Project DELTA

COORDINATED COORDINATION OF THE PROMOTION OF EFFICIENT MULTIMODAL INTERFACES

Coordination Action
Grant Agreement No: 218486

Comments: Kerstin, 2010-12-02, 2010-12-05

Deliverable D5.4

Recommendations for Future Policy Support and Research Needs

Version: Final
Date: October 2010
Dissemination level: Public
PROJECT INFORMATION

Title: Concerted coordination for the promotion of efficient multimodal interfaces

Acronym: DELTA

Grant Agreement no: 218486

Programme: 7th Framework Programme

Funding Scheme: Coordination Action

Start date: 1st January 2009

Duration: 24 months

Web site: www.delta-project.eu

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<th>No</th>
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<td>Centre d'Etudes Techniques de l'Equipement du Sud Ouest</td>
<td>CETE SO</td>
<td>France</td>
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Deliverable D4.3: Recommendations for Future Policy Support and Research Needs

**DOCUMENT PROFILE**

- **Document status:** Final
- **Deliverable code:** D5.4
- **Deliverable title:** Recommendations for Future Policy Support and Research Needs
- **Work Package:** 5
- **Preparation date:** October 2010
- **Submission date:** December 2010
- **Total pages:** 52
- **Dissemination level:** PU
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**Abstract:** The aim of this work and of the present document is to propose guidelines and recommendations for the European Commission and other research bodies and policy agencies towards policy-making, as well as to define future research priorities in the thematic area of seasonal variations of transport demand sustainable mobility.
EXECUTIVE SUMMARY

The main goal of the present document is to propose future research priorities and policy recommendations that will effectively address the knowledge gap in the field of seasonal traffic peaks. All of the project results and the gaps in the current knowledge, which have been identified in the process of achieving them, have been unified in this single document that includes proposed guidelines for the EC towards policy making and future research directions in the thematic area of mobility management and optimization of multimodal interfaces in regions with seasonal traffic peaks.

More specifically, all of the technical deliverables of the project have been reviewed focusing basically on the conclusions that have been drawn. As technical deliverables were considered all of the deliverables of the project, except the ones having to do with the project management or dissemination actions.

The consolidation of all the conclusions drawn throughout the course of the project led to the identification of several research needs and policy recommendations. As research needs were considered the identified missing “pieces” necessary to bridge the gaps in current knowledge and promote new research priorities and fields. On the other hand, as policy recommendations were considered several more direct mobility management measures that can be taken by policy agencies in order to improve their knowledge and effectively handle seasonal peaks in local communes and agglomerations.

All of the identified research needs and policy recommendations were thoroughly analyzed in terms of the way they were identified, the directions to which focus should be placed, the main goals to be achieved, as well as the involved target groups.
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1. **INTRODUCTION**

1.1. **Scope of the Document**

In the course of DELTA and in the process of trying to achieve the project objectives, a number of actions have been conducted by the partners in several related fields. This research often resulted in the expected outcomes, while in other cases gaps in existing knowledge were identified. In order to close these gaps it would be recommended to go deeper in specific fields, an action however, that is out of the scope of the project.

For this reason, the overall objective of this work is to provide the interested parties with recommendations and guidelines for future policy support and research needs. More specifically, the technical outcomes of the project have been used in order to identify gaps and possible thematic areas for future research regarding:

- Mobility management.
- Optimization of multimodal interfaces in regions with seasonal traffic peaks.

As far as the research needs are concerned, the goal is to spot missing “pieces” so as to bridge the gaps in current knowledge and to promote new research priorities. These research needs and priorities may be addressed by entities promoting research, such as the European Commission, as possible topics for future calls for research, while they will also be dealt with by organizations, universities and even industries that actually conduct research in order to meet the identified needs and take current knowledge to the next level.

On the other hand, the policy recommendations will concern more direct mobility management measures that can be taken by policy agencies in order to improve their knowledge and effectively handle seasonal peaks in local communes and agglomerations. This can be achieved through the identified research needs and other suggestions related to data availability, legislation to promote standardization, education on specific tools, and many others. The recommendations will be based on the outcomes of the project and will have as a target group, transport planners, local authorities, decision makers, etc.

The two above mentioned components are not necessarily separate, but should rather be considered as connected to one another. This is because the research needs may lead to certain policy recommendations if and when they have provided concrete and ready for use results, while on the other hand, policy objectives may and probably will generate new research priorities.
1.2. Targeted Audience

The recommendations for future policy support and the research needs identified in the present document will have as a target audience several entities and organizations, which actually conduct research and can use these guidelines in different ways.

The most important of these entities are:

A. The European Commission, which can:
   - Include the identified future research directions and needs as topics in the Work Programme for transport of future calls;
   - Update the Urban Mobility Action Plan or other action plans of related topics with the identified needs.

B. International Research Organizations, such as TRB, ECTRI, ERTRAC, etc. These organizations often formulate strategic research agendas, which could be enriched and updated with the findings of the present deliverable and more specifically with the research needs that will be identified.

C. Other research entities, such as Institutes, Research centers, Universities, etc. These entities are generally interested in the research field of mobility management and they participate in numerous research projects. They could be therefore interested in the research work implemented in DELTA in order to prepare for future proposals as well for future projects.

D. Policy oriented entities, such as governmental agencies, tourism operators, transport planners, etc., which can explore and potentially adopt the policy recommendations targeting to a sustainable mobility environment in the local touristic areas.

E. International Associations, such as UITP, which may examine the mass transit mobility schemes that can be applied in touristic areas.

The above target groups have different views, needs and priorities related to the subject of mobility management and seasonal traffic peaks. The particularities of the target groups have been examined when deriving the research priorities and policy recommendations, and a mapping process has been done relating the research needs and policy recommendations against the above target groups.

1.3. Structure of the deliverable

Apart from the present introductory chapter, the deliverable includes four more chapters. In the second chapter, the overall approach followed throughout the document in order to identify research needs and policy recommendations is described, along with an overview and classification of the findings of the DELTA project based on their type of content and targeted
audience. Following, the conclusions drawn throughout the whole project are presented, together with the research needs and the policy recommendations identified based on these conclusions.

In the third chapter, the future research needs that were mentioned in the previous chapter are thoroughly analyzed, whereas in chapter four, the same happens for the identified policy guidelines.

In the fifth and final chapter, some concluding remarks have been included summarizing all of the above.
2. **OVERVIEW OF THE DELTA RESEARCH RESULTS AND FINDINGS**

2.1. **Approach and source of information**

In order to identify research needs and to give policy guidelines, all of the work done in the course of the project and basically the conclusions that have been drawn were reviewed. This refers only to the technical part and not the outcomes of other actions such as dissemination or management. All the deliverables were reviewed in order to identify gaps and needs for future research.

More specifically, the work was done in three steps, as can be seen in Figure 1 below. The three steps are also described below.

![Figure 1: Overall approach](#)

**Step1: Review of work conducted in the technical work packages**

At this point, the technical deliverables were reviewed in order to derive the needs for further research or the potential policy recommendations. Focus was placed more on the interesting conclusions that have come up and less on the actual methodology that was followed in the various tasks of the project. Not all of the deliverables that have been created in the course of the project were reviewed, as for example deliverables having to do with dissemination or management of the project don’t have, in this case, anything to offer. Therefore, the deliverables that were analyzed are the ones listed in Table 1 below:
Table 1: List of Deliverables reviewed

<table>
<thead>
<tr>
<th>Code</th>
<th>WP</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>D2.1</td>
<td>2</td>
<td>State-of-practice in seasonal demand management</td>
</tr>
<tr>
<td>D2.2</td>
<td>2</td>
<td>Methodology of variables to be collected and data collection methods</td>
</tr>
<tr>
<td>IR2.1</td>
<td>2</td>
<td>Data collection report from participating regions</td>
</tr>
<tr>
<td>IR2.2</td>
<td>2</td>
<td>Data collection report from additional regions</td>
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<tr>
<td>D2.3</td>
<td>2</td>
<td>Knowledge base of regions with seasonal varying demand profiles</td>
</tr>
<tr>
<td>D3.2</td>
<td>3</td>
<td>Framework of mobility schemes</td>
</tr>
<tr>
<td>D3.3</td>
<td>3</td>
<td>Benchmarks handbook</td>
</tr>
<tr>
<td>D4.2</td>
<td>4</td>
<td>Final Decision Support Instrument</td>
</tr>
<tr>
<td>D4.3</td>
<td>4</td>
<td>FRAME extension to seasonal varying transport demand functions</td>
</tr>
<tr>
<td>D5.1</td>
<td>5</td>
<td>External Research Stakeholders Forum Proceedings</td>
</tr>
</tbody>
</table>

**Step 2: Analysis of the results**

The results that were reviewed in the previous stage were analyzed and further expanded in terms of gaps in knowledge and needs for further research. With the word "gaps" is meant that, the research conducted during the DELTA Project concluded that for some specific topics of specific sectors the current knowledge is not enough in order to deal with specific existing problems. Therefore, further research is considered essential. These gaps comprise the future research needs and requirements for policy guidelines.

**Step 3: Identification of policy guidelines and research needs**

The above mentioned analyzed results led to the identification of policy guidelines and future research needs. For example, the gap in the existing knowledge regarding the handling of seasonal traffic peaks, consequently lead to the identification of the need for further research in the thematic area of handling of seasonal traffic peaks. On the other hand, the missing data for the concrete analysis of the existing situation in touristic regions led to recommendations to local authorities or responsible statistical agencies indicating the exact data that should be collected, in what time basis and also, what kind exactly of data processing should be conducted.
2.2. Overview and classification of the DELTA results

In the course of the DELTA project, several outcomes/results have been achieved that can be classified based on their targeted audience as well as based on their type of content. In Table 2 below the results achieved so far have therefore been classified with respect to the following targeted audiences:

- European Commission
- International Research Organizations
- International Associations
- Policy oriented entities
- Other research entities (Institutes, Research centers, Universities, etc.)

and to the following types of content:

- Data
- Methodology
- Networking and coordination
- Tools

The aim of this table is to provide a consolidated overview of the DELTA results relevant to the purpose of the analysis that follows.
<table>
<thead>
<tr>
<th>No</th>
<th>Origin WP</th>
<th>Description</th>
<th>Targeted audience</th>
<th>Type of content</th>
</tr>
</thead>
</table>
| 1  | 2         | State-of-practice in seasonal demand management                              | • International research organizations  
   • International Associations  
   • Other research entities  
   • Policy oriented entities | Data                                                                        |
| 2  | 2         | Data collection methodology                                                  | • International research organizations  
   • International Associations  
   • Other research entities | Methodology                    |
| 3  | 2         | Knowledge base of regions with seasonal varying demand profiles             | • European Commission  
   • International research organizations  
   • International Associations  
   • Other research entities | Data                                                                        |
| 4  | 3         | Classification of regions with seasonal varying transport demand profile    | • International research organizations  
   • International Associations  
   • Other research entities | Methodology                    |
| 5  | 3         | Framework of Mobility schemes                                               | • International research organizations  
   • International Associations  
   • Other research entities  
   • Policy oriented entities | Data                                                                        |
<table>
<thead>
<tr>
<th>No</th>
<th>Origin WP</th>
<th>Description</th>
<th>Targeted audience</th>
<th>Type of content</th>
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</thead>
</table>
| 6. | 3         | Benchmarks handbook                                   | • International research organizations  
• International Associations  
• Other research entities  
• Policy oriented entities | Data                                     |
| 7. | 4         | Validated Decision Support Instrument                 | • European Commission  
• International research organizations  
• International Associations  
• Other research entities  
• Policy oriented entities | Tool                                     |
| 8. | 4         | FRAME extension to seasonal varying transport demand functions | • International research organizations  
• International Associations  
• Other research entities | • Methodology  
• Tool  
• Networking and Coordination |
| 9. | 5         | Establishment of an External Research Stakeholders Forum | • European Commission  
• International research organizations  
• International Associations  
• Other research entities  
• Policy oriented entities | • Methodology  
• Networking and Coordination |
<table>
<thead>
<tr>
<th>No</th>
<th>Origin WP</th>
<th>Description</th>
<th>Targeted audience</th>
<th>Type of content</th>
</tr>
</thead>
</table>
| 10.| 5         | DELTA Network (Network of European target cities)                | - International research organizations  
                 - International Associations  
                 - Other research entities  
                 - Policy oriented entities  | Networking and Coordination        |
| 11.| 6         | DELTA Project website                                            | - European Commission  
                 - International research organizations  
                 - International Associations  
                 - Other research entities  
                 - Policy oriented entities  | Networking and Coordination        |
| 12.| 6         | DELTA Project final dissemination conference                     | - European Commission  
                 - International research organizations  
                 - International Associations  
                 - Other research entities  | Networking and Coordination        |
2.3. Description of results

In the sections that follow the review of each one of the deliverables mentioned in section 2.1 is presented.

2.3.1. Structure

In order to achieve homogeneous results, a template was created, based on which the review was conducted. This template includes the following fields:

- **Code and title**
- **Brief abstract**: A short summary of the document mentioning its specific objectives.
- **Main results and conclusions**: The most important results of the work accomplished and reported in the specific deliverable are mentioned here. These results have been elaborated in order to show how they lead to the identification of new research priorities and policy recommendations.
- **Future research needs**: Very brief description of the identified needs; their thorough description is presented in the relevant chapter 3.
- **Policy recommendations**: Very brief description of the recommendations; their thorough description is presented in chapter 4.

2.3.2. Review of D2.1: State-of-practice in seasonal demand management

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>D2.1 State-of-practice in seasonal demand management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brief abstract</strong></td>
<td>D2.1 documents the results of the wide inventory and the in-depth analysis of previous and ongoing European R&amp;D projects and other international initiatives addressing the theme of transport demand management. A list of 79 projects and initiatives was reviewed for their relevance to DELTA, while 16 of them with medium and high relevance to DELTA were further analyzed. Innovative approaches, mobility management measures, pilot applications and their results were examined. The most important results and findings of this deliverable have been used as input to other deliverables.</td>
</tr>
<tr>
<td><strong>Main results and conclusions</strong></td>
<td>The main outcome of the deliverable was the collection of a wide range of results from previous projects (79). The projects were divided into relevant and not-relevant, in terms of conclusions, with the DELTA project objectives. Thus only relevant projects (16) were further analyzed. The main results include the following:</td>
</tr>
</tbody>
</table>
The issue of mobility management has been extensively addressed by many projects and initiatives and at different levels.

No projects were found directly addressing the problem of handling seasonal traffic peaks, while few projects have examined seasonality from a peripheral perspective and only marginally.

There is a gap in existing knowledge (practice and research) on the issue of handling seasonal variations of transport demand.

It was noted that there have been isolated initiatives and actions taken locally in some touristic regions to address seasonal mobility issues. These attempts are totally isolated without any scientific foundation or evaluation, without the support of a national mobility plan and without long term perspectives.

From the above, the main conclusions drawn are:

- There is a gap in both research and practice on the issue of handling seasonal variations of transport demand.
- The existence of a mobility management guidebook adapted to the needs of these regions is considered helpful.
- Existence of a network of regions for sharing experiences and knowledge could be of major assistance.

### Identification of future research needs

1. Implementation of a Best-Practice into one or more touristic regions affected by seasonal transport demand in order to study the full process of analysis, design and implementation of the mobility scheme regions.
2. Impact analysis of Mobility Measures for touristic areas.
3. Definition of an evaluation methodology for effective Benchmarking.

### Identification of policy recommendations

The implementation of mobility schemes/best practise may require policy support in terms of ambitions to improve conditions in cooperation between stakeholders...

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**2.3.3. Review of D2.2: Data Collection Mechanism (DCM)**

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>D2.2 Data Collection Mechanism (DCM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief abstract of the Deliverable</td>
<td>The aim of the Data Collection Mechanism (DCM) was to support the data collection activity in the DELTA project. The purpose of the mechanism was to ensure that the data collection activity would meet the requirements of the consecutive analyses and the development of the Decision Support Instrument (DSI).</td>
</tr>
<tr>
<td>Main results and</td>
<td>The DCM included instructions and templates for collection of</td>
</tr>
</tbody>
</table>
### Conclusions of the Deliverable

Both quantitative and qualitative data in order to meet the overall aim of the DELTA project. The DCM ensured that the data and information that was collected from 23 different tourist regions were of the same format in order to meet the requirements of the consecutive tasks.

All data and information was structured into four categories (Region characteristic, Seasonal characteristic, Transport infrastructure and Transport system) and were entered into a structured Knowledge base. This database was used as one basis for the subsequent work with classification of cities, identification of Mobility schemes and finally the definition of the Decision Support Instrument (DSI).

The instructions and templates produced in D2.2 included a large number/amount of quantitative (numerical) and qualitative (descriptive) data since it is not well known which characteristics of tourist regions are the most relevant for the understanding of traffic peaks as well as the analysis and identification of measures to reduce these seasonal peaks.

### Identification of Future Research Needs

Better knowledge is required about which characteristics of tourist regions are the most relevant for:

1. The understanding of seasonal traffic peaks.
2. The understanding of the transport system.
3. The analysis and identification of measures and Mobility schemes to reduce seasonal traffic peaks in specific regions.

In particular, the theoretical basis for the understanding of these issues and relations is very weak and needs further development. A theoretical basis is required in order to improve the possibilities to develop knowledge that can be generalised and in this case to identify which conditions are required for the application and effect of different measures and mobility schemes.

### Identification of Policy Recommendations

Policy recommendations to support these research needs could for example be the development of policies that focus on sustainable tourism research.

### 2.3.4. Review of IR2.1: Data Collection Report from Participating Regions

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>IR2.1 Data collection report from participating regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief abstract of the Deliverable</td>
<td>This document provides the data collected in the seven European regions participating in the DELTA project and additional provisional analysis of the collected, both quantitative and qualitative, data. The experiences drawn from the data collection activity are also reported. All quantitative and qualitative contributions of the data</td>
</tr>
</tbody>
</table>
acquisition activity were consolidated in a Knowledge base (database).

**Main results and conclusions of the Deliverable**

The main conclusions that came up from the data collection in the participating regions are the following:

- Several problems were encountered during the data collection activity due to the lack of data as well as to the different ways in which data was collected in each region and country.
- The time frame also proved to be a problem as the partners had to collect a lot of information from many different organizations in a limited period of time.
- Another problem was the reluctance of people in the organizations to give data.
- The data analysis has highlighted the need for specific information on area accessibility and of maximum capacity in terms of vehicles per hour of both the main access roads to the region and of the internal roads. This information, compared with the flux of the peak period is able to furnish a measure of the degree of the congestion of each region.
- Finally, the methodological approach used seems to be very effective and the list of quantitative variables well arranged.

**Identification of future research needs**

Establishment of a common methodology for data collection and analysis so as to have available the necessary data in order to solve the problem of seasonal traffic variations.

**Identification of policy recommendations**

Establishment of easier and more effective procedures for the provision of data from responsible organizations to researchers and transport planners.

### 2.3.5. Review of IR2.2: Data collection report from additional regions

**Deliverable**

IR2.2 Data collection report from additional regions

**Brief abstract of the Deliverable**

This document describes the work carried out in the data acquisition activity from additional regions. The main objective of the activity was to collect data and information from 16 additional regions in order to complement the data from the participating regions.

The methodology for the data collection was defined in Deliverable D2.2 Data Collection Mechanism (DCM). The data of each region was collected by one or more local partners. The data originates from public or private databases, as well as stakeholders interviews, etc. All quantitative and qualitative contributions of the data acquisition activity were collected in
Main results and conclusions of the Deliverable

A large quantity of data for the regions in the DELTA project and the additional regions (in total 23 regions) were collected. In total, 228 quantitative variables and 76 qualitative variables were collected. The data originates from public or private databases as well as stakeholders interviews.

One of the most important conclusions was that for several of the chosen variables it was either very difficult or even impossible to get the data. The missing variables differ from region to region and from country to country thus making the comparison between the regions very difficult. Some missing variables were, however, the same. For certain regions even the data for road transport such as the number of car trips during high season and low season, number of rented bicycles, number of bus trips, bus capacity, bus load factor and traffic volumes of cars could not be acquired.

For other regions missing data regarded demand, as for example the number of visitors, the medium age and gender. Both the data of the road transport and the data regarding the demand are important in solving the problem with high seasonal demand.

Identification of future research needs

Establishment of a common methodology for data collection and analysis so as to have available the necessary data in order to solve the problem of seasonal traffic variations.

Identification of policy recommendations

Common methodology for data collection and analysis.

2.3.6. Review of D2.3: Knowledge base of regions with seasonal varying demand profiles

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>D2.3 Knowledge Base of regions with seasonal varying demand profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief abstract of the Deliverable</td>
<td>The Knowledge Base (Access database) is one of the key outcomes of the DELTA project. It contains information to be used by the work packages that follow, such as the classification of regions, the framework of mobility schemes and the definition of the Decision Support Instrument (DSI). Indicative data that are included are factors and variables that affect the variability of transport demand, the characteristics of the cities, local policies and measures of mobility management, etc. All data and information was structured into four categories (Region characteristic, Seasonal characteristic, Transport infrastructure and Transport system).</td>
</tr>
<tr>
<td>Main results and conclusions of the Deliverable</td>
<td>The Knowledge base contains quantitative and qualitative data compiled to meet the overall aim of the DELTA project.</td>
</tr>
</tbody>
</table>
Deliverable D4.3: Recommendations for Future Policy Support and Research Needs

Deliverable
The database was used as one basis for the subsequent work with classification of cities, identification of Mobility schemes and finally the definition of the Decision Support Instrument (DSI).

The Knowledge base included a large number/amount of quantitative (numerical) and qualitative (descriptive) data, since it is not well known which characteristics of tourist regions are the most relevant for the understanding of traffic peaks and the analysis and identification of measures to reduce these seasonal peaks.

Identification of future research needs
Better knowledge is required about which characteristics of tourist regions are the most relevant for:

1. The understanding of seasonal traffic peaks and
2. The analysis and identification of measures and Mobility schemes to reduce seasonal traffic peaks.

Identification of policy recommendations
More priority on sustainable tourism research.

2.3.7. Review of D3.2: Framework of mobility schemes

Deliverable
D3.2 Framework of mobility schemes

Brief abstract of the Deliverable
The report describes 46 mobility schemes identified in the DELTA project that can be applied to regions with seasonal variations of transport demand in order to reduce the effects of traffic peaks. A brief overview of the work done to develop the framework of mobility schemes is also provided.

Main results and conclusions of the Deliverable
Results:
- Term “mobility scheme” has been defined
- Consolidates 46 mobility schemes and 20 policy and strategy measures
- The mobility schemes presented go beyond the traditional mobility schemes, they also include measures related to organization, policy, information awareness and infrastructure
- Provides information that facilitates better understanding and future implementation potential of the schemes
- Includes important variables and conditions that are essential in both implementing the mobility schemes in the best way but also to provide important details of the schemes
- Provides best practice examples for each mobility scheme
- Provides the basis data for the DSI database

Conclusions:
Deliverable D4.3: Recommendations for Future Policy Support and Research Needs

- Very few dedicated mobility schemes for seasonal peaks are available
- Besides the mobility schemes, policy measures also need to be implemented
- Very often there is no detailed information available for best practice examples (e.g. benchmarks and indicators reached costs of the measure etc.)

| Identification of future research needs | 1. Benchmarks for mobility schemes  
| 2. Establishment of a common methodology for the general description of mobility schemes (benefits, effects etc.) for regions with different starting position and framework conditions  
| 3. Identification of rural best practice examples regarding seasonal demand in transport / seasonal traffic peaks  
| 4. Details of best practice examples (target group, reason for implementing the scheme etc.) are necessary  
| 5. Establishment of methodologies for the marketing of the mobility schemes by the regions |

| Identification of policy recommendations | Dissemination and acceptance of mobility schemes |

2.3.8. Review of D3.3: Benchmarks handbook

| Deliverable | D3.3 Benchmarks Handbook for mobility schemes addressing regions with high seasonal transport demand |
| Brief abstract of the Deliverable | The handbook provides guidance on mobility schemes and strategies for regions with seasonal variations of transport demand. Benchmarks for sustainable mobility are described based on ten thematic areas, such as change in car use, public transport use, and bicycle use as well as shift to off-peak and change in CO2 emissions. For each thematic area, feasible mobility schemes are presented based on a review of previous R&D projects and best practices successfully implemented in various regions across Europe are described. |
| Main results and conclusions of the Deliverable | The Benchmarks Handbook presents only examples (cases) which have been evaluated and are considered to be reliable. In the benchmarks review, 244 examples (cases) from 16 comprehensive R&D projects have been analysed. 99 of them were considered to be reliable. However, only six of the 244 also involved quantitatively evaluated values for the benchmarks. For most cases, estimations of effects in terms of either decrease or increase are the only information. Almost all of the analysed reliable examples (cases) were related to decrease in car use (94 of 99 cases) and local public transport use (85 of 99 cases). 47 of 99 cases were
related to railway use and 35 of 99 to bicycle use. No effects were found for change in waterway and airway use as well as for costs. Thus, one important conclusion from the Benchmarks Handbook is that evaluated implementations of mobility schemes are rare, especially in the field of seasonal transport demand. Furthermore, a mobility scheme is often implemented together with other mobility schemes, as for example simultaneously improving public transport and implementing restrictions for individual motorized vehicles, marketing strategies, etc. The isolated effect for each mobility scheme is therefore difficult to estimate in such package measures. Another issue to consider is that benchmarks generally originate from projects implemented in urban areas and more seldom in a rural or regional context. Benchmarks also originate from projects implemented in countries around Europe with different and inhomogeneous boundary conditions. These are all issues to be considered when comparing results.

**Identification of future research needs**

1. Development of support for the evaluation of mobility projects addressing seasonal transport demand. / Evaluation methods of implementation strategies.
2. Ways to raise awareness on the importance of proper evaluation of mobility projects.
3. Ways to estimate isolated effects for each mobility schemes implemented simultaneously with other mobility schemes.
4. Ways to facilitate comparability between various contexts (e.g. urban and rural) and countries/regions.
5. Benchmarks covering all transport modes – research on waterway and airway use.
6. Characteristics of the typical tourist and visitor / Identification of preconditions and preferences of tourists.

**Identification of policy recommendations**

1. Development of a comprehensive approach on implementation - improvements, restrictions and marketing.
2. Promotion of mobility schemes by proper marketing strategies.
3. Identification of key actors (municipality/city/region, tourist associations, travel agencies, hotels and other tourist businesses, public transport operators/authorities, bike rental companies and other local companies) and establishment of cooperation.

### 2.3.9. **Review of D4.2: Final Decision Support Instrument (DSI)**

| Deliverable | D4.2 Final Decision Support Instrument (DSI) |
**Brief abstract of the Deliverable**

The actual outcome of the specific topic is the final validated version of the DELTA Decision Support Instrument (DSI). The scope of the deliverable is to present the DSI, including the validation procedure and to consolidate all the modifications and improvements proposed for towards the final version of the DSI.

The validation procedure took place in the following 4 steps:

- Evaluation of the mobility schemes and roadmaps proposed by the DSI. This step took place in 50 different touristic regions;
- Rating of all the mobility schemes. This step took place in 28 touristic regions;
- Sensitivity analysis. During this step the sensitivity of the outcome of the system was examined against all variables and their values. 4 different metrics were calculated in total;
- The fourth and final step of the validation included the analysis and elaboration of the results of the previous 3 steps as well as the identification of corrective actions to improve the DSI.

**Main results and conclusions of the Deliverable**

The goal of the DSI is to assist local transport and other agencies of regions with seasonal varying transport demand profiles in the selection of the most appropriate, in each case, mobility scheme (or combination of schemes) in order to manage this demand in a sustainable way. The instrument does not terminate its use at the point of the selection of the mobility scheme, but it also provides implementation guidelines and target values of various transportation, environmental and other elements that shall be achieved after the implementation of the proposed solution (i.e. mobility schemes).

The DELTA DSI is comprised by several databases and logical statements and constraints, which result in the identification and suggestion of the most appropriate mobility schemes according to the users’ inputs.

The DSI was well accepted by the stakeholders who participated in the testing and validation procedure;

- Some uncertainties were reported by the participants in terms of the values to be selected. These were mostly identified in Step 1 of the DSI and included the definition of the region extend;
- Better explanations should be provided for some variables.

The validation derived very useful comments, suggestions for improvement and errors. The majority of these have been incorporated in the final version of the system. Some of the most important ones are:

- Include an explanation for the ‘region’ extend, before the user actually starts to use the DSI, preferably at the ‘Use the DSI’ section and at the ‘DSI info’ section.
- Provide a better description of necessary data in order to
Deliverable D4.3: Recommendations for Future Policy Support and Research Needs

<table>
<thead>
<tr>
<th>Identification of future research needs</th>
<th>Identification of policy recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Further investigation of seasonal characteristics, in order to better integrate them in the DELTA DSI and provide better results according to the local seasonal aspects.</td>
<td>1. Integration of the DSI in the planning processes of a region with seasonal traffic peaks.</td>
</tr>
<tr>
<td>2. Updated version of the DELTA DSI, which will include capabilities to receive and integrate the feedback of the end user and will thus form an autonomous, intelligent and self-updating system.</td>
<td>2. Seminars/workshops for getting technical departments of regions with seasonal traffic peaks acquainted with the DSI.</td>
</tr>
<tr>
<td>3. Extend the capabilities of the DELTA DSI, in order to provide concrete outputs, taking into account the exact local needs and characteristics, with the provision of tangible and quantified benefits.</td>
<td>3. Support the use of intelligent Decision Support Instruments for policy makers.</td>
</tr>
<tr>
<td>4. Include a description of the DSI computational logic in the final results/outputs, in the form of a justification of the selected mobility schemes, in order to better facilitate the openness of the system and prevent the users from handling the system as a black box.</td>
<td></td>
</tr>
<tr>
<td>5. Further development and research on end-user needs.</td>
<td></td>
</tr>
<tr>
<td>6. Further development and research on user friendliness and acceptance of Decision Support Instruments.</td>
<td></td>
</tr>
<tr>
<td>7. Integration of the DSI in the current transport planning processes.</td>
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</tbody>
</table>

2.3.10. Review of D4.3: FRAME extension to seasonal varying transport demand functions

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>D4.3 FRAME extension to seasonal varying transport demand functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief abstract of the Deliverable</td>
<td>The deliverable on the FRAME extension for seasonal varying transport demand provides input to the European Architecture in order to include the functions and requirements that have been captured during the analysis of the mobility schemes of the Delta Project.</td>
</tr>
</tbody>
</table>
The deliverable provides recommendations for extending FRAME including those aspects of the mobility schemes that have an impact on the functional structure of the Architecture.

### Main results and conclusions of the Deliverable

FRAME has been designed to represent the expectations of mobility towards the design of ITS systems. FRAME also defines the Functional Architecture that allows the implementation of the users’ needs. During the analysis of the mobility schemes it was evaluated that the European Architecture, although it was designed having a long range perspective, is more focused on classical transport means. The request for more sustainable transport systems requires the remodelling of the architecture so as to include in more detail the opportunities behind old and new transport means. FRAME should therefore be extended to:

- more precisely model the sustainable transport mobility schemes, such as bike sharing, bike rental, car pooling and car sharing,
- include the existing relationship among accommodation and attraction management, allowing thus the modelling of the specific touristic related mobility requirements, and
- allow the management of the effect of the touristic demand directly from demand originating areas and to the touristic demand affected areas, to obtain a more sustainable mobility solution.

### Identification of future research needs

1. FRAME extension with reference to the new requirements as well as considering the provision of more accurate description of mobility solutions.
2. DSI and European Architecture – Extension of the DSI and of FRAME so as to allow a smooth process from measure selection based on region characteristics to the definition of the appropriate solution.
3. Normative and standardized framework for European Architecture to support minor/touristic regions.

### Identification of policy recommendations

1. Definition of an association to support specification adaptation and standardization, normative specification and adaptation of mobility schemes interfaces for touristic regions.
2. Setting-up of a table for normative road map definition at European and national level for local administration and touristic sector.
3. Setting-up of a table for specification/standardization road map definition at European level for local administration.
4. Setting-up of a certification process for existing standards and future one.
# 2.3.11. Review of D5.1: External Research Stakeholders Forum (ERSF) and Local Stakeholders Forums (LSF) Proceedings

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>D5.1 External Research Stakeholders Forum (ERSF) and Local Stakeholders Forum (LSF) Proceedings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brief abstract of the Deliverable</strong></td>
<td>This deliverable includes the proceedings of the External Research Stakeholder Forum (ERSF) workshop held in Graz, Austria, on the 5th of May 2010 where selected experts from all over Europe participated in order to evaluate the main result of the DELTA project. This report reflects some main discussions and feedback received regarding the outcomes of the project and especially the DSI and the mobility schemes associated to the DSI. Furthermore, this report includes the comments received at the seven Local Stakeholder Forums (LSF workshops) held in the DELTA participating regions. The purpose of these workshops was similar to the ERSF, but with different target groups.</td>
</tr>
</tbody>
</table>
| **Main results and conclusions of the Deliverable** | - The DSI was considered a good collection of know-how and best practice exchange.  
- Most of the mobility schemes included in and suggested by the DSI were rated as relevant with the issue of seasonal varying transport demand by the experts.  
- The mobility schemes should be better described. This was actually done and the new descriptions have been incorporated in the DSI.  
- Many mobility schemes are very interesting and important, but the issue of information awareness of tourists on these measures should be widely promoted. |
| **Identification of future research needs** | 1. Transferability of the DSI in urban environments and cities.  
2. Further investigation on the tourist mobility patterns in the various regions / More detailed research is required regarding tourists.  
3. Investigation of the pre-conditions necessary for the implementation of each proposed mobility scheme.  
4. Forecasting of transport demand for touristic places (e.g. weather dependent); better / more data for prediction is required to apply ad-hoc mobility schemes.  
5. Identification of additional mobility schemes and best practice examples.  
6. Mapping of measures against tourist types in the regions (long term / short term, families, backpackers...).  
7. Further research on the topic of seasonal transport peaks.  
8. Implementation of behaviour change measures in countries with excessive car-dependent lifestyle in order to assist the success of mobility schemes.  
9. Further investigation of new social networks (e.g. Facebook) in order for them to act as tools providing real time information successfully to the relevant target groups. |
10. The DSI was seen as a good collection of know how; therefore there is a clear need to update the results constantly.

| Identification of policy recommendations | 1. More awareness campaigns and implementation measures should be funded to allow implementation and marketing of sustainable mobility offers to tourists.  
2. In education, a focus should be laid on soft measures (e.g. MM) not only on “infrastructural measures”. |

2.4. **Overview of research needs and policy recommendations**

The following two tables consolidate the research priorities and policy recommendations, as derived from the above review of the DELTA results. They are presented in two levels: topic and sub-topic.
### Table 3: Final list of identified research priorities

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
<th>Origin Deliverable(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topic 1. The understanding of seasonal traffic peaks</strong></td>
<td></td>
<td>D2.2, D2.3, D5.1</td>
</tr>
<tr>
<td>Subtopic 1.1. Establishment of a common methodology for the collection and analysis of data necessary for the understanding and dealing with seasonal traffic variations</td>
<td></td>
<td>IR2.1, IR2.2</td>
</tr>
<tr>
<td>Subtopic 1.2. Data methods to facilitate comparability between various contexts (e.g. urban and rural) and countries/regions</td>
<td></td>
<td>D3.2, D3.3</td>
</tr>
<tr>
<td>Subtopic 1.3. Identification of the characteristics of the typical tourist (age, sex, preference, preconditions for travelling, etc.) - Mapping of measures against tourist types in the regions (long term / short term, families, backpackers...)</td>
<td></td>
<td>D3.3, D5.1</td>
</tr>
<tr>
<td>Subtopic 1.4 Forecasting of transport demand for touristic places (e.g. weather dependent); better / more data for prediction is required to apply ad-hoc mobility schemes</td>
<td></td>
<td>D5.1</td>
</tr>
<tr>
<td><strong>Topic 2. Analysis of Mobility Schemes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtopic 2.1. Impact analysis of Mobility Measures for touristic areas implemented either as stand-alone measures or in combination with others</td>
<td></td>
<td>D2.1, D2.2, D2.3, D3.3</td>
</tr>
<tr>
<td>Subtopic 2.2. Identification and analysis of mobility schemes to reduce seasonal traffic peaks for specific types of regions, examining accessibility to and from the region and relevant to all modes of transport (including air and waterway)</td>
<td></td>
<td>D2.1, D2.2, D2.3, D3.2, D3.3, D5.1</td>
</tr>
<tr>
<td>Subtopic 2.3. Investigation of the preconditions necessary for the implementation of each proposed mobility scheme</td>
<td></td>
<td>D2.1, D2.2, D2.3, D3.2, D3.3, D5.1</td>
</tr>
<tr>
<td>Subtopic 2.4. Definitions of methods for the effective marketing of mobility schemes in the target regions</td>
<td></td>
<td>D3.2</td>
</tr>
<tr>
<td>Subtopic 2.5. Establishment of a common methodology for the effective benchmarking of mobility schemes implemented in regions facing seasonal traffic peaks</td>
<td></td>
<td>D2.1, D3.2, D3.3</td>
</tr>
<tr>
<td><strong>Topic 3. Implementation of a Best-Practice into one or more touristic regions affected by seasonal transport demand in order to study the full process of analysis, design and implementation of the mobility scheme</strong></td>
<td></td>
<td>D2.1</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td><strong>Origin Deliverable(s)</strong></td>
<td></td>
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<tr>
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<td></td>
</tr>
<tr>
<td><strong>Topic</strong></td>
<td><strong>4. Tools for (seasonal) mobility management</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Subtopic</strong></td>
<td>4.1 Development of a tool (such as the DELTA DSI) for urban environments</td>
<td></td>
</tr>
<tr>
<td><strong>Subtopic</strong></td>
<td>4.2. Development of a tool (such as the DELTA DSI) which will include capabilities to receive and integrate the feedback of the end user and will thus form an autonomous, intelligent and self-updating system</td>
<td></td>
</tr>
<tr>
<td><strong>Topic</strong></td>
<td><strong>5. Further investigation of new social networks (e.g. Facebook) in order for them to act as tools providing real time information successfully to the relevant target groups</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Topic</strong></td>
<td><strong>6. ITS Applications</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Subtopic</strong></td>
<td>6.1. FRAME extension with reference to the new requirements as well as considering the provision of more accurate description of mobility solutions</td>
<td></td>
</tr>
<tr>
<td><strong>Subtopic</strong></td>
<td>6.2. DSS and European Architecture – Development of a DSS such as the DELTA DSI and extension of FRAME so as to allow a smooth process from measure selection based on region characteristics to the definition of the solution</td>
<td></td>
</tr>
<tr>
<td><strong>Subtopic</strong></td>
<td>6.3. Normative and Standardization framework for European Architecture to support minor regions</td>
<td></td>
</tr>
</tbody>
</table>
Table 4: Final list of identified policy recommendations

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
<th>Origin Deliverable(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic 1. Data collection guidelines</td>
<td>Subtopic 1.1. Establishment of easier and more effective procedures for the provision of data from responsible public organizations to researchers and transport planners.</td>
<td>IR2.1</td>
</tr>
<tr>
<td>Topic 1. Data collection guidelines</td>
<td>Subtopic 1.2. Concrete guidelines on what data and in what way should be collected so as to be able effective solutions to the problem of seasonal traffic peaks.</td>
<td>IR2.2</td>
</tr>
<tr>
<td>Topic 2. Marketing of mobility schemes</td>
<td>Subtopic 2.1 Promotion of mobility schemes by local agencies with proper marketing strategies.</td>
<td>D3.2, D3.3</td>
</tr>
<tr>
<td>Topic 2. Marketing of mobility schemes</td>
<td>Subtopic 2.2 Funding of awareness campaigns and implementation measures in order to allow implementation and marketing of sustainable mobility offers to tourists</td>
<td>D5.1</td>
</tr>
<tr>
<td>Topic 3. In education a focus should be laid on soft measures (e.g. MM) not only on “infrastructural measures”</td>
<td></td>
<td>D5.1</td>
</tr>
<tr>
<td>Topic 4. Establishment of cooperation channels between all the relevant actors (transport and touristic sector) in touristic regions with seasonal traffic peaks</td>
<td></td>
<td>D3.3</td>
</tr>
<tr>
<td>Topic 5. Standardization and normalization</td>
<td>Subtopic 5.1. Definition of an association to support specification adaptation and standardization, normative specification and adaptation of mobility schemes interfaces for touristic regions.</td>
<td>D4.3</td>
</tr>
<tr>
<td>Topic 5. Standardization and normalization</td>
<td>Subtopic 5.2. Setting-up of a table for normative road map definition at European and national level for local administration and touristic sector.</td>
<td>D4.3</td>
</tr>
<tr>
<td>Topic 5. Standardization and normalization</td>
<td>Subtopic 5.3. Setting-up of a certification process for existing standards and future one.</td>
<td>D4.3</td>
</tr>
<tr>
<td>Topic 6. Use of DSS by local authorities</td>
<td>Subtopic 6.1. Integration of the DELTA DSI in the planning processes of a region with seasonal traffic peaks.</td>
<td>D4.2</td>
</tr>
<tr>
<td>Topic 6. Use of DSS by local authorities</td>
<td>Subtopic 6.2. Education and training of technical staff authorities in the use of a DSS similar to the DELTA DSI.</td>
<td>D4.2</td>
</tr>
</tbody>
</table>
3. **FUTURE RESEARCH NEEDS**

3.1. **Introduction**

In the previous sections, the results achieved in the framework of the DELTA Project were presented. Based on these results, several future research needs and policy recommendations were identified and mapped against the conclusions drawn by each one of the reviewed deliverables.

It was observed however, that the research needs and policy recommendations identified through different deliverables had great similarities among them. By this it is meant that, in some cases they were identical, while in other cases they were similar or even complementary to one another. This of course was an anticipated outcome, as the work done in the various WPs and reported in the deliverables was rather an integrated effort than fragmented parts of research.

The present chapter is dedicated to the further analysis and elaboration of these identified research needs, in terms of areas in which research should be focused, the main goals to be achieved, as well as the relevant involved target groups.

3.2. **The understanding of seasonal traffic peaks**

3.2.1. **Establishment of a common methodology**

In order to effectively address the problem of seasonal traffic peaks, the first step would be to identify the factors contributing to it by collecting and analyzing the relevant data. Plenty of the needed data however, are currently missing in many touristic regions around Europe. Without this data it is hard to define the level of the problem, to find an effective solution and also to define the effectiveness of the solution/solutions. There is, therefore, a clear need for the establishment of a common methodology regarding the variables that need to be collected and the ways in which the subject should be deeper investigated.

The above mentioned methodology should include concrete guidelines first of all, on the kind of data that needs to be collected. This regards demographic data (population, area, etc.), data from the touristic sector (number of tourists, number of businesses related to the touristic industry, etc.) and of course transport data regarding the existing infrastructure both to/from the region and inside the region, as well as data related to the local transport system, such as traffic, accidents, etc. The methodology should also include guidelines on how often this data should be collected and updated, in what way and by whom, so as to gain useful input for further investigation.

The collection of data alone is not sufficient, but it has to be analyzed, so as to lead to specific conclusions on the factors contributing to the seasonal
traffic peaks as well as to the methods of resolving this problem. Therefore, the methodology should also include a very specific data analysis methodology. This would regard the statistical analysis of existing data, forecasting of various values as well as the calculation of useful indicators.

The target groups of the above described data collection and analysis methodology are local authorities, transport planners, policy makers, tourist agents and generally all the involved parties dealing with the problem of seasonal traffic peaks and facing its negative effects.

3.2.2. Data methods to facilitate comparability between various contexts (e.g. urban and rural) and countries/regions

One major issue aroused in the analyses within the DELTA project concerned the comparability of results from R&D projects implemented in various contexts. The benchmarks produced for example, generally originate from projects implemented in urban areas and while many touristic regions are rural areas. Furthermore, these benchmarks originate from projects implemented in countries around Europe with different and heterogeneous boundary conditions.

These various contexts should be taken into consideration when the results of a project are considered and evaluated. Nevertheless, the comparability is facilitated by systematic evaluations of implemented measures. There is likely a need of improved awareness among local and regional transport planners on the importance of evaluation as well as of improved knowledge and skills derived from the evaluation process. Therefore, a future research topic concerns the development of support for the evaluation of mobility projects addressing seasonal transport demand. This can be achieved by, for example, inclusion of seasonal aspects in existing MAX Mobility Management tools, such as MaxSumo (a methodology for evaluation of mobility projects) and MaxEva (a database where evaluated mobility projects are reported). These tools will also point out which data that should be collected to achieve comparability.

3.2.3. Identification of the characteristics of the typical tourist - Mapping of measures against tourist types in the regions

Knowing the characteristics of a region and of the tourists visiting the region is necessary in order to handle seasonal transport demand. Firstly, the various types of tourists should be defined on the basis of their needs and preferences. For example, there is likely a difference in needs and preferences among:

- Longterm and short-term stay tourists
- Youths, families with children, older people, couples etc.
- Tourists with and without heavy luggage or sports equipment
Tourists interested in cultural events, sport activities, partying, beaching, relaxing, backpacking etc.

The views of tourists and visitors can be collected through surveys in different types of regions. Tourist associations, travel agencies and other actors can also contribute with information on the characteristics on tourists and visitors. All information collected must then be analysed to define the various tourist types. A standardized questionnaire could be created to be used by local and regional planners, when conducting surveys of their own.

Secondly, it is necessary to examine how these needs and preferences can be addressed. Measures to handle seasonal traffic peaks can be mapped against various tourist types to find feasible combinations. This may result in a tool helping planners to select measures according to tourist types in the region.

By knowing the regional characteristics as well as the characteristics of the tourists visiting the region, an implementation strategy can be adapted to prevailing circumstances and thereby be more successful.

3.2.4. Forecasting of transport demand for touristic places

During the DELTA project, it has been discovered that different short term influences depend on the number of tourists (e.g. the topic of weather dependency in tourism). The visiting of sights and touristic places like beaches, mountains and lakesides is very often dependent on weather conditions or other short term factors that can not be controlled. For example, on a rainy day in Croatia in August (which is considered to be the peak season) it might happen that the usually crowded beach and the according access roads are completely empty. This picture can change already on the next day if the weather gets better. The parking places and access roads will be crowded, shuttle services will be required in high frequency and tourists will want to get information on how to get to their destination.

There is a clear need to have more comprehensive data on various factors to forecast the transport demand for touristic places better. The reason for this need lies on the requirement to whether or not organise ad-hoc mobility measures for the relevant areas in short-term. This approach requires a more sophisticated embedding of data and a cooperation of different regional stakeholders.

As the planning of ad-hoc / short-term mobility schemes has not been part of DELTA, the project can not deliver any answers to this requirement. The reason for this is that this would have been too much detailed planning for the DELTA project and that regional availability of data is different everywhere.

Nevertheless, this practical input is considered as very important for touristic areas and could be considered in future research projects. Possible approaches are combining databases, employing forecasting models, improving the data gathering network or strengthening cooperation between local stakeholders. The target group for this are local stakeholders like public...
3.3. Analysis of Mobility Schemes

3.3.1. Impact analysis of Mobility Measures for touristic areas

The inventory of best practices and of benchmarks performed in the DELTA project revealed that there are very few documented examples of Mobility measures or schemes in rural tourist regions. The importance of systematic evaluations is therefore obvious, especially in the field of seasonal transport demand and in a rural or regional context.

Many local and regional authorities usual wonder what could be the effects and benefits from the implementation of a specific mobility measure. This was also the case in the DELTA project. The project also results that one can hardly find quantified benefits from the implementation of a measure, so that other regions can obtain a practical knowledge and facilitate their decision making process.

Therefore, this research need addresses the lack of the impact analysis of the implementation of mobility measures in touristic regions.

3.3.2. Identification and analysis of mobility schemes to handle seasonal traffic peaks for specific types of regions

The identification of mobility schemes or measures potentially relevant for reducing traffic peaks in a certain tourist region depends on a number of factors and conditions related to the characteristics of the region. Such factors include types and location of attractions, components and quality of the transport system. In addition to region characteristics also the characteristics of the transport system to and from the region as well as the tourism and the tourists’ particularities are highly relevant for the effect or efficiency of different mobility schemes. The success of a specific mobility scheme or measure is also highly dependent on the implementation; for example in terms of stakeholders’ involvement and cooperation.

The identification of relevant mobility schemes needs to be based on common grounds in terms of a common understanding of the problems and how it relates to different characteristic of regions and of the tourism. However, there are very few benchmarks on different mobility schemes available from rural tourist regions. Consequently, there is a lack in know-how about the relevance of both implementation and other local conditions for identifying mobility schemes. There may also be a lack of knowledge about mobility patterns of different tourist types in the regions (long term / short term, families, backpackers...).
In particular, the theoretical basis for the understanding of the relationships between characteristics of tourism and tourist regions and the relevance and effectiveness of different mobility schemes is very weak and needs further development. A theoretical basis is required in order to improve the possibilities to develop knowledge that can be generalized and in this case to identify which conditions are required for the application and effectiveness of different mobility measures.

A theoretical foundation for analyses of the requirements of different tourist regions is one first step that forms a basis for the collection of relevant data and information. During the data collection in DELTA it was evident that the availability and quality of data and information varies widely between different regions.

In order to specify criteria for the identification of mobility schemes, research and evaluation of case studies, for example pilot regions, are required. Better knowledge about the relevance of different factors for the identification of efficient mobility schemes in different tourist areas may for example be useful for Municipalities, touristic area administrations, touristic operators, transport operators, etc.

3.3.3. Investigation of the pre-conditions necessary for the implementation of each mobility scheme

The effect of a mobility measure identified as potentially relevant in a certain tourist region for reducing traffic peaks depends on a number of factors and conditions related to the characteristics of the region. Such factors include types and location of attractions, components and quality of the transport system, but also the characteristics of the tourism and the tourists.

Furthermore, the effects or efficiency of a specific mobility measure also depends on various implementation aspects, as for example accommodation to local conditions, stakeholder involvement and roles, the implementation organization, the set-up of collaboration and co-operation, funding and information to travelers. Moreover, the implementation process, as well as common grounds for stakeholders regarding knowledge and the view on problems and improvement needs, objectives and goals, is also of great relevance.

In order to specify criteria that create favorable pre-conditions for the implementation of mobility schemes, research and evaluation of case studies, for example pilot regions, are required. Since, there is a lack of reported experiences of focused initiatives of the implementation of mobility schemes into touristic regions affected by seasonal peaks there is a general need for study’s and evaluations addressing the whole range of issues related to both the identification and implementation of mobility schemes.

Better knowledge about pre-conditions for implementation as well as the implementation process of mobility schemes in tourist areas may for example be useful for Municipalities, touristic area administrations, touristic operators, transport operators, etc.
3.3.4. **Definition of methods for the effective marketing of mobility schemes in the target regions**

Marketing, awareness and promotion are key words in European mobility management. Although many regions already actively apply mobility management measures, the tourism industry is very often not aware about it. It is also obvious that just implementing mobility management measures or schemes is not sufficient in order to ensure that they will be successful. A couple of factors do also have to be considered. For example, the proper pre-planning or cooperation with local stakeholders is a precondition to be fulfilled to elaborate the schemes.

One major aspect in the elaboration phase is also the proper marketing of the schemes on various regional and international levels. Besides, future users also other stakeholders benefiting from this scheme or potential followers have to be addressed. In tourist regions, especially for the guests some factors need special attention: the language in which the information is presented and the easy access to this information. Also the point of time when the information is provided to the guests and tourists is important. There have been already several projects dealing with defining proper marketing methods, as for example the Project SEGMENT (SEgmented Marketing for ENergy Efficient Transport) that focused on the use of market segmentation technique to persuade people to change their behaviour and adopt more energy efficient forms of transport.

The promotion and detailed description of the mobility schemes is also beneficial for other potential follower regions. This is why regions and cities should be motivated to publish details of their best practice examples regarding the mobility schemes (e.g. on the DELTA network [www.delta-network.eu](http://www.delta-network.eu) or on ELTIS [www.eltis.org](http://www.eltis.org)). Besides the usually available public description on how to use the mobility scheme (e.g. where to buy tickets for the shuttle service or how to reach the nearest bus stop), details about e.g. the target group, the reason for implementing the scheme etc. should be available. Pilot regions should be motivated to market their mobility scheme and implementation to exchange know how and experiences.

3.3.5. **Common methodology for the effective benchmarking of mobility schemes**

The DELTA project identified very few quantitatively evaluated projects, which is a pre-condition for an effective benchmarking of mobility schemes. Thus, the importance of systematic evaluations is obvious, especially in the field of seasonal transport demand and in a rural context.

There is likely a need of improved awareness among local and regional transport planners on the importance of evaluation as well as of improved knowledge and skills concerning how to evaluate. The importance of evaluation - and the necessity to plan for the evaluative parts of a project
already from the beginning - must be communicated. For example, an implementation strategy should always include an evaluation plan in order to provide information on impacts and benefits.

Future research may concern development of support for the evaluation of mobility projects addressing seasonal transport demand. It could be interesting to evaluate both on policy-level (process evaluation) as well as on the effectiveness of implemented measures (effect evaluation).

A common methodology for evaluation should cover aspects such as regional characteristics, external and internal factors, measure characteristics, funding schemes etc. The methodology should also provide guidelines on data needed to be collected as well as on data collection methods. Here, there is likely a need for a standard data collection mechanism to help local and regional authorities on this matter. This will lead to a better definition of the problems in a region and also help in finding effective solutions to the problems. Since regions with seasonal transport demand differs depending on population, climate and other regional characteristics as well as on their opportunities in collecting data, such support could be helpful.

One way to go is by inclusion of seasonal aspects in existing MAX MM-tools such as MaxSumo (a methodology for evaluation of mobility projects) and MaxEva (a database where evaluated mobility projects are reported). These tools are available online on www.epomm.eu. A future research project on that matter should investigate whether inclusion is possible or whether the development of a separate evaluation methodology for seasonal transport demand is necessary. Here, the creation of a certification process for the evaluation methodology could be an interesting step, both in terms of certified auditors and certified touristic regions.

These are also the variability of contexts to be aware of when benchmarking, e.g. depending on whether benchmarks originates from urban or rural context, inhomogeneous boundary conditions in various counties and regions, etc. Nevertheless, comparability is facilitated by systematic evaluations of implemented measures. A common evaluation methodology for seasonal transport demand will point out, for example, which data should be collected to achieve comparability (see previous relevant subtopic).

3.4. Best practice implementation as pilot study

The complete process of the analysis, design and implementation of a specific mobility scheme in a specific touristic region suffering from seasonal traffic peaks would be of great interest. This way it would be easier to better understand which the critical pre-conditions for the successful implementation are in correlation with the issues dealt with in previous section.
This can be achieved through the pilot application (complete feasibility study) of a mobility scheme, in which all the stages (planning, development, evaluation, funding etc.) will be investigated and analysed.

The same mobility scheme could then be implemented in other regions with similar or identical characteristics to verify that the pre conditions and outcomes are the same.

3.5. Tools for (seasonal) mobility management

3.5.1. Development of a tool (such as the DELTA DSI) for urban environments

The problem of seasonal traffic peaks does not regard only popular touristic regions, but very often makes its appearance also in urban environments, especially during great events such as the Olympic Games, various music concerts, etc. In any case, the issue of mobility management is always very important in large, as well as in smaller cities and for this reason it would be useful to investigate the possibility of creating a Decision Support System similar to the Decision Support Instrument (DSI) that was created in the framework of the DELTA Project.

The goal of the system should be to give to the local authorities and transport companies, responsible for the provision of transport services in the city the necessary tools and knowledge to deal with the problem and the effects of excessive transport demand. The relevant methods and strategies should be included, for the minimizing of the unnecessary passenger trips, the creation of efficient multimodal interfaces between the existing transport means and the maximizing of the use of existing resources.

The procedure of creating such a tool for urban environments is of course much more complex than in the case of a smaller region. More data would be necessary including more complex analysis. It would be however a very good opportunity to collect in a common index all of the existing mobility schemes that are implemented in cities around the world, to evaluate them and to identify the best - in each case - solutions.

The proposed by the tool solutions should be accompanied with specific guidelines for their implementation, the possible barriers and the desired outcomes.

The target groups that would have important gains from the creation of such an instrument are plenty and various: first of all, the policy makers would have a very helpful tool in their hands which could assist in their decision making towards any change in the transport environment of the city under their supervision. The transport companies could benefit by being able to better plan their routes, maximize the use of their resources and possibly maximize their financial gains. Last but not least, the end user would of course have
benefits by the more efficient mobility management leading to easier, quicker and less expensive travelling around the city.

3.5.2. Development of an interactive, intelligent and self-updating DSS

Decision Support Systems (DSS), such as the DELTA DSI, are designed to support their users in the identification of problems, needs, opportunities and finally in the process of decision making. These tools request several pieces of information from the user and after conducting various calculations, provide him with one or more solutions.

It is often observed, however, that the proposed solutions are not actually considered useful by the user due to various reasons that may not have been taken under consideration during the designing of the tool. In these cases it would be very useful if the user had the opportunity to give, following a particular procedure, feedback to the system regarding the received output. In the case of the DELTA DSI for example, where the user receives proposed mobility schemes for the handling of seasonal traffic peaks in the region under study, it would serve both the system and the user if he could evaluate the received output (proposed mobility schemes) and possibly explain the reasons why part of it is not valid or useful.

This way, the feedback of the user could serve as an update of the system, thus resulting to its immediate improvement and achieved autonomy from other sources of information.

3.6. Investigation of social networks acting as tools for provision of real time information

New emerging media, like social networks, should be assessed on their contribution to distribute transport related information. It would be necessary to identify how social networks can be used exactly for providing (public) transport information to passengers and drivers or if it can help to improve the quality of the offer.

It is considered that these already widely used media could also provide tourist related information. Due to their high amount of users and high frequency of usage, it would be possible to distribute real time information about a region and the seasonal peaks and solutions offered.

For example, at the Italian DELTA Local Stakeholders Forum, a representative of the public transport operator of Rome mentioned that they already use new information systems based on social networks (e.g. Facebook and Twitter) for distributing transport related information. The operator reported about the unexpected success to inform people about traffic and the public transport network in Rome.
3.7. ITS Applications

3.7.1. FRAME extension towards new requirements and more accurate descriptions of mobility solutions

The FRAME ITS Architecture was designed to represent the mobility-related expectations of users, which can affect the design of ITS systems. FRAME collects these requirements and on this basis defines a Functional Architecture that will enable these user needs to be implemented. FRAME also provides a methodology that can be used during design phase of ITS systems.

During the activities of DELTA, the Mobility Schemes identified in the project were analyzed in relation to the FRAME Architecture. It was evident that the latter focused mainly on conventional means of transport. The demand for more sustainable transport systems makes it necessary to model in greater detail the opportunities offered by more innovative transport solutions.

It was therefore recommended that FRAME should be extended in order to:

1. Model more precisely sustainable forms of transport, such as bike sharing, bike rental, car pooling, car sharing etc.;
2. Provide a closer relationship with accommodation and attraction management to allow the modelling of the specific tourist-related mobility requirements; and
3. Make it possible to manage directly the impact of tourist demand from demand originating areas that affect the areas under study, in order to obtain a more sustainable mobility solution.

Extension of the European ITS Framework Architecture should be considered with respect to the new requirements generated by the Mobility Schemes of the DELTA project. The aim is to ensure that the Architecture provides a more accurate description of innovative mobility solutions, which respond to the demands generated by tourism. The proposed modifications should be accompanied by a procurement-implementation phase, where they are tested against a real implementation.

Main Goals of the research group shall be the:

1. extension of the European Architecture
2. test of the architecture’s output with real implementation

The research groups shall consist of ITS providers, tourist operators, Research Institutes, Local/Regional Tourist Administrations and the FRAME Community.
3.7.2. **DSS, such as the DELTA DSI, as a front end to FRAME**

During the DELTA activity, during which the FRAME extension towards DELTA needs and mobility measures took place, it emerged from discussions with FRAME representatives, that initial difficulties were found in using the Architecture as it does not offer easy access to the information contained in the architecture itself. It is therefore proposed that the DSI of DELTA should be used as a front end. This was also discussed with the FRAME partners.

Research is therefore needed to extend the DELTA DSI and FRAME to allow a smooth progression from the selection of mobility schemes based on regional characteristics to the definition of the ITS solution. In this context, FRAME would also be able to model the external system with which the specific region currently - or in the future - has to interface. The output of the FRAME selection process should also highlight the key components to implement and the components which need to be interfaced with respect the selected mobility schemes.

Main Goals of the activity of the research group shall be to:

1. design a general front end for FRAME and the selection process
2. extend the European Architecture
3. extend the DELTA DSI to be used as a front-end
4. test the architecture output with real implementation

The relevant research group that could undertake this activity shall be constituted of ITS providers, tourist operators, Research Institutes, Local/Regional Tourist Administrations and the FRAME Community.

3.7.3. **Normative and standardization framework for European Architecture to support touristic regions**

The DELTA partners propose the establishment of a general standardization or normative framework to support the technological solution implemented (or planned) by a tourist area. In order to improve mobility, a tourist region may be willing to invest in telematics systems, but to ensure a positive effect on mobility demand as a whole; the system needs to be interoperable with external systems, present and future, especially those in areas which generate high demand. To facilitate interoperability with external systems, the interface needs to be standardized and norms established.

Indeed small touristic regions willing to invest on ITS shall be able to make technology and architectural choices for the development of services to meet the expected demand and local mobility without the need to have a coordination at national or international level. The adoption of well established and supported standards or normative functional specifications and interfaces will enable to gain more positive effects even to reduce the size of investments.

Main goals of the research group shall be to:
1. Identify the key interfaces to be standardized for the implementation of tourist support systems and those needed to be supported by compulsory norms.

2. Promote development of missing standards.

3. Conduct standardization bodies (e.g. CEN) to achieve consensus and support the standardization procedure.

4. Support for normative adaptation.

The various activities of the research group shall be performed of ITS providers, FRAME partners, Research Institute, Normative Bodies, and Standardization Bodies.
4. **Policy Guidelines**

4.1. **Introduction**

In the present chapter the policy recommendations that have been identified in chapter 2 through the evaluation of the results and outcomes of the project are further analysed and elaborated, in terms of the main goals to be achieved, as well as the relevant involved target groups.

As in the case of the identified research needs, the guidelines and policy recommendations, have also been categorized in main topics and subtopics, based on their content.

4.2. **Data collection and availability**

4.2.1. **Guidelines for data collection**

A basic pre-condition for an effective benchmarking of mobility schemes is the collection and availability of the appropriate data as well as the quality and integrity of data. Unfortunately, there is a lack of data describing the characteristics and traffic situation in regions with seasonal demand. For example, the issue of the lack of national travel surveys in many European countries has been a key aspect for discussion the recent years.

Data needs to be collected in an early stage and on regularly basis. Proper data collection and analysis is necessary in order to define the problem. This form a basis for identifying solutions and for evaluating implemented solutions. Data on traffic flows and duration of peak periods need to be collected as well as information regarding characteristics of the region and the tourists visiting the region. There is likely a need for more support regarding data collection.

4.2.2. **Data availability procedures**

The acquisition of various kinds of data is very often critical for scientists and researchers conducting research in various sectors, who without it cannot investigate existing problems, identify the factors contributing to them and conclude to possible solutions. The same case applies to transport planners and researchers dealing with transport issues, who have found themselves many times in the position of requesting data from organizations and not being able to receive it, either due to bureaucracy issues or due to existing laws forbidding its provision.

It is therefore essential to establish an easier and more effective procedure so that the interested parties can acquire existing data from the relevant organizations quickly and without the responsible for the provision of data people worrying that these are breaking some kind of law by giving this data.
Furthermore, the interested parties should have access to these databases so as to be able to know what kind of data they include, as very often planners and researchers collect already existing data due to this lack of knowledge. It would be useful to investigate the opportunity of creating an online tool through which the interested and authorized parties could review existing data, make some kind of a request in order to receive the necessary data.

4.3. Marketing of Mobility Schemes

4.3.1. Promotion of mobility management by local agencies with proper marketing strategies

Strategies are required to introduce and promote the issue of mobility management and corresponding mobility schemes. The aim is that mobility management becomes widely known and accepted as an efficient and suitable tool to solve mobility problems.

The European Platform on Mobility Management defines mobility management in the following way: “Mobility Management is a concept to promote sustainable transport and manage the demand for car use by changing travellers’ attitudes and behaviour. At the core of mobility management are “soft” measures like information and communication, organising services and coordinating activities of different partners. “Soft” measures most often enhance the effectiveness of “hard” measures within urban transport (e.g. new tram lines, new roads and new bike lanes). Mobility Management measures (in comparison to “hard” measures) do not necessarily require large financial investments and may have a high benefit-cost ratio”\(^1\).

The promotion of mobility management is especially important in tourism regions, as local actors often fear that from the implementation of soft measures in their region, it will become less attractive for tourists. But there is also a huge potential for those regions in positioning themselves and committing themselves to become a sustainable region.

4.3.2. Funding of awareness campaigns and implementation measures

The implementation of sustainability projects, campaigns and implementations projects in tourism regions is often considered to be a difficult issue. One reason might be the fear of decreasing the number of overnight guests by implementing soft measures in the region. Another reason might be the different opinions and strategies of the local stakeholders (e.g. tourism association versus environmental concerns).

Financial support or funding of such projects is a very helpful tool to stimulate the uptake of sustainable mobility measures in regions and cities. Many successful projects would have not been possible if funding would have not been available.

Besides the necessity of the sustainability aspect of the projects to be supported there are other factors to be focused on. For example, the incorporation of all actors in the project and the boosting of local strengths should be major points to be considered. Furthermore, a special focus should be laid on requesting suitable reporting by the regions. The measures, benefits and benchmarks reached should be described thoroughly and they should be asked to actively share their experiences with others.

4.4. **Promote education on “soft” measures, not only on infrastructures**

Education provides a framework to promote and disseminate mobility management and respective measures. Education in mobility management can start already in the kinder garden. The awareness of children (and their parents) regarding their mobility behaviour can be improved by applying various measures like a mobility diary or by presenting alternative transport modes beside the private car (e.g. cycle trailers for children). This measure is suitable to change the mobility behaviour in general and to provide the younger generation with alternatives to traditional behaviour.

To increase the number of professional and sustainable mobility management implementations, the issue of mobility management should already be included in higher education (e.g. at universities) programs. The focus of the curricula of traffic engineers should include, besides infrastructural hard measures, also soft measures like mobility management. This ensures the further uptake of sustainable ideas and stimulates further projects.

4.5. **Establish cooperation channels between actors of the transport and tourism sector**

There are many actors involved in transportation, especially in the field closely related to tourism businesses. Cooperation with all relevant actors is often necessary in order to handle seasonal traffic peaks in touristic regions. In fact, integration of the transport and touristic section is pointed out as a major success factor in this work. Sometimes an initiative for sustainable mobility in touristic regions may come from the transport sector (e.g. by the municipality) and sometimes from the tourist sector – the importance is that the actors involved begin to communicate and cooperate.
The identification of key actors is the first step in this process. Such key actors may be, for example, the municipality/city/region, tourist associations, travel agencies, hotels and other tourist businesses, public transport operators/authorities, bike rental companies and other local companies.

The following steps involve communication with identified actors. Here, it is necessary to inform them about this issue and together find ways to handle it. The benefits for each actor must be clarified. Finally, there has to be an agreement on the involvement (also financially speaking) and responsibility of each actor in the implementation of solutions.

When evaluating an implementation strategy, it is also interesting to evaluate the cooperation achieved among the interested parties.

4.6. Standardization and normalization

4.6.1. Definition of an association to promote standardization

Definition of standards at interface level for the main functions involved in the touristic regional demand management shall be integrated with a general standardization process. The definition of specialized and integrated specification shall be performed by technical persons from industrial sector and representing end user expectation. This process shall be defined and carried out with the constitution of an association aiming at improving specifications and standards definition.

The DELTA partners propose to support the definition of a working group on the topic of seasonal traffic peaks with representative from the transport and touristic industries, research bodies and industrial partners.

4.6.2. Roadmap for the adoption of standards

Beside the constitution of a standardization and specification association or working group, an accompanying action shall be carried out at normative level at national and European levels. A strong prerequisite of this task is to define a roadmap for the adoption of standards or specification. This can be a table of discussion (round-table) aiming to normative adaptation and including touristic region representatives, national and European representatives, research bodies and industrial representatives.

4.6.3. Standards certification process

The third ingredient for a successful implementation of a normative roadmap that support the adoption of common and interoperable solution is the constitution of a certification process. Certification shall support the adoption of specifications and standards rather than block development of solution. Self certification process can also be established. The topic is either a
4.7. Use of DSS by local authorities

4.7.1. Integration of a DSS, such as the DELTA DSI, in the planning processes

In regions suffering from seasonal traffic peaks, the local authorities are often the ones called to deal with the problems and find sustainable solutions for the handing of the excessive transport demand. The staff, however, of these authorities does not necessarily have the essential knowledge on issues of mobility management in order to make the correct decisions.

In these cases, a Decision Support System such as the DELTA DSI could be of great assistance, as the responsible people will only have to insert information regarding the region that most probably is available. Even in the case that the information is not available, as might happen in the case of some pieces of information regarding the transport modes (routes, infrastructure, etc), it would be much easier to acquire this information, than to make the actual decision.

For this reason, it would be very useful to integrate such a system in the overall planning and decision making process of a region suffering from seasonal traffic peaks, as it would make the whole procedure easier, quicker and most importantly standardized. Moreover, it would give the opportunity to all involved parties to easily go through the information inserted in the system, alter it or just comprehend in a better way the outcomes of the system and the solutions implemented.

4.7.2. Education and training of technical staff

The possible benefits that could come up from the use of a Decision Support System, such as the DELTA DSI, are numerous and have been analyzed in previous sections. In order, however, to be in the position to fully take advantage of these systems, the technical staff in the relevant authorities that will be using them, must be trained and educated accordingly.

This training would mainly regard the familiarization of the staff with the various terms used in the system (and mobility management in general) that may not fall under the field of their education. For example, people in local authorities come from different backgrounds such as the economical or law sector and are not familiar with terms having to do with mobility management. Moreover, they should be well trained as regards the sources to which they should search in, in order to acquire the necessary information for the system.
The people to train the staff in the local authorities would ideally be the same that have designed the system. Alternatively, people familiar either with the system or with the various terms used and input requested could also assist in this task.
5. **CONCLUDING REMARKS**

In the course of the DELTA Project several issues having to do with the issue of mobility management in touristic regions suffering from seasonal traffic peaks were examined and analyzed. From this research, numerous conclusions were drawn some of which actually regarded the identification of gaps in the existing knowledge.

The goal of the present document was to consolidate all of the findings having to do with missing knowledge and finally identify future research needs and policy recommendations in the thematic area of mobility management and optimization of multimodal interfaces in regions with seasonal traffic peaks. To do that, all of the technical documents created throughout the project were reviewed and their conclusions were listed. From these conclusions many interesting relevant research needs and policy recommendations came up.

The main research needs identified regarded the following issues:

- The understanding of seasonal traffic peaks in the concerned regions.
- Further analysis of existing mobility schemes and identification of new ones.
- Implementation of a specific best practice in a particular region in order to study the full process of analysis, design and implementation.
- Tools for seasonal mobility management.
- Investigation of the possibility of exploiting new social networks (e.g. Facebook) acting as tools providing real time information successfully to the relevant target groups.
- Promotion of research on ITS applications, standardization and normalization.

On the other hand, the policy recommendations that were identified refer to the following:

- Data collection and availability guidelines.
- Marketing of mobility schemes.
- Placement of focus on behalf of education not only on “infrastructural measures” but also on soft ones.
- Establishment of cooperation channels between all the relevant actors (transport and touristic sector) in touristic regions with seasonal traffic peaks.
- Promotion of standardization and normalization at policy level.
- Use of Decision Support Systems (DSS) similar to the DELTA DSI by local authorities.
REFERENCES


