

# URBAN ITS EXPERT GROUP

## GUIDELINES FOR ITS DEPLOYMENT IN URBAN AREAS



## MULTIMODAL INFORMATION

## Document Information

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## Members of Urban ITS Expert Group

ALBRECHT Hanfried	Albrecht Consult GmbH / OCA	DE
BEASLEY Simon	Reading Borough Council / UDG	UK
BLAQUIERE Alexandre	Tisseo - Toulouse Public Transport Authority	FR
BROWN Tony*	Hampshire County Council	UK
COLDEFY Jean*	Greater Lyon Region	FR
DIEGO BERNARDO Enrique	EMT - Madrid Public Transport Authority	SP
ELIASSEN Jarl*	Trafikanten AS	NO
FIBY Hans*	Transport Association East Austria	AT
FRANCO Gino	Mizar / Swarco	IT
HASELBERGER Rainer	City of Vienna	AT
HEDIN Johan	Hybris Konsult	SE
IZDEBSKI Piotr*	ZTM Warsaw	PL
JENSEN Helge	City of Oslo	NO
KEARNS Steve	Transport for London	UK
LEFEBVRE Olivier*	STIF Ile-de-France	FR
LEIHS Dietrich	Kapsch TrafficCom	AT
MEEUWISSEN Marcel*	City of Enschede	NL
PLANATH Susanne*	Swedish Transport Administration	SE
SPELL Sabine	Volkswagen AG	DE
TØFTING Svend*	North Denmark Region	DK
TOMASSINI Maurizio	ISIS - Rome	IT
TYRINOPOULOS Yannis*	Hellenic Institute of Transport (HIT)	GR
VAN DEN ABEELE Didier	Alstom Transport	FR
VLEMMINGS Tiffany*	National Data Warehouse for Traffic information	NL
WINNING Ian	City of Cork	IE

\* Members of the Multimodal Information Subgroup

## Notices

The Urban ITS Expert Group thanks following external experts for their contributions to this document:

- RADEMACHER Berthold, VDV
- ROSS Jürgen, VBB

Editors of document:

- SZELIGOWKSA Dorota, European Commission, DG Mobility and Transport
- EGELER Christian, Rapp Trans AG

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## Abbreviations und Acronyms

Abbreviation	Description
CEN	European Committee for Standardisation
DAB	Digital Audio Broadcasting
DATEX	Standard for the exchange of traffic related data
EC	European Commission
ETSI	European Telecommunications Standards Institute
GPS	Global Positioning System
GSM	Global System for Mobile Communications
ISO	International Organisation for Standardisation
ITS	Intelligent Transport Systems
MIS	Multimodal Information Service
MMI	Multimodal Information (Traffic & Travel information on several modes and their connections)
NeTEx	Network Exchange (prCEN Standard for exchanging PT schedules)
NTS	National Travel Survey
POI	Point Of Interest
PSI	Public Sector Information
PT	Public Transport
RDS	Radio Data System
TMC	Traffic Message Channel
TPEG	Transport Protocol Experts Group
TSI	Technical Specifications for Interoperability

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## 1. Summary

Mobility issues are increasingly important in today's fast-growing urban centres all over the world, but particularly in the European Union where 75% of inhabitants live in urban areas. At the same time the supply of mobility services is continuously increasing as well as people's demand for complete, more reliable, real-time and easy to use travel information.

Thus the cities have 4 main objectives in terms of mobility policy:

- **Ease the movement of people and goods, and answer to the citizens' demand for reliable and easy to use travel information,**
- **Ensure accessibility of the towns and their economic development,**
- **Reduce environmental and socio-economical impacts of transport,**
- **Re-conquer public space from private car use for eco-friendly modes and urban planning.**

Although the investments made in new transport infrastructures were massive in the past decades all over Europe, the impacts on these objectives and challenges are still limited: in the last 10 years, the modal share of private car use in most of European conurbations has slowly decreased. That's why, complementary to the building of new infrastructure that is more and more complex to implement, solutions based on new tools connecting different networks and optimising transport systems as a whole - such as Multi / Inter-Modal Information Services and Systems - are promising tools to address the urban mobility policy objectives. Multimodal Information thus means information on all modes of transportation (car incl. parking, public transport, railway information, bike, bike or car sharing services, car pooling etc.) allowing the users any combination of modes to go from A to B.

In that perspective, multimodal traveller information has an important role to play and is an incentive for the users to change their mobility routines (from exclusive use of car to non-exclusive use). Some studies have estimated the potential of Multimodal Information on modal shift at approximately 5%.

The main factor for understanding key issues in Multimodal Information Service deployment is the absence of autonomous **business models that are not viable without public support, as the users often take information for granted and are not ready to pay for it.**

**In this context, the expert group proposes some recommendations with the most important one listed as follows:**

**1. Role of public and private sector:**

- **The public sector shall provide Multimodal Information Service when there is no autonomous commercial economic/business model.** This can be performed directly by public authorities or by the private sector through public procurements.
- **The private sector shall provide services when there are viable autonomous business models. To encourage the provision of such services, public data or services should be made available, with a stress on quality of the data, to favour commercial businesses. This availability of data should be dependent on the coherence of the data use with the public policy on mobility;**

**2. Availability of data and/or information for each mode of transport and mobility services:**

- **Setting up multimodal data set for each European city, controlled by the public sector:** Following the aforementioned positioning of the public and private stakeholders roles, the expert group estimates that urban public authorities should be in charge of setting up a multimodal dataset for their urban area, gathering the various sources of data of the transport operators, including real-time information, when available. This multimodal data set should then be made available to private stakeholders, either through Open Services, or Open Data, depending on each European city's policy on information provision, **allowing a fair competition between service providers**, who should be able to plug their software into any urban multimodal data set and provide services to the users.
- **Availability of local rail data: The experts group recommends an affordable - as traveller information businesses are thin - and transparent access to local rail timetable and real-time information databases.**
- **Availability of public data:** Since multimodal traveller information is a tool for public policy to support public interest, the expert group recommends that **availability of data or services should be made under the condition that the services based on the data/services provided shall be consistent with the modal shift policy.**
- **Lack of data, quality of data and information services:** The expert group recommends **increasing the quantity and quality of mobility data**, through the deployment of monitoring devices and systems, development of social media and the labelling of the quality of the data or services. Cooperation between public and private sector is highly recommended in this area.

**3. Market the modal shift and traveller information services:**

Multimodal information is also about changing people's habits and travel behaviour. Travellers must not and can not be 'forced' into public transportation. The choice to use multimodal information must be based on pragmatic and practical grounds to guarantee longevity in the modal shift. **A specific focus should be made on the marketing of these services and the advertising about modal shift,** to get the full potential of MMI services on modal shift

**4. Harmonisation and continuity of services**

- The expert group recommends to foster **cooperation between the private cars actors (car manufacturers, navigation services providers) and soft modes actors (public transport and bike services operators) to develop Multimodal Information Service that addresses user needs (continuity of services) and mobility policy objectives (modal shift).**
- To allow easy exchange of information and decrease the software cost for Multimodal Information Service, the expert group recommends that the use of **existing standards for new Multimodal Information Services should be mandatory** and to standardise the connections between different modes (the multimodal urban dataset) and the data for the new mobility services (car sharing, car pooling, free bike services, ...etc).

## 2. Introduction

Nowadays, there are a number of challenges lying ahead of the transport system. The idea of a Single European Transport Area, promoted by White Paper for Transport 2011, sets the goals to be achieved by 2050. The transportation has to become more competitive and resource efficient within this time horizon.

The **goals for urban transport**, in this respect, are to promote the use of cleaner cars and cleaner fuels. The need is also to reduce the number of fatalities. Yet another challenge is that the amount of traffic in Europe's urban areas has been increasing inexorably during last decades. The task of people involved in urban traffic management is to best allocate the scarce resources of road and kerbside space to potentially competing transport modes, within a network that has finite capacity.

Smart technologies and **Intelligent Transport Systems (ITS)**, in particular, have a role to play in achieving the aforementioned goals. ITS can significantly contribute to a cleaner, safer and more efficient transport system, especially in urban areas. The ITS Directive (2010/40/EU) gives the legal framework in order to accelerate the coordinated deployment of innovative transport technologies across Europe. It aims to establish interoperable and seamless ITS services while leaving Member States the freedom to decide which specific systems to invest in.

Two recent European Action Plans include complementary actions on the issue of ITS for urban areas:

- The **ITS Action Plan** (2008) foresees the set-up of a specific ITS collaboration platform to promote ITS initiatives in the area of urban mobility.
- The **Action Plan on Urban Mobility** (2009) foresees that the Commission will offer assistance on ITS applications for urban mobility, possibly in form of a guidance document, to complement the ITS Action Plan.

Resulting from these provisions, the **Expert Group "ITS for Urban areas"** has been set up in December 2010 for 24 months, in order to support the European Commission in its work concerning the aforementioned Action Plans. The Expert Group was multi-modal in its focus, broad in nature and covered the urban region taking into account the interfaces between the urban and inter-urban mobility. Both passenger and freight issues were considered and a dialogue between public and private stakeholders encouraged.

The tasks of the Expert Group have been three-fold: to provide guidance on ITS deployment in urban areas, collect best practices on successful deployment and identify a possible need of standardisation. The group had to develop specific **Guidelines** to promote and show the benefits of the use of ITS in urban areas along the individual travellers' mobility chain. The Guidelines despite the fact that they do not have mandatory character have the aim to foster interoperability and continuity of services within Europe.

The Guidelines target the organisations in charge of decision making and technical deployment of ITS on local level. For each **key application of urban ITS** a separate document has been issued:

- Traffic and Travel Information
- Smart Ticketing
- Traffic Management and Urban Logistics

### 3. Stakes and Public Policy in European Urban Areas

Mobility issues are increasingly important in today's fast-growing urban centres all over the world, but particularly in the European Union where 75% of inhabitants live in urban areas. The 21st century is indeed the century of cities, where we also find the bulk of economic development and innovation potential. None of major urban areas escape this basic trend; there are important local mobility issues, especially in relation to:

- **accessibility:** every day, thousands of private cars enter European conurbations, around 50% of daily trips are made by car and certain public transport lines are saturated while covering longer distances due to urban sprawl and the momentum behind dynamic cities;
- **the environment:** transport generates 30% of CO<sub>2</sub> and micro particles emissions, of which 95% come from cars and lorries, creating real problems in terms of public health, noise and road safety;
- **quality of life in urban centres,** with a need for modal shift from private cars to public transport and eco-friendly modes; in a lot of cities, around 60% of car journeys cover distances of less than 3 km, so there is room for "improvements";
- **public space management:** all these stakes must be managed on a limited public space that has to be shared among the different transport modes (soft modes such as walking and cycling, public transport, private car, urban freight) and other uses (shops, leisure and urban facilities);
- **informing citizens about all mobility services, about the usual and real-time travel conditions, in their cities:** Information is nowadays an important mean to foster behaviour changes towards more sustainable travel habits, while the offer of mobility services is continuously increasing as well as people demand for complete, more reliable, real-time and easy to use travel information.

After half a century of massive investments in transport infrastructures, to ensure urban and economic development, connecting networks has become a priority. This objective was introduced in transport public policies through fostering extensive use of more efficient modes in multimodal combinations<sup>1</sup>.

The information and communication technologies (ICT) applied to transport have allowed in the 1990ties the deployment of network management systems and afterwards of the first traveller information systems.

At the same time, environmental and financial constraints have hugely limited the capability to build new infrastructures. A new logic, based on a service approach and the information and communication technologies, optimising the use of the existing infrastructures, has emerged to address the increasing mobility demand.

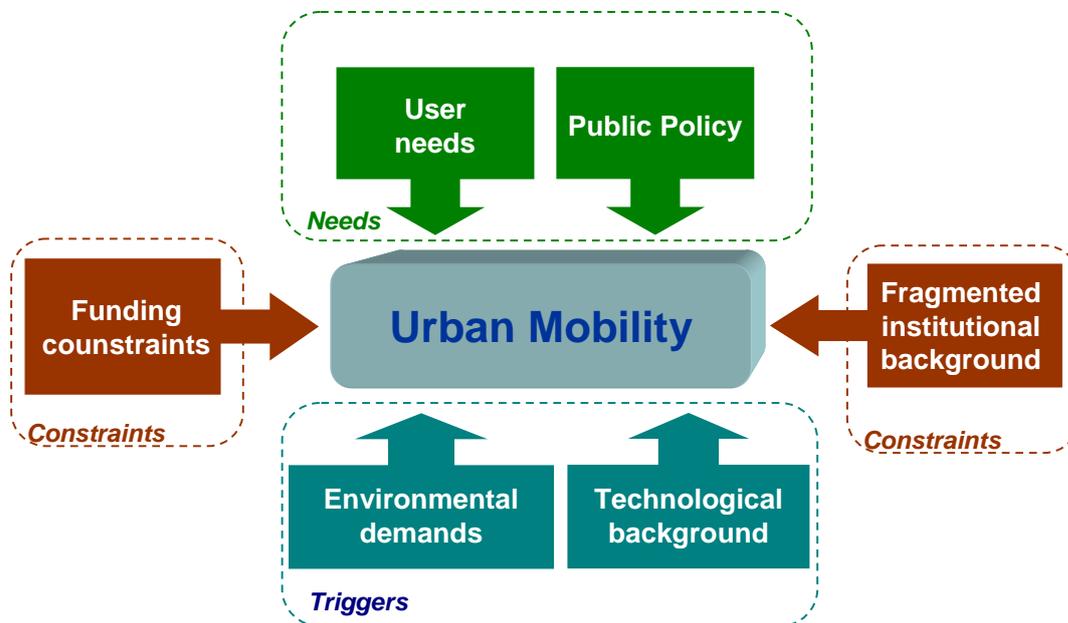
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<sup>1</sup> EU White Paper on transport COM(2011) 144 final

When it comes to the technological and business models, two major developments have (and will continue to) considerably influenced mobility policies and the role of public and private stakeholders:

- The free access to the GPS signal with the associated booming of digital maps services,
- The boom of smart phones (and of the mobile internet), associating GSM and GPS technologies (+41% growth in 2010 in Europe<sup>2</sup>), available for everyone at a very reasonable price today.

The developments of these personalised digital applications on the internet and on smart phones have greatly reduced the costs of delivering multimodal information to the potential users and increased the chance of reaping the benefits of the modal shift (triggered by multimodal information).



In this context, European cities have to face a particularly complex challenge:

- Ease the move of persons and goods
- Meeting the increasing citizens demand for reliable and easy to use travel information
- Ensure accessibility of the towns and their economic development
- Reduce environmental and socio-economical impacts of transport (pollution, noise, loss of time in traffic jams, accidents)
- Re-conquer public space from private car use to eco-friendly modes and urban planning

<sup>2</sup> Source: ComScore

Although the investments made all over Europe in new transport infrastructures were massive in the past decades, the impacts on these objectives and challenges are still limited: in 10 years, the modal share of car use in most of European conurbation will have slowly decreased.

That's why, complementary to the building of new infrastructures that are more and more complex to implement, solutions based on new tools connecting the different networks and optimising the transport systems as a whole - such as multi- / inter-modal information services and systems - are promising tools to address the urban mobility policy objectives.

## 4. Benefits and Impacts of Multimodal Travel Information

Intelligent Transport Systems and services (ITS) - and in particular Multimodal Information Services based on ITS - are a means of addressing these objectives, since they help to optimise existing infrastructures, in terms of space and time, and to build new services to enhance quality of life and to allow private vehicles to be used more wisely and to be combined with other modes of transports.

The following lines describe the impacts of Multimodal Travel Information on the different objectives identified in section 2.

Modal shift mainly deals with individuals' routines and habits. In that perspective, the traveller information is key and multimodal information is an incentive to the users to change their mobility routines (from exclusive use of car to non-exclusive use), and ensure them that it is feasible and reliable. Multimodal information is thus a technical word meaning information on all modes of transport (car, including parking, public transport, railway information, bike, bike or car sharing services, car pooling, ...) allowing the users any combination of modes to go from A to B. Supporting increased modal shift requires good quality pre-trip and on-trip multimodal traveller information to allow more efficient pre-trip routing decisions and/or departure times and re-routing/diversion when needed, thus increasing network efficiency.

- **Ease the move of persons and goods, answer to the increasing citizens' demand for reliable and easy to use travel information**

Multimodal Traveller Information Services in urban areas provide the traveller with comprehensive travel information for all modes allowing for well-informed travel decisions (pre-trip information) as well as information during the journey (on-trip), wherever the traveller is, whenever the information is asked for.

Multi-modal travel information essentially aims to utilize existing transportation modes in the most efficient way possible by informing travellers about the variety of travel choices available and by combining them in the most efficient way. Clearly, the potential of multimodal information is very high, as it implicitly increases the efficiency of public and soft modes transportation and the road networks as the travellers are informed which modality is best to use at a certain time.

- **Ensure accessibility of the towns and their economic development**

Modal shift is encouraged through governmental policies to slow down congestion increase on the road networks. As (road) mobility is expected to increase in the coming decades, in combination with ageing infrastructure, goals are set to reduce congestion on road networks through better occupation of public transportation facilities and use of soft modes. Multimodal information is considered an important development and factor for increasing the modal shift, especially if combined with the growth of highly personalised

high quality information and transportation services accessible in real-time through the internet and smart phones.

Some studies have analysed the impact and the potential of multimodal information on modal shift. The conclusion was that reliable multimodal / intermodal information (on smart phones or other media) could lead to a significant (around 5% and more) modal shift in terms of numbers of daily travels.

- **Reduce environmental and socio-economical impacts of transport**

Transportation in congested city centres accounts for around 30% of CO<sub>2</sub> emissions, also including noise disturbance and road safety problems. In the last decades, policies have focused on limiting car access to city centres and deploying public transportation infrastructures. The implementation of multimodal information is the next main achievement to persist in the development of these policies. Regulations that impose a limit on CO<sub>2</sub> emissions in cities mean that every emission reduction is a welcome one.

Increased use of public transportation and soft modes has shown improvements in air quality as traffic congestion is being reduced. Improved air quality increases the liveability in cities and ensures a better standard of life in densely populated areas. Multimodal information contributes to an increased share of public transportation and soft modes in the modal split, allowing more travellers to choose for a cleaner way of travelling to or through city centres.

Lyon conurbation (1.5 million inhabitants) has identified different costs of measures aiming to reduce CO<sub>2</sub> emissions. Taking into account that 1% of modal shift from cars to bikes and public transport accounts for 24 000 tons of CO<sub>2</sub>/year, the ratio cost of the different actions to reduce CO<sub>2</sub> emission are the following:

- Multimodal information : 10 Euros / t CO<sub>2</sub> saved
- Thermal Isolation of buildings: 50 Euros / t CO<sub>2</sub> saved
- Car pooling: 100 Euros / t CO<sub>2</sub> saved
- 400 km of new bike lanes: 400 Euros / t of CO<sub>2</sub> saved
- New tram lane: 17 000 Euros / t CO<sub>2</sub> saved,

to be also compared to the current price - around 20 € - of CO<sub>2</sub> tons on the CO<sub>2</sub> market.

- **Re-conquer public space from private car use to eco-friendly modes and urban planning**

Reduction of road congestion allows for a reduction of public space allocated to road transport, for new public transportation infrastructure, bike lanes, pedestrian and urban projects. Multimodal information, by fostering modal shift and ensuring that the change of mobility habits is feasible, reliable and safe, supports the reallocation of public space from car to eco-friendly modes and urban projects.

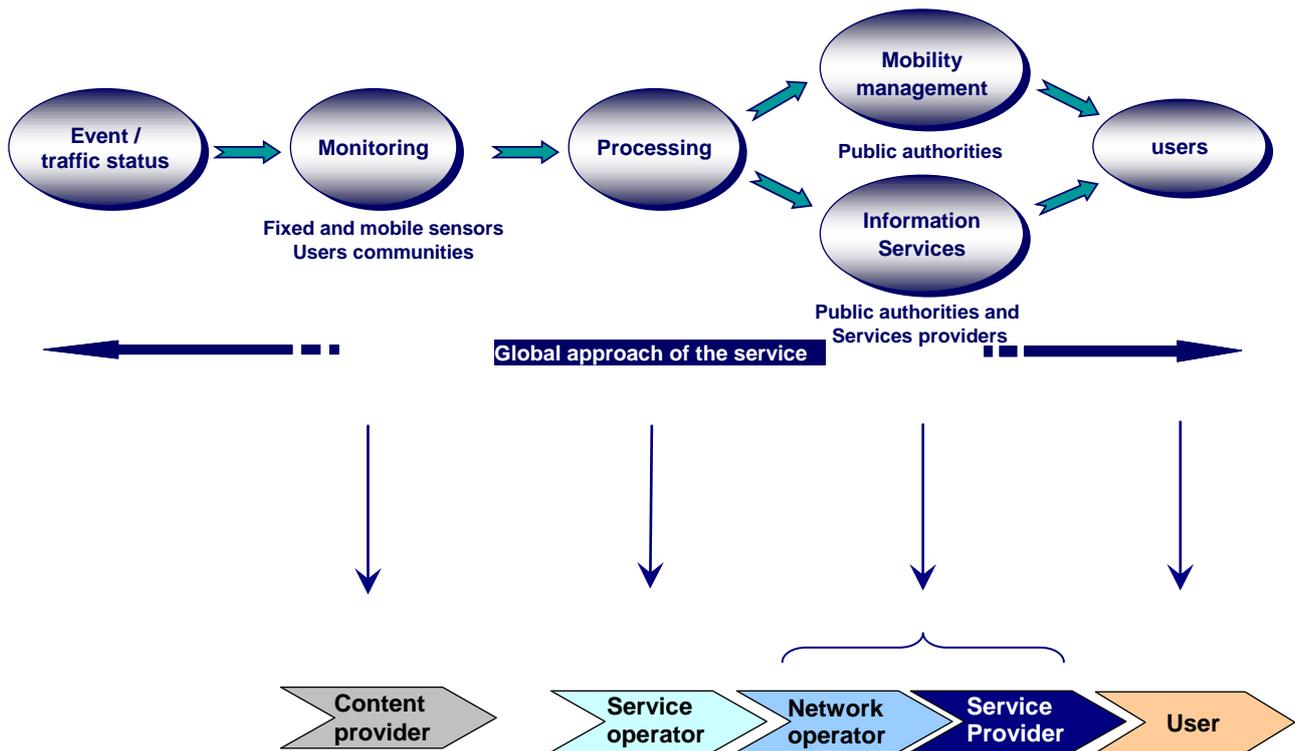
In synthesis, the following table illustrates the potential benefits of Multimodal Information Services. This is not an exhaustive list of multimodal information benefits, but it is designed to give an understanding of the potential of these services in order to reach the urban mobility policy objectives.

<b>Impact of multimodal information</b>	<b>Level of impact</b>
<b>Ease the move of people and goods</b> (changing mobility routines, altering decision to travel and departure times, more effective routing decisions, etc.)	<b>Very high</b>
<b>Ensure accessibility of the towns and their economic development</b> (increased modal share of public transport and bike)	<b>Very high</b>
<b>Reduce environmental and socio-economical impacts of transport</b> (reduced congestion)	<b>Rather high</b>
<b>Re-conquer public space from private car use to eco-friendly modes and urban planning</b>	<b>Rather high</b>
<b>Answer to the increasing citizens demand on reliable and easy to use travel information</b>	<b>Very high</b>

## 5. Introduction of Organisational Models for Travel Information

### 5.1. The Traveller Information Chain

Basically, traveller information services need many data sources of good quality and deal with long information and business chains involving many actors, as described in the following diagram:



#### ***Information and value chains for traffic information services (refer also to EasyWay guidelines)***

In Multimodal Information Services, the service is provided by combining different information chains for each transport mode, each involving many actors, making it even more complex.

Thus Multimodal Information Services include different type of actors:

- **Content Providers**, who are in charge of the collection of the raw data through monitoring means. They are mainly public stakeholders, or (private) actors acting under public procurement agreements. New private actors using FCD (floating car data) have become a major content provider for road traffic management, although data quality has to be checked in urban environments. The monitoring part of the information chain is the most important one for the quality of service, as also the most costly one.
- **Service Operators** are in charge of processing the raw data. They use data from the content providers, which is refined and processed to generate information. They are usually private entities that work under the frame of public contracts for public bodies, due to the fact that there are no, or very thin, real autonomous (i.e. without public funding) business models today for travel information services.
- **The Network Operators** are the actors providing the communication channels needed to deliver the information to the end users and to suitably interconnect the actors involved.
- **The Service Providers** provide the direct interface to the end users with the purpose of offering services including traffic information. The service providers are mainly public (mobility manager and information service providers) with some private actors (information service providers), as today's business models are very thin for travel information services.
- **The End User** is the 'customer' of the service providers, although the current willingness to pay for travel information at present is very low.

The role of information as defined is to:

- (i) make the individual aware of multiple travel modal options;
- (ii) empower the individual to make fully informed choices;
- (iii) assist the individual to successfully undertake and complete the journey.

## 5.2. ITS, Aid to a Comprehensive Approach to Travel Information

The deployment of Multimodal Information Services (MIS) based on ITS requires innovative approaches that are guided by the users and by the possibilities that present technologies have to offer, particularly mobile internet and satellite-based location systems which are now widely accessible via smart phones at prices which have decreased considerably.

Such approaches need to ignore barriers between the different modes, which tend to be handled somewhat individually. European conurbations intend to develop a comprehensive approach focusing on the users, addressing their needs, and in accordance with the modal shift policy, as this is the only way to

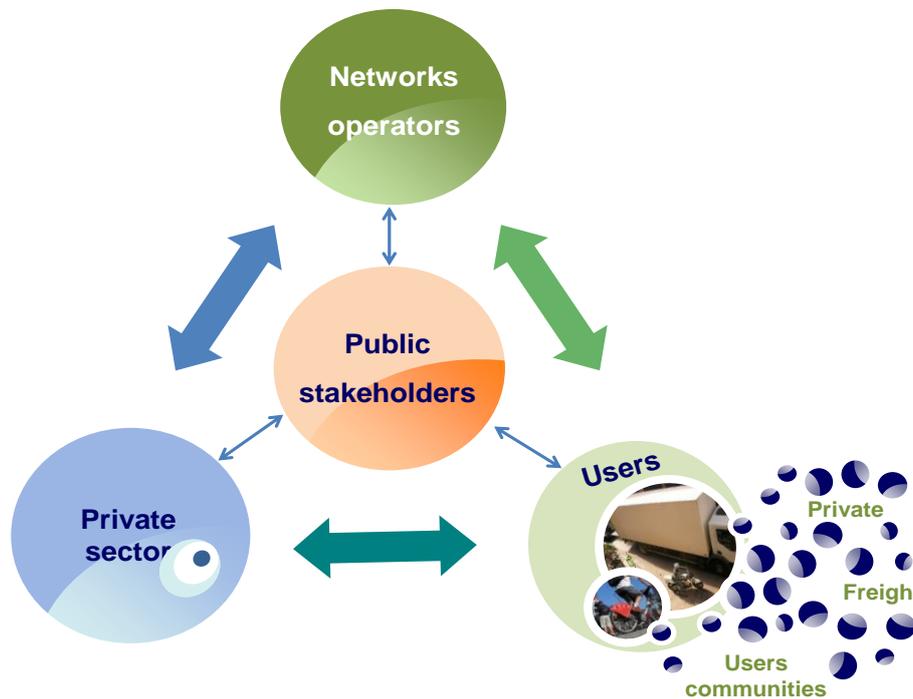
guarantee the overall efficiency of the transport ecosystem. Every citizen is in turn a pedestrian, cyclist, driver or passenger on public transport. Modal shift is not achieved by decree. **A pragmatic approach is to build alternatives to make modal shift credible. This is the best way to encourage citizens to change to more sustainable mobility habits.** There are many ways to do this and **ITS should certainly be strengthened and adapted to the particularly complex characteristics of urban mobility.**

Today, nobody doubts the effectiveness of ITS tools for tackling urban mobility issues. They turn data into information upon which a large number of innovative services to users rely.

They raise questions about the place of public and private actors and how they can complement one another.

**Two issues are today at the heart of successful Multimodal Information Services deployment:**

- the **fragmentation of stakeholders** and corresponding responsibilities;
- the **autonomy of business models** that, in many cases at present are not viable without public support, as the users often take information for granted and are not willing to pay for it.



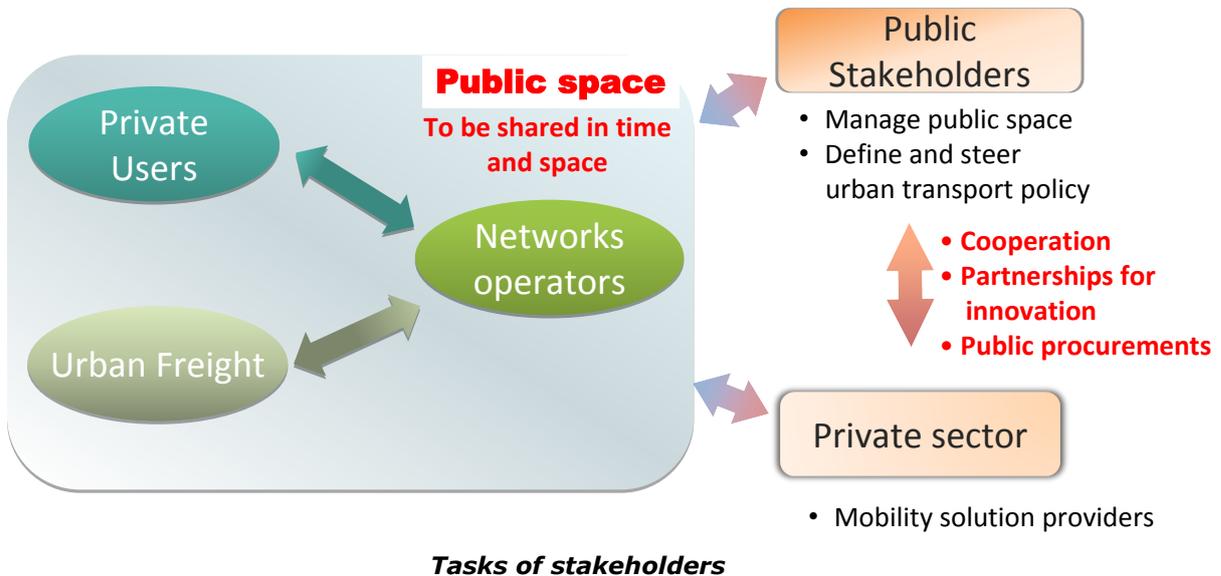
***Stakeholders involved in providing MMI services***

### 5.3. Public and Private Actors, Mobility and Economic Development Policy: a Proposal for a Win-Win Approach to ITS

The following lines propose a strategy based on an approach which positions public and private actors on the one side and, on the other side, the conurbation users.

We are clearly moving from implementation by public authorities to partnerships sought with the private sector and the involvement of service users, relying on and optimising the benefit(s) of each group of actors:

- the public sector and the relevant stakeholders in charge of the public interests (especially in terms of PT and road infrastructure)
- the private sector with its high technological capacity
- the users, who assess the services, can take part in (through social networks), and pay for the services either through the taxes or directly to a private service provider



In practical terms, this strategy has 3 axes:

- **Services carried out by the public sector** (directly or not), when there is no autonomous economic / business model. In this case, the public sector conducts the development and operation of ITS-based services: information on traffic, bike sharing services, public transport, pedestrians etc. via the mass media: internet and radio; this can be performed directly by public authorities or by the private sector through public procurements.
- **Services carried out by the private sector** when there are autonomous / business models that are viable. To encourage such services, public data or services should be made available. This availability of data should be conditioned to the coherence of the data use with the

public policy on mobility; this is a cooperation scheme between public and private stakeholders.

- **A proactive policy of collaborative innovation.** Innovation and building of future services require the implementation of collaborative projects bringing together public and private actors and users, with each party contributing its expertise in order to study and test new mobility services. It is also in this context that new Web 2.0 approaches are developed, to move from logics of producing services for users to one of co-producing services with users. This is a cooperation scheme between users, public and private stakeholders.

#### **5.4. ITS: Turning Data into Information, Generating the Development of a Digital Economy for Mobility**

While the public sector cannot handle everything directly; it does not mean that it can abandon public policy to the private sector, as it is not their role. So, **making information available can encourage the development of innovative services that are sustainable and economically autonomous**, providing citizens rapidly with mobility services at reasonable prices. Business opportunities can emerge from the availability of public data on mobility, traffic and transport. In this context, the private sector can contribute substantially to urban mobility, using public data. The issue here though is the appropriateness of such services to public urban mobility policy, and data can be made available only with the associated guarantees; the individual behaviour does not necessarily contribute to common benefit, as we can see from the transport situation in cities every day with the intensive and exclusive use of private cars.

Besides, the field of ITS is important for economic development and innovation. In an age when the car is being reinvented (from owned cars to "service" cars), the economy's actors search for new economic models combining different transport modes, with ITS as a logistics and technical aid. The public sector cannot ignore this. On the contrary, it must encourage the deployment of ITS.

## 6. The Pre-Condition for Multimodal Information Services: an Urban Multimodal Data Set Controlled by the Public Sector

As stated in chapter 4, the basic prerequisite for Multimodal Information Services is the setting up of a multimodal database that shall gather all information about urban mobility, already existing from the various transport operators and services providers.

**This multimodal dataset is at the core of any Multimodal Traveller Information Service.** It should include real-time information when available. It is designed to separate the data part from the application part, and ensured a fair competition between service providers that should be able to plug their software into any urban multimodal data set to provide services to the users, in a plug and play logic.

Due to the prominent role of public stakeholders in the field of mobility and the necessary control of mobility strategies by urban public authorities, **the harmonisation and integration of all urban mobility information in the multimodal dataset shall be managed by a public body as a service to the citizens by:**

- fostering the development of high quality information services while ensuring a fair competition among private information service providers
- ensuring the consistency between the services provided with the transport public policy

The stress shall be put on the data quality, which are a pre-condition for **the success of modal shift** (users have to trust information, otherwise they won't change their behaviours) and any autonomous business model for travel information services

### ***Content and organisation of multimodal dataset***

The information for the Multimodal Traveller Information Service is often distributed among many stakeholders. **These stakeholders should join their efforts, under the umbrella of a public body in charge of the data integration and harmonisation or interconnection of existing information,** as follows:

- **The public decision makers in a city or region shall lead the project.** They provide political and financial support and promote the project results. They are in charge of the overall mobility management, gain guidance for their citizens and better accessibility of their city.
- **The administration of the city or town or the region has valuable information:** Traffic departments have online data from traffic detectors and from the traffic control centre(s). Information and experience on traffic and mobility are widely available. Often a traffic model is already established and can be used as a basis for the work. Multimodal traveller information can provide the traffic department with new means of traffic control and with comprehensive harmonised traffic and mobility data as a side effect. The geographic and planning departments normally have

addresses and local POI-data, detailed and up-to-date road maps including the connections for non-motorised traffic and base data for the background maps as well as aerial photos. The harmonised traffic and mobility data produced as a side effect of multimodal traveller information is a valuable basis for city planning. The multimodal traveller information can be used to enhance the online city maps. Also the road administration should provide detailed information on road works and use the historic traveller information data for the planning of the construction site layout and course of events so congestions can be avoided.

- **Public transport operators or associations, bike services operators etc. can provide harmonised PT and soft modes information** to the urban data set such as timetables, digital PT/bike services, real time travel times, etc. maps and real-time information. Multimodal traveller information will inform car drivers about soft modes alternatives and attract more costumers to public transport, bike services, carpooling, etc.
- **The national rail operators are often reluctant to share their timetable and real-time data with stakeholders that provide multimodal traveller information.** The Telematics Applications for Passenger Services - Technical Specifications for Interoperability (TAP-TSI), as adopted by the EC in May 2011, make sure that timetable information is provided. The provision of real-time data information will hopefully be regulated in the near future, as local trains are an important element of urban mobility.
- **Road operators – either public or private (motorway operators) – can provide detailed road maps and real-time information** such as traffic volume, speed, messages from variable message signs and weather information. By cooperating with the multimodal content providers, road operators can gain a wider view of the traffic situation around their networks and provide their customers with comprehensive and up-to-date traffic information.
- **Police (in some cities) provide up-to-date traffic messages on accidents, congestions and traffic incidents.** The police can benefit from harmonised information of the traffic situation.
- **Public buses and other public services can provide floating vehicle data** to broaden the basis for the harmonised traffic status. The bus operators and the public services will also benefit from harmonised information.

In addition to traffic information from public stakeholders, **data from private organisations should also be included:**

- **Floating vehicle data** is available from many sources and can be a valuable basis to determine the current traffic situation. Many radio taxis, buses and managed fleets already collect the position of their vehicles. These data should be acquired for the purpose of multimodal traveller information.

- **Navigations system** vendors establish a back channel in their devices to gather floating vehicle data for most of Europe. Background map layers are also available.
- **Broadcasters edit traffic messages** for spoken radio information and often disseminate this information via digital channels as well (RDS-TMC, DAB-TPEG).
- **Other information such as POI**, coming from both public and private stakeholders should also enrich the content of the information and services.

The data from private corporations can be bought according to regular procurement procedures. If these corporations produce data under the frame of a contract with a public body, then the data should be made available for free to the public body, with full right of reuse.

**A major success factor for the harmonisation and integration of multimodal traveller information is a multimodal location referencing system.** Common navigation system maps provide good coverage of the road network for car traffic. They are generally incomplete for non-motorised traffic. The public transport networks are mostly not integrated in these maps at all. Thus a coordinated effort must be made to set up a digital network graph that is up-to-date and can be used as a basis for the location referencing of multimodal traffic information. All subsystems should use this multimodal network graph for location referencing. Functions for the mapping of external reference systems such as TMC-Location, addresses and so on should be part of the location referencing system.

### ***Legal framework for Multimodal Information Services***

i. The Directive on the re-use of public sector information (PSI)

The legal regulations of most relevance for organising multimodal traveller information are specific national laws based on the Directive (PSI) 2003/98/EC on the re-use of Public Sector Information.

The PSI Directive is a general framework for the conditions governing re-use of public sector materials in order to ensure fair, proportionate and non-discriminatory conditions for the re-use of such information. National legislations based on this Directive are not totally consistent.

In general the following rules apply:

- Exchange of information between private stakeholders is not affected by this legislation.
- Information can be exchanged freely between public bodies fulfilling their public duties.
- Information from private corporations can be procured according to applicable norms.
- Information from public bodies can only be reused by private organisations, according to the rules on non-discrimination in this legislation.

The opening of the multimodal dataset to private service providers must follow the non-discrimination rules of the PSI Directive and its national legal implementation. **It is highly recommended that this access is conditioned by provision of services consistent with the mobility public policy. This aspect should be included in the current revision process of the PSI directive or into the upcoming specifications on MMIS.**

ii. The Directive 2010/40/EU – ITS Directive

The objective of the ITS Directive is to ensure the coordinated and coherent deployment of interoperable Intelligent Transport Systems throughout the Union. It gives the basis and the legal framework for the development of a traveller information service at European, national and local levels. To ensure a coordinated and effective deployment of ITS within the Union as a whole, specifications, including, where appropriate, standards, defining further detailed provisions and procedures will be introduced.

In the context of the ITS Directive, the specifications concerning the EU-wide multimodal travel information services will be presented before the end of 2014.

iii. The Directive 2007/2/EC (INSPIRE)

The EC Directive 2007/2/EC (INSPIRE) requires that public authorities collect and publish geographical information on the transport network. This digital network graph can be enhanced to be used as location referencing system for multimodal traveller information.

As every piece of information is based on many data providers, a scheme for the data access, exchange and gathering must be established.

As most of the data is produced by public organisations serving the public interest, it could be considered - depending on local regulations - to exchange data between public and private parties or use - when such a contractual scheme is set up - the revenues of public data provision and re-use rights only for the acquisition of non-public data and the costs related to harmonisation and integration of the content, as well as for the delivery of the information in real-time.

Another way of working is the provision of information services via open interfaces to the private sector, ensuring fair competition between transport operators when providing routine advice and route planner services

## 7. Recommendations to Deploy Multimodal Information Services Successfully

Thus, the European Commission's Expert Group on urban ITS has identified key points for successful implementation of Multimodal Information Services:

- **Availability** of data and/or information for each mode of transport and mobility solution
- **Marketing** aspects of traveller information services
- **Harmonisation** and continuity of services

For each of these points, the Urban ITS Expert Group has identified several short and medium terms issues to be addressed in order to foster the full potential of ITS in the field of multimodal information. For some of them the Expert Group provides recommendations to the decision makers.

### 7.1. Availability of Data and/or Information

The following recommendations are made by the Expert Group:

- **Lack of data, quality of data and information services**

Multimodal travel information will probably have a greater effect in future when additional data is made available. Information about the return journey, comfort, environmental aspects and cost comparisons of various options are believed to contribute to the popularity of multimodal travel information. At the same time the demand for quality is high and the general belief about a successful implementation of multimodal information is that it has to be 'done well or not at all'. The credibility of the information has to be guaranteed. Historical databases and real-time databases should be set up. This will allow for the emergence of traveller information services based on statistics for mobility advice and real-time information service. The lack of quality is a strong barrier for credibility and commercial businesses of travel information services. **The main issue today is a lack of data to allow seamless and inter-modal information services on urban areas.**

In European projects, the Expert Group recommends the EC to **include specific support for data monitoring in urban areas, for real-time and historical data**. A specific urban mobility deployment project could frame this approach, as done in the MIP on the TERN with EasyWay (an urban EasyWay program). **The use of social media to collect and broadcast travel information should be considered as another source of data**, in a co-production with the public sector providing public information and individuals enriching this data through social networks for the benefit of the quality of services.

The Expert Group recommends to **set up, at national and European levels, quality requirements for incoming as well as outgoing data as well as for information services** (e.g. through a label), using results from national and European projects and studies on this topic (e.g. 2DECIDE, CONDUITS projects, etc).

- **Setting up of multimodal data set for each European city or region, controlled by the public sector**

Following chapter 4 about the positioning of the public and private stakeholders and description provided in chapter 5, the Expert Group proposes that the **urban public authorities set up a multimodal data set for their urban area**, gathering the various sources of data.

This multimodal data set should then be made available to private stakeholders, either through Open Services or Open Data, depending on each European city's policy on information provision. The private stakeholders should also cooperate with the public stakeholders by providing their data and take into account public policy rules within their services. This cooperation will enrich the multimodal dataset, thus **increasing the quality of the data and subsequently the chance of success of modal shift and the feasibility of autonomous business models for the provision of travel information.**

- **Availability of rail data**

Availability of rail information (timetable and real-time information) is key, given that local trains are one of the most efficient modes in terms of costs and time for the travellers to access and leave the European cities.

The Expert Group recommends **an affordable and transparent access to local rail timetables and real-time information databases**. If no fair arrangements can be found, MS or EC shall take the lead to support such an approach and speed up the process for the next phase of TAP TSI work.

- **Availability of public & private data**

Since multimodal traveller information is provided for the sake of public interest, the Expert Group recommends that **availability of data or services should be made conditional upon the fact that the services based on the data/services provided shall be consistent with the modal shift policy** and of course used only for the agreed services. There should be a distinction between the availability of PT data and traffic data. Available real-time data must be distributed and used in routing recommendations, taking into account local or regional conditions concerning networks and services.

**In order to enrich the data in urban areas, vehicle probe data should also be made available to public authorities in charge of traffic management. The Expert Group recommends an affordable and transparent access to these vehicle probe real-time information databases.**

Thus, some basic rules should be imposed on the service providers using the data, such as:

- The comparison of the modes must be fair. Realistic travel times from door to door (including parking) must be given for all modes of transport. Environmental impact has to be taken into account. In general the precondition of provision of public data to private parties should be that the use of these public data should not go against the objectives of transport public policy.
- Through traffic must be guided, residential areas should be avoided; the regional routing recommendations for through traffic must be followed.
- Traffic management regulations and recommendations, for example for the access to events (sports, concerts, etc.) must be followed.
- Available real-time data must be distributed and used in routing recommendations, taking into account local or regional conditions concerning networks and services.
- Data quality and information/services levels requirements must be followed.

## 7.2. Marketing Aspects of Multimodal Information Services

- **Market the modal shift and traveller information services**

Multimodal information is also about changing people's habits and travel behaviour. Travellers must not (and cannot) be 'forced' into public transportation by tactics that are clearly meant to seduce them with distorted information. The choice to use Multimodal Information must be based on pragmatic reasons to guarantee longevity of the modal shift. If the prerequisite is high quality and reliable information service, nevertheless, a specific focus should be made on the marketing and advertising of these services to realise the full potential of MMI services on modal shift and achieve reductions of CO<sub>2</sub>, noise and accidents.

To foster modal shift, people must be aware that different transport modes options are available, and can easily access the cost and travel times of different travel options before they make their decision.

The Expert Group recommends to **foster the exchange of Best Practices and lessons learnt** in this field: travellers segmentation, awareness campaign, Multimodal Information Services design, modal shift design, etc. through different media (newspapers, radio, internet, smart phones, etc.)

- **Assess the impact of Multimodal Information Services on mobility behaviours**

Evaluation of the impact of MIS services on travel behaviour is today an important issue for decision makers. Modal shift is a common policy objective in European cities and MIS services are a tool for it. Nevertheless, the knowledge concerning the potential impact of these services on individual behaviour is still fragmented and not available on a large scale.

The Expert Group recommends **inclusion of evaluation of impacts on individual behaviours in each Multimodal Information Service**. In each European project on Multimodal Information Services, the EC could make it mandatory to incorporate a work package on impacts on individual behaviour and on cost benefit ratios of Multimodal Information Service. A European study could also gather the available studies and disseminate ratios on impacts and cost benefits.

- **Understanding of travel behaviour and mobility trends**

Understanding current travel behaviour and recent trends from a cross-European perspective is an important requirement. Local and National Travel Survey (NTS) data that could give significant insight on travel behaviour and MMI are quite sparse.

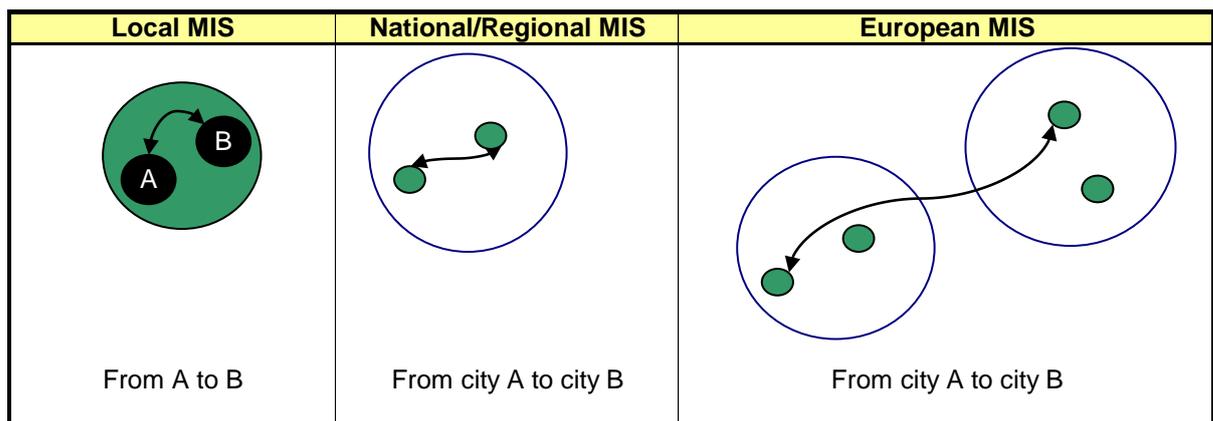
The Expert Group recommends **the development at a National and European scale of experiments on the use of smart phone data to get annual urban mobility surveys** (origin/destination matrix, mode used, etc.). Such experiments shall obviously be consistent with national regulations on privacy protection.

### 7.3. Harmonisation and Continuity of Services

- **Continuity of information services, between cars and the other modes and also between European cities** is still a challenge.

From the end user’s perspective, the multimodal approach is the one to provide useful and efficient travel information service (complete route guidance – including ticketing as an additional asset - from A to B whatever the mode, with a “seamless look”).

Today there are two main issues to address: continuity of service between in-car information services and multimodal personal assistant (through smart phones), and continuity of services between different European cities (national and European level, as 75% of Europeans live in cities).



**Types of MIS**

The Expert Group recommends to foster **cooperation between urban mobility stakeholders** (private and public), **navigation systems and services providers and car manufacturers**, for setting up services that address user needs (continuity of services) and mobility policy objectives (modal shift).

The continuity of MIS at national and European levels should be improved by provision of long distance data or information to service providers (refer to 6.1.).

- **Standardisation:**

There are a lot of existing (or under development) transport data standards (DATEX, NETEX, TRANSMODEL, SIRI, etc.) within CEN, ETSI and ISO.

To allow for easy exchange of information and decrease the software cost for Multimodal Information Service, the Expert Group recommends that the **use of existing standards for new Multimodal Information Services should be made mandatory.**

Car sharing, car pooling, free bike services are new services that face more and more success in urban areas. Multimodal Information Services need to include the information provided by these new services, in order to propose to the users a complete set of mobility solutions.

Moreover, to move from a "silo" way of working towards a real multimodal approach, the structure of the multimodal urban data set should be standardised.

To allow for easy exchange of information and decrease the software cost for Multimodal Information Service, the Expert Group recommends **standardising the data for the new mobility services** (car sharing, car pooling, free bike services, etc).

To facilitate interoperability of software from one city to another, **work on the standardisation of a logical structure and architecture for the multimodal dataset should be launched.**

## 8. Further Information and Contacts

### 8.1. Best Practices

The Urban ITS Expert Group has collected in a special report a variety of Best Practices. In the area of Traffic Management following Best Practices are presented:

AT	Graphs Integration Platform for Austria
AT	Vienna - A Joint Traffic Information Project
DE	Düsseldorf – Dmotion, Cooperative Traffic Management in the Metropolitan Area of Düsseldorf
DE	Berlin - Integrated real-time based Travel Information Services for Public Transport, VBB Berlin Brandenburg
DE	Deutsche Bahn: Touch & Travel (NFC Pilot)
DE	Cologne - Intermodal Transport Control System for Public Transport
DE	Leipzig - Public Transport Traffic Control and Passenger Information
DE	Intermodal Transport Control Systems for Public Transport
DE	RNV Real-Time Passenger Information (Rhein-Neckar-Verkehr)
DE	Networking of Intermodal passenger travel information and Realtime in Public-Transport (itcs/RBL/FIS/ABF/RBL-Light etc.)
DE	Stuttgart - Journey Planner (EFA)
DE	Logistic V-Info, Professional Tour Planning Information
EL	Online Portal for transport data/content management and transportation service provision
ES	Madrid – WiFi on Buses
EU/DE	Provision of nationwide and European wide public transport journey planner system (DELFI & EU-SPIRIT)
EU/DE	Integration of regional public transport routing information system within the public transport network of Nation- and European wide journey planner
EU	Europe-In-Time (Delivering Intelligent and Efficient Travel Management for European Cities)
EU	European cross-border travel information network «EU-Spirit»
FR	Lyon - Grand Lyon Urban Traffic Management System (CRITER)
FR	Toulouse-Multimodal Traveller Information Centre
FR	Paris – INFOMOBI Mail / SMS Service for PRMs
IT/DE	SMART-WAY: Mobile public transport navigation
NL	Rotterdam-The Traffic Enterprise (De Verkeersonderneming)
NL	Rotterdam - Havenbedrijf (Port of Rotterdam Authority)
NL	Brabant – Spitsmijden,Avoiding the Peak
NL	Maintenance of Information Standards for Public Transportation BISON
NL	Public Transport Information without frontiers GOVI
NL	Enschede – Incentive Zone
PL/DE	Warsaw - Cross Border Travel Planner
PL	Warsaw – Voice Portal
SE	Gothenburg - Motorway Control System
SE	Gothenburg – ITS4 Mobility
SE	Gothenburg – Attractive Travel Service
UK	Urban Traffic Management & Control (UTMC) Open System Integration
UK	Bristol - Environmental Road Pricing
UK	Leicester - Traffic Information Service Database / Smart Ticketing

**8.2. Contact Information**

Jean Coldefy

Coordinateur programmes gestion de trafic et transports publics

Grand Lyon / Mobilité Urbaine

Lyon, France

phone: +33 4 26 99 32 65

e-mail: [jcoldefy@grandlyon.org](mailto:jcoldefy@grandlyon.org)