in transport related property development).
- PPPs has been utilised more heavily in some countries compared to others. For example, Barcelona and Dublin are seen by stakeholders as having good examples of successful PPPs for urban public transport projects. The case studies show that they are used widely in Madrid, but not used in Vienna and the other EU12 cities considered (Brno, Burgas, Poznan). However, there is interest in PPPs in all cities reviewed. For example, in Brno, there has been much attention paid to potentially developing PPP projects with the support of the Czech Ministry.
- PPPs are used in a number of ways with varying degrees of success. For example, Madrid has deployed PPPs for the development of its new bus interchange system. This saw the creation of grade separated bus stations at major network nodes in the central areas. The new stations allow the separation of buses from other road traffic (greatly reducing local congestion and enhancing junction performance), and provide secure and comfortable interchange facilities for passengers. The PPP contract also includes provisions for cleaning and allows for other commercial development above the station. However, there are also examples of failed PPPs which have cost the public sector (e.g. Metronet in London, which the National Audit Office estimated as having cost the taxpayer between £170 million and £410 million).

- The Crossrail scheme is seen as a very good example of local authorities (and central government) using innovative approaches in obtaining alternative multiple sources of finance. It has done so by obtaining contributions from businesses and property owners that will benefit from the significant improvements in access that the project is expected to deliver. It may be that this type of collaboration with project stakeholders and alternative ways of obtaining project finance can be expected to be more prevalent in the future.
- In many countries, private sector finance can be prohibitively expensive. This exacerbated by the lack of capacity at city level in some countries to identify projects that are suitable for private sector involvement, and then to properly plan and procure contracts in a way that is both attractive to the private sector and realise the public good value from the project. In addition, it is more likely that the private sector will be interested in financing or obtaining equity in an urban transport project if it has sufficient scale to justify the relatively high transaction costs involved. It is highly unlikely that such initiatives could be attractive for smaller scale projects, or projects where the benefits of private sector involvement (around reducing risk, cost control and delivery) are sufficient, compared to conventional public debt based financing. Whilst private financing is highly attractive at a time of fiscal austerity and difficulties in public financing, it is important to acknowledge that such financing does require a commercial return, and unless the public sector benefits outweigh this cost, private financing may not necessarily be the best option.
- There appears to be a role for the EU in assisting city authorities in identifying appropriate ways of finding alternative finance arrangements, from long term planning, structuring finance deals, and procuring and managing contracts.
- It may include identifying options available for different types of projects, including the use of private financing, investment of private equity in developments or ways of integrating or packaging projects that need to incorporate public funding, revenue sources and private finance. For example, significant developments that can be attractive to the private sector include major property developments associated with public transport hubs, toll roads or car parks.
- The EIB's JESSICA programme is geared towards funding urban development and regeneration initiatives. It is an innovative financial engineering approach that is a move away from traditional grant funding. It involves the use of 'revolving instruments' (Urban Development Funds (UDFs), Holding Funds) set up in participating Member States, which can be used to make repayable investments (loans, guarantees, etc.) in urban development schemes. Member States are able to allocate some of their structural grants to the funds, and catalyse urban mobility projects that are associated with urban redevelopment and regeneration projects.
- There are 16 Holding Funds established in the EU, and 15 have delegated management to the EIB. In addition, there are 15-20 established UDFs. JESSICA is active in 11 EU Member States, with around €2 billion in funds allocated to date. However, projects so far have been predominantly to support energy efficiency for residential accommodation. In the next year or so it is expected that there will be more prospects for JESSICA to fund urban renewal projects.
- A key benefit of JESSICA is that it can put financing in a structure that can ensure it is used on a revolving basis. Including grants in these instruments can reduce the cost/risk for financing urban development, attracting private sector investors (within the limits of State Aid rules), and incentivises investment in financially sustainable projects.

- Fundamentally, success under the JESSICA programme depends on the ability of project promoters to submit appropriate (and quality) projects to the UDF. They need to be part of an integrated plan, generate financial and economic returns, have a good quality investment strategy and project preparation capability. JESSICA tends to be more likely to finance smaller transport schemes that support urban regeneration and property developments, or those that have a strong potential to generate revenue (e.g. car parking facilities). As such, this does not suit regions that are geared toward using the traditional grant funding model.
- Recognising that regions/cities wanting to access JESSICA do not have access (at EU level) to technical assistance for the development of plans and projects in the same way that they are for JASPERS projects, there could be a role for the EU in expanding technical assistance to support the JESSICA initiative. In addition, the scope for combining grants with revolving instruments has not been clarified, but this could be an effective way to further leverage both types of funding. Overall, there appears to be potential to promote the use of JESSICA for urban transport schemes.

## **8. IMPACT OF CLIMATE CHANGE (ENERGY CONSTRAINTS)**

- Global economic trends and a move to implement climate change mitigation policies are likely to create significant energy constraints, but also opportunities that will affect the urban transport sector.
- For example, fossil fuels are expected to become significantly more expensive in the future. This is linked to a combination of measures to constrain CO<sub>2</sub> emissions through carbon trading and carbon taxes, and the availability of accessible oil reserves which are themselves having to cater for growing demand from large emerging economies (e.g. China, India).
- As governments seek to implement appropriate climate change mitigation strategies it is likely that a combination of taxation, regulation and subsidies will put pressure to move towards more energy efficient transport operations and vehicles to reduce CO<sub>2</sub> emissions. This is expected to target private motor vehicles and less energy efficient buses and trucks. It is less likely to impact on rail transport given its low share of total CO<sub>2</sub> emissions
- With such measures and recent rises in oil prices, people and businesses are already changing their travel behaviour in response to these trends. This includes a marginal switch to public transport and active modes, and a greater demand for fuel efficient vehicles which is being met by many motor vehicle manufacturers through the provision of better engine technology, as well as with the sale of hybrid and electric vehicles. Beyond reductions in CO<sub>2</sub> emissions, there are concurrent reductions in noxious emissions associated with local air quality, such as particulate matter and consequential improvements in environmental and public health incomes.
- Commercial vehicle users in particular, are sensitive towards improving vehicle efficiency, so are keen to replace or re-engine vehicles to achieve worthwhile savings in fuel consumption, and concurrent CO<sub>2</sub> emissions. The introduction of low emission zones for commercial vehicles can effectively accelerate transitions towards cleaner fleets.
- A combination of taxation measures (e.g. lower vehicle purchase and licensing taxes) can help to encourage a shift to lower emission vehicles, although the economic crisis has reduced demand for new vehicle purchases. Incentives around concessionary parking charges and tolls can also be used to encourage new vehicle purchasers to consider lower emission vehicles.
- It is expected that improvements in vehicle fleets over time will see net reductions in overall fossil fuel consumption, even without significant changes in modal shares.
- Use of technology and pricing measures to make major improvements to the efficiency of road networks (e.g. road pricing and intelligent traffic management systems) could also further reduce emissions caused by congestion and idling time, as well as incentivise shifts to more energy efficient modes.
- In the public transport sector, rail based public transport is typically seen as having the potential for lower levels of per passenger/km CO<sub>2</sub> emissions, as long as patronage is at significantly high enough levels. This is particularly the case for electrified lines, but also new diesel-electric vehicles. However, as rail vehicles typically have long capital lives (e.g. 30-50 years), performance can vary and there remain opportunities to improve the net energy consumption of railways in vehicle service and station/depot operations.
- Meanwhile, significant improvements have been made in bus efficiency, particularly with the introduction of viable hybrid engine options that can significantly reduce



emissions. Some cities are also trialling hydrogen fuel cell and ethanol based buses. In addition, some cities still have trolley bus networks that can deliver zero local emissions, and can rival the total CO<sub>2</sub> emission levels of rail based networks. As with tram/light rail systems, these have longer vehicle and infrastructure operating lives compared with conventional diesel buses, but also significantly higher upfront capital costs that are not necessarily offset by commensurately lower operating costs. The EU may see value in investigating whether there are climate change policy benefits in supporting renewal of trolley bus networks or encouraging a wider transition towards ultra-low emission alternatives.

- Moving to electrically powered commercial vehicles, taxis and cars is seen as one of the more promising ways to achieve the required reductions in greenhouse gas emissions in the transport sector. Governments can lead the way by converting its own fleet. However, a large increase in share of electrically powered vehicles would need to be supported by investments in electricity generation and distribution networks. For localised urban transport, this may be more viable for bus, taxi and local delivery fleets.
- Achieving this will require effective partnerships with industry (e.g. R&D funding, trials and demonstrations, joint ventures, etc.) and better use of private capital given the scale of investments required. Other incentive/penalty schemes should be considered (e.g. stronger tax incentives, subsidised charging points, low emission zones, etc.).
- The potential role of active transport modes (walking, cycling) should also not be ignored, as a significant proportion of trips in cities are for distances of less than 2km, which for many can be viable by active modes. Active modes have the lowest emissions, can reduce pressure on public transport networks and roads, promote public health and if encouraged, can promote a more people-friendly urban form, which also encourages economic activity in downtown areas, helping to reduce the incidence of urban sprawl. Active modes should be considered as an integral part of urban transport network design, particularly for new developments, whether it be to access public transport or associated with road construction. The EU could encourage this as part of any funding and financing it provides for urban transport infrastructure.
- The EU could have a valuable role to fund R&D into alternative fuels, promote successful implementation and incentivise vehicle manufacturers through standards setting. This could include co-ordinating stakeholders across Member State boundaries, particularly for standards that may be necessary for filling stations, recharging points and other infrastructure necessary for any wholesale change in road vehicle fuel sources. However, it is critical to note that the EU is not well placed to “pick winners” in terms of future energy technologies (of which there are several contenders), but should help facilitate the development of the market and enable cities and other authorities to be informed of how they can follow trends rather than risk options that may prove to go nowhere.
- Beyond the obvious gains from changes in fuels, there are also benefits from the EU encouraging a more holistic approach to reductions in emissions. Reducing energy consumption for heating, lighting and operations at stations and other building, recycling energy and adopting more energy efficient operating patterns can also make a difference.
- The EU can also help to promote changes in urban transport network operations to improve fuel efficiency, such as the infrastructure needed to facilitate road pricing and intelligent traffic management systems.

## **9. DE-CARBONISATION OF TRANSPORT**

- The de-carbonisation of transport is a fundamental challenge for ensuring that the citizens of the EU can continue to enjoy the benefits of mobility on a sustainable basis as it reflect aspirations both of climate change policy and to reduce dependency on imported fossil fuels.
- This goes beyond acknowledging the benefits from more fuel efficient vehicles and the potential for changes in vehicle fuel technology, but to more actively aim to shift towards a new paradigm for powering urban transport across all modes. It means a shift towards a carbon-neutral view of urban transport over time. Given the relatively short distances and lower speeds of urban trips, there is significantly greater potential to drive decarbonisation in that context compared to intercity or rural transport, where the lower densities, higher distances and speeds are more demanding of vehicle technologies.
- To achieve the objectives for a sustainable transport future, city authorities, businesses and Member States need to work to develop strategies to transition towards systems for clean urban transport and commuting. In cities, the aspiration is for a switch to cleaner transport to be facilitated by lower requirements for vehicle range and higher population densities. As such, public transport choices would be more widely available, along with safe and attractive options for walking and cycling.
- It also envisaged that the greater role for public transport, supported by appropriate demand management (including through better road and other infrastructure pricing) and land-use planning, and that the use of smaller and light passenger vehicles will be encouraged. Large fleets of urban buses, taxis and delivery vans have also been identified as being suitable for the introduction of ultra-fuel-efficient engines (e.g. hybrids), or alternative fuels and propulsion systems. This also includes new vehicle construction technologies that greatly reduce the unladen weight of buses and delivery vehicles, this can make it more efficient for smaller vehicles to undertake more frequent trips. For buses, this means high frequency services (which are necessary to attract people from private car use) could become more viable, and for new engine and fuel technologies to also become viable.
- The implementation of ITS can also support these objectives by improving the performance of road networks and enhancing public transport. This can mean road space is reallocated among higher priority users (e.g. freight, public transport and active modes), but can also minimise energy intensive stop-start flows. It can mean using both technology and selective road infrastructure improvements to enhance existing network efficiencies to support such changes.
- Achieving these aspirations is going to require a sustained commitment from the EU, Member States and citizens, recognising that each party has a role to play. Policy and financial support to these objectives and measures will require coordination across all layers of government and effective partnerships with the private sector.
- The best way the EU can contribute is by promoting best practice, building capacity and knowledge across the EU of lessons learnt (including options that may not have delivered desired results) and support for the development of standards that can support these endeavours. In particular, the EU may wish to link any financial assistance towards supporting measures for decarbonisation (e.g. active modes, alternative fuels). The likely solutions for individual cities to encourage decarbonisation will vary. Some will need significant shifts in behaviour and growth patterns, others will need support to maintain mode shares in active and public transport modes, whereas others may need

support for new fuel infrastructure. In all cases, this should be considered alongside policies on climate change, environment, trade and the economy.

## **10. CITY-REGIONAL CONTEXT AND URBAN-RURAL LINKAGES**

- There are important synergies between cities and the wider regions. Cities provide centres of economic activity, are administrative/service centres and generate demand for goods. They provide many of the physical connections with international markets (i.e. airports and shipping). Conversely, rural areas and regions are bases for various economic activities such as manufacturing, agriculture and tourism.
- Supported by effective transport links, the wider regions can support labour catchments and consumer markets, and provide parkland and green space. As such they can become part of the commuter belt for some cities, or become important in their own right for urban visitors for leisure purposes.
- Cities and their surrounding regions often involve different layers of government and planning, which can provide for competing interests (e.g. situation of larger cities that dominate a region compared to smaller cities). They tend to have particularly high demands for transport infrastructure at high costs (because of the price of urban land and the costs to mitigate the impacts of transport networks on urban residents), compared to rural and regional areas, which are likely to have less pressure on congestion. Conversely, rural areas may struggle to generate enough demand or tax revenue to support lightly used public transport services or long, low volume road networks. It may be substantially easier to build and develop transport infrastructure in regional areas, because of the reduced costs and planning sensitivities. From a transport policy point of view, encouraging more development in regional and rural areas can make sense, as such networks are likely to have more unused capacity. Regional and rural authorities are also likely to encourage more development. However, urban authorities may see such areas as more likely to offer opportunities for dormitory suburbs or sources of visitors or customers to businesses in their cities. The likely outcomes for any city-regional or rural situations will vary considerably, depending on the type of economy concerned, land prices, transport network connections and expected growth patterns.
- Connections to regions and rural areas are much less likely to be the responsibility of urban authorities, but rather national/regional agencies which look after national and regional railways and highways. It is important for urban authorities to consider how their networks co-ordinate and interchange with those national and regional networks, and to develop options for co-modality to support sustainability for intra and inter-regional travel (e.g. rail and coach corridors park and ride facilities, etc.).
- The continued investment in the TEN-T means that the EU can take an active role in supporting these objectives. Although there are limitations to how much the EU can support connectivity to smaller regions and rural areas.
- Creating productive relationships between city authorities and regional managing authorities that administer EU structural grants is very important to ensure EU funds are allocated effectively at city level. There is a risk that important transport and urban development schemes are not being funded because of administrative boundaries. Encouraging more strategic approaches across such boundaries when considering applications for funding could help to bridge such gaps.
- Cross-border issues can also arise at the regional level within Member States, or across national borders. There are a number of instances around the EU where cross-border pressures (growth of adjacent urban areas or risks to historic services from one side) are creating needs to upgrade infrastructure that involve complex funding arrangements between Member States (e.g. Berlin and Warsaw, Vienna and Bratislava, etc.). These

issues can be exacerbated by differences in administrative levels/capability across borders. This is often a result of two different phenomena – 1) the requirement for massive investment to provide for growth, and/or 2) the maintenance of legacy transport systems. The EU can facilitate cross-border dialogue and strategy planning in those cases, and by identifying locations where there would be benefits in international urban transport planning.

## **11. SPECIFIC NEEDS FOR DEPRIVED URBAN NEIGHBOURHOODS**

- The built environment within urban neighbourhoods which are considered deprived often have the following characteristics:
  - Poor quality or insufficient housing stock (the Second State of European Cities Report highlights that respondents believe that there is a scarcity of affordable housing in most cities across Europe);
  - Low level public infrastructure provision (such as street lighting, car parking, public amenity areas etc.)
  - Poor quality infrastructure provision such as roadways/cycleways and walkways and isolation from such facilities;
  - Greater levels of disrepair, vandalism and decay of public facilities, including transport terminals and corridors;
  - Limited access to (including perceptions of access to) the full range of local employment, education and healthcare facilities in the city;
  - Relatively higher densities of housing compared to the urban average;
  - Lower levels of air quality
- For the inhabitants of these areas, these conditions are exacerbated by their own constraints or characteristics. These often include low incomes and/or levels of employment, social exclusion (sometimes linked to ethnicity or culture), higher than average levels of health or disability issues, and lower levels of personal safety (due to higher levels of street crime). It is the interplay between the environment and the personal circumstances of the residents which exacerbates deprivation and as such transport has a role to play.
- Transport policies/interventions to address the needs of deprived urban neighbourhoods can range from policies to improve neighbourhood environments to improving accessibility in order to allow social mobility, particularly in relation to accessing employment, education and healthcare.
- In addition, transport infrastructure can play a role in measures to regenerate or improve the built environment, by helping to ensure that stations, stops and vehicles are perceived as being safer, cleaner and not to a lower standard than that of other parts of a city. For streets, it can mean addressing issues of safety related to motorists, cyclists and pedestrians both from transport network use and crime.
- It should also not be ignored that in many cities, deprivation is not necessarily associated with lack of access to private vehicles. Policies which adopt a blanket approach to deterring private motoring for environmental reasons, may negatively affect access by certain groups to employment (e.g. increases in vehicle ownership or fuel taxes, or taxes on older vehicles). Such groups may use old second-hand vehicles to access employment not readily served by other transport modes. They are unlikely to ever be able to afford new vehicles, to live close to public transport hubs or have discretion about commuting patterns.
- There are many approaches to tackling these issues. For example, improving the environment can be achieved through:
  - Implementing air quality improvement measures such as vehicle access restrictions (i.e. to control emissions), traffic engineering to reduce congestion, or bypasses to remove through traffic from built up areas etc.

- Improving infrastructure such as bus stops, pavements, road crossing points and signage to improve security and mobility for vulnerable groups;
  - Addressing wider environmental issues such as vandalism, graffiti and litter, which contribute towards perceptions of poor personal safety and lack of concern about local residents;
  - Provision of well lit, regularly maintained dedicated infrastructure such as walkways/cycleways to main employment and education centres;
  - Work with public transport operators, police and community groups to improve security and reduce vandalism
- Targeted improvements in transport service provision can also be effective. This could include:
    - Modifications to timetables to increase accessibility for target groups (part-time or shift workers etc. who value services in early morning and late evening periods)
    - Extensions or modifications of routes to take in target areas, including reviewing whole networks to determine if they adequately meet the needs of major trip patterns;
    - Innovation on transport provision (e.g. community bus services linking into the core public transport network, rideshare services);
    - Prioritising targeted concessionary fare schemes that improve access to core services and facilities, over generic concessionary fare schemes that may poorly target those at need;
    - Innovations in funding for increasing access to low- cost, sustainable transport such as bicycles or bus passes etc.
  - By itself, transport policy and service provision cannot be expected to eliminate or even substantially ease urban deprivation. For example, some of the UK's most deprived urban areas are in London and enjoy high levels of public transport connectivity. Reflecting the many drivers of urban deprivation, effectively reducing its severity requires properly integrated land use, transport and social policy making.
  - EU policy and funding mechanisms provide significant support to regions that want to implement measures aimed at regenerating deprived urban neighbourhoods. The JESSICA programme specifically supports urban redevelopment and provides Member States with the opportunity to leverage their allocation of structural grants over the longer term. Improvements to urban transport association with such redevelopment may be able to gain some support under that programme, but it is dependent on being able to generate net financial returns from the overall developments. Many of the measures outlined above may not support this.
  - However, the current funding framework carries some limitations. For example, the EU could consider whether the spending of structural grants on urban transport and regeneration initiatives should meet certain standards or achieve desired impacts. This could be met by improving the framework for project evaluations and, and carrying ex-post monitoring in order to showcase project successes and failures so that lessons can be learned for future projects. The EU could also work to ensure there is the capacity at local level to procure and manage technical specialists that will vary depending on project needs.
  - Projects that promote regeneration in deprived areas ideally should form a cell around which further improvements can be encouraged around the redevelopment. At the level of urban transport policy, this means thinking, at the very least, about upgrading

neighbouring road corridors, specifically lighting, footpaths, signage, lining and road crossings. Such an approach could begin to ensure that when the wide range of policy areas responsible for addressing social deprivation are considered, that transport policies are seen to support, not exacerbate perceptions of social division and neglect. The EU could link support for such projects to commitments to deliver on extending high standards of streetscape improvements beyond such redevelopments.



## **12. CAPACITY BUILDING AT LOCAL LEVEL TO PROMOTE INTEGRATED AND SUSTAINABLE SOLUTIONS AND TO REDUCE FINANCING NEEDS**

- Provision of urban transport infrastructure and services can provide unique challenges for transport authorities that require appropriate governance and a high degree of technical competency.
- For example, a key characteristic of transport is that significant changes to networks often involve high capital costs and long asset lives compared to other areas of government investment. They may also create a large land footprint and significant impacts on urban form, by replacing revenue (and tax) generating land use, with less financially lucrative corridors and facilities. Transport networks are also important in terms of their support economic development and social interaction.
- The economic and political realities of transport mean that it can be very difficult to recover the full costs of infrastructure provision, particularly for mass transit systems and active mode networks. Funding for long term operations and maintenance can be difficult to recover given issues in raising sufficient fare revenue, competing needs for public expenditure and the political appetite to continue to fund higher profile capital works rather than routine maintenance.
- In addition, rapid economic change can mean that demand for infrastructure is growing faster than some Member State's capacity to provide it. It is well recognised that in cities from medium sizes up, there is no lack of potential projects to reduce bottlenecks, improve corridors and enhance access and mobility. For example, in the new Member States with economies that are expected to continue to grow rapidly, there is a window of opportunity to ensure urban environments are developed in the right way to meet future needs on a sustainable basis. This can include reserving potential future corridors so that development of networks can be done affordably.
- Combined, these issues create significant risks for project delivery and long term planning that city authorities are struggling to manage. Although these risks are considerable, there is significant potential for savings by optimising investment, improving management and operations and by efficiently tackling transport externalities.
- The current governance, policy and funding frameworks (i.e. grants, EIB loans, etc.) are more geared toward developing big projects rather than promoting effective long term management and planning, or in building institutional capabilities and processes that can support this. This can mean that while large projects may be advanced, the capacity of authorities to fully take advantage of those projects may be limited, and priorities remain with large high-profile projects rather than the funding of operational improvements and some smaller-scale projects that are less capital intensive but provide significant sustainability benefits.
- Given these issues, and the objective of strengthening territorial cohesion, there is a role for the EU to support capacity building at local levels to better enable authorities to promote integrated and sustainable solutions to meet financing needs, and get more value from existing investments.
- At one level, there is a role for the EU in providing best-practice guidance and highlighting successful case studies where these initiatives have been effective in reducing funding needs. The EU is already taking an active role in this area. Initiatives like ELTIS, the EU's urban mobility portal, provide transport professionals with access to news, events, case studies and tools to assist with the task of sustainable transport planning.

- The development of Sustainable Urban Mobility Plans (SUMP) is a part of the ELTIS Initiative. It is financed by the EU under the Intelligent Energy - Europe (IEE) Programme and managed by the Executive Agency for Competitiveness and Innovation (EACI). SUMP is defined as a set of interrelated measures designed to help satisfy the mobility needs of people and businesses on a sustainable basis. Resources are provided to practitioners in terms of guidelines, good practice examples and tools to develop an integrated planning approach to address all modes
- To be effective, these types of support mechanisms require active participation at local level, in terms of a desire to implement sustainable transport solutions and to follow best practice, and the appropriate governance and technical capacity to build the right long-term planning approach. As such, there are many regions across the EU where the political and institutional landscape is less capable of accommodating this.
- The EU could further advance development of such capacity by providing Member States with supporting activities to help cities take a longer term strategic approach to how they manage existing assets and develop future capital programmes. The emphasis could be on financial and economic sustainability being complementary to environmentally and socially sustainable outcomes. This support could be on a range of technical functions, including integrated planning, asset management, procurement and facilitating partnerships with private financiers and developers.
- This approach could be managed by the EU (e.g. via a dedicated bureau) or by an existing executive agency (e.g. EIB, as part of an expansion to its remit for JASPERS and ELENA).
- Over the longer term, these types of initiatives could be built into a framework that ensures EU funds are only provided for urban mobility projects that satisfy certain conditions. These conditions could relate to the planning approach, as well as to the impacts of any project in terms of economic, financial, social and environmental sustainability.
- For example, an effective way of doing this would be to create a framework whereby cities of a certain size that wish to use EU funds for urban mobility projects should be required to demonstrate that they form part of approved Sustainable Urban Mobility Plans (SUMPs). This could be linked to efforts to develop national project planning and evaluation frameworks and the provision of expanded technical assistance through a reinforced existing financial instrument (i.e. JASPERS/JESSICA, etc.)
- It is recognised that this would form a significant change to current practices, where regional bodies within Member States are able to allocate grants to funding priorities as long as they can demonstrate that they are compliant with the strategic priorities of the EU funds and operational programmes. As such, there would be a need for a negotiated position with the Member States, and changes to relevant regulations for the use of future EU social and regional funding, and of the regulations for the reinforcement of the chosen implementing instrument.
- The EU value-add in this approach relates to supporting the objectives of European transport policy as outlined in the White Paper. A key enabler for the success of this approach would relate to the ability of the EU support programme, however defined, to unlock locally available funding and financing options for city transport authorities. This could include from existing funding instruments (e.g. charges for parking, road use, fares, development contributions) or potential private funding partnerships. It could be enhanced by additional direct funding support at EU level (e.g. a dedicated funding instrument).

### **13. THE ROLE OF ITS IN DELIVERING SUSTAINABLE TRANSPORT SOLUTIONS**

- Intelligent Transport Systems (ITS) can contribute towards positive transport outcomes related to: better standards of mobility, reduced delays, improved network and service reliability, improved safety and security, and reduced environmental impacts.
- ITS integrate information and communications technologies to improve the efficiency, effectiveness and safety of transport networks. The use of ITS can contribute significantly to sustainable urban transport solutions, in various ways such as:
  - active traffic management systems to smooth road network flows;
  - smart ticketing systems to reduce delays and ease public transport transfers;
  - real time information systems to advise network users of travel times and incidents to help with travel planning or to change behaviour;
  - charging systems to allow for intelligent pricing of roads and parking;
  - improved signalling systems to get better use of networks to reduce delays and increase capacity;
  - warning systems to advise of obstacles or breakdowns to enable rapid response to incidents to avoid congestion;
  - safety systems to reduce the incidence of accidents.
- There are several risks for cities in implementing ITS applications and technologies. Such projects tend to be capital intensive and required specially trained staff to properly utilise them, even after installation. Without business rules and complementary systems and processes in place, ITS can result in “orphan” systems that provide information that is not effectively used, or which can even have negative outcomes (e.g. users expecting warnings that are not reliably provided). Local authorities may also be unable to negotiate effectively with ITS vendors keen to sell the latest equipment and applications, without sufficient knowledge of whether deployment elsewhere has been successful, how to ensure successful deployment from the users’ perspectives and whether there are issues of interoperability or compatibility with other systems. The fast moving dynamic nature of the ITS sector means it can be difficult to be up to date on the latest developments, successes and failures.
- Such risks may mean cities are hesitant to adopt ITS for fear they may procure the “wrong” system, or spend too much (or too little) money on prospective solutions that may not work. A lack of technical capability and procurement experience can exacerbate this. Early negative experiences can contribute to this perception.
- The EU already takes a positive role in encouraging ITS deployment, but could further contribute towards increased take-up of ITS by cities. A notable gap is how to consider critically what ITS applications and systems would best meet a city’s needs, and how to integrate this into a wider transport strategy. Not all ITS technologies are likely to generate value in all cities, so it will be important for local and regional authorities to build capability in assessing options, and to manage relationships with vendors keen to sell systems. Similarly, whilst some cities can benefit from a large scale ITS architecture development, others may only need deployment of selected technologies and applications to obtain worthwhile benefits.
- The EU could usefully contribute towards building regional/local authority capabilities in assessing options, developing strategies that include ITS and in procuring from ITS vendors. It can also helpfully monitor trends in technology, user responses to ITS and provide an impartial source of knowledge and information about how cities have successfully and unsuccessfully introduced ITS, including lessons learnt.

## **14. PROJECT EVALUATION AND CONDITIONS FOR EU FUNDING ALLOCATIONS TO URBAN MOBILITY**

- Formal project evaluation processes provide a standardised approach to assessing the (mostly monetised) economic, environmental and social impacts of an investment in new infrastructure and/or services.
- Although they carry a number of limitations, formal project evaluation tools are an effective way to prioritise projects for funding and implementation if they are well designed and managed. They are particularly useful when choosing between investments or programmes in the same sector (e.g. transport).
- In the EU, the use of formal appraisal methodologies is not widespread. For example, while formal appraisal is practiced heavily in the UK and some other areas under transparent and well developed frameworks, the case studies show that they are not used in many European regions and cities. Reasons for the lack of take-up of formal appraisal methodologies could be linked to:
  - Historical preference for alternative approaches to project selection (e.g. technical approach to network development based on engineering considerations);
  - Controversy around some of the underlying assumptions, particularly for cost-benefit analyses that rely on economic assumptions that may contradict a government's objectives for social equity;
  - Limited resources and/or technical capacity to develop and manage effective frameworks;
  - Political imperative to allocate funding based on objective criteria is not always apparent; and
  - Current funding frameworks do not incentive the use of such frameworks.
- The EU and EIB role in supporting new Member States by providing technical assistance to deliver transport and other infrastructure projects ensures that some progress is being made in deploying appropriate project selection frameworks.
- Given the growing pressure on the EU and Member States to deliver value for money on their spending decisions under future financial frameworks this strengthens the case for expanding the scope of project evaluation at EU level. This could ensure that Member States that decide to invest their structural grants on urban transport projects, do so in a way that delivers value for money and contributes to the EU's sustainable development objectives.
- This could be implemented to reinforce existing financial instruments (e.g. JESSICA, JASPERS), or could form part of a wider initiative over the longer term to enhance accountability in cohesion and regional funding allocations.
- An effective framework would have to be appropriately governed (i.e. at EU level by a dedicated bureau or through an executive agency) and have a well developed methodology that holds up to technical challenge by independent advisors. The methodology should be made to be scalable so that it can be applied by local authorities in smaller cities and/or for smaller projects, across different modes.
- The challenge would be for the EU to find the best way to enhance project planning at city level, which could include working with national authorities to develop national project evaluation frameworks. The frameworks could also include a post-implementation project review process, which could be used to showcase good practice and provide additional guidance for local authorities.

- The EU may also consider how it can demonstrate when projects do not meet expectations in a way that retains transparency, without causing embarrassment or concern by Member States where such projects reside. The key point being that there are always projects that sometimes fail to meet expectations in any country, and that learning from such experiences can help to fine tune the criteria used by any evaluations.
- Over the longer term, these types of initiatives could be built into a framework that ensures EU funds are only provided for urban mobility projects that satisfy certain conditions. These conditions could relate to the planning approach, as well as to the impacts of any project in terms of economic, financial, social and environmental sustainability.
- For example, an effective way of doing this would be to create a framework whereby cities of a certain size that wish to use EU funds for urban mobility projects should be required to demonstrate that they form part of approved Sustainable Urban Mobility Plans (SUMP). This could be linked to efforts to develop national project planning and evaluation frameworks and the provision of expanded technical assistance through a reinforced existing financial instrument (i.e. JASPERS/JESSICA, etc.)
- It is recognised that this would form a significant change to current practices, where regional bodies within Member States are able to allocate grants to funding priorities as long as they can demonstrate that they are compliant with the strategic priorities of the EU funds and operational programmes. As such, there would be a need for a negotiated position with the Member States, and changes to relevant regulations for the use of future EU social and regional funding, and of the regulations for the reinforcement of the chosen implementing instrument.

## **15. CREATION OF A NEW EU FUNDING INSTRUMENT FOR SUSTAINABLE URBAN MOBILITY**

- Whilst the EU provides some funding and financing support for urban mobility projects indirectly through various funds, some gaps have been identified in providing adequate support to Member States, regions and cities. While it is likely that the EIB will continue to support high value projects through loans and supporting financial engineering, this will not be able to address needs for projects that may generate economic and environmental benefits, but insufficient financial returns to be of interest.
- A key issue is the focus on large projects, and in supporting the procurement and implementation of such projects, rather than transferring knowledge and capability to cities. The likely capacity to fund future large projects will be constrained, yet there is ample evidence of scope for high value lower cost projects that could enhance the financial, economic and environmental sustainability of urban mobility in cities which currently are eligible for Cohesion Fund assistance.
- Such projects could be relatively lower cost, high value projects that could directly influence urban mobility such as:
  - Strategies to enhance the safety and attractiveness of walking as a mode for commuting and to be complementary with public transport;
  - Enhancing the safety and accessibility of cycling;
  - Use of ITS to enhance the attractiveness of public transport and to improve the management of road networks;
  - Support the trial and development of intelligent road and parking pricing systems that can significantly affect user choice, reduce congestion, reduce emissions and enhance the viability of more environmentally sustainable transport modes.
- The other value can come from supporting activities to help cities take a longer term strategic approach to how they manage existing assets and develop future capital programmes, with the emphasis on financial and economic sustainability being complementary to environmentally and socially sustainable outcomes. Such projects could include:
  - Development of asset management strategies and maintenance strategies for urban road networks with a view to improving service standards and reducing long run costs through long term performance based management contracts;
  - Development of procurement capabilities, outsourcing and contract management capabilities, in order to enhance the capacity of local and regional authorities to initiate, procure and manage small to medium sized projects and optimise the value from such projects;
  - Facilitating participation of private sector investment, in infrastructure and service provision, as part of a long term partnership arrangement, to reduce fiscal burdens, but also with a user focus. This should be consistent with objectives to support competition and transparent use of public funds;
  - Preparation of integrated transport and land-use strategies that develop a framework for prioritising capital, operational and maintenance spending, which are dynamic according to changes in transport and land use patterns, and enable authorities to maximise the value of public spending within available funding envelopes.

- However, for cities to want to access funding to undertake restructuring and improvements in their own capabilities, they will want to have incentives to do so beyond the savings that are available from undertaking those activities. It may be worthwhile to link funding for high value small to medium sized projects to providing assistance to improve overall governance and management of urban mobility to meet EU policy objectives. This could be further extended to be linked with EIB loans and Cohesion Fund support for urban transport related projects.

#### *Type of body and functions*

- It is envisaged that such a programme could be managed by a dedicated bureau or unit within the European Commission, as funding would be in the form of grants and for the Commission to purchase specific assistance in lifting the capabilities of the authorities concerned.
- The body could offer grants which could build a programme based on, for a particular city:
  - Initial strategic assessment of issues, needs and gaps;
  - Assistance to undertake governance reform to better enable a city to manage its transport assets and services;
  - Assistance to develop an integrated transport strategy, including prioritisation of expenditure and projects;
  - Assistance to develop management systems for assets, contracting, capital programmes and operational services to improve efficiency and enhance service delivery;
  - Assistance to develop procurement capabilities for ITS, and to manage relationships with private sector providers;
  - Assistance to support active transport mode programmes, high value ITS deployments and other initiatives that can deliver long term improvements to sustainable urban mobility for a city.

## 2. Appendix 2: Analysis of Financial Engineering & Other EU Measures

This section sets out some of the analysis we have undertaken to support the development of the Issues Notes and study findings.

### 2.1.1 *Review of Current Financial Engineering*

#### **Public Private Partnerships**

Public Private Partnerships are methods of obtaining financial resources and services from the private sector to fund public services. The benefits of the PPP approach generally derive from the enhanced allocation of risk between the government and the private sector. They also provide a number of other benefits including:

- Improved delivery of projects – PPPs have a good track record of on-time and on-budget delivery
- Value for money on infrastructure – through harnessing the private sector’s expertise in securing low cost and high quality resources
- Spread financing cost of the infrastructure across its lifetime
- Improved sustainability and innovation – through increased competition<sup>1</sup>

They can also provide necessary investment funds when public finances are tight, as is increasingly true with austerity budgets across the EU. Although, liquidity conditions in private sector financial markets and the risk preferences of potential partners for PPPs can affect costs and value for money compared to traditional funding sources. The economic crisis has made it more difficult to secure long term capital investment in capital intensive projects.

The utilisation of PPPs as a finance tool varies across the EU-27. Case study evidence shows that they are widely used in Madrid in a variety of forms but used much less in Vienna and in the three EU-12 cities studied. Burgas has executed 10 small-scale PPP projects in the city but none in the field of transport, although they did give consideration to using PPP to fund a monorail project in the city. In Brno, the municipality has given much attention to the concept of PPP, and the Czech Ministry of Finance has set up an organisation PPP Centrum a.s. with the objective of creating the conditions for the implementation of PPP projects. However, there remains a lack of experience in large PPP projects and unsuccessful past PPP projects have led to their developing a bad image. Poznan has shown an interest in PPP projects and has been considered by the JESSICA programme. However the evaluation found that the projects considered, which had mostly been identified and prepared for financing from EU funds in the 2007-2013 budget, would be “ready for implementation only within the grant system.”<sup>2</sup>

Madrid has used PPPs to fund much of the capital investment in the transport network which has delivered such good results in improving the modal share of public transport. However, the ability of these projects to withstand the full impact of the recession is likely to be tested in coming years as austerity measures begin to take effect.

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<sup>1</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Mobilising private and public investment for recovery and long term structural change: developing Public Private Partnerships, Sep 2009

<sup>2</sup> [http://www.eib.org/attachments/jessica-poland-west\\_en.pdf](http://www.eib.org/attachments/jessica-poland-west_en.pdf)



PPPs have been successfully used in Madrid for the implementation of its innovative urban bus interchange system. This consists of major grade separated bus stations that are located at key points on the transport network, enabling them to feed major employment centres and provide interchange connections with metro stations. Separate bus lanes and grade separation enables the buses to be kept separate from car traffic, which has led to a significant improvement in traffic flow on roads near the stations. In addition to fare revenue, the PPPs related to the project also include revenue from parking, advertising, vending machines and shopping, as well as expenditure on cleaning and security.

Further PPP-funded projects in Madrid include a number of metro line extensions and light rail improvements.

According to the city's transport master plan Vienna actively pursues and seeks the inclusion of private investors through PPP schemes, although not for the major expansions of its rail systems. In particular, this is done for contracts for traffic and mobility management, the construction of stations, goods terminals, logistic centres and connection of major projects on the periphery in the city with public infrastructure. An example of a project funded through PPP in Vienna is the park and ride scheme. Park and ride car parks are situated at access points to the public transport system and parking tickets are combined with Wiener Linien tickets for public transport.

Whilst PPP can provide vital investment in spite of public finances constraints, critics claim that the schemes can represent poor value for money in the long term as the returns on investment are lost. It is yet to be seen how a potential future sovereign debt crisis in Spain would affect the proliferation of PPPs in Madrid.

There are also a number of examples of failed PPPs which have had to be re-absorbed into the public sector, such as in the London Underground. Between 2003-2008 London Underground worked in partnership with the private sector organisation Metro net, which had responsibility for the maintenance, renewal and upgrade of 9 of London's underground lines. In July 2007 Metronet became unable to meet its spending obligations and the company went into administration. The Government bailed out the company until May 2008 when the contracts and employees of the company transferred to Transport for London. As part of this process London Underground had to buy 95% of Metronet's debt obligations from private sector lenders in February 2008 rather than repaying the debt over the 30 years of the contract. A National Audit Office report published in 2009 found that the overall cost to the taxpayer was between £170 million and £410 million.

As well as providing vital capital for infrastructure, PPPs can be useful in larger projects such as the Joint Technology Initiatives introduced by the Seventh Framework Programme. These JTIs work to promote research in fields where the scale of objectives is so great that traditional funding instruments do not suffice. JTIs have so far been set up in five fields including fuel cells and hydrogen, working to progress innovative fuel technology to reduce emissions and fossil fuel consumption from motorised transport.<sup>3</sup>

## **JESSICA**

The JESSICA project (Joint European Support for Sustainable Investment in City Areas) helps Member States to form and benefit from PPPs for urban regeneration projects. These can include investments in transport infrastructure and services in support of other

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<sup>3</sup> Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Mobilising private and public investment for recovery and long term structural change: developing Public Private Partnerships, Sep 2009

regeneration initiatives (i.e. as enabling investments). It helps Member States access to loan capital and attracts private funding and technical expertise. It allows Member States to access a portion of their allocated EU Structural Fund from the EBRD to make repayable investments (in the form of loans/equity) in urban development projects, including in transport. This money is drawn into an Urban Development Fund which can then include private funding.<sup>4</sup>

The advantages of JESSICA as a financing tool include:

- Sustainability – as the funds are repayable it is possible to recycle the returns on investment to create new investments
- Leverage – structural funds act of leverage for private sector finance and other sources of funding
- Flexibility – in the use of funds which can be either equity, debt or guarantee investment
- Partnerships – JESSICA can act as a catalyst for establishing partnerships between countries, regions, cities, the EIB, CEB and other banks.
- Speed – transfer of funds to JESSICA speeds up the absorption rate of Structural Funds

Up until November 2010, 54 JESSICA evaluation studies were undertaken in 19 Member States. A total of EUR 1.65 billion has been committed to 19 JESSICA projects across 11 Member States. Of the 19 JESSICA projects, 5 have been created at national level for national development plans.<sup>5</sup>

Whilst JESSICA has clear advantages, there are issues with its application in certain parts of the EU. These issues generally relate to the types of transport projects being put forward by some cities. An evaluation of the JESSICA programme in Bulgaria illustrates some of these issues. Burgas developed a project proposal for a monorail in the city using JESSICA, but the evaluation study concluded that JESSICA might not be *“the best financial engineering mechanism to be applied”* to this type of project. The report noted that transport projects require large capital investments and *“cannot provide leverage of private capital and have very slow rates of return”*, concluding that the proposed sustainable urban transport projects *“seem not suitable for JESSICA”*<sup>6</sup>

In addition, Burgas lacks sufficient experience in PPPs to fully take advantage of the JESSICA project and the local administration lacks the capacity and experience to prepare and manage investment projects, and there have been problems with previous attempts at their implementation.

A further issue arises from the fundamentally different approach required from local authorities in considering JESSICA as a financing engineering tool, which requires a different approach to projects that are grant funded. JESSICA requires a fundamental re-appraisal of the role of the public sector, taking a more entrepreneurial outlook which require a completely different skill set for that needed to use grants.<sup>7</sup>

In order to improve uptake of JESSICA in the EU-12 countries, it may be necessary to incorporate an element of capacity building into the initiative. This would train local

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<sup>4</sup> [http://www.eib.org/products/technical\\_assistance/jessica/index.htm](http://www.eib.org/products/technical_assistance/jessica/index.htm)

<sup>5</sup> <http://www.eib.org/attachments/general/events/jessica-snapshot-an-introduction.pdf>

<sup>6</sup> <http://www.eib.org/attachments/documents/jessica-preliminary-study-for-bulgaria-en.pdf>

<sup>7</sup> [http://ec.europa.eu/regional\\_policy/funds/2007/jjj/doc/pdf/jessica/bg-jessica-preliminary-study-for-bulgaria-en.pdf](http://ec.europa.eu/regional_policy/funds/2007/jjj/doc/pdf/jessica/bg-jessica-preliminary-study-for-bulgaria-en.pdf)

authorities to understand and take advantage of the JESSICA's benefits. A further drawback of the use of JESSICA to stimulate investment in transport infrastructure is that transport projects tend to have a slow rate of return, thereby negating the benefit of the recycled returns which is a key element of JESSICA.

## **JASPERS**

### *EIB Review*

The EIB recently conducted a review of their role in the JASPERS programme.<sup>8</sup> The findings of the study showed that, in terms of implementation, there was and remains a clear need for the initiative as shown by the economic benefits it brings. JASPERS was rapidly established and has been successful at adapting to changing circumstances. It has gained a good reputation amongst stakeholders and expanded its activities successfully. Its rapid implementation meant that it dealt with challenges in an ad hoc, rather than strategic and planned, manner. In the early years it lacked direction and did not properly ration its resources. The programme was also found to not have a formal needs assessment or clear priorities.

In terms of the effectiveness of the programme, the study found that there has been a lack of formal agreement on timescales and scope of projects, leading some projects to overrun or lack deliverables. However resource planning has improved with time. More than half the projects considered were found to be less than satisfactory in terms of their effectiveness (judged on whether their objectives were achieved). This was mostly due to disagreements with the Commission. The initiative is not very good at being efficient as it viewed itself as a "free" resource when in fact it is limited and valuable. Also, a lack of early co-ordination with the Commission led to advice given by JASPERS being contradicted by the Commission, resulting in waste of time and money.

The study also found that JASPERS was slow to understand and accommodate the type of technical advice required on projects. Advice given by JASPERS has been too passive and equivocal, lacking strong recommendations and prioritization. This was the case in JASPERS assignments evaluated in the Hungarian urban transport sector. JASPERS has historically not seen capacity building as a priority. Especially as JASPERS has become more involved in the grant application side of things, it has limited the amount that it is able to affect project outcomes – which would lead to economic benefits.

Other key findings of the study include:

- JASPERS is seen as independent, which can lead to complications when a different view emerges between the Commission, EIB and JASPERS.
- A tripartite collaborative process has emerged between the Commission, JASPERS and the Member States.
- JASPERS is part of the wider project preparation process, something which is time-consuming and expensive but is often not considered as a separate cost. The UK DfT estimates that the transport projects, planning tends to account for 12% of total project costs.
- ISPA, one of the pre-accession instruments aimed at capacity building now superseded by the IPA, devoted more of its funding to technical assistance than does JASPERS, even over a shorter timescale.

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<sup>8</sup> Synthesis Report: Evaluation of the EIB Role in the JASPERS Initiative: Gavin Dunnett, Rene-Laurent Ballaguy, Deirdre Gloster, Sara de Pablos, Jean-Paul Clin. Dec 2010

- The location of the JASPERS offices seemed to be dictated by political reasons not operational need. (There are offices in Luxembourg, Bucharest, Warsaw and Vienna).

The study's recommendations to enhance the effectiveness of the programme are listed below:

- Priorities should be revisited - as it is not operating optimally it could do more by concentrating more on capacity building.
- Now would be a good time to do a comprehensive needs assessment to refocus its priorities, identifying sectors and countries for priority treatment.
- The "tripartite approach", whereby JASPERS works in partnership with the Commission and Member States, works well. This tripartite relationship should be formalised through regular meetings between parties. This will improve efficiency.
- Should consider attempting more capacity building as a long term solution. It could improve its efficiency by being more strategic "educating the trainers, rather than the trainees".
- JASPERS should become more efficient at resource allocation. This could be done through a consultancy approach, with a clear "client" identified for each project and a clear timescale and deliverable set out. Progress should be closely monitored.
- JASPERS should develop a more consensual and communicative relationship with the Commission to avoid the provision of contradictory advice.

In relation to the EIB's role in JASPERS, the study concluded that the problems addressed by JASPERS will continue into the future so the EIB should secure long-term funding from its partners. If new partners are to be considered, the EIB should first regularise arrangements with existing partners and should ensure that any new inputs are manageable.

As EIB has a reputational stake in JASPERS it should seek greater involvement to make sure that its objectives are closely aligned to those of the EIB and ensure that its continued input is efficient and effective. Failing this it should scale down its involvement. It must develop a clear exit strategy.

EIB should undertake a full evaluation of its involvement in JASPERS and should consider whether JASPERS is the best use of its scarce resources. JASPERS should only be used where there is a particular need for the EIB's expertise. The evaluation should include an examination of the governance arrangements and the levels of risk.

### *Recent EIB Views*

At a recent JASPERS stakeholder meeting, EIB representatives made some further points regarding the evolution of the JASPERS programme. The key points include:<sup>9</sup>

- Looking forward, the EIB is hoping to have greater continuity into 2014-2020 programming period to be more time efficient. Some staff are already working on projects for the new programming period to help cross-over.
- In relation to improving applications made through JASPERS, the programme is developing a new completion note to be more useful for beneficiaries and stakeholders. Will separately set out comments, recommendations and additional considerations.

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<sup>9</sup> JASPERS Stakeholder Meeting: How to Improve the Quality of Submissions and Streamline the Application Process. Budapest, April 2011

- Fewer interruption letters. Reasons for interruption letters are, in descending order of quantity received: analysis of the environmental impact; cost-benefit analysis; project details; financing plan; compatibility with community policies and law; results of feasibility studies; timetable; justification for the public contribution. This shows that in general insufficient analysis (CBA and environmental impact analysis) is undertaken before documents and projects are submitted.

Will hold “tri-partite” progress meetings between JASPERS, DG Regio and the Managing Authority, beneficiaries and review bodies. The meetings will be used to discuss progress, and address issues especially horizontal issues affecting the sector.

### 3. Appendix 3: City Case Studies – Detailed Information

[Note: case studies are in draft format. Further data is to be added to each case study if possible, and further accuracy and other checks are to continue]

#### 3.1 Burgas, Bulgaria

##### Introduction

The city of Burgas (Byprac in Bulgarian) is situated in the east of Bulgaria, on the coast of the Burgas gulf on the Black Sea. It is the second largest city in Bulgaria, and the fourth most populous, after Sofia, Plovdiv and Varna. It is an important industrial, tourist, cultural, trade and transport centre. It has the largest port in Bulgaria and accounts for 60% of national sea import-export trade. It also has the second largest airport in Bulgaria, and is well-connected by railway and road. As a major tourist city, pressures on the transport system vary by season.

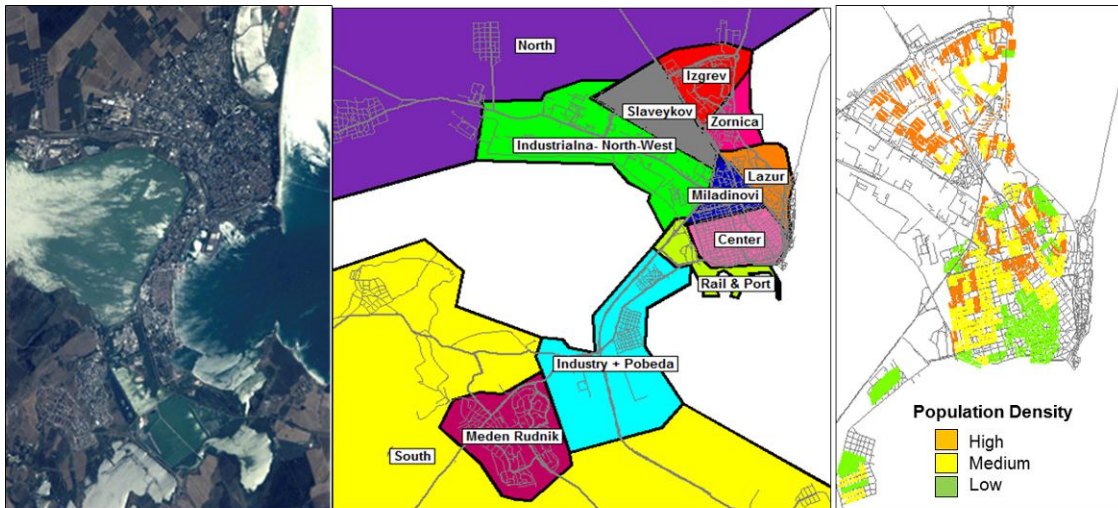
The Burgas region is the second most economically important region in Bulgaria and it has a considerably lower unemployment rate than the country as a whole: 3.45% compared to 7.29% for the first half of 2009.

**Table 1: Burgas – Key Facts**

Burgas	
Location	Bulgaria, 42°30'N 27°28'E
Population (2011)	197,301
<i>Working age population (2008)</i>	140,000
GDP (millions EUR) (2008)	5,274
Unemployment rate (2009)	3.45%
Car ownership rate (per 1000)	
Modal share of cars	59%
Forms of public transport	Bus and trolleybus; limited train services to suburbs
Passenger journeys per day (bus and trolleybus) (2008)	126,700

Sources: National Statistics Institute of Bulgaria, Stakeholder input, Booz & Company analysis

**Figure 1: The City of Burgas**

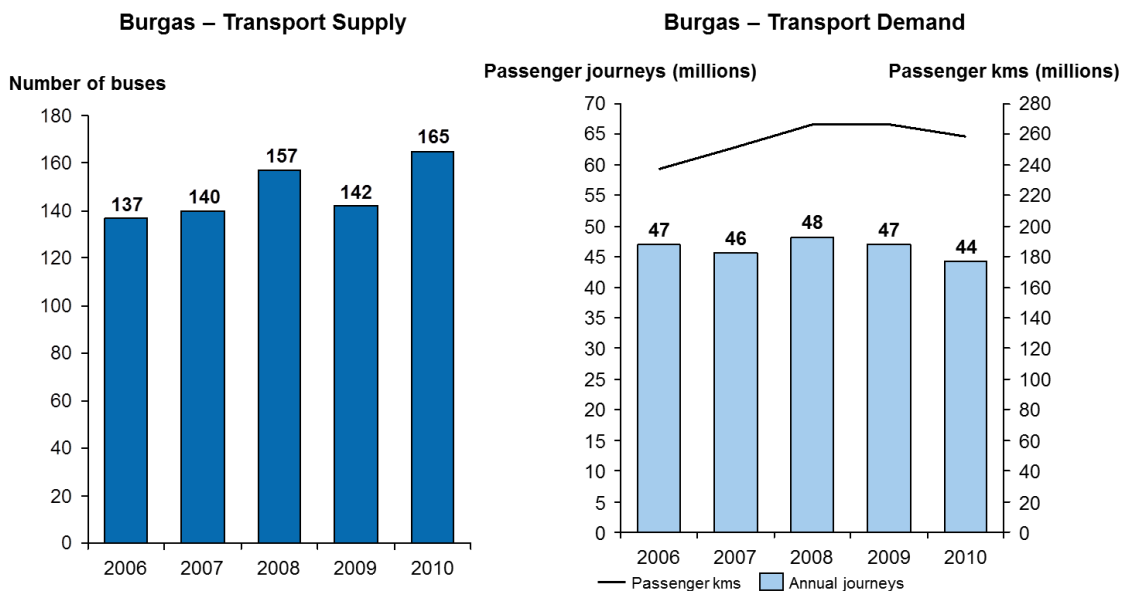


Sources: NASA; Arup ROM Transport

### Transport Supply and Demand

The data received related to Burgas’s bus network, which is the main form of public transport for city residents. While there is a railway system serving suburbs outside of Burgas, the role of in local urban transport is very limited. Daily modal split of car usage is 59%. Average car occupancy is 1.59 which is much higher than the European average of 1.2 due to low rates of car ownership. A remarkable feature of transport in Burgas is that there is no peak hour in demand, with the number of passengers in the middle of the day sometimes higher than in the morning or afternoon commuting periods.

**Figure 2: Burgas – Transport Supply & Demand**



Source: Stakeholder Input

The rolling stock for the trolleybus network consists of old second hand trolleybuses from Switzerland and Russia. Historical underinvestment has earned the service a bad reputation for reliability and speed and a review of the system found that many passengers prefer to take the bus. The depot has not been renovated or refurbished since its construction in 1989.

The trolleybus is slow with average speeds of 12.9km/h at peak times. Occupancy of the trolleybus is considerably lower than that of the bus.

Ticketing on the trolleybus network can cause problems. Passengers are unable to travel to the northern part of the city without having to transfer between trolleybuses and pay an additional fare. The system review cited this as a missed opportunity resulting in a limitation of patronage.

Apart from the new CNG and midibuses, the buses used on the network are generally very old, mostly imported from Germany. High ridership and frequency of the buses results in significant “wear and tear” but the high reliability rate (95-100%) means that the system scores highly on measures of quality. The average speed of buses at peak hour is 21 km/h, however as there is low congestion in the city the average speed for cars is also very high – at 35 km/h.

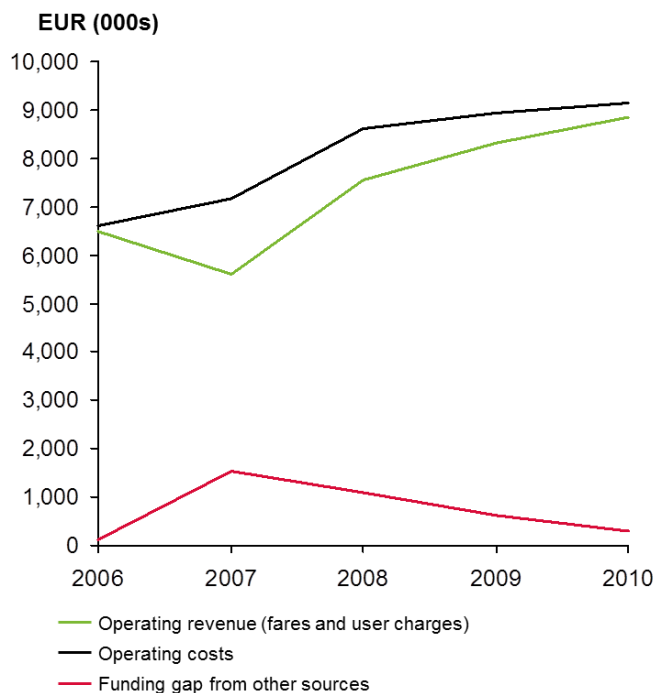
The Central Railway Station in the centre of the city has trains that run from Sofia and Plovdiv. This is located close to one of the city’s two bus stations providing a convenient interchange. There is one other railway station in the city and three railway stations serving suburbs in the Burgas area. However, the service is very limited with only seven local trains daily.

The ticketing system is paper-based with no electronic system of ticketing available. The fare structure is flat and there are no transfer agreements so passengers have to pay twice if they transfer between vehicles. Average transfer rate for buses is 6%. The flat structure means that the fare bears no relation to the cost as distances travelled vary considerably.

#### Transport Revenue and Expenditure

As above, the data received related to Burgas’s bus network, which is the main form of public transport for residents.

**Figure 3: Burgas - Costs and Revenue**



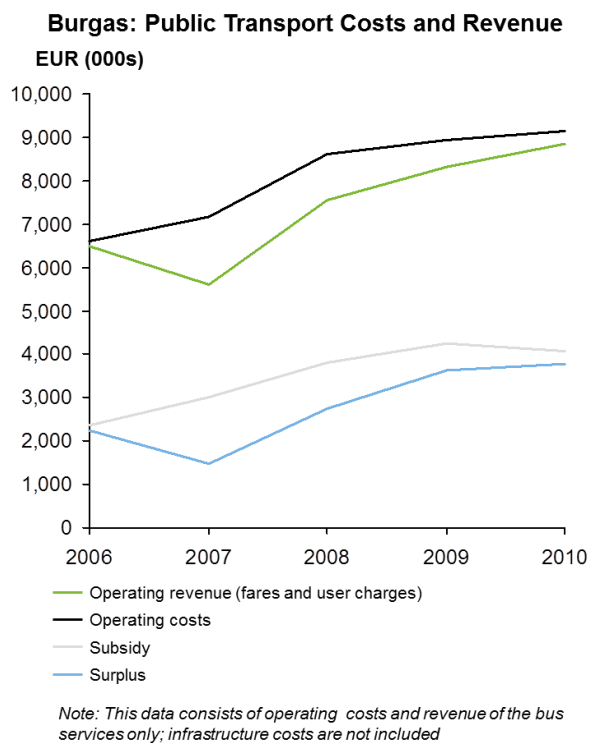
*Note: This data consists of operating costs and revenue of the bus services only; infrastructure costs are not included*

Sources: Municipality of Burgas, Bulgaria; Booz & Company analysis



This indicates a small funding gap between fare revenue and operating costs from the bus companies. However, if national and municipal subsidies are taken into account, which are given in order to fund subsidised transport for key passenger groups (the elderly, the disabled, students and children) this gap is more than mitigated and there is in fact a surplus:

**Figure 4: Burgas – Costs, Revenue and Surplus**



Sources: Municipality of Burgas, Bulgaria; Booz & Company analysis

Buses clearly have the advantage of being low-cost, which facilitates social and economic sustainability.

The subsidy given to groups for concessionary travel in Burgas is fairly complex. Public transport companies receive subsidies from the state for the compensation of the reduced tariffs for special groups including pensioners, students and disabled people. The law states that it obligatory for all public transport operators to provide transport to these groups at the discounted rate. However, the state subsidy is only paid until the state budget for compensation is exceeded, meaning that if concessionary travel exceeds budgetary expectations the costs will fall upon the operator. Groups eligible for concessions are divided and allocated a specific quantity of subsidy:

**Table 2: Concessionary Rates**

Concessionary Group	Monthly Tariff Net for Customer
Passenger over 65 years	10.75 Lev
Passenger over 70 years using one line	6.30 Lev
Passenger over 70 years using two lines	8 Lev
Over 71% disabled, mothers with more than 3 children, people with diabetes and Parkinsons	8.5Lev
Over 50% disabled, people with damages on their legs or with children requiring assistance (for use on 2 lines)	10 Lev
Over 90.1% disabled, people having problems with their movement ability, for example in a wheelchair (for use on 1 line)	6.50 Lev
Disabled with more than 80% visual handicap, or people over 50% of disability due to cancer (for use on 2 lines)	8.50 Lev
Students, Class 1-8 only (1 line)	11 Lev
Students (2 lines)	13 Lev
Students (1 suburban and 1 urban line)	11 Lev

Source: Stakeholder Input

This table demonstrates the complexity of the concessionary tariff structures. Data suggests that around 45% of all the public transport subscription cards that are sold are student cards. Pensioners over the age of 70 buy around 21% of all subscription cards and workers account for around 4-6% of all the cards bought.

#### Funding: Current and Future

The operational costs of the public transport system appear to be well covered by the combination of passenger ticket revenue and government subsidy. However, development of infrastructure and improving the environmental impact of the public transport system are both areas where further financing may be beneficial.

##### 3.1.1.1 Demographic Trends

Bulgaria has a declining population, in spite of which the population of Burgas has grown very slightly in recent years. The demographic profile of the population is changing, showing a growth in older people as a proportion of the population. Between the years 2007 to 2008 the total number of under 18s decreased by around 600, whilst all other sections of the population increased. An ageing population increases future funding needs as the existence of concessionary fare schemes for older people requires subsidy. Meanwhile a reduced proportion of working age adults reduces tax receipts for the government.

##### 3.1.1.2 JASPERS

The City of Burgas, with assistance from JASPERS, has put forward an Integrated Urban Transport Project with a cost of €67 million of which up to €47 million will be provided by

the EU Cohesion Fund on a grant basis with a further loan of up to € 11.1 million from the EBRD (currently under consideration).

The project components are to include the construction of new roads and terminus infrastructure for buses, enhanced traffic management, acquisition of a new bus fleet and improvements for cyclists and pedestrians. The Project Description supplied by the EBRD gives a full description:

- Construction of a 15 km Bus Rapid Transit (BRT) corridor – A new segregated bus lane corridor will be constructed to provide quick, reliable travel for users;
- Associated traffic management and public transport prioritisation to meet the needs for the BRT corridor - To enhance the reliability of the services and provide improve user quality;
- Bus depot extension, bus shelters and new multi-modal Central Bus Station and Bus Terminal construction. The new services will be accompanied by bus terminal designed to link passengers to other public transport services, including regular bus services and rail. The investment in the depot expansion is necessitated by the City's decision to introduce larger buses (CNG and diesel) to operate over the enhanced infrastructure, based around the BRT concept;
- New CNG and clean diesel fleet acquisition – This will involve the introduction of some 60 new CNG and diesel buses to operate over the improved infrastructure. The new vehicles will replace Burgas Bus' oldest buses and will contribute to a greatly improved and reliable service, with reduced emissions as well as reduced maintenance costs and more attractive public transport.;
- CNG bus service infrastructure – The investment will focus on the construction of a new CNG filling station to serve the expanded CNG bus fleet. This will be located at the Burgas Bus facilities, and will be an expansion of the current CNG filling station already in use;
- Integrated ticketing system – The new system will allow users to make seamless transfers from all major modes of public parking;
- Non-motorised transport – This will involve key investments in a cycling network and pedestrian facilities to improve safety. As an important component contributing to urban sustainability, the cycling paths will be designed to allow both residents and tourists to circulate conveniently and safely throughout the downtown and beach areas of Burgas.

In addition to the improvements in terms of passenger service, there are expected to be benefits for the financial credibility of Burgas. According to the Project Description supplied by the EBRD:

“Improved contractual framework for markets through introduction of a long term Public Service Contract. The new multi-year contractual arrangement between the City and the operators will establish sound and transparent relationship which will enable a solid framework for service delivery and regulation of a key public service, and will facilitate improved service quality, corporate development and will help achieving cost efficiency over time. Burgas will be one of the first cities in Bulgaria to implement a PSC which follows the guidance of the EU Regulation 1370/2007, which came into effect on December 2009. The PSC approach ensures a long-term sound and transparent contractual relationship which:

- allows introducing sustainable business conditions for operator, by setting the initial service volume, level of standard and rate per service unit;

- makes the operator creditworthy and enables long-term financing;
- creates natural incentives for a city to increase tariffs on regular basis and for an operator to seek cost efficiency, thus reducing any public support levels;
- establishes improved sector regulation, whereby the City is able to hold the operator accountable for delivering a high-quality service in exchange for public support payments paid for operating low-volume routes and transporting any passengers at discounted rates due to social policy.

Although the revision of the PSC is partially driven by EU requirements, the Bank will support the City which wishes to contract its 'internal' (i.e. municipal) operator, Burgas Bus."

Environmental benefits are also expected in terms of reduced emissions and reduced fuel consumption. This will be achieved by:

- the replacement of the obsolete and inefficient rolling stock with the new, clean diesel and CNG buses. According to the Project's Feasibility Study prepared by JASPERS, replacement of the old rolling stock itself should result in a reduction of 50 per cent for CO<sub>2</sub>, and 90 per cent for NO<sub>x</sub>, NMHC and PM<sub>10</sub>;
- the higher commercial operating speeds on the BRT corridor will allow for a 15-20 per cent reduction in fleet sizes, thus further reducing fuel consumption;
- the development of BRT should produce a moderate modal shifts from private cars to public transport, thus reducing emissions even further.

The project has been categorised B in accordance with EBRD's 2008 Environmental and Social Policy, that is, it is a project where "the potential adverse environmental or social impacts are typically site specific and/or readily identified and addressed through mitigation measures, risks or issues".

The EBRD Project Description concluded: "the priority investments are expected to provide significant improvements to quality, safety, accessibility and energy efficiency of public transport system, contribute to improve ambient air quality and pedestrian safety in the City of Burgas, as well as promote environment-friendly and sustainable modes of transport."

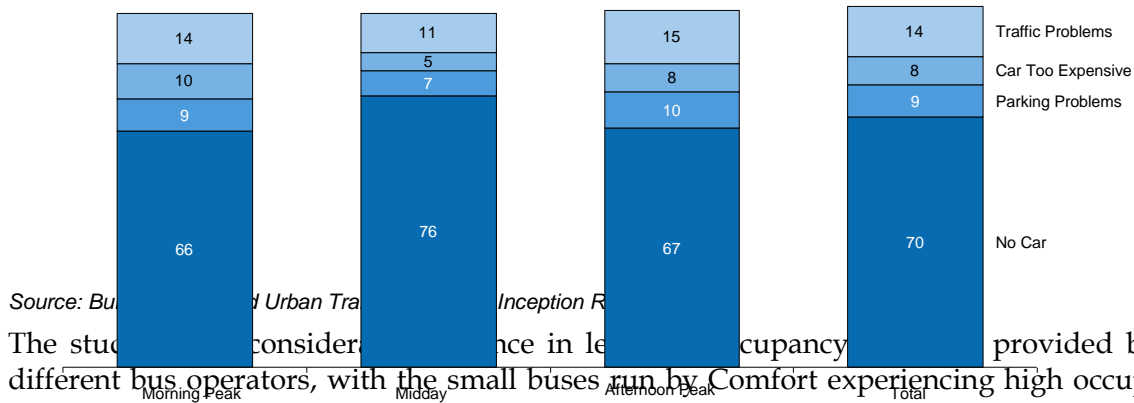
Further to the specific goals of the project, JASPERS worked with Burgas to drawn up a long-term strategy for urban transport development, including the development of a new parking system, the installation of park and ride facilities, the creation of multimodal interchanges and the introduction of light rail transit.

Feedback from the Burgas municipality showed that their experience with the JASPERS initiative was positive. The success of the JASPERS project was in part due to the flexibility of the model, with the JASPERS consultant able to adapt the proposed solution to the local context. An outcome of the JASPERS project is the Burgas municipality has committed to taking forward lessons learned, in terms of data usage and communications, to help with the development of future transport plans.

### 3.1.1.3 *Inception Report*

As part of JASPERS assistance for the Burgas Integrated Transport Project, JASPERS provided funds for the hire of consultants to advise the city on its transportation model. The resulting report was a thorough assessment of the current state of transport in Burgas. The survey carried out a multi-faceted analysis of the transport systems, including factors such as reasons for bus usage.

**Figure 5: Distribution of Passengers By Reason of Using Bus**



Source: *Bus and Urban Transport Inception Report*

The study considered the difference in occupancy provided by the different bus operators, with the small buses run by Comfort experiencing high occupancy levels throughout the day and times of over-capacity at peak times. This was in comparison to the Burgas Bus and Burgas Volan line which have average occupancy levels of 0.2-0.4. The consultants' recommendations included a possible re-arrangement of the route system.

The study found discrepancies in the annual ridership estimates, suggesting that these differences might arise from a misinterpretation of monthly ticket usage, with the number of trips taken by discount card holders evaluated incorrectly. The report also noted that seasonality would affect passenger numbers, particularly due to the seasonal nature of demand in Burgas due to varying rates of tourism at different times of year.<sup>10</sup>

#### 3.1.1.4 JESSICA

The Burgas municipality, along with other Bulgarian cities, hopes to make use of funding through the JESSICA initiative.<sup>11</sup> JESSICA in Bulgaria will be allocated € 33m for the period up to 2013. Two UDFs will be established, one to serve Sofia and the other to serve Burgas and five other Bulgarian cities. EIF begins working as a holding fund in Bulgaria in the second half of 2011 and will allocate JESSICA funding for use as guarantees, loans and equity financial instruments.<sup>12</sup>

#### Transport Planning

Burgas has developed a transport master plan which includes the development of bypass roads to take account of Burgas's location on a trans-national crossing. The proposed highways and bridges will be planned and funded at a national level with the Burgas municipality supporting the planning through the use of local data. The master plan also proposes a new ferry system to help develop tourism.

### 3.2 Brno, Czech Republic

#### Introduction

Brno is located in central Europe, in the Czech Republic. The City of Brno is the second largest city in the Czech Republic and is the major metropolis of the South Moravia Region. Brno is the centre of the Czech judiciary, and is the seat of, among others the Constitutional Court, the Supreme Court and the Supreme Administrative Court. Brno also contains thirteen universities and is famous for its trade fairs.

<sup>10</sup> *Transportation Model for Burgas, ARUP- ROM Transport*

<sup>11</sup> [http://vladkopianayotov.eu/wp-content/uploads/2011/05/Bulgaria-EE-buldings-27-April-2011\\_final-.pdf](http://vladkopianayotov.eu/wp-content/uploads/2011/05/Bulgaria-EE-buldings-27-April-2011_final-.pdf)

<sup>12</sup> [http://www.kpmg.com/RO/en/IssuesAndInsights/ArticlesPublications/Press-releases/Documents/EU%20Funds%20in%20CEE%202011\\_KPMG.pdf](http://www.kpmg.com/RO/en/IssuesAndInsights/ArticlesPublications/Press-releases/Documents/EU%20Funds%20in%20CEE%202011_KPMG.pdf)

**Table 3: Brno – Key Facts**

Brno	
Location	Czech Republic, 49° 12' N, 16° 37' E
Size (square km)	230
Population (2010)	371,200
GDP (millions EUR)	Not reported
Unemployment rate (2010)	8.24%
Car ownership rate (per 1000)	433 <sup>13</sup>
Modal share of cars	26.2%
Forms of public transport	Tram, bus, trolley bus, train
Passenger journeys per day (2010)	1,054,000

Sources: Stakeholder input, Booz & Company analysis

**Figure 6: Location of Brno**



Source: Brno City Strategy

### Transport Supply and Demand

In former decades, Brno, like many other Central and Eastern European countries, relied largely on mass transportation. After the Velvet Revolution in December 1989, where the Communist government was ejected, public transport's modal share declined steadily for a decade, reaching a rate of 55% in 2000, while number of personal cars grew along with road congestion. Thus, in 2000, the prime goal for Brno's Transport Department was to stabilise the modal split. Public transport in Brno underwent substantial qualitative changes and Integrated Transport system was established.

The current mode share for commuters is shown below, which indicates increased use of public transport since its low of 55% in 2000. Brno has a high number of commuters; in 2001 the total number of commuters was over 65,000, accounting for around one third of the total jobs in Brno.

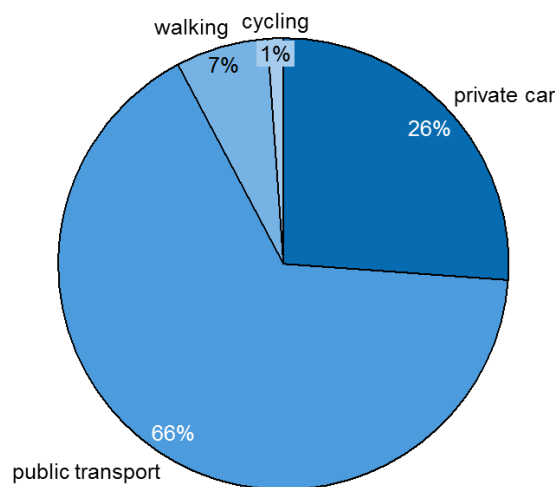
Brno suffers from high levels of congestion in the city centre, particularly during peak times. Much of the public transportation system, such as trams, trolleybuses and buses, operates on road surfaces and so high road usage severely limits the speeds of these modes at peak times. This high level of congestion has emerged partially as a result of growth in road traffic intensity resulting from transformations in Czech society and lifestyle. Residential

<sup>13</sup> Private car ownership rate given; vehicle ownership rate per 1000 is 589.

and commercial suburbanisation has led to increased commuting, for example the out-of-town retail centres in the south of the city are used by residents from the north, resulting in cross-city traffic. Increased suburbanisation is often poorly supported by public transport and it impacts upon the social and economic character of the city with a trend towards ghettoisation and degradation of specific areas. Unrestrained suburbanisation is recognised as a threat to the city by the Brno City Strategy.

A number of improvements designed to ease congestion have not been completed, such as the Big City Ring and the R43 highway. Congestion is further exacerbated by insufficient parking capacity in the city centre and at public transport junctions on the edges of the city. The Brno City Strategy recognises the absence of Park & Ride as a significant weakness for the city and an improvement of parking facilities at transportation centres would contribute to the growth of the Park & Ride system and thus reduce congestion in the city centre.

**Figure 7: Transport Mode Share 2010**



Source: *Factum Invenio*, as ordered by Spatial Planning and Development Dpt. of the City of Brno

Brno benefits from the provision of a number of different public transport modes: there is a rail system for suburban commuters, while inside the city, trams and trolleybus – both low-pollutant systems of public transport – form the “backbone” of the system, transporting passengers into the city centre, and buses serve either as feeder lines for the tram and trolleybuses or as “tangential lines” to connect periphery parts of the city. An additional system of conventional buses serves the fringe areas of the city.

Brno City justifies the cost of the provision of good quality services on economic grounds: “Lower quality of transport in some city parts will result in lower attractiveness for the citizens and therefore decrease in property value or even emptying of these areas. Costs of solutions of these negative processes may exceed costs of providing quality public transport.”<sup>14</sup>

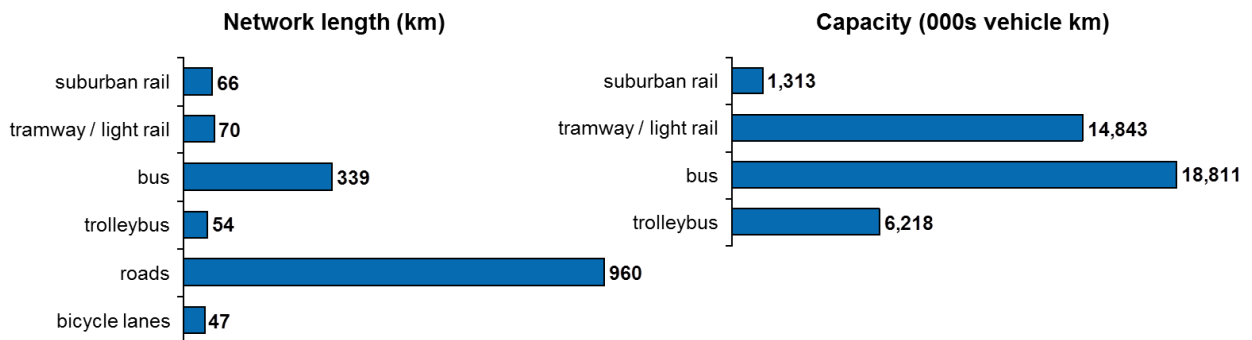
The main public transport operator in the city of Brno is DPMB (Brno public transport company) which also operates the Integrated Public Transport System of the South Moravian Region. DPMB operates all the trams, buses and trolleybuses in the city as well as six boats on the Brno reservoir during the summer season – these boats are powered by environmentally-friendly electric engines with accumulators. Other public transport operators in the region include other Czech Railways and 13 regional bus operators.

<sup>14</sup> *Stakeholder Input*

In addition to public transport, Brno also has a cycle network with 47km of cycle lanes, including two “international cycling lanes” which bisect the city and an inner city network of radial and tangential cycling lanes. However, there remains more to be done to encourage cycling and the Brno City Strategy highlights the lack of cycling paths as a problem.

The provision of transport in terms of network and capacity is shown below:

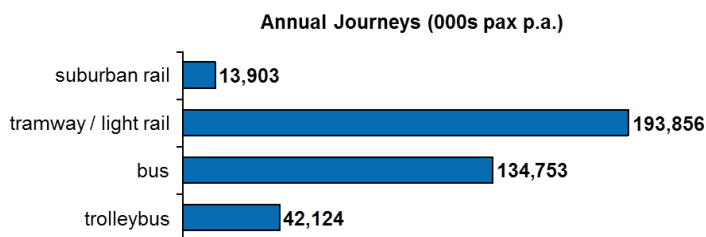
**Figure 8: Brno – Transport Supply 2010**



Source: Stakeholder Input

In terms of passenger use, the tram system has over 190 million passenger journeys a year, while buses have almost 135 million and trolleybuses 42 million passenger journeys a year.

**Figure 9: Brno – Transport Demand 2010**

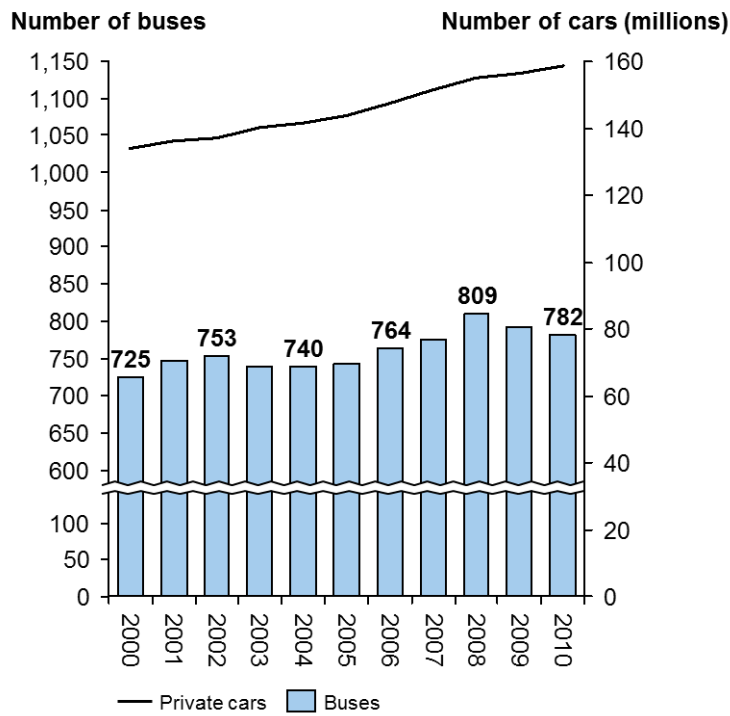


Source: Stakeholder Input

Data on the evolution of transport supply and demand was not available. The only relevant information available was on the number of registered vehicles in the city over the last decade, which shows an increase in both the number of cars and buses from 2000 to 2010, though there has been a slight decrease in the number of buses over the last two years (from 809 buses in 2008 to 782 buses in 2010). However, this data does not include figures for trams or trolleybuses and so it is not clear whether a decrease in the number of buses would constitute a decline in public transport supply as a whole or whether it indicates a change to different transport modes.



Figure 10: Brno – Transport Supply: cars vs. buses



Source: Stakeholder Input

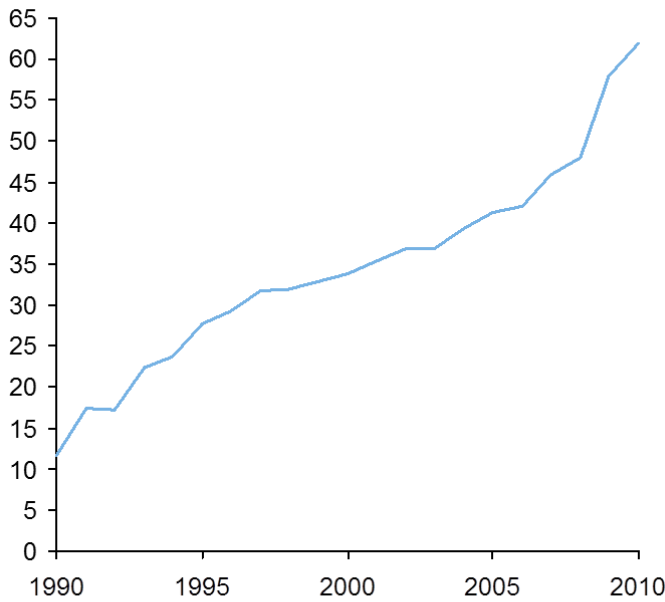
### 3.2.1 Transport Revenue and Expenditure

The yearly operational cost of transport in Brno is € 83.6m which is made up of € 34.2m transport fare revenues, making up 41% and € 49.4m, accounting for 59.1% of the total. Capital expenditure was CZK899,257. Funding for capital expenditure comes from city budgets as it is considered to be investments of the City of Brno. The state does not play a part in public transport funding.<sup>15</sup>

<sup>15</sup> Stakeholder input

**Figure 11: Brno - City Budget - Subsidy Given to DPMB**

EUR Millions

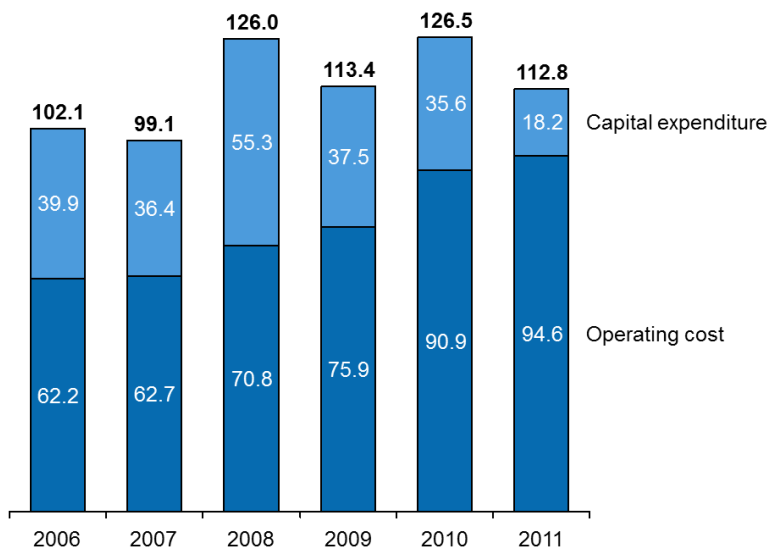


*Note: Given in nominal terms, with EUR exchange rate as at 2010. A constant exchange rate of CZK:EUR at 0.0396 has been used so that the evolution of expenditure can be seen without being obscured by exchange rate fluctuations*

Source: Stakeholder Input

**Figure 12: Brno - Expenditure on Public Transport**

EUR Millions



*Note: A constant exchange rate of CZK:EUR at 0.0396 has been used so that the evolution of expenditure can be seen without being obscured by exchange rate fluctuations*

Source: Stakeholder Input

### 3.2.1.1 Funding

Sources of funding from the EU include:

- Regional Development Fund – which is used for Fleet Renewal
- EIB loans
- EU grants - including CZK 25m from CIVITAS and CZK 10m from TROLLEY

Through the CIVITAS Initiative the European Commission aims to support the implementation for sustainable urban transport strategies. The initiative is currently in its third phase, which started in 2008, CIVITAS PLUS. This latest phase includes 25 cities from across the EU-27 taking part in 5 projects demonstrating clean urban transport measures promoting new technology and building up markets for innovation. It is funded by the European Commission.

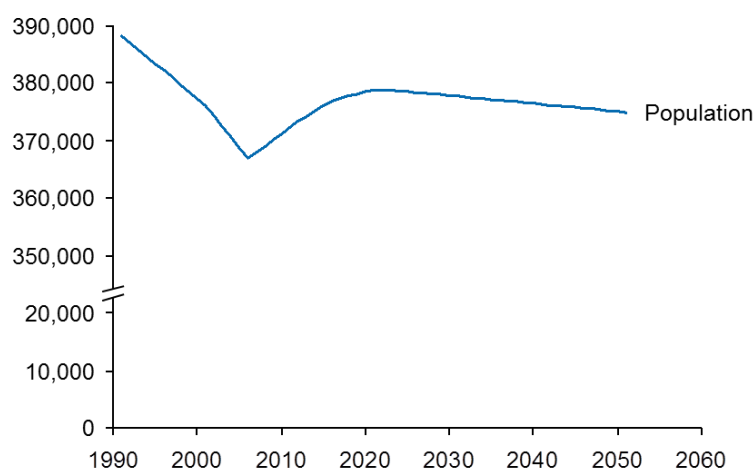
Brno takes part in one of the five projects, CIVITAS-ELAN, as a learning city benefitting from the experiences of other cities involved.<sup>16</sup> Brno has a number of objectives through the CIVITAS-ELAN project, planning to implement six key measures:

- Optimising energy consumption in public transport networks by introducing a heating regulation system
- Increase quality of public transport services through providing minibuses for reduced mobility passengers
- Intermodal infrastructure planning through establishing a best practice platform
- Comprehensive mobility dialogue for raising citizen engagement and awareness
- Introduction of Integrated Information Services
- Installation of Ticket-Vending Machines with a system of wireless modems and online alert transmission to the dispatching site.<sup>17</sup>

#### Demographic Trends

The chart below shows the changing population of Brno, with forecasts to 2051. The chart shows that population is predicted to increase fairly rapidly to 2021 before beginning to decline steadily thereafter. The actual and predicted increase in population from 2007 is due to increased migration resulting from the Czech Republic’s accession to the European Union.

**Figure 13: Brno Population Growth – Historical and Forecast**



Source: Stakeholder Input

<sup>16</sup> Stakeholder input

<sup>17</sup> CIVITAS ELAN – Introductory Brochure

### 3.2.2 *Future Transport Projects*

The Europoint project aims to modernise the railway junction. A key objective of the project is to enhance Brno's status as a European crossroad or hub city. Brno is situated at a crossroad of two European rail corridors and the station has rail links with Germany, Slovakia, Hungary, Austria, Serbia, and Croatia. The railway station is at full capacity and requires expansion, but this is not possible in the station's current location. The municipal authorities have made plans to relocate the station about 1km away to the south to create a new railway junction which would connect the seven railways in the area. The new location of the station would also be placed near to the bus station encouraging inter-modal transfer.

The project would encourage the redevelopment of the less prosperous South Centre part of the city and the Jižní centrum Brno joint stock company was set up for the management and implementation of the project. The rebuilding of the railway junction has faced some delays through political opposition to the project from different stakeholder groups. The municipality had hoped to secure EU funding for the project but it is looking increasingly unlikely that this could happen from the 2007-2013 programme period due to delays in preparation procedures. The project is predicted to cost around CZK 30bn.

There are plans for the electrification of a stretch of railway line between Brno and Zastávka u Brna. This project is using support from JASPERS to prepare a bid for funding.

The EIB evaluation of opportunities for JESSICA in the region recommends projects to reduce congestion in the city centre and improve the interconnectivity between passenger traffic and public transportation. These projects include:

- Construction of parking houses
- Construction of park and ride type parking
- Completion of Big City Ring, including the construction of the Dobrovského tunnels (estimated to cost around 30bn CZK for the ring and 6bn CZK for the tunnels)
- North-South Tram Diameter<sup>18</sup>

Further projects envisaged include:

- Construction of R 43 road (to be financed by the state)
- Extension of the tram network (costing upwards of 2,166bn CZK)

### 3.2.3 *Transport Planning*

The City of Brno doesn't currently have a Sustainable Urban Transport Plan or an Urban Mobility Plan. Such a plan is currently in the development phase, with implementation scheduled for 2012. The department responsible is the Department of Spatial Planning and Development.

The Public Transport Master Plan will look ahead to the next 15-20 years and build upon the reorganisation of the public transport system which occurred in 1995, allowing for simplification and the development of a "backbone" system of trams and trolleybuses with buses serving as feeder lines and connecting border parts of the city. The basic concept of the Master Plan is for railway to provide the backbone of the system with non-railway transportation performing and feeder and branch aspects.

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<sup>18</sup> [http://www.eib.org/attachments/documents/jessica\\_in\\_south\\_east\\_cohesion\\_region\\_czech\\_republic\\_eng.pdf](http://www.eib.org/attachments/documents/jessica_in_south_east_cohesion_region_czech_republic_eng.pdf)

### 3.3 Vienna, Austria

#### 3.3.1 Introduction

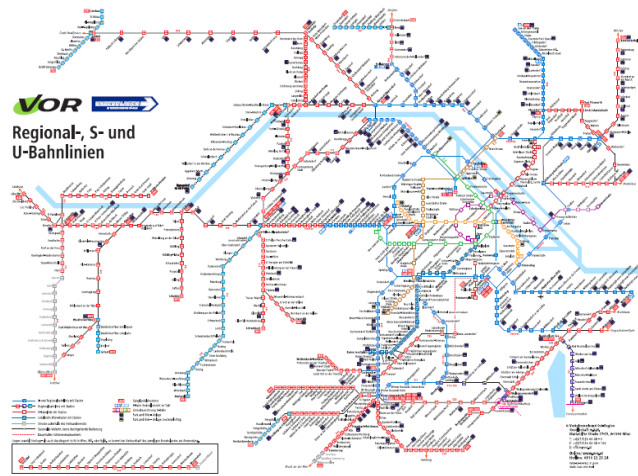
Vienna (Wien) is the capital of the Republic of Austria. Geographically it lies in the north eastern part of the country, just over eighty kilometres by road from the Czech border to the North and just under eighty kilometres from the Slovakian border and the town of Bratislava to the East. The city forms one of Austria's nine states and is divided into twenty-three districts. Vienna is the political hub of Austria and is perceived as the economic and cultural centre. International organisations, such as the United Nations and OPEC are located in the city. On 1 January 2011, the population of Vienna stood at just above 1.7 million.

**Table 4: Vienna - Key Facts**

Vienna	
Location	Austria, 48°12'N 16°22'E
Population (2011)	1,713,957
Population greater VOR region (2011)	2,600,000
GDP/capita Vienna (millions EUR) (2011)	45,000
Unemployment rate (2011)	9.0%
Car ownership average 2011 (per 1000)	390.8
Modal share of cars (inner city) 2006	31%
Forms of public transport	Bus, subway train; train services to suburbs
Public Transport - Passengers carried 2009 (bus and trolleybus)	882.9 million (+0.5% compared to previous year)
Public Transport - Ticket revenue 2009 (	€542.6 million (+0.05% compared to previous year)

Sources: Eurostat, Traffic Masterplan Vienna 2008, Stakeholder input, Booz & Company analysis

**Figure 14: Geographical Location of Vienna Figure 15: Metropolitan/regional public transport map**



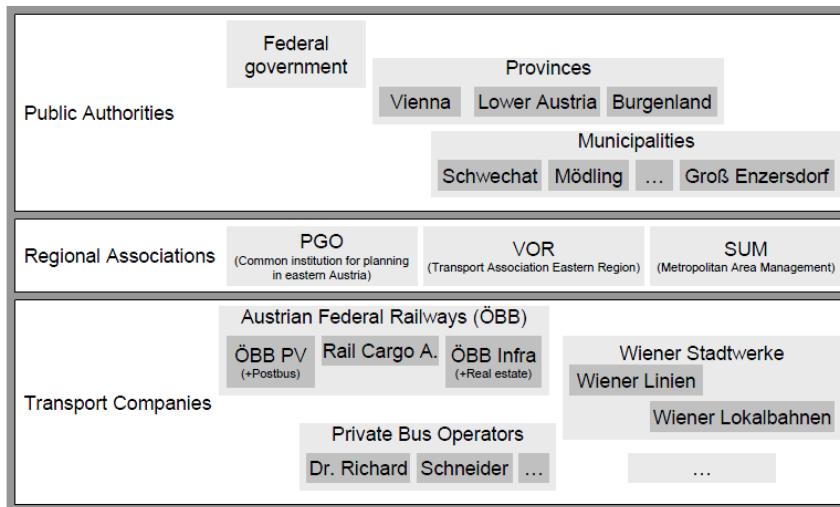
Sources: VOR – Traffic Association for the Eastern Region

### 3.3.2 Supply and Demand

The metropolitan transport network of Vienna is extensive. Busses, trams and five underground train lines serve the city. The metro system comprises of 5 lines with a total length of 68.9km. The bus network comprises 84 lines and has a total length of 649.9km. The tram network is served by 28 lines.

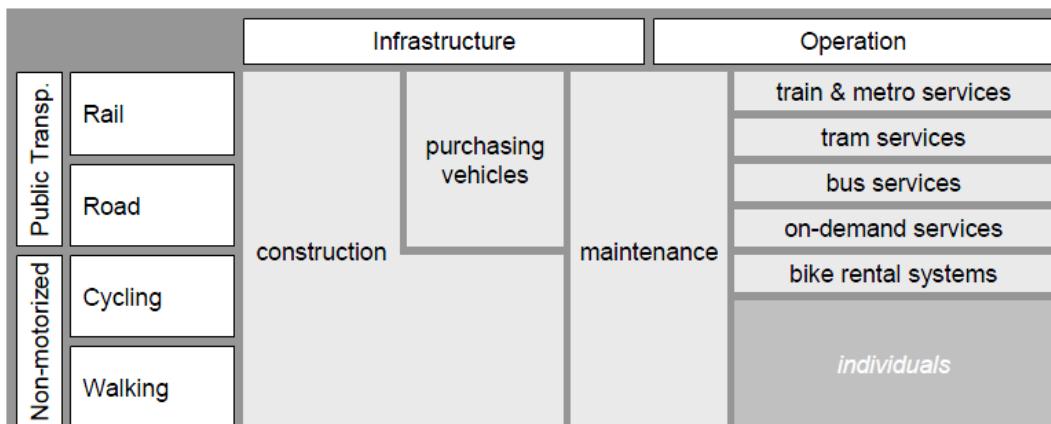
The public transport network is partially run by Wiener Linien which operates 5 underground lines, 31 tram lines and 80 bus lines. Wiener Linien is entirely owned by the City of Vienna. Public transport in Vienna is part of the Verkehrsverbund Ost-Region VOR transport body which has responsibility for the eastern regions of Austria. The institutional divisions of the Vienna public transport are depicted in the following graphics.<sup>19</sup>

**Figure 16: Vienna Public Transport Institutions**



Source: Stakeholder Input

**Figure 17: Institutional Involvement in Public and Private Transport Sectors**



Source: Stakeholder Input

Additionally, the city has an extensive road network and is connected to multiple motorways. Just under nine kilometres outside the city, to the south east, is Vienna International Airport, which serves domestic and international flights and is the hub for Austrian Airlines.

<sup>19</sup> <http://conduits.eu/documents/city-summaries/Vienna.pdf>

**Table 5: Vienna – Transport Infrastructure Supply**

Vienna – Transport Infrastructure	
Viennese Lines (City of Vienna)	1,156 km, 122 lines
Railway (suburban and regional)	1,800 km, 37 lines
Regional Busses	5,350 km, 175 lines
Cycle paths (City of Vienna)	1,170 km
Free Park & Ride spaces close to railway stations in the region	32,000
Subject to charge P&R terminals within the City of Vienna	8

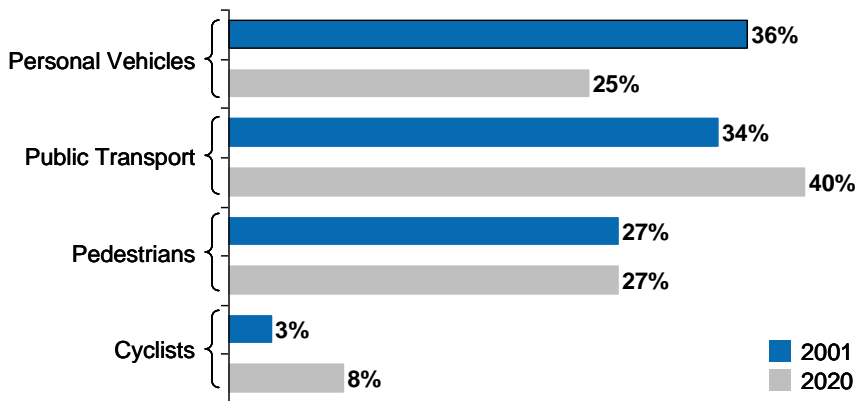
Sources: Stakeholder input, Booz & Company analysis

### 3.3.3 Modal Split

Within the inner city of Vienna the modal split can be categorised into four main areas:

- Personal Vehicle
- Public Transport
- Pedestrians
- Cyclists

**Figure 18: Vienna – Modal Split (2001 – 2020)**



Source: Traffic Masterplan Vienna 2008

One key driver for achieving the modal shift from personal vehicles to public transport is the accessibility of public transport access points. Currently, within the city of Vienna, one hundred percent of the population lives no further than fifteen minutes’ walk away from the nearest access point to the system. The city plans to maintain this parameter, even under the constraint of growing population.

The city aims to encourage the use of bicycles through the “City Bikes Wien” scheme which consists of more than 60 bike stations available at all hours of the day. The first hour of usage is free with prices rising progressively for each subsequent hour. Vienna has good cycling infrastructure with a 1100km network of cycle lanes and 1697 cycle parking spaces available.

### 3.3.4 Funding

Operational costs of public transport in the City of Vienna are funded through ticket income, public services contracts on a national, regional and local basis and through special government funding for school passes.

According to the Transport Masterplan for the City of Vienna, 2003, financing of investment projects is undertaken in various ways.

#### 3.3.4.1 Roads

A and S Federal highway projects are financed by ASFINAG, the operator of these roads and the relevant toll system. ASFINAG has responsibility for planning, construction, financing, maintenance and management.

Other streets are the responsibility of the Municipal Magistrat der Stadt Wien which is in charge of planning, construction, financing, maintenance and management.<sup>20</sup>

The EU Eurovignette Directive regulates full cost recovery for roads through the collection tolls for heavy goods vehicles – it also allows for the cross financing of road and rail projects<sup>21</sup>

#### 3.3.4.2 Public Transport

The Magistrat der Stadt Wien and Wiener Linien have responsibility for planning, construction, financing, maintenance and management in public transport. Österreichische Bundesbahnen has responsibility for planning, construction, financing, maintenance and management in the railways. The main shareholder of ÖBB is the central government. The expansion of the tram network is the responsibility of the City of Vienna. The expansion of the subway system is undertaken 50% each by the Federal and Province governments.

**Table 6: Project Information – City of Vienna Underground (Subway) Projects**

Project Information – City of Vienna Underground (Subway)			
Project Title	City of Vienna Cost share (€ million)	Estimated Completion	
		2008-2013	2014-2020
U2 Station-Aspernstraße	430	2010	
U2 Aspernstraße-Flugfeld	360		2013
U2 Reumannplatz-Rothneusiedl	860		2015
U2 Süd Karlsplatz-Gudrunstraße	670		2019
<b>Total</b>	<b>2,320</b>		

Source: Traffic Masterplan Vienna 2008

Funding sources include taxes, road pricing and public transport fares. Stakeholder feedback showed that EU funding is not seen to play a major role in Vienna as the available funds are small and the administrative burden is seen as prohibitive in certain cases. The City actively pursues and seeks the inclusion of private investors through PPP Schemes. In particular, this is done for contracts for traffic and mobility management, the construction of stations, goods terminals, logistic centres and connection of major projects on the periphery in the city with public infrastructure. An example of a project funded through PPP in Vienna is the park and ride scheme. Park and ride car parks are situated at access points to the

<sup>20</sup> <http://conduits.eu/documents/city-summaries/Vienna.pdf>

<sup>21</sup> Source: Transport Masterplan for the City of Vienna, 2008

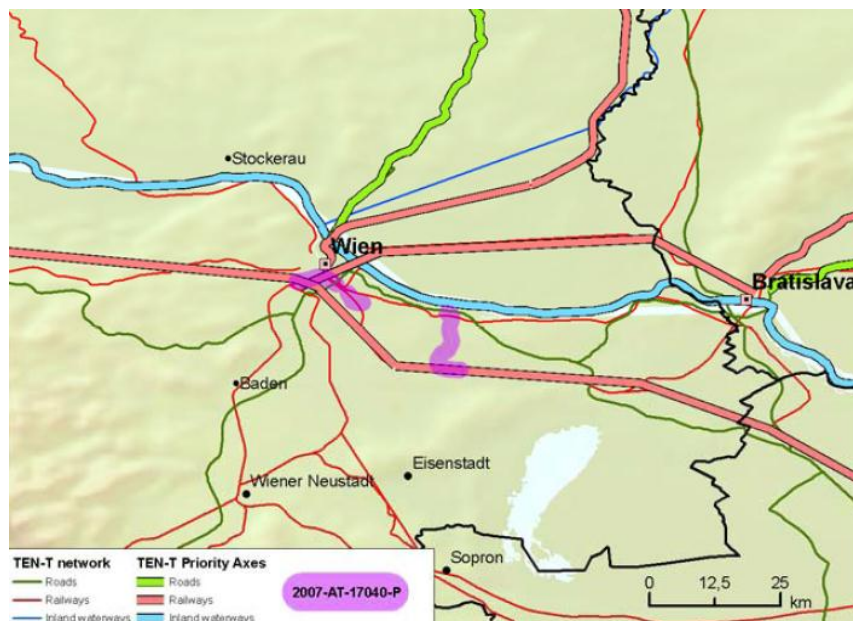


public transport system and parking tickets are combined with Wiener Linien tickets for public transport.

Additionally, some projects are part funded by EU funding initiatives. These include the Vienna to Bratislava railway line, which forms part of the TEN-T Priority Project 17 railway axis from Paris-Strasbourg-Stuttgart-Vienna-Bratislava. Project 17 targets the provision of a continuous new and upgraded high speed railway line from Paris to Bratislava for both passenger and freight traffic. Six sub-projects of Project 17 fall into the region of Vienna:

- Connection of the new central station in the city with its railway stations to the East, West and South railway stations (6 km), merging all of the railway lines (N, S, E, W) in a new through station – Vienna Central station
- Kledering loop – a connection between Vienna Central and Vienna International Airport, connecting the east railway line to the airport suburban railway line (2km)
- Goetzendorf clip: double track construction, connecting to the airport to the East railway station and further to Bratislava (14.2 km)

**Figure 19: Project 17 – City of Vienna Area**

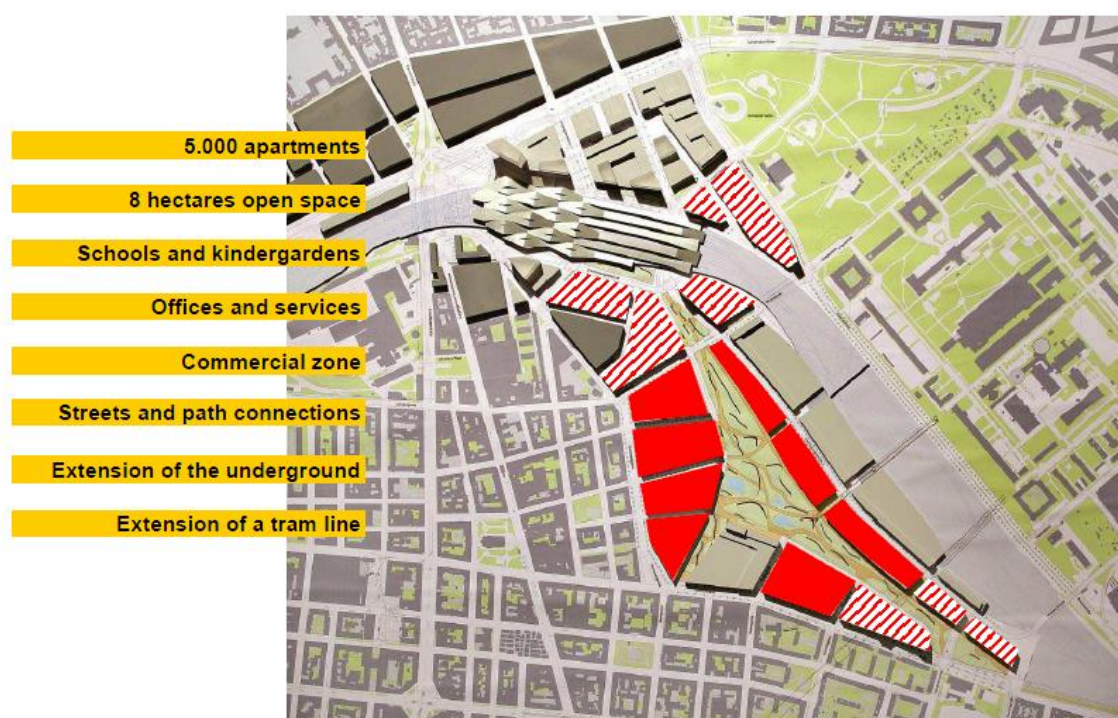


Source: Traffic Masterplan Vienna 2008

The overall value of the six sub-projects of Project 17 is estimated to be €925.5 million. The overall funding available through the TEN-T-EA is €129.8 million, equalling 14.03%. The support available by the EU will be used to equal parts for study and built related activities. The city of Vienna contributes financially to the projects (for example: €40 million to the new central rail station)

Vienna has well-integrated land use and transport properties. The main central station project will allow for the regeneration of the urban area around the station with the construction of 5,000 apartments and services. The project is also a good example of innovative financing: the upgrading of the line between Vienna and Bratislava will be partially funded through contributions from the developers who will construct the new commercial and residential premises on the station site.

Figure 20: Vienna Railway Station Project



Source: Stakeholder Input

### 3.3.5 Transport Masterplan of Vienna

In 2003, the Vienna City Administration, Municipal Department 18 for Urban Development and Urban Planning Transport Planning and Regional Development Section, published a Transport Masterplan for the city, defining specific strategies and measures addressing the city's special transport needs up to the year 2020. This masterplan was revised and reissued in 2008.

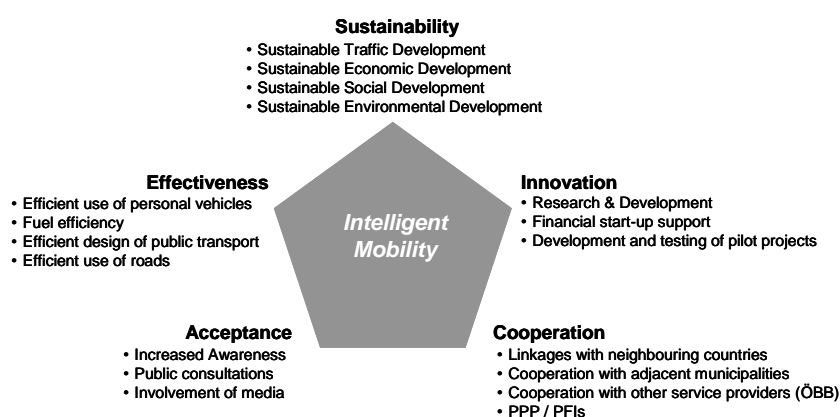
The strategies and initiatives outlined within the masterplan are underpinned and driven by the following assumptions:

- Expected population growth of the city between 2005 and 2020 and the resulting additional strain on the transport network;
- Stringent energy, environment and climate change policies, on a national and international, including EU-wide basis, legislate a need for change;
- Technological advancement and innovation, as well as making the city more environmentally friendly within the national and EU-wide regulatory and fiscal framework which can only be achieved by relevant investments and actions;
- Increasing fuel and energy costs trigger the need for actions to ensure social mobility within the city.

The 2008 update of the masterplan, confirms the strategic goals set in an earlier plan from 2003, and stresses the requirement to expand the public transport network in the city and surrounding (catchment) areas.

An integral part of the masterplan is the city's resulting 'Intelligent Mobility' transport policy model is based on five principles as outlined in the graphic below.

Figure 21: Masterplan Sustainability Criteria



Source: Vienna Transport Masterplan

The framework in place means that all new projects have to meet the sustainability criteria set out in the masterplan. The projects have to fit with these criteria before they are approved, whilst they are being built and in their existence afterwards.

### 3.3.6 Future Trends - Predicted Population and Traffic Growth

The transport masterplan assumes the number of journeys by car within the city will grow at the same rate as the city's population, as outlined in the tables below.

Table 7: Vienna - Population Development

Vienna Population Growth Forecast (2005-2020) in Millions				
	2005	2020	Change 2005-2020	
Vienna Town	1,626.4	1,838.7	+212.2	+13.0%
Vienna Surrounding Areas	589.5	669.8	+80.2	+13.6%
Total	2,216.0	2,508.5	+292.5	+13.2%

Source: Traffic Masterplan Vienna 2008

With +22.7%, the population in the inner city districts 11, 21-23 is expected to experience the strongest growth, followed by suburban areas.

The masterplan assumes that overall growth of the population in the city and suburban (catchment) area will consequently lead to longer routes for travellers, putting additional strain onto the system. Another future planning consideration by the city planning is the growth in the population of people over the age of sixty by an estimated additional sixty-thousand by 2020. Under the sustainability principles outlined, there is a requirement to provide means of access to the transport system for this part of the population, guaranteeing mobility and social inclusion.

Table 8: Vienna - Traffic Development (Passenger Cars Drivers - Viennese Citizens only)

Vienna City Traffic Development - Passenger Car Drivers (2005-2020) in Millions			
	2005	2020	Increase
Population	1,626.4	1,838.7	+13%
Total number of journeys per person per day	2.7	2.7	
Of which are by car	1,098.0	1,241.0	+13%
Total number of journeys per person per day by car	1.48	1.48	

Source: Traffic Masterplan Vienna 2008

Under the current assumptions, the number of journeys taken by car would increase in direct proportion to the growth in population, +13% between the years 2005 – 2020. Therefore, any strategic traffic improvement initiatives, introduced by the 2003 masterplan, would be compensated by the population growth alone.

An additional driver for the revision and update of the original masterplan was the ongoing development of Vienna to a TEN (Trans-European Transport Network) node for passenger and freight traffic.

### 3.3.7 Appraisal criteria for initiatives outlined in the masterplan

The table below outlines the appraisal criteria for the initiatives outlined in the traffic masterplan for the city of Vienna. In essence, the appraisal criteria did not change since the publication of the 2003 report, but were expanded and further defined in the 2008 report.

**Table 9: Vienna – Transport Project Appraisal Criteria**

Appraisal / Performance / Success Review Criteria of Transport Projects	
Modal Split (Trips of Viennese Citizens)	<ul style="list-style-type: none"> <li>▪ Increase in cyclists to 8% by 2020 (2001 base)</li> <li>▪ Increase of public transport share to 40% by 2020</li> <li>▪ Maintain pedestrian share of 27% (2001 base)</li> <li>▪ Choice of mode of transport should reach 75% environmentally friendly modes, across all genders</li> </ul>
Modal Split (Trips of commuters)	<ul style="list-style-type: none"> <li>▪ Change of distribution of modes of transport between public transport and motorized individual transport (personal vehicles) by 2020 to 45%-55% (2001 base)</li> </ul>
Traffic Density in Vienna	<ul style="list-style-type: none"> <li>▪ Number of journeys by car (km) should not increase (2002 base)</li> <li>▪ Number of journeys by car should decrease</li> <li>▪ Freight and goods transported by road (tonne kilometres should not be greater than the regional GDP</li> </ul>
Average Distance Travelled (km – Viennese Citizens)	<ul style="list-style-type: none"> <li>▪ Average distance travelled by car should not increase</li> </ul>
Traffic Count (average)	<ul style="list-style-type: none"> <li>▪ No further increase of traffic crossing the boundaries of the inner city as defined by the Gürtel and the Danube Channel</li> <li>▪ Reduction of traffic crossing the boundaries of the inner city as defined by the Gürtel and the Danube Channel (2000 base)</li> <li>▪ Reduction of traffic on relevant A + B roads</li> </ul>
Mobility	<ul style="list-style-type: none"> <li>▪ 100% of all Viennese citizens should live no further than 15 minutes to the nearest access point of the public transport system</li> <li>▪ Annual season ticket prices will remain constant, at least in relation to the average income (2002)</li> </ul>
Transport Safety	<ul style="list-style-type: none"> <li>▪ Reduction in deaths and injuries by 50% (2002 base)</li> </ul>
Emissions	<ul style="list-style-type: none"> <li>▪ Instances of exceeding the maximum NO<sub>2</sub> limits at road intersections to be reduced to zero (2002 base)</li> <li>▪ Reduce proportion of residents affected by traffic noise pollution by 20% by 2020 (1996 base)</li> <li>▪ Reduction of CO<sub>2</sub> per capita, caused by traffic (base 1990)</li> </ul>

Source: Traffic Masterplan Vienna 2008

Other examples of appraisal criteria for traffic related projects include: improved national and international connectivity of the city of Vienna with other hubs, improved quality of public transport stops and stations, improved quality of rail and tram vehicles and busses,

number of public car parking spaces in the inner city and offer of park & ride schemes and length of cycle routes and bicycle stands.

### 3.3.8 *Future Projects*

The projects outlined in the transport masterplan for the city of Vienna are allocated to eight different categories:

- Passenger long distance and freight traffic by rail: 23 projects
- Commuter and regional traffic by rail: 16 projects
- Inner city traffic by underground: 4 projects
- Inner city traffic by tram: 9 projects
- Traffic on superior roads (motorways and expressways): 32 projects
- Waterways and aviation: 2 projects
- Stationary traffic: 2 projects
- Mobility management and public relations: 6 projects

Completion periods for the projects are scheduled for the years 2008-2013, 2014-2020 and post the year 2020, with the majority of the projects to be completed during the first period mentioned.

A further objectives for the Vienna region includes the development of an intermodal and dynamic traffic information system:

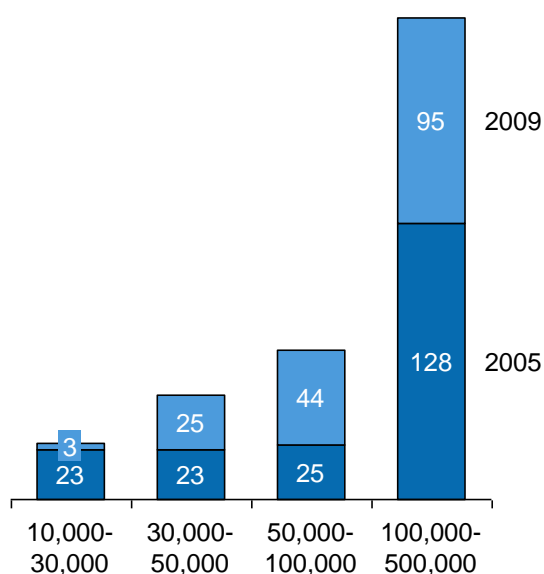
- Dynamic and intermodal routing for all transport modes
- Common reference network
- Traffic pool data and modelling
- Traffic monitoring and strategy coordination including cooperative traffic management

### 3.3.9 *Austrian City Study*

The Austrian Association of Towns and Cities carried out a study of 16 Austrian urban areas of varying size. The study found that both transport revenues and expenditure rose in the period 2005-2009, with expenditure rising by twice as much (26% compared to 13%).

The study showed clear differences in the funding requirements of large and small urban areas. As illustrated by the graph below, smaller cities with 10,000 to 30,000 inhabitants had the lowest per capita net costs at € 26 in 2009. The largest cities of 100,000 to 500,000 inhabitants had the highest net costs of €223 per capita. Larger cities also saw a higher proportional growth in net funding need between 2005-2009: net expenditure in cities sized between 50,000 to 100,000 more than doubled between 2005-2009 from €25 to €69.

**Figure 22: Per Capita Net Costs in Austrian Urban Areas**



Source: Austrian Association of Towns and Cities

### 3.4 Madrid, Spain

#### 3.4.1 Introduction

The city of Madrid is the capital of Spain and also its largest city. It lies in the centre of the country. Madrid, or the region of Madrid, is one of the autonomous regions of Spain and it is formed by 179 municipalities in an area of over eight thousand square kilometres and 6.4 million people live within this area.

**Table 10: Madrid – Key Facts**

Madrid	
Location	Spain, 40 23'N, 3 43'W
Size (square km)	8030.2
Population city (2010)	3.3 million
GDP (millions EUR) (2005)	28,064
Unemployment rate (1996)	11.2%.
Car ownership rate (per 1000) (2004)	504
Modal share of cars	35%
Forms of public transport	Tram, underground bus, trolley bus, train
Total trips per day in the region (2010)	15.2 million

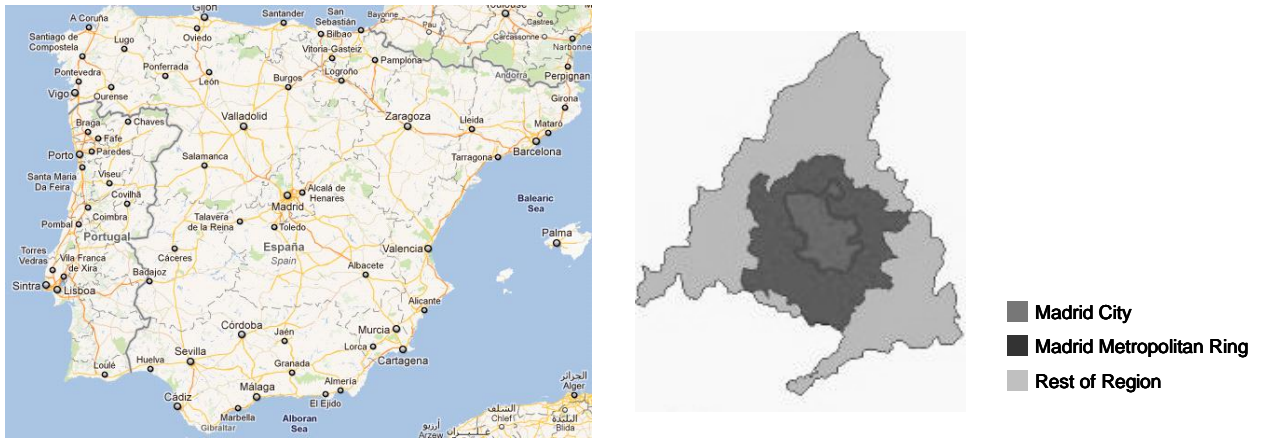
Sources: Stakeholder input, Booz & Company analysis

The region of the city can be broken down into the following elements, following a functional structure of three clearly differentiated concentric rings:

- *Madrid City*: main municipality of the region, accounting for 3.3 million inhabitants; strongest concentration of economic activities;
- *Madrid Metropolitan Ring*: consisting of a number of large and medium sized entities around the municipality of Madrid; strong relations with the central city; accounting for 2.7 million people;

- *Rest of the Region*: small and mid sized municipalities; accounting for four hundred thousand people.

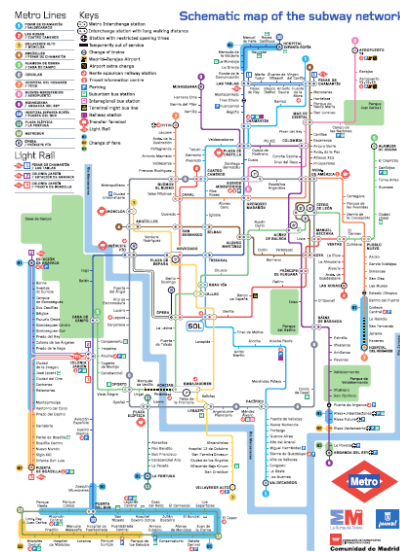
**Figure 23: Geographical Location of Madrid & Metropolitan Boundaries**



Sources: Booz Analysis, Stakeholder Input

Madrid boasts an extensive transport network, consisting of motorways, ring roads and radial roads, as well as an extensive underground (metro), tram and city and suburban bus network. It is also the hub of Spain's high-speed rail network and a number of regional services.

**Figure 24: Madrid Metro - Schematic Map**



Source: Metro Madrid

### 3.4.2 Transport Supply and Demand

The public transport system of the Madrid Region carried 1,528.6 million passengers in 2009. This represents a decline of -4,4% compared to the previous year.

#### 3.4.2.1 Madrid Metro

Due to its capacity, the metro system is considered to be the core mode of transport in Madrid. The metro system of Madrid operates twelve lines, plus the Ópera-Príncipe Pío Branch Line, comprising a total network length of 240.43 km. The network includes 227 stations, one quarter of which are connecting / interchange stations. About ten percent of stations also connect with the suburban rail network. Further connection points /

interchanges allow passengers to continue their journeys to the airport or to join the main rail network. At the end of 2011, the rolling stock consisted of 2,281 cars, with an average age of 12-17 years.

The following table provides an overview of the network length of the individual lines. The distances are calculated from the centre of the first to the last station on the relevant route and include turn-around points.

**Table 11: Madrid Metro – Network Overview**

Madrid Metro – Network Overview (2010)			
Lines	Total length (m)	Exact length (m)	Length between head-of-line and end-of-line stations (m)
1	23.320	21.915	21.824
2	9.365	8.930	8.870
3	14.798	13.498	13.407
4	14.625	14.386	14.315
5	23.207	22.580	22.470
6	23.472	23.472	23.472
7	19.676	19.226	19.103
Metro Este	9.341	8.881	8.770
8	16.459	15.601	15.486
9	19.720	17.937	17.823
TFM	18.280	19.095	18.974
10	24.216	23.604	23.490
MetroNorte	15.568	15.352	15.259
11	4.978	4.539	4.539
12 MetroSur	40.596	40.596	40.596
R.O.P.P.	1.092	1.038	976
ML 1	5.401	5.401	5.296
<b>Total Metro System</b>	<b>284.114</b>	<b>276.050</b>	<b>274.556</b>

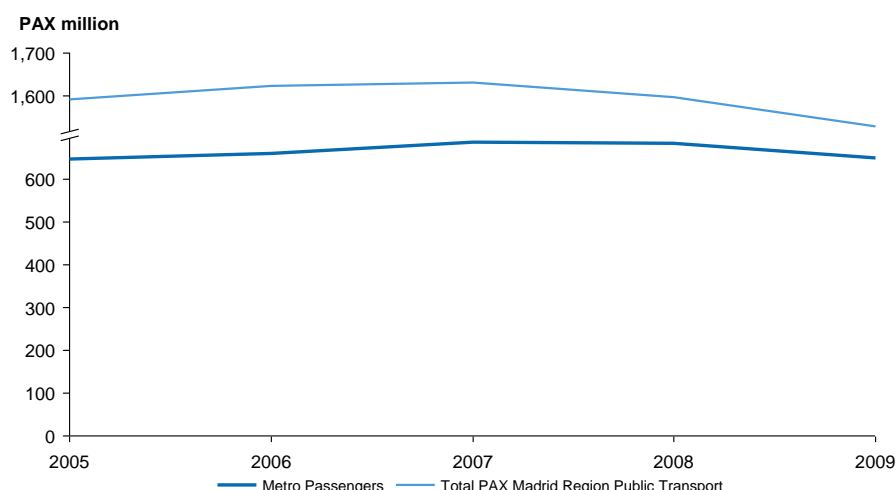
Source: Consorcio Transportes Madrid ([www.ctm-madrid.es](http://www.ctm-madrid.es))

Over the past year, the network has remained stable, ensuring constant levels of services during peak hours in both directions. In total, the supply of car-kilometres, during the year 2010 was 193,18 million, which included 192,36 millions of service car-kilometres.

Passengers using the Madrid Metro system had declined by -5.2% during the year 2009, compared to the previous year, to 650 million. – In comparison, London’s underground system carried 1,065 million passengers from April 2009 – March 2010.



**Figure 25: Madrid Metro – Passenger Development (2005-2009)<sup>22</sup>**



Source: Consorcio Transportes Madrid ([www.ctm-madrid.es](http://www.ctm-madrid.es))

### 3.4.2.2 Buses (EMT)

By the end of 2009, Madrid's public bus network (EMT) comprised two hundred and twelve lines. This network can be subdivided into 175 daytime lines (Integrated Diurnal Network (IDN)) and 38 lines operating during the hours of darkness, plus two lines covering special services.

The EMT fleet comprised 2092 vehicles at an average of 5.6 years each. Four hundred and eleven vehicles were fitted with engines operating on compressed natural gas.

Since the year 1999, the development of the EMT operations have been continuous, as outlined in the figure.

**Table 12: EMT Service Development**

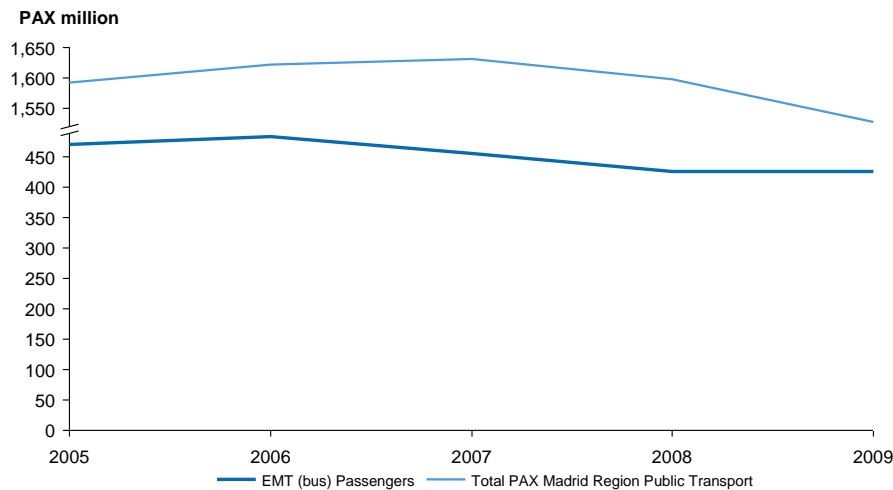
EMT Service Develop				
Year	Bus-Km in service (in millions)	Vehicle/hours (in millions)	Bus trips (millions)	Average Speed (km/h)
1999	94,44	6,47	11,89	14,59
2000	94,18	6,49	11,86	14,51
2001	95,91	6,75	12,12	14,21
2002	96,15	6,86	12,03	14,02
2003	96,74	6,88	12,01	14,06
2004	96,78	6,94	11,99	13,95
2005	97,53	6,99	12,06	13,94
2006	99,93	7,23	12,29	13,83
2007	97,10	7,07	11,71	13,71
2008	95,54	7,00	11,54	13,65

Sources: Consorcio Transportes Madrid ([www.ctm-madrid.es](http://www.ctm-madrid.es))

<sup>22</sup> Source: Railway concessions, Consorcio Transportes Madrid ([www.ctm-madrid.es](http://www.ctm-madrid.es)), from 2007 onwards, the demand for TFM is included in the group Railway Concessions

The total number of passengers making use of the bus system in Madrid (EMT) recovered during 2009 after experiencing a decline during the two preceding years and reached a total of 426.5 million.

**Figure 26: Madrid EMT (buses) – Passenger Development (2005-2009)**



Source: *Consortio Transportes Madrid (www.ctm-madrid.es)*

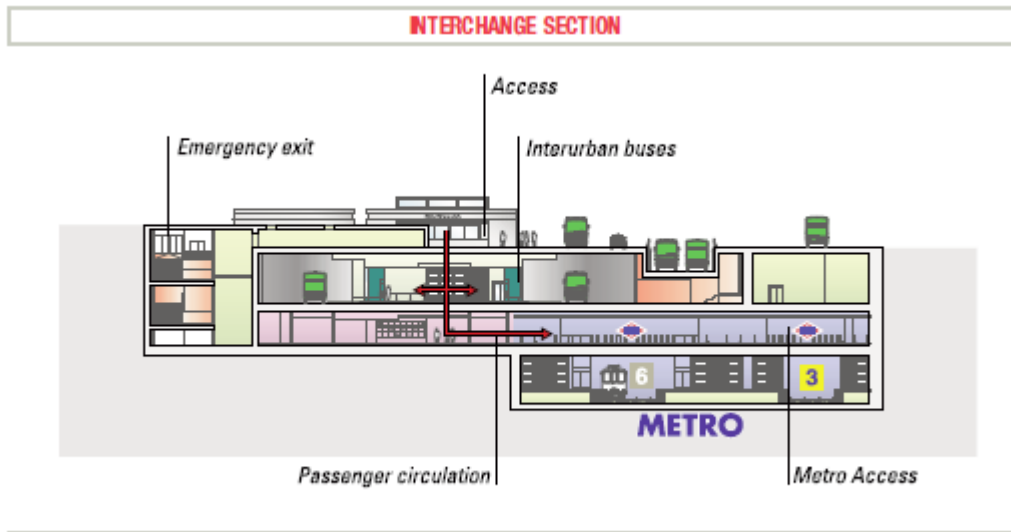
In addition to the EMT, Madrid offers an extensive interurban bus system. By the end of 2009, this system in the Madrid Region consisted of 351 lines (478 lines if municipal services in coronas B & C are included), operating completely within the region. These lines are operated by 29 private companies under 31 government franchises. There are also 7 municipal franchises, and 2 public municipal companies.

The interurban bus system has utilised reserved bus platforms on roads since the early 1990s. The original initiative was built along the A-6 road to the northwest of Madrid and consisted of a lane reserved for buses and high occupancy vehicles, a bus-only section upon approach to the city, an underground interchange at Moncloa and a good connection with the metro system via two metro lines and a number of bus lines. The system is reversible, going towards the city at the morning peak and towards the suburbs in the afternoon peak. It is situated in the middle of the dual carriageway and is separated from the rest of the traffic by rigid barriers. The scheme is viewed as a success and the Ministry of Public Works is currently studying other areas where it can be applied.<sup>23</sup>

As at Moncloa, the bus network is well-connected to the metro system and the importance of inter-modal connectivity is fully understood by the Madrid municipality, and its intention is to achieve “optimal modal integration”. The Interchange Stations Plan for interurban buses and metro is based upon three key principles: location of interchange, integration with the public transport system, and concentration of terminals. The interchange system utilises traffic management systems which are controlled from a Local Control Post, which forms part of the CRTM’s Integrated Public Transport Management Centre.

<sup>23</sup> *Madrid, A World Reference, 2010*

Figure 27: Cross-section of Interchange



Source: Madrid, A World Reference, Consorcio Transportes Madrid

### 3.4.2.3 Tram (light rail) and Suburban Rail

The information published by Consorcio Transportes Madrid states that Madrid's light rail line to Sanchinarro and Las Tablas assumed service in May 2007, comprising a network length of 5.5 kilometres, consisting of two lines (Línea 2 - Pozuelo and Línea 3 - Boadilla). Thirty percent of the track runs above ground, with the remaining network running underground to avoid crossings with road and other infrastructure. The service connects Metronorte and Pinar de Chamartin station through nine stations, five of which are underground. The system benefits 40,000 residents of the North PAU'S and transported almost 4.9 million passengers in 2009. Since its inception, tram services have gained on popularity in Madrid and annual passengers carried have almost doubled from 12.7 million in 2007 to 23 million by the end of 2009<sup>24</sup>.

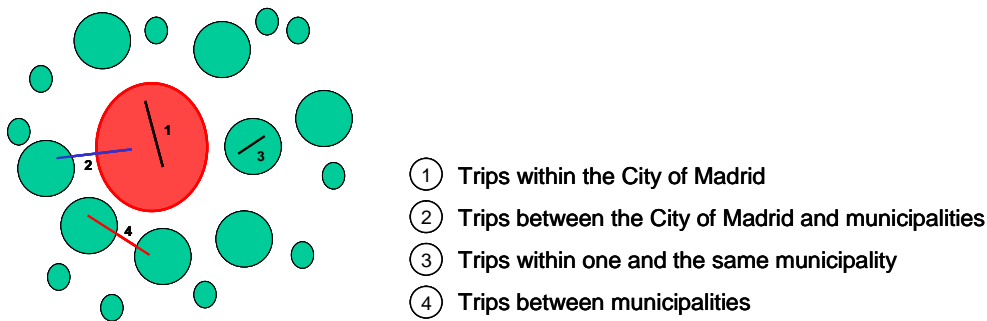
The Suburban rail system is run by Cercanías Renfe, a public company dependent upon the Spanish Ministry for Public Works. The system consists of 8 lines and has a length of 3,632km. There are 100 stations and 1,146 serving 184 million passengers.

### 3.4.2.4 Traffic by private car / vehicles and Modal split

The use of private car varies in the Region of Madrid, depending on origin and destination of trips. According to the information received and as outlined in the figure below, all passenger trips can be differentiated by four criteria.

<sup>24</sup> Source: Railway concessions, Consorcio Transportes Madrid ([www.ctm-madrid.es](http://www.ctm-madrid.es)), include operators TFM, MLM, MLO and Paria tram.

**Figure 28: Modal Split / Differentiation by Origin and Destination**



Source: Stakeholder Input

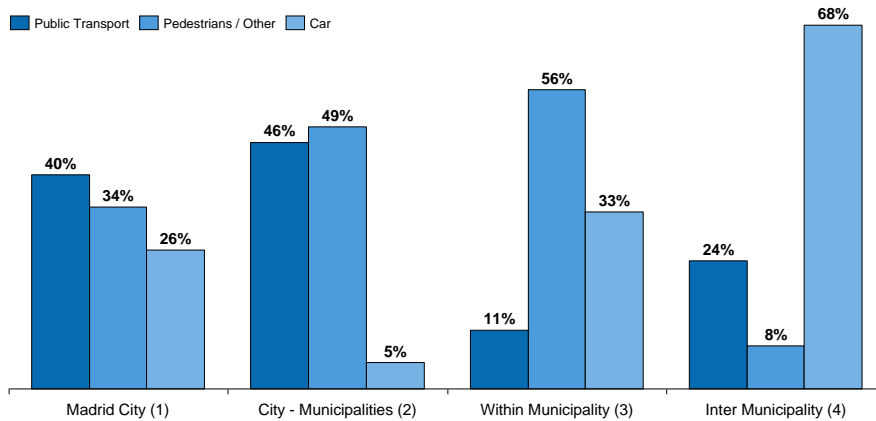
The Stakeholder information indicates that the total number of trips per average working day in the overall Madrid region in 2004 was 15.2 million trips, equalling 2.6 trips per inhabitant per day. The trips were equally divided in a balanced way among the three means of transport:

- 34% of trips were made by public transport
- 35% of trips were made by private car
- 31% of trips were made by walking

Fifty percent of all these trips were took place within the City of Madrid (1); twenty five percent were urban trips, within the municipalities (3). Fifteen percent of overall trips were trips between the City of Madrid and municipalities and the remaining ten percent were trips between the municipalities.

Private car use versus use of public transport or walking depended is driven by the type of trip undertaken and it differentiated by the categories mentioned above.

**Figure 29: Modal Split by Origin and Destination**

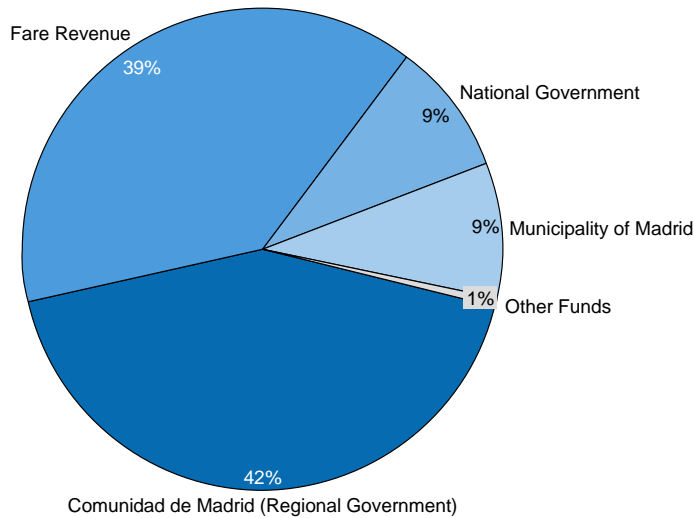


Source: Stakeholder Input

### 3.4.3 Funding

During the year 2010, a total budget of €2.199 billion was available to the Consorcio Transportes (CTM) Madrid. The following figure illustrates the breakdown of this amount by source.

**Figure 30: Madrid Transport Budget – Funding Sources**



Source: Consorcio Transportes Madrid ([www.ctm-madrid.es](http://www.ctm-madrid.es))

Madrid has made good use of innovative financing techniques to fund improvements to its public transport system. The 1995-1999 Metro Extension Plan received a total investment of €1,632 million which was partially financed through the public company ARPEGIO whose assets were used as surety for loans. The 1999-2003 Metro Extension Plan was developed by the publicly-owned company MINTRA. Madrid has used developer contributions to fund new schemes such as the Metro Line 1 extension. This scheme was also partially funded by public companies. PPPs have been used to fund infrastructure developments, as in the construction of interchange bus stations such as that at Moncloa. The interchange system allows for easy transfer between urban buses and the metro and an efficient bus service separated from cars. Public sector investments into the project are repaid through percentage collection of fares and revenue from parking, advertising, vending machines and shopping.

### 3.4.4 *Transport Strategy of Madrid*<sup>25</sup>

According to feedback from the stakeholder, the Madrid Region has experienced great changes in its mobility in the last 25 years. The creation of Consorcio Regional de Transportes de Madrid in 1986 supposed a milestone in the public transport organization. It was created by Law, as unique Public Transport Authority in Madrid Region, integrating different political and administrative levels, with competences on fare policy, planning, coordination and integration of the public transport system.

During these years the transport infrastructures have improved greatly, by extending the metro network to three times its original length, implementing a new mode in the region (light rail) and developing an Interchange Plan to favour the intermodality and reduction in journey time. The construction of the BUS-HOV (Bus and High Occupancy Vehicles) system together with the Moncloa interchange have made the A-6 highway corridor very successful to public transport use and have triggered a modal shift away from private car use. Also the implementation of the Travel Pass (multimodal travel ticket for use on all public transport modes without restriction, for a determined period and a geographical zone) has been a success, increasing ticket sales from 11% in 1986 to 63% in 2008. All these factors, together

<sup>25</sup> Source: Stakeholder Input

with the service quality improvement focusing on the user, have resulted in an increase in demand by 61% while the population has increased 34%.

### 3.4.5 *Sustainability of Transport in Madrid*

The stakeholder's view is that recent achievements in public transport in Madrid mentioned must have continuity to assure a more sustainable mobility in the region, getting passengers from the cars onto public transport and other modes, such as walking, bicycles.

The city is facing very important challenges, emphasized by current economic crisis. They include

- Need to further adapt the functions of the Transport Authority to match the new mobility needs, becoming more an integrated "Mobility Agency"
- Implementation of new technologies in the ticketing system (contactless, payment by mobile, etc.)
- Simplification of fares and adapting them to new social fares
- Integration of all modes and their AVMS in the Transport Control Centre to be able to coordinate and manage the whole public transport system
- Improvement of availability of information, before, during and after the trip, at all levels and all users, for which TIC (Technologies for Information and Communication) are to be used
- Modernisation Plan on interurban bus fleet under developing aims to adapt the bus concessions to the new European PSO (Passenger Service Obligation) Regulation. This affects 2000 buses of interurban bus services, and pursues the quality enhancement, the service and management improvement, the commitment to new technologies, and the fleet renewal, to offer the citizens more efficient mobility solutions
- Integration and structuring of the existing metro network
- Completion of the Interchange Plan, building the two interchanges left and start developing a new level of interchanges in the metropolitan crown
- Promotion the medium capacity modes (light rail and metropolitan bus in metropolitan context)
- Coordination with the Public Works Ministry the 2009-2015 Infrastructure Plan in Suburban Railways, awaiting for the possible transfer in competences
- Support of less pollutant urban bus fleet, with hybrid technologies, CNG, etc.
- Continuous promotion of the Urban Mobility Plans in municipalities and economic activity centres
- Promotion of a better integration among urban planning and mobility
- Resolve new financial needs on the public transport system, due to the decrease on demand and public resources

### 3.4.6 *Infrastructure Plan*

Upon request, we received an outline of actions contained within the infrastructure plan (2007-2011) of Madrid which includes the following projects:

- Extension of the metro network to residential neighbourhoods in the north of Madrid called Mirasierra (Line 9), in the east part to Las Rosas (Line 2), and in the southwest to another municipality, Leganés, called La Fortuna (Line 11). The total length of all the extensions is 10.5 km (already in operation)

- A new commuter railway line (14.5 km), from Móstoles to Navalcarnero under a concession system, and an underground commuter railway bypass in Torrejón de Ardoz
- Also a major extension and capacity enlargement plan of the suburban railway network will be carried out in the period, 2007-2015 by the National and Regional Government, which include the following actions:
  - New lines in the commuter railway network: a line connecting Chamartín train station in the north with Madrid-Barajas airport, and a transversal axis East-Southwest
  - Extension of lines, with a total length of 69.4 km, in the north and south of the region
  - Enlargement of capacity by quadruplicating 66 km of existing rail tracks, in the south and northwest of the network
- With regards to IT'S, during the next two years a contactless ticketing system will be implemented in Madrid Region public transport. A period of trials has been carried out and next phase is to apply this kind of ticketing to the Youth Travel Pass in Madrid City (Zone A). Then, it will be extended progressively to the different types of travel passes, finishing with the implementation of such system to non-personal contactless cards containing 10 trips tickets
- In December 2009, CRTM started a Modernization Plan for the interurban bus fleet at the same time that the concessional period has been extended a further 10 years period (with a chance of extension for a further five). This plan, which involves 2,000 buses, pursues the quality enhancement, the service and management improvement, the commitment to new technologies, and the fleet renewal, to offer the citizens more efficient mobility solutions

### 3.4.7 *Movele*

The Madrid municipality provided details of the Movele project in Spain, a pilot project on electric mobility aimed at demonstrating the feasibility of electric vehicles. The project was led by IDAE, the Institute for Diversification and Saving of Energy, a public company linked to the Spanish Ministry of Industry, Tourism and Commerce. Movele has been helped through support from the ELENA initiative of the EIB. ELENA support was requested to help implement the project through PPPs and to define the best approach to utilise investments for charging stations.<sup>26</sup> The pilot has a target of a million electric and hybrid vehicles in 2014.

Three cities were selected for the pilot: Seville, Barcelona and Madrid. Madrid had a target of installing 280 charging points in public places by 2012. The Madrid project had a budget of €1.4 million, made up of 43% from an IDAE contribution and 57% from a Madrid Council contribution. In order to achieve its aim, Madrid City Council began by collecting information on expected future demands for electric vehicles in order to map proposed locations for charging points and estimate the reception of electric vehicles, pinpointing certain sectors where demand electric cars would be strongest. The first charging points were installed in in May 2010. In order to encourage the take-up of electric vehicles, a number of parking areas in the city and in car parks have been reserved for charging vehicles.

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<sup>26</sup>[http://www.polisnetwork.eu/uploads/Modules/PublicDocuments/EI\\_%20programmes\\_for\\_urban\\_mobility,Leonor\\_Berriochoa,European\\_Investment.pdf](http://www.polisnetwork.eu/uploads/Modules/PublicDocuments/EI_%20programmes_for_urban_mobility,Leonor_Berriochoa,European_Investment.pdf)

It is too early to evaluate the effectiveness of the project as it is ongoing. However it is already clear that Movele has gone some way to raise awareness of electric vehicles as an alternative to convention fuel vehicles.

### 3.5 Poznań, Poland

Poznań is one of the oldest and largest cities in Poland. It is the historical capital of the Wielkopolska Region, where the Polish State originated. Today, Poznań is an important centre for trade, services, the automotive and chemistry industries, culture, higher education and science. It is also among the leading Polish cities in terms of its economy.

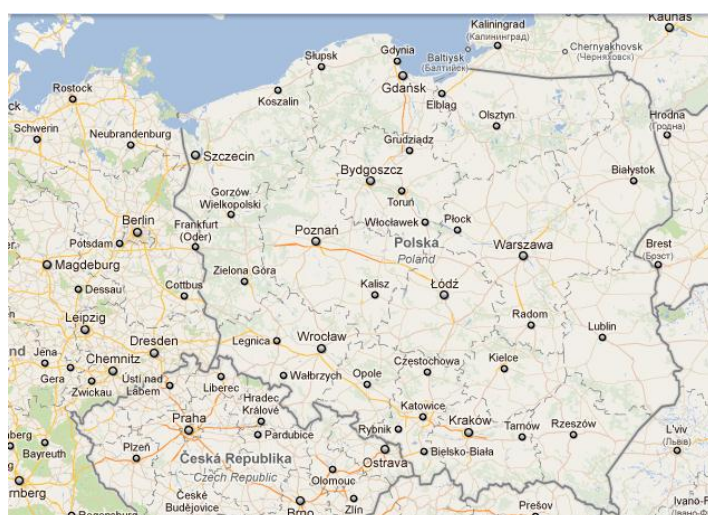
**Table 13: Poznań – Key Facts**

Poznan	
Location	Poland, 52° 25' N, 16° 58 E
Size (square km)	262
Population (2010)	553,000
GDP/capita (thousand EUR), 2008)	16.8
Unemployment rate (2010)	3.5%
Car ownership rate (per 1000)	494
Modal share of cars (2000)	53%
Forms of public transport	Tram, Bus
Passenger per year (2010)	200,641,000

Source: Stakeholder Input

Poznań is located 300 kilometres to the West of Warsaw, the capital of Poland and under 200 kilometres East of the German border and the city of Frankfurt/Oder. Berlin is and less than 300 kilometres from Poznań. It is an important regional road and rail hub and it has an international airport.

**Figure 31: Geographical Location of the City of Poznań**

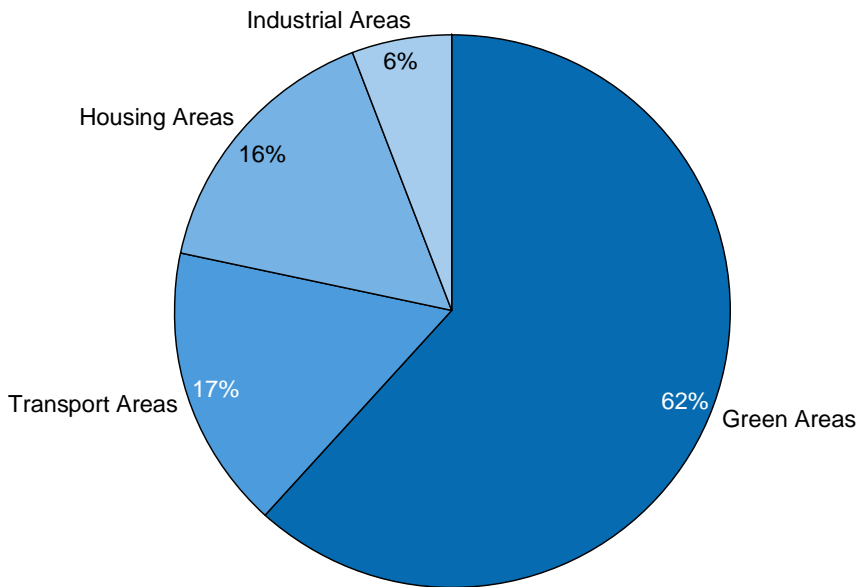


Source: Worldwide Web

The city itself covers an area of 262 square kilometres, almost two thirds of which are green areas, resulting in a population density of 2,200 people per square kilometre.



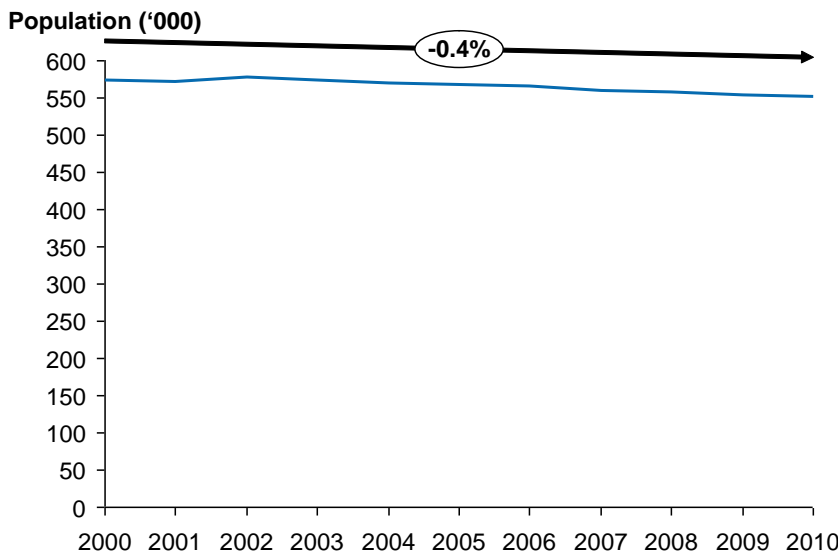
**Figure 32: Poznań – Land Usage**



Source: Stakeholder Input

Poznań ranks fifth among Polish cities in terms of population (after Warsaw, Łódź, Krakow and Wrocław). As the largest city and capital of the region, Poznań concentrates the highest demographic potential in the Wielkopolskie Province. Since the year 2000, the population of the city has experienced a slight decline of -0.4% (CAGR) and by end of 2010, the city was inhabited by 553k people.

**Figure 33: Poznań – Population Development (2000 – 2010)**



Source: Stakeholder Input

### 3.5.1 Supply and Demand

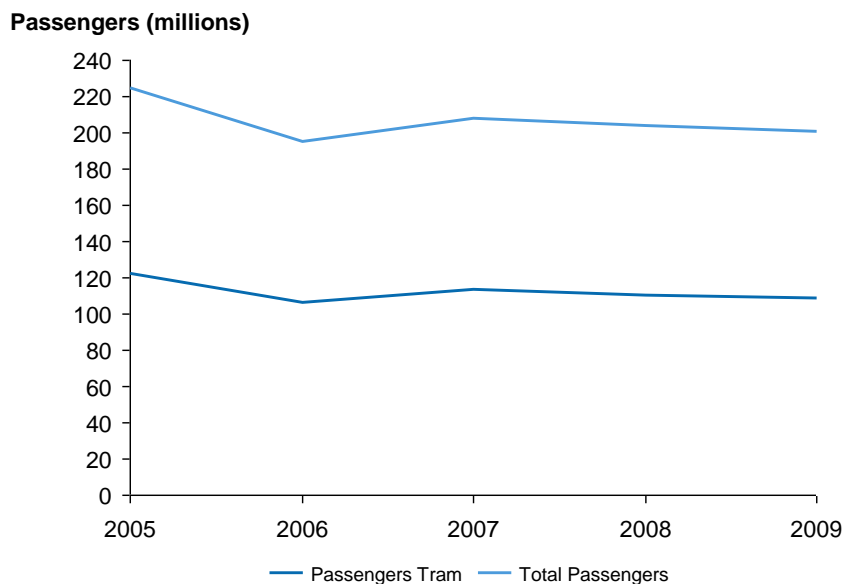
The public transport system in Poznań is extensive for the city's size. The system comprises trams and urban and suburban busses. In the south-east of the city centre is the main railway station. Smaller stations can be found to the north-east of the centre and on the outskirts of the city. Several main roads lead from the city to, for example, Warsaw, Berlin in Germany and several other cities in Poland.

In total, the system carried over two hundred million passengers during the year 2009 via its trams and busses to almost equal parts (tram 54%, busses 46%). The public transport network is managed by the Urban Transport Authority, Zarząd Transportu Miejskiego (ZTM). ZTM has responsibility for determining the locations of lines and stops, distribution of tickets and ticket inspection, forecasting and modelling solutions, determining the volume of transport services, and monitoring quality of the services provided by the operators. There are four operators providing services for ZTM lines, the largest of which is MPK w Poznaniu Sp. z o. o.

### 3.5.1.1 Tram

The tram system carried close to one hundred and nine million passengers during 2009. It allows passengers access to the system via 116 stops on the network, which spans over 67.7 kilometres. The different lines operating on the network total a route length of 224.6 kilometres.

**Figure 34: Poznań – Public Transport Passengers - Tram**



Source: Stakeholder Input

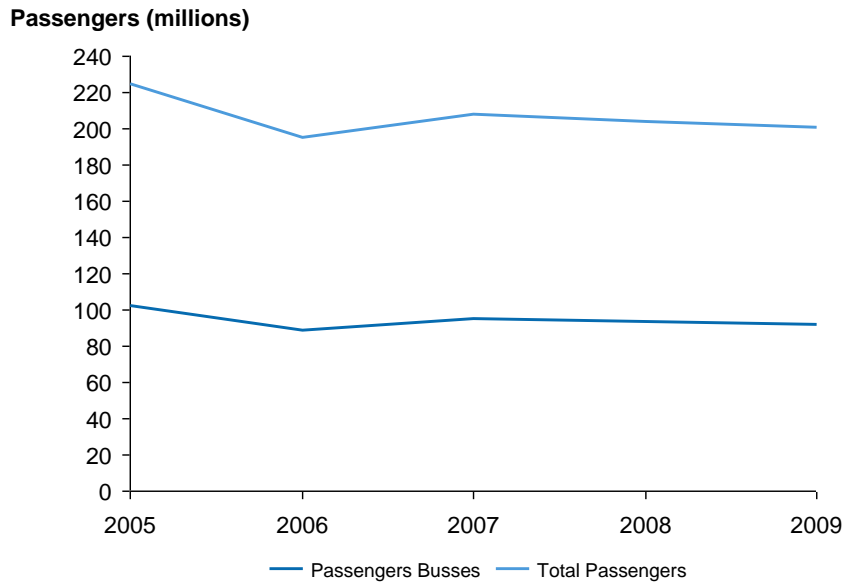
The data supplied indicates that the tram system of Poznań has been expanded since 2005 from 64 to 67.7 kilometres.

### 3.5.1.2 Buses

The bus system within its Poznań city borders, comprises three hundred and sixteen vehicles, plus one additional hybrid vehicle. In 2009, close to ninety two million passengers used the system.

The bus lines, which cover almost 805 kilometres can be divided by to types: fifty six day lines and twenty one night lines. The bus route network for both lines combined spans just over three hundred and thirty kilometres.

**Figure 35: Poznań – Public Transport Passengers - Buses**

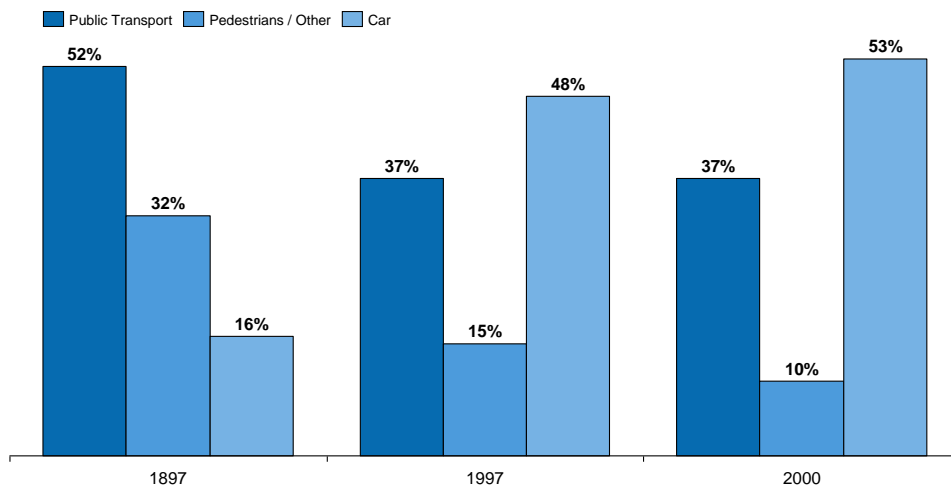


Source: Stakeholder Input

### 3.5.2 Modal Split

In contrast to cities studied in Western Europe, car usage in Poznań has increased by thirty seven percent between the years 1987 - 2000.

**Figure 36: Poznań – Modal Split 1897 - 2000**



Source: Stakeholder Input

### 3.5.3 Future Projects

Poznan is preparing to be a host city for the Euro Football Championships in 2012 and is improving its public transport provision as a result. As well as a number of improvements to transport around the Poznan vicinity and to the airport, planned improvements include:

- Reconstruction of the Kaponiera Roundabout transportation junction
- Street expansion
- Construction of road infrastructure in the Marcelin district
- ITS Traffic Light Control System
- Expansion of the Poznan Fast Tram network

- Construction of the Os. Lecha – Franowo tram route
- Purchase of new rolling stock<sup>27</sup>

### 3.5.4 *Transport Planning*

The Poznan Transport Policy was adopted in November 1999, the main goals of which were to respond to increased congestion from motor vehicles and to improve the standard of the public transport network. Following from this policy, a number of programmes have been adopted: the Sustainable Public Transport Development Plan for 2007 to 2015 (2006); the Poznań Bicycle Programme for 2007 to 2015 (2008); the Poznań Parking Policy (2008); the Poznań Road Programme for 2008 to 2015 (2008); and the Development Strategy for the City of Poznan to 2030 (2010).

The main objective of the Sustainable Public Transport Development Plan was to create a fully sustainable transport system through increasing the modal share of public transport and cycling, reducing traffic noise and emissions and improving disabled access.

The Development Strategy for the City of Poznan sets out plans for the city with the broad aims of creating an innovative economy, increasing the city's importance in fields such as culture and tourism, improving the life of the city's inhabitants and developing the metropolitan functions of the city. The Strategy includes a number of strategic programmes addressing specific aspects of development, one of which is on Sustainable Transport Development.

The key aim of the Sustainable Transport Development strategy is to develop a sustainable transport system in order to create conditions for an increase in public transport usage. The key aims of the strategy include:

- Amelioration of traffic noise
- Integration of city, railway and road transport systems
- Upgrade of rolling stock
- Traffic control system
- Construction of new railway routes and transfer stations
- Extension of tram networks
- Construction of Park and Ride system
- Development of cycle paths and bicycle infrastructure
- Development of road system with separate lanes for public transport
- Restriction of heavy vehicle access to the city centre.

These aims will be used to achieve a number of objectives including the attainment of fully accessible public transport, increased public transport speeds, shorter commuting times, preservation and an increase in the number of public transport passengers, higher priority for trams at crossroads and greater numbers of Park and Ride parking places.

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<sup>27</sup>[http://www.i-mobilitynetwork.com/assets/News-images/its\\_national/pdf/przygotowania\\_poznania\\_do\\_euro\\_2012\\_ang.pdf](http://www.i-mobilitynetwork.com/assets/News-images/its_national/pdf/przygotowania_poznania_do_euro_2012_ang.pdf)

The strategy identifies a number of areas which present potential obstacles to the implementation of the programme. These include:

- Lack of financial resources due to restricted budgets
- Lack of credit
- Bankruptcy of execution entities
- Legislative problems
- Protests from businesses providing deliveries to the city
- Political protests over car restrictions
- Lack of investments from external partners

The strategy does not set out plans to ensure that these potential problems for the scheme can be overcome.

### 3.5.5 *EC Assistance - JASPERS*

Two of the future projects listed above were able to go ahead due to grant applications awarded after assistance from the JASPERS project.

The JASPERS programme assisted the Poznan public transport operator to bid for funding to buy low-floor trams. The objectives for the project were to improve comfort on the public transport system, improve accessibility, reduce system failures, reduce noise levels and decrease operating costs.

As a result of the assistance received from JASPERS, funding was successfully secured and Poznan has order 45 trams to be delivered before the 2012 European Football Championships.

The Lecha - Franowo project is aimed to improve passenger flows and make the network more accessible to potential passengers. The project is based around the construction of trams tracks and passenger stations and the reconstruction of the road pavement. JASPERS assistance on this project enabled it to bid for EU funding.

There are also a number of JASPERS assignments still in progress which have implications for transport in Poznan:

- Development of High-Speed Line Warszawa Lodz Wroclaw Poznan
- Poznan Airport Ławica
- Modernisation of E59 Railway, section Rawicz - Poznan
- Building of *Franowo Tram Depot in Poznan*

#### 3.5.5.1 *EC Assistance - JESSICA*

Poznan aims to utilise JESSICA for projects developing the city centre. The total JESSICA allocation for the Wielkopolska region (of which Poznan is a part) is €66m, €50m coming from the ERDF and €15m from a state budget contribution. Poznan has produced a tender for the EIB to be allowed to establish a UDF. The main focus for a "JESSICAble" project in Poznan is the regeneration of an old gasworks. This project does not have a direct impact upon urban mobility but the introduction of a Poznan UDF and the recyclable fund element

of JESSICA would mean that additional funding for urban transport investment could become available in the future as a result of Poznan’s involvement with JESSICA.

### 3.6 Helsinki, Finland

Helsinki is the capital and by far the largest city of Finland. It is the major political, financial, educational and cultural hub in Finland and it is the host to around 70% of the foreign companies which operate in Finland. It has a population of 583,350 in the city centre, which 1,033,933 inhabitants living in Helsinki’s larger metropolitan area which includes the cities of Espoo, Vantaa and Kauniainen. This metropolitan area is home to around 20% of the country’s population and is the world’s most northerly urban area.

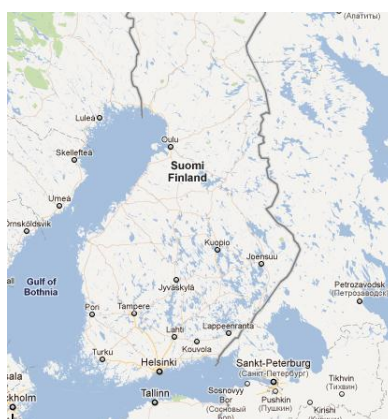
**Table 14: Helsinki – Key Facts**

Helsinki	
Location	Finland, 60° 10' 15" N, 24° 56' 15" E
Population (2009)	1,033,933
Number of Jobs (2009)	615,044
GDP/capita (thousand EUR) (2008)	42.9
Unemployment rate (2009)	8.1%
Car ownership rate (per 1000) (2009)	382
Modal share of cars	37%
Forms of public transport	Rail, metro, tram, bus
Passenger journeys per year (2010)	327 million

Source: Stakeholder input

The Helsinki metropolitan area is in the region located in southern Finland in the region of Uusimaa, on the shore of the Gulf of Finland. It is around 80 kilometres north of Tallinn, Estonia, 300 kilometres west of St. Petersburg, Russia, and 400 kilometres east of Stockholm, Sweden.

**Figure 37: Geographical Location of the City of Helsinki**



Source: Worldwide Web

The Helsinki metropolitan area is served by an extensive public transport network which includes suburban rail, metro, trams, a bus network and two ferry lines. The international airport is located in Vantaa, 19 kilometres north of Helsinki city centre.

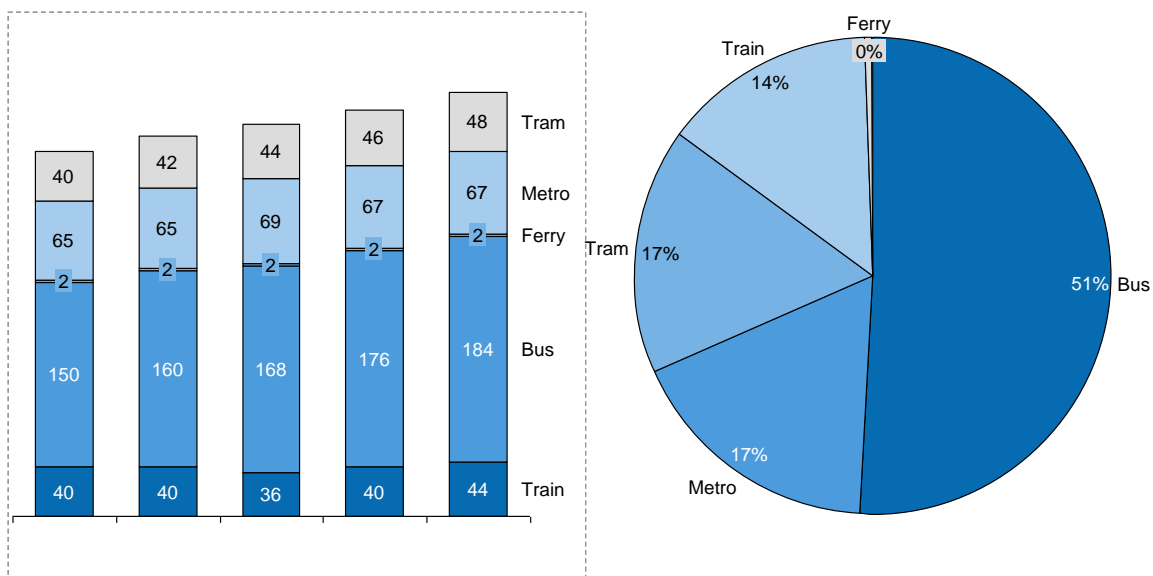
Since the beginning of 2010, public transport in the Helsinki Metropolitan Area has been run by the Helsinki Regional Transport Authority (HSL). HSL has responsibility for the planning and organisation of public transport in the area, including procurement, ticketing systems and the preparation of the Helsinki Region Transport System Plan. Before the creation of HSL in 2010 the planning and procurement functions were carried out by two separate organisations, the new system therefore allows for a more integrated approach for all transport functions.

The area covered by HSL is slightly wider than the Helsinki metropolitan area, including the additional municipalities of Kerava and Kirkkonummi. It is likely that the scope of HSL will expand in the future to include an additional eight municipalities as a larger geographical focus is considered to be important in future planning.

### 3.6.1.1 Supply and Demand

The data received from HSL showed that passenger transport numbers have been increasing year on year since 2007, with 327 million journeys made on public transport in 2010. The total increase has mostly been as a result of increases in the number of people using the bus network, which is the most popular mode accounting for slightly over half the journeys made.

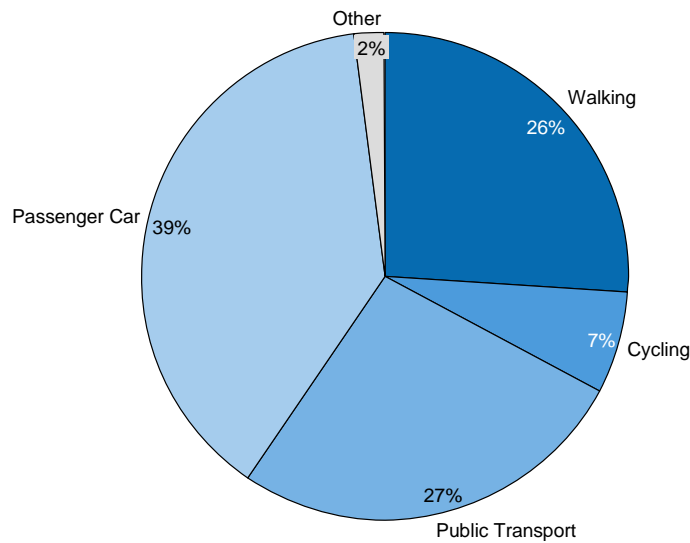
**Figure 38: Public Transport Modal Split**



Source: HSL Annual Report

Because of the good provision of public transport, the level of total car ownership is low for a city of its size and wealth levels (with a GDP per capital of €42,857 Helsinki is one of the richest cities in the EU-27).

**Figure 39: Total Modal Split**



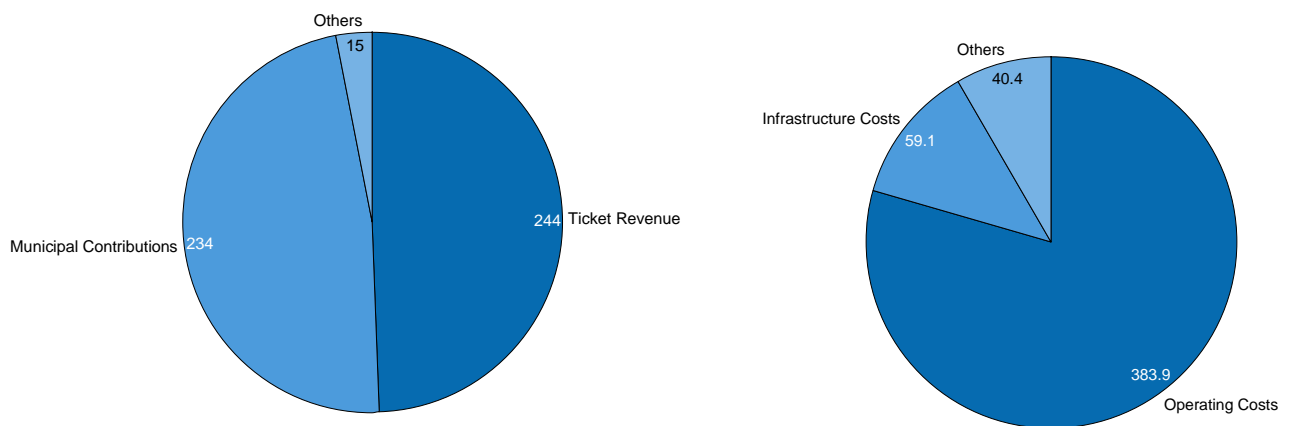
Source: Helsinki Regional Transportation Plan

**Revenue and Expenditure**

The transport authorities’ operating income was €492.8 million in 2010. Ticket revenue accounted for 49.4% of operating income and municipal contributions for 47.5%, with the remaining 3.1% made up of government subsidies, ticket inspection revenue and other sources of income such as rental income from drivers’ rest facilities.

Operating expenses were €483.4 million, leaving an operating margin of €9.5 million of which €5 million was profit. Of operating expenditure, €383.8 million was spent on public transport operating costs, €59.1 million on infrastructure expenses and €40.4 million on other costs including personnel and renting expenses.

**Figure 40: Operating Income and Expenditure**

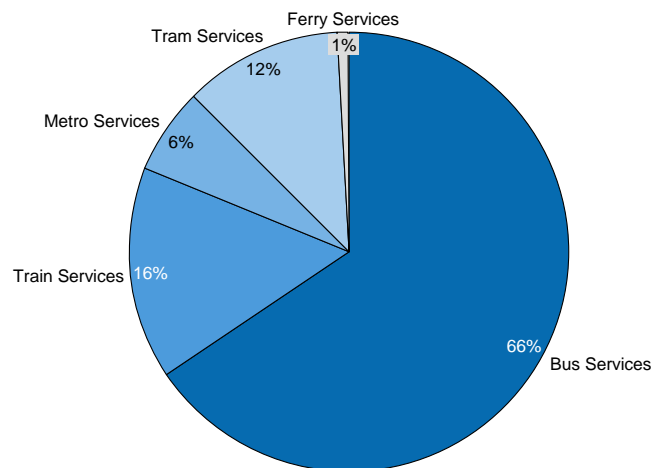


Source: HSL Annual Report

When broken down by mode of transport, it is possible to see that the operating costs are disproportionately spent on bus services. Metro services, which are the second most used mode, receive, by comparison, a very small proportion of operating cost expenditure.



**Figure 41: Operating Costs by Mode**



Source: HSL Annual Report

This graph shows that bus services are proportionately the most expensive mode of transport, whilst metro services are proportionately the cheapest. This may be due to size variations. Helsinki has only a small metro service with a single forked line covering a distance of 21.1 kilometres and serving 17 stations. The metro carries 57 million passengers per year. By comparison, the bus network covers 970km in the main city and 1,685km in the whole PTA area with 5,839 stops in total. The bus network carries a total of 158 million passengers per year. The bus network is more complex than the metro system with 11 operators in place of 1.

#### **Helsinki Region Transport System Plan**

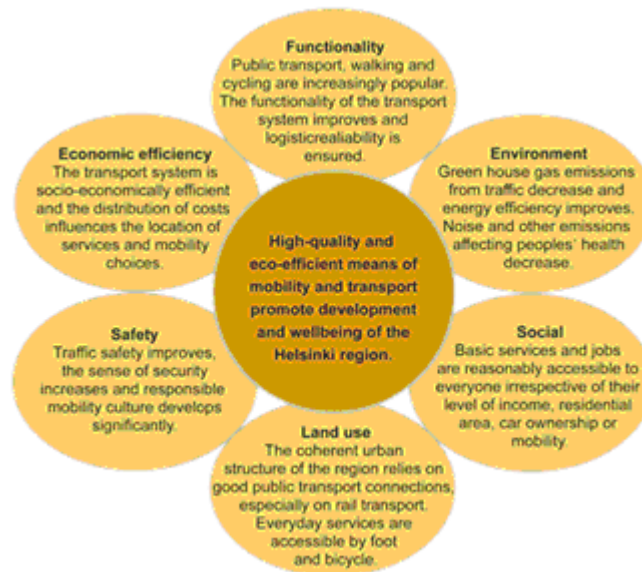
A plan for transport in the Helsinki region was completed in spring 2011, following on from plans published in 1994, 1998, 2002 and 2007. It is a long-term strategic plan which considers the whole of the transport system including the incorporation of related policy areas such as land use and housing.

The plan consists of five development levels:

- Sustainable urban structure and land use
- Public transport, walking and cycling connections and services
- Mobility management, pricing and regulations
- Operation and maintenance of the transport system
- Transport infrastructure

These will be utilised to achieve the key goals and objectives of the plan as outlined in the graphic below:

**Figure 42: Helsinki Transportation Plan Vision**



Source: Helsinki Region Transportation Plan

The plan sets out three phases dating from 2010 to beyond 2050. These phases can be outlined as follows:

1<sup>st</sup> period – retention phase – 2011-2020

The first phase is focused upon improving the competitiveness of public transport and developing seamless travel chains. This phase will prioritise projects promoting land use development and compact urban structure.

2<sup>nd</sup> period- fill-in phase - 2021-2035

The phase will see an increase in the capacity of the rail service and the development of the rail service network. The quality of bus service corridors will be improved and the road transport infrastructure will be developed. These improvements will help to improve sustainable mobility solutions and transport connections for the region. Mobility demand and mode choice will be influenced through the use of “a comprehensive set of measures”.

3<sup>rd</sup> period – expansion phase – 2036 – 2050+

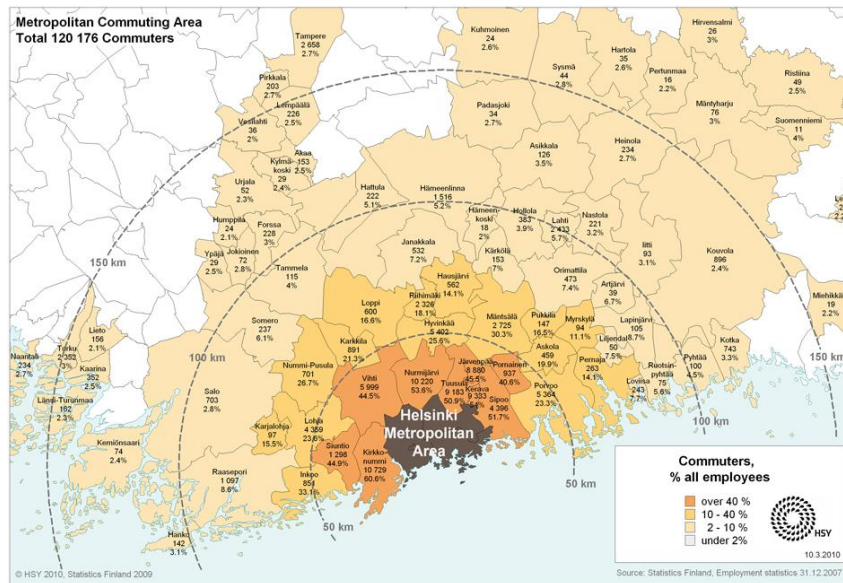
This phase will be characterized by an expansion of the rail network including the opening of short rail corridors and the development of areas around stations. The road network will be developed in a way consistent with land use development and the needs of public transport and freight traffic.

### **Forthcoming Projects**

#### *3.6.1.2 Infrastructure Investments*

One of the challenges facing the transport system in the Helsinki Metropolitan Area is managing the large number of commuters who come into the city centre from surrounding areas. The Transport Plan maps the influx of commuters to the metropolitan area:

Figure 43: Helsinki Commuter Map



Source: Helsinki Regional Transportation Plan

To cope with the predicted future increase in commuter demand, a number of infrastructure improvements are planned. These include major rail traffic and road development projects, and a number smaller scale projects including:

- Developing infrastructure for walking and cycling
- Developing infrastructure for intelligent transport systems
- Establishing new park and ride connections
- Securing the functionality of public transport and freight transport on radial roads
- Improving traffic safety of the arterial network
- Creating new freight transport service areas
- Improving crosstown connections of the road and street network

The graphics below illustrate how peak hour demand is expected to rise and how improvements to the transport network will be made to accommodate it. New rail lines, shown in blue, will make new connections between existing lines. The metro, shown in orange, will be extended to almost double its current length. The tram network, represented in green, will become more extensive in the city centre.

### 3.6.1.3 Land use

Land use is a consistent theme running through the Helsinki Region Transport System Plan. Land use planning will play an important part in the development of future infrastructure projects. A study into land use and the rail network has already been carried out, which has informed the target rail network and its implementation path. The objective of an integrated land use and transport development strategy is to help the region grow in a controlled manner around rail corridors.

### 3.6.1.4 Sustainability Planning

Helsinki is active in promoting sustainable transport systems. HSL commissioned a study on the possibilities for improving the energy efficiency of public transport. It has trialled the use of biofuel-powered buses in a collaborative project between HSL, bus operators and private

companies and it showed encouraging results with an average decrease in particle emissions of 30%. On certain routes it has also trialled hybrid buses which harness breaking energy, with initial results showing a reduction in emissions, noise level and energy consumption.

The scoring of CO<sub>2</sub> emissions is now included in the tendering of bus services, a green public procurement measure which promotes the introduction of lower emission vehicles in the city and stimulates the market for lower emission vehicles. HSL undertakes a number of projects to encourage modal shift, including:

- A scheme allowing passengers to take bicycles for free on trains
- Marketing and mobility planning
- Increasing consciousness through a carbon calculator incorporated into the journey planner system and a weekday travel carbon calculator
- Studies of the transport authority's staff's own mobility habits and the use of pilot studies on staff
- Tailored mobility plans for businesses
- Employer sponsored travelcards
- Park and ride system

However, some attempts to increase sustainability have been limited by infrastructure and funding constraints. The share of gas buses in the region is limited to around 10% as gas operated buses are unable to enter the Kamppi terminal and gas buses are more expensive to buy and maintain.