MIMP

MULTIMODAL TRANSPORT INFORMATION, MANAGEMENT AND PAYMENT SYSTEMS

ROADMAP SUMMARY

TRANSFORUM TRANSPORT 2050

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SEVENTH FRAMEWORK PROGRAMME

ROADMAP SUMMARY towards goal 8 of the White Paper on Transport: »By 2020, establish the framework for a European multimodal transport information, management and payment system.«

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MULTIMODAL TRANSPORT INFORMATION, MANAGEMENT AND PAYMENT- ROADMAP SUMMARY

1 The White Paper goal on Multimodal Transport Information, Management and Payment (MIMP)

TRANSFORuM's Thematic Group on MIMP deals with goal no. 8 of the European Commission's 2011 Transport White Paper (European Commission, 2011):

By 2020, establish the framework for a European multimodal transport information, management and payment system.

Establishing a common European multimodal transport information, management and payment system has the potential to ensure that any kind of transport is carried out in the most efficient manner, while taking into account various mode-specific features and limitations (e.g. comfort, price, speed, flexibility, reliability, etc.). Such systems should allow users to optimise their choice of transport mode(s) depending on their different selection criteria (e.g. cost minimisation, speed, emissions, schedule and ease of use). This way it is possible to make efficient use of existing infrastructure resources and at the same time to ensure cost efficiency and minimal environmental impact while meeting user needs and thus helping to achieve the overall emission reduction target.

2 Understanding the White Paper goal

TRANSFORuM understands the term 'framework' in the wording of the White Paper goal in the sense that it only provides necessary preconditions for MIMP systems to be implemented on a national and, ultimately, a European scale. The framework considers general conditions and specifies the actors that need to be involved. It does not, however, in itself encompass the implementation of the actual technical systems. Instead, it must ensure a common legal and technical basis to lower the access barriers for passengers and at the same time guarantee efficient and fair participation in the market for the different operators and service providers.

In practice, we may be looking at a framework made up of different parts, one for information, one for management and one for payment and ticketing. This would allow for the different requirements these different components have, their different levels of maturity and the different challenges involved in each of them to be taken into account. An important task of the overall framework is to ensure that the respective parts are not in conflict but, in fact, complement each other and support integration and harmonisation where it is needed and beneficial.

3 Background, trends and barriers

3.1 Brief mapping of the field

In order to make the whole transport system greener, more sustainable and more efficient, the provision of seamless multimodal door-to-door mobility is crucial. A MIMP system will also play an important role to support several other targets of the White Paper. On closer examination, this system actually consists of three different systems – information, management and ticketing and payment – each adding an additional layer of complexity.

The 'information' part is more integrated than the other elements like payment or ticketing. If an integrated system includes ticketing and payment functions, higher demands must be met, especially with regard to privacy, liability and security. To ensure efficient management, reliable real time information is one of the basic prerequisites. A lot of different players from different modes with different (commercial) interests and business models are involved. Each system on

its own can contribute to the overall efficiency of the transport system, but they must be seen in combination in order to get the optimal benefits.

For example, better information on availability increases the likelihood that a transport option will be used. On the other hand, even the best information will not be sufficient if booking options are unclear or not easily accessible (e.g. due to the need to change between different portals). How far this integration must go is of course a matter of debate and eventually it must be a trade-off between costs and benefits. So ultimately, it is not necessarily one single MIMP system but rather a combination of systems that are linked to each other that will offer the necessary services and support multimodal transport.

Currently, numerous individual solutions exist at local, regional and national levels. It is a very dynamic field, but systems usually only cover certain geographic areas and data availability is often limited due to proprietary solutions by established operators. The limitations of existing legislation would need to be overcome, with clear terms and conditions for the use and re-use of data. Legislative measures at the EU level may support data sharing and thus encourage industry to devise different solutions. A step-by-step approach and process is necessary, as the field can develop in different directions with different advantages and disadvantages.

The potential benefits of integrated transport, both in monetary and non-monetary terms, have been shown in different studies (e.g. Preston, 2012). However, the key challenges in achieving a more integrated European system are not primarily technical but rather relate to 'soft' areas like having a clear vision of the future of the European transport system, and the willingness of all actors to cooperate in a competitive market and agree on a level-of-service quality which is necessary to ensure efficient and seamless mobility. This requires the commitment of all relevant stakeholders as well as funding to support the initial decision-making process.

3.2 Relevant trends

There are a lot of different trends which may have an impact on future developments in this area. Some may be highly relevant in the future although their possible impacts cannot yet be fully grasped (e.g. social media).

Nevertheless these must be considered and observed carefully in the future. Some of the trends covered in the TRANSFORuM MIMP Roadmap include:

- A shift away from the perception of cars as status symbols towards other technological consumables, such as the smartphone. Indeed, mobile computing, in the form of tablets and smartphones will continue to have a large impact on how users access MIMP systems;
- Social media, computers, smartphones, etc. have increasingly led to bottom-up approaches to information provision, filling gaps left by the transport operators, which puts on an enormous pressure on operators to provide better service quality;
- The willingness to pay for information only exists if a service provides notable additional value to the users, since a lot of free services are available. In this area, new inventions like for example, smartwatches or Google Glass (Google, 2013) could have a significant impact, but could also bring up discussions about data protection and privacy issues for the user and the people around;
- The question of possible surveillance is one that is being asked more frequently than in the past and any MIMP systems must stand up to public scrutiny and ensure that privacy and security issues can be addressed satisfactorily. If this is not the case, then this might be an issue where, in the long run, public acceptance could be lower than expected and thus a European MIMP system may have very little impact on modal choice.

All these and other trends must be seen as opportunities to which one has to react rather than as threats. It should also been seen as an encouragement for further cooperation both within one mode (e.g. different train operators) as well as between modes to offer the best services for customers and make multimodal transport more attractive.

4 Steps towards a MIMP system

In order to reach the White Paper goal, we actually have to deal with three different systems (information, management and payment). These systems are closely related to the data they use, to infrastructure and communication channels. At the same time, they are very different with regards to timeliness, security, trust, liability and so forth. Different actors are involved to differing degrees as well. What binds them together is that they all rely on information, either as a user or as a provider – and very often as both. We already see some problems involved – privacy and security. The closer it gets to being a real time system; the more this becomes an issue. It is not yet clear how and to what extent the three systems will ultimately be integrated.

In the next sections the three topics of information, management and payment will, as a first step, be treated separately, trying to capture the status quo and suggest possible ways forward. The last section relates to the potential of integrating the three systems.

4.1 Topic A: Multimodal information system

Multimodal information is currently the most developed of the three topics in Europe. Current Directives (e.g. PSI, ITS, INSPIRE) also already address how and what data must be made available. Nevertheless, there is still a long way to go before reaching a truly European multimodal information system. This is due to enduring concerns over data availability, the willingness to share existing data and certainly also a lack of a convincing business models. Moreover, clear, shared expectations concerning the role of the public and the private sector are also missing.

What has become clear through the TRANSFORuM process, however, is that a truly European information system must take into account all systems already in place and provide interfaces to help connect them. In addition, it must be ensured that all those participating in such a system will not have a competitive disadvantage. In the long run, such a system should be advantageous to all actors involved and the general public as well, and a detailed assessment should be carried out to evaluate this.

4.2 Topic B: Multimodal management system

A multimodal management system should help make best use of the available transport resources, avoid or reduce congestion and react to different kinds of disruption. This is furthest developed in urban areas, where there is a direct interest to manage different modes of public transport in an efficient manner, especially if only one actor is involved.

The TRANSFORuM Roadmap highlights many possible steps that need to be taken in order to reach this subgoal. Some of the most important ones are:

- Management system operating on all geographic levels and data exchange between regions and countries are crucial to ensure seamless medium- and long-distance transport. Therefore, for cross-border transport, interfaces must be defined in order to provide relevant information to all users;
- Awareness that there may be no business case, unless it helps to increase efficiency of a particular network – but intermodal management systems are of high public value and the EU should support further development and implementation of these over the coming years;
- A perspective on specific corridors (i.e. a core network connecting Member States and regions) may be helpful as these are cases where multimodal management has a larger potential impact. These may also benefit from existing protocols between transport management institutions;
- Awareness that multimodal management may not be the most useful instrument to make the transport system more efficient (e.g. by encouraging modal shift). Instead, this can only happen if other improvements like better public transport infrastructure or the introduction of fair pricing across transport modes take place in parallel.

4.3 Topic C: Multimodal payment and ticketing system

Fare management is most complex when combining different modes and operators. How to deal with promotions, group discounts, weekly or monthly passes etc.? Many actors are involved in setting up a multimodal payment and ticketing system, e.g. customers, public transport authorities and operators and the payment industry. For the transport industry, the long-term advantages would be that services become more attractive to customers and should also lead to a reduction of costs. Integrated ticketing is beneficial for both daily commuters who have to use different modes of transport as well as those who have varying or less frequent/regular travel patterns.

Achieving these systems would mean changing many back-office processes. Public acceptance is very important, and the introduction of any new system will probably encounter resistance unless it is well-communicated. The awareness-raising related to privacy and security is also something to consider. In the field of ticketing, standards are already well-established, e.g. the ISO/IEC 24014-1 standards for fare management systems (implementation specification for the use of smart ticketing published in 2013) which is due to the high sensitivity of any payment and ticketing operation.

Of course, many problems remain: the distribution of collected fares among different operators might be one of the most challenging. But robust suggestions also exist about how progress can be made. The full version of the TRANSFORuM MIMP Roadmap contains 15 of them.

5 Considering different contexts across Europe: A perspective on Central and Eastern Europe

The current process of expanding the EU through the accession of a number of new Member States began in 2004. Countries in Central and Eastern Europe which were formerly under the regime of socialism wanted to join the project of European integration. To affiliate to the EU, a state needs to fulfil economic and political conditions. The transport sector is an important area for the national economies of Central and Eastern European countries, influencing virtually all domains of public and private life as well as the business sphere. It is a very financially demanding sector but at the same time it also contributes significantly to public budgets. This sector represents a necessary condition for improving the competitiveness of Central and Eastern European countries, as with the rest of Europe, mobility is a key part of modern life. Private and business travel has become possible and affordable for increasing numbers of people in the EU. Multimodal information is an important factor for smart and seamless door-to-door mobility. The potential societal, environmental and economic benefits of multimodal travel information and planning services are huge (European Commission, 2014).

Every state, every city has its own historical, geographical, socio-economic, demographic and business characteristics. That is why transport requirements are not the same everywhere – each region has its own requirements and priorities which fit with its distinct administration, institutions, organisation and planning. Local policies are influenced by both EU regulation and specific national legislation. Many cities are implementing systems utilising different MIMP elements, but they are not compatible with each other because they use different technologies, or are based on different formal and legal solutions (Catch-MR, 2012).

It is clear that MIMP systems are being developed at a very slow pace, in Central and Eastern European Member States, as well as in the rest of the EU, on the basis of voluntary coordination of key players and by means of incentive funds from public budgets. This allows defined strategies and transport policies to be met at both national and European level. This is long-term process which often exceeds the lifespan of the implemented systems.

There are not specific challenges that could be generally considered in relation to just new Member States or Central and Eastern European countries. Within Central and Eastern Europe we can find diverse public transport organisation. We can say that in a majority of these countries, public transport has a long history. In the Communist era public transport organisation worked quite well as there was no competition between carriers and central management

was applied. The subsequent privatisation of public transport has resulted in fragmentation into functional units.

Then there are systems where services are run by several competing companies. The resultant situation means that if you buy a train ticket, you have to know not only where and when you want to go, but also with which transport company. The tickets are valid only for one transport company and not necessarily for others. Also competition can lead to situations where connections do not function.

Such a complicated situation obviously causes problems for information as well. There are search engines that enable journey planning but often cannot provide information about transfer connections (although they may say that they do) and none of them have data from all carriers (such cases can also be found in Western countries).

On the other hand we can also find well-organised public transport within Central and Eastern Europe, for example in the Czech Republic where (urban) public transport still has a high modal share in comparison to EU-15 countries (Union of Passengers in Public Transport in Czech Republic, 2013). This success began with the development of integrated transportation systems at the beginning of the 1990s. Nowadays the individual systems, formally administrated by counties (municipalities), are integrated at various levels.

Generally we can say that within cities in most of Central and Eastern Europe, the public transport works and is organised very well – even from a MIMP point of view. After the privatisation of city public transport companies, a business model similar to a joint-stock company – where a city is the only shareholder – has often been applied. The reason for this is simple – such a small company is much more flexible than the city administration. We can find competition between carriers and reluctance for MIMP integration more in intercity or regional public transport.

6 European integration

It is assumed that eventually there will not be one European MIMP system but a number of systems, be it local, national and sometimes European, for either information, management and payment and ticketing or a combination of these. The essence of a future truly intermodal European system is in the interfaces, data formats and standards, security and privacy systems, defined minimum service levels and in general, a common understanding of what is being done and why. Such an approach must, however, reconcile contradictory interests.

As a first step there must be an agreement as to how far the integration of the different systems should go and what benefits can be achieved by this integration. Benefits must be examined both for the different actors and for the European transport system, and alongside the achievement of the White Paper goals in general. When looking at actors, the role of the public and private sector is extremely important. On the one hand they must cooperate to a certain extent; on the other hand they are in competition.

In the different areas of information, management and payments systems, this applies to varying degrees. One actor perhaps plays the most important role in speeding up integration – the traveller. As instant information and comfortable interfaces are seen as a minimum requirement nowadays, all actors in the transport sector must try to meet these expectations or otherwise lose potential customers. So when we talk about the willingness of actors to participate in integrated MIMP systems – whatever form these might have – this will soon not be a matter of choice, but of survival. At the same time the wider policy dimension must be considered, e.g. reduction of greenhouse gas (GHG) emissions, optimal use of infrastructure, maintaining a certain level of service, and so forth.

At the ITS European Congress Helsinki in June 2014 it was shown that there are already many projects implementing cross-border multimodal travel services, but in order to reach full interoperability and real cross-border solutions with existing services, international agreements are necessary to avoid the need for new middleware-platforms. If interoperability between services throughout Europe is to be achieved, this would require a central platform, with a central actor operating it.

Other approaches to achieving cross-border functionality include the standardisation of interfaces/protocols or the exchange of data among various regions or countries such as the EDITS project proposes. It

might be the case that total interoperability will be unachievable because of limited demand, relatively high cost to address organisational issues, and the necessity of multiple platform interfaces (ITS European Congress Helsinki 2014, 2014).

The figure below is designed to illustrate the multifaceted integration challenge. The TRANSFORuM Roadmap outlines a multitude of measures towards a framework for each sub-topic – information (**A**), management (**B**), and payment (**C**). This corresponds with the fact that it will not be possible to create a single all-encompassing system that fulfils the requirements of all three topics (see above).

However, the preparation (**1**) and creation (**2**) of systematic interfaces between the topics and systems must be kept in mind throughout the process – and this is where the measures proposed in the present section play their role. The current unsystematic and sometimes confusing practice of linking single systems needs to be overcome by agreements and a reasonable balance between cooperation and competition as outlined above. While the White Paper goal itself 'only' refers to establishing a framework until 2020, such constructive collaboration will allow for fully functional systematic links between information, management and payment systems to be made in the more distant future.

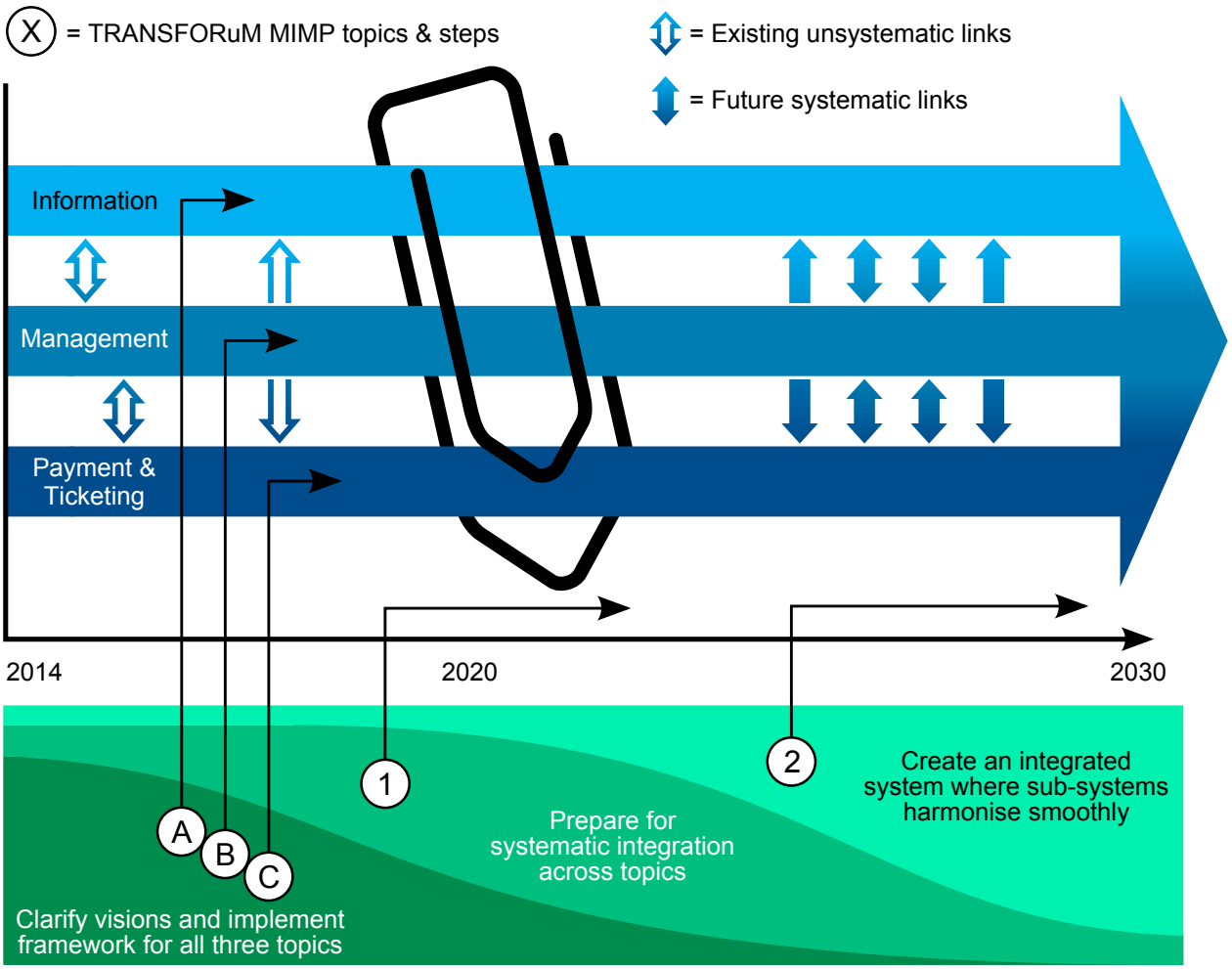

Figure1: Moving towards the White Paper MIMP goal

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ACRONYMS AND ABBREVIATIONS

GHG	Greenhouse gas
ITS	Intelligent Transport Systems
MIMP	Multimodal transport information, management and payment
PSI	Public sector information

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