

## **Part 1: Final Publishable Summary Report**

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## EXECUTIVE SUMMARY

INTERCONNECT has examined the function of local, regional and intermodal transport interconnections where they form part of longer-distance and inter-regional passenger journeys in Europe, in order to address the potential for greater economic efficiency and reduced environmental impact.

The main goals of the project were: to reveal the extent, impact and causes of poor interconnectivity; to identify existing good practice and potential solutions, analyse them using appropriate methods and establish their likely contribution to improving interconnectivity; and to disseminate the findings widely and promote take-up of best practice. This has been achieved through the work undertaken and reported in the following areas:

- literature surveys of current good and bad practices in interconnectivity and available policy documents;
- the identification of potential solutions to good interconnectivity;
- the analysis of these solutions in real situations in case studies and test beds;
- seeking feedback from stakeholders in identifying solutions;
- the development of the matrix contained in the INTERCONNECT toolkit of solutions and their applicability;
- analysis of potential impacts of improved interconnectivity; and
- dissemination of project results, for example through the project website, leaflet and E-Conference.

Early in the project an extensive literature review of key sources on current practice in interconnectivity uncovered relevant input from all countries in Europe and EC-wide documents. These key sources were analysed to identify particular examples of problems and barriers to interconnectivity that exist, as well as notable examples of good practice. At the same time as this literature review all relevant (European) national and EC-wide policy documents relating to interconnectivity were identified.

With the literature search database providing the main input, potential solutions for improving interconnectivity were identified, grouped in a number of thematic areas. The initial thematic areas were revised to better fit all the solutions identified, as follows: local link infrastructure solutions; improved public transport services; improvements at the interchange; improved procedures for check-in or luggage transfer; ticketing and marketing solutions; and enabling solutions.

Feedback from stakeholders on the applicability and relevance of all solutions identified in INTERCONNECT was sought at WCTR in July 2010, and also through an on-line questionnaire conducted in November 2010. This work led to the development of a matrix of solutions and their feasibility, applicability and potential impact on interconnectivity in long-distance passenger journeys. This forms the INTERCONNECT “toolkit” reported in public deliverable D3.1, *An Analysis of Potential Solutions for Improving Interconnectivity of Passenger Networks*.

A number of case studies of interconnectivity were analysed to show the real-world implementation of some of the solutions identified and their effectiveness in these locations. All case study reports are contained in D4.1, *Factors Affecting Interconnectivity in Passenger Transport*. A smaller number of “test beds” were studied to analyse potential transferability of solutions to other situations.

D5.1, *Impacts of Improved Interconnectivity on a European Scale*, reports on the implications for EU policy that can be drawn from the analyses carried out, as well as the transferability of findings on interconnectivity to other situations, and also on the models and tools currently available for modelling interconnectivity at a European scale and the potential need for improved models. There was further investigation into models currently available to represent the impacts of interconnectivity and a meta-model based on Trans-Tools was developed. In addition the *IC module* was developed to allow for realistic modelling of interconnection facilities. The developed models were reported in D5.2, *Meta-models for the analysis of interconnectivity*, and D5.3, *Modelling module for interconnectivity*, and were used in test bed analysis and also to provide conclusions on the impacts of good practices in interconnectivity as reported in D5.4, *Conclusions and Recommendations from the INTERCONNECT project*.

## 1 PROJECT CONTEXT AND MAIN OBJECTIVES

### 1.1 CONTEXT AND GENERAL PROJECT OBJECTIVES

INTERCONNECT has examined the function of local, regional and intermodal transport interconnections where they form part of longer-distance and inter-regional passenger journeys in Europe, in order to address the potential for greater economic efficiency and reduced environmental impact.

The main goals of the project were: to reveal the extent, impact and causes of poor interconnectivity; to identify existing good practice and potential solutions, analyse them using appropriate methods and establish their likely contribution to improving interconnectivity; and to disseminate the findings widely and promote take-up of best practice. This has been achieved through the work undertaken and reported in the following areas:

- literature surveys of current good and bad practices in interconnectivity and available policy documents;
- the identification of potential solutions to good interconnectivity;
- the analysis of these solutions in real situations in case studies and test beds;
- seeking feedback from stakeholders in identifying solutions;
- the development of the matrix contained in the INTERCONNECT toolkit of solutions and their applicability;
- analysis of potential impacts of improved interconnectivity; and
- dissemination of project results, for example through the project website, leaflet and E-Conference.

### 1.2 SPECIFIC SCIENTIFIC AND TECHNICAL OBJECTIVES OF THE PROJECT

The INTERCONNECT Description of Work (that forms Annex 1 of the Grant Agreement) sets out the specific scientific and technical objectives of the project:

- To produce quantitative evidence on the current and likely future extent and impacts of poor interconnectivity between long distance and local/regional travel in Europe
- To provide evidence on key stakeholders' perceptions of the underlying causes of the problems and of the applicability of specified solutions
- To identify and investigate gaps and apparent inconsistencies in the European and national strategic planning concerning interconnection
- To provide an analysis of evidence on the nature and seriousness of identified barriers to effective interconnectivity
- To provide an assessment of the effectiveness of available analytical tools for the assessment of problems and solutions in this domain
- To provide an assessment of the performance of selected policy interventions designed to improve interconnectivity in specific situation
- To provide evidence on the potential impact of improved interconnectivity on a European scale in particular, though not only, on
  - Decongesting overcrowded transport corridors
  - Encouraging a shift towards the more sustainable transport modes
  - Reduction of Green House Gas (GHG) emissions
- To provide policy guidance on good practice in implementation of improved interconnectivity
- To disseminate project findings widely to policy-makers

The schedule of work in the project was defined, in milestone and deliverables submission, so that these objectives would be achieved. With the successful completion and submission of all project milestones and deliverables, these objectives have all been achieved. This is described in more detail in Table 1.1 below.

**Table 1-1 INTERCONNECT: Achievement of project objectives**

| Project Objectives                                                                                                                                                       | Achievement of the Objective                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To produce quantitative evidence on the current and likely future extent and impacts of poor interconnectivity between long distance and local/regional travel in Europe | With the extensive literature search undertaken in workpackage 2, that was reported in internal deliverable D2.1, <i>Status-Quo in Interconnections for Passengers</i> , this was achieved. The contents of public deliverable D2.2, <i>The Role of European and National Policies in Improving Interconnectivity for Passengers</i> , are also relevant to this objective.                                                                                |
| To provide evidence on key stakeholders' perceptions of the underlying causes of the problems and of the applicability of specified solutions                            | Stakeholder consultation provided key input to the project, in particular to the development of the toolkit in D3.1, <i>An Analysis of Potential Solutions for Improving Interconnectivity of Passenger Networks</i> .                                                                                                                                                                                                                                     |
| To identify and investigate gaps and apparent inconsistencies in the European and national strategic planning concerning interconnection                                 | The review of national and EC-wide policy documents was completed and reported in public deliverable D2.2, <i>The Role of European and National Policies in Improving Interconnectivity for Passengers</i> .                                                                                                                                                                                                                                               |
| To provide an analysis of evidence on the nature and seriousness of identified barriers to effective interconnectivity                                                   | The analysis of the results of the literature search in WP2 focused on the existence of good and bad practices (i.e. barriers) and this was reported in internal deliverable D2.1, <i>Status-Quo in Interconnections for Passengers</i> . The case study reports presented in public deliverable D4.1, <i>Factors Affecting Interconnectivity in Passenger Transport</i> , also analyse the existence of barriers and poor practices in interconnectivity. |
| To provide an assessment of the effectiveness of available analytical tools for the assessment of problems and solutions in this domain                                  | This objective was achieved with the submission of milestone report M2.4, <i>Availability and utility of analytical techniques</i> , which fed directly into the development of the INTERCONNECT toolkit in D3.1.                                                                                                                                                                                                                                          |
| To provide an assessment of the performance of selected policy interventions designed to improve interconnectivity in specific situations                                | This objective was achieved with the submission of the INTERCONNECT toolkit in D3.1, <i>An Analysis of Potential Solutions for Improving Interconnectivity of Passenger Networks</i> , and was further investigated in the milestone report M4.5, which covered the test bed analysis. Although M4.5 is not public, there are test bed presentations on the E-Conference website.                                                                          |
| To provide evidence on the potential impact of improved interconnectivity on a European scale                                                                            | This objective was achieved with the submission of D5.1, <i>Impacts of Improved Interconnectivity on a European Scale</i> .                                                                                                                                                                                                                                                                                                                                |
| To provide policy guidance on good practice in implementation of improved interconnectivity                                                                              | This was achieved with the submission of the IC toolkit in D3.1, <i>An Analysis of Potential Solutions for Improving Interconnectivity of Passenger Networks</i> , and D5.4, <i>Conclusions and Recommendations from the INTERCONNECT Project</i> .                                                                                                                                                                                                        |
| To disseminate project findings widely                                                                                                                                   | This has been achieved through the project website (D6.1), project leaflet (D6.2), plans for dissemination detailed in D6.4, <i>Final Dissemination and Use Plan</i> , and through the virtual E-Conference presentations available on the website.                                                                                                                                                                                                        |

## 2 MAIN SCIENTIFIC AND TECHNICAL RESULTS

### 2.1 OVERVIEW

The work of the INTERCONNECT project has been carried out within six workpackages as defined in the Description of Work. Workpackage 1 covered all project management and co-ordination tasks. With the submission of all reports, milestones and deliverables in good time, with the successful organisation of consortium meetings, with the swift distribution of project payments and all other day to day issues regarding the smooth running of the project, this workpackage has been successfully concluded. Workpackage 6 covered dissemination and exploitation, and these tasks are covered elsewhere in this report.

The main scientific and technical results of the project are contained within the public outputs of workpackages 2 to 5 – deliverables, webpage content, and the project results reported in stakeholder consultations and the E-Conference presentations. The work undertaken and the results from each of these workpackages is outlined below.

### 2.2 WORKPACKAGE 2 DEFINING THE PROJECT AND METHODOLOGY

#### 2.2.1 Work Undertaken in WP2

There were three tasks in workpackage 2 that defined the areas of work undertaken:

- Review of available evidence
- Forecasting and modelling tools
- Interconnection policy at the European and national level

##### *Review of available evidence*

The review of available evidence was carried out through a literature survey of examples of good and bad practices in interconnectivity. Each partner carried out the literature review for specific countries within Europe so that complete coverage was achieved. The final output of the literature review included <xx> sources, and this formed a very useful resource for subsequent tasks in the project. The list of sources from the literature review formed an internally-distributed milestone.

##### *Forecasting and modelling tools*

This covered a review of forecasting and modelling tools and the theoretical requirements for the modelling of interconnectivity. Again, all partners provided inputs and the results were reported in an internal milestone, though the output of further modelling tasks was reported in public deliverables in WP5.

##### *Interconnection policy at the European and national level*

The review of interconnection policies at the European and national level gave thorough coverage of all relevant policy documents related to interconnectivity. This review is reported in public deliverable D2.2, described more fully below.

#### 2.2.2 Scientific and Technical Results from WP2

The main outputs of WP2 are the internal deliverable D2.1, *Status-Quo in Interconnections for Passengers*, that formed the basis for further work in the project and the public deliverable D2.2, *The Role of European and National Policies in Improving Interconnectivity for Passengers*.

D2.1, *Status-Quo in Interconnections for Passengers*, contains a summary of the literature identified from the literature review of sources on good and bad practice in interconnectivity, and tables summarising published data on long distance travel in Europe. The final, updated version of D2.1 contains the literature sources and also updated chapters on good and bad practices identified. Although D2.1 is not a public deliverable, and therefore its dissemination is within the consortium only, the contents fed directly into work undertaken in the

development of the toolkit (reported in D3.1, *An Analysis of Potential Solutions for Improving Interconnectivity of Passenger Networks*) and the analysis and reporting of the case studies (reported in D4.1, *Factors Affecting Interconnectivity in Passenger Transport*).

The final and complete version of D2.2, *The Role of European and National Policies in Improving Interconnectivity for Passengers*, was compiled with input from INTERCONNECT and with contribution from the HERMES project. This deliverable gives a thorough overview of all policy documents available at EU level, and at national level within Europe, with an analysis of their content as it relates to intermodal trips and the interconnections between these trips. There is a summary of the focal points of EU policy in this area and the areas covered by national policy, as well as the gaps that exist in documentation of interconnectivity policies.

The INTERCONNECT project was responsible for the review of national policy documents, which reached the following conclusions:

- In general, there is a lack of focus on interconnections in national policy documents.
- New/improved links seem to attract more attention compared to e.g. legal and organisational arrangements.
- There is more focus on interconnections to rail and air than to ferries.
- The overall lack of focus in national strategic policy formulation leads to a rather uniform situation within the member states of the EU with no major differences between countries: passenger interconnections are made without an overall strategic guidance.

The deliverables described above stand alone and also feed into the work in WP3 and WP4

## **2.3 WORKPACKAGE 3 POTENTIAL SOLUTIONS**

### **2.3.1 Work Undertaken in WP3**

The aim of WP3 was to bring together the analysis and assessment of potential solutions to improve interconnectivity within modes and between modes, leading to the development of the INTERCONNECT "toolkit" that lists all potential solutions together with a set of criteria for the applicability each solution. Initially work focused on identifying barriers to interconnectivity and potential solutions within six subtask definitions:

- Legal and organisational arrangements
- New or improved links
- New or improved interchanges
- Infrastructure pricing
- Integrated ticketing and pricing
- Information and marketing

With the literature search database (described under WP2 above) providing the main input, potential solutions for improving interconnectivity were identified, grouped in the thematic areas described above. At the same time as the list of solutions was taking shape time a framework for the toolkit was developed.

All solutions identified at this stage were subject to an initial analysis of their impact and applicability. This *initial* assessment of solutions identified (submitted as a milestone report) was further developed into a *preliminary* assessment of solutions that was circulated for comment to all project stakeholders and to the CLOSER and HERMES projects. Feedback was also sought at a workshop at WCTR in Lisbon in July 2010 and through an online questionnaire in November 2010. This allowed feedback on the solutions identified in advance of preparing the draft version of the toolkit (also submitted as a milestone). This draft toolkit took into account all feedback received, as well as the findings of the case study analyses carried out in WP4.

Stakeholder feedback at this stage, as well as the extra discussion within the consortium as the *initial* assessment evolved into the *preliminary* assessment proved extremely useful, for example leading to the re-categorisation of solutions from the six thematic areas defined at the start of the project. As the work of WP2 and WP3 in developing and analysing these solutions progressed, a decision was taken to group the solutions as shown in the rightmost column in Table 2.1 below.

**Table 2-1 Categorisation of solutions for good interconnectivity**

| Initial Categories of Solutions (T3.1 to T3.6) and reported in M3.3 ( <i>Initial Assessment</i> )                                                                                         | Categories in the <i>Preliminary Assessment</i> circulated in July 2010, also in M3.4 (draft toolkit)                                                                                                                           | Revised Categorisation following July 2010/October 2010 stakeholder feedback and reported in the final IC toolkit in D3.1                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Legal and organisational arrangements<br>New or improved links<br>New or improved interchanges<br>Infrastructure pricing<br>Integrated ticketing and pricing<br>Information and marketing | Local link infrastructure solutions<br>Local public transport services solutions<br>Improvements at the interchange point<br>Check-in and luggage transfer solutions<br>Ticketing and marketing solutions<br>Enabling solutions | Local link infrastructure solutions<br>Improved local public transport services<br>Improvements at the interchange point<br>Check-in and luggage transfer solutions<br>Pricing and ticketing solutions<br>Solutions involving marketing, information and sales<br>Enabling solutions |

### 2.3.2 Scientific and Technical Results from WP3

The main output of WP3 is the public deliverable D3.1, *An Analysis of Potential Solutions for Improving Interconnectivity of Passenger Networks*, which contains the INTERCONNECT toolkit.

The final version of the toolkit, reported in D3.1, builds upon the work in other areas of the project, from the literature searches that first identified potential solutions (WP2), the initial and preliminary assessments of solutions in WP3, the analysis of selected solutions in the detailed case study and test bed reports (WP4) and the feedback received from stakeholders in the WCTR workshop and questionnaire responses received (WP6).

The toolkit deliverable gives an overview of the purpose of the toolkit in presenting solutions to overcome the problems of poor interconnectivity that may be associated with:

- non provision (or inadequate standard) of the infrastructure for local links;
- poor design, maintenance or operation of modal interchange points;
- inefficient procedures for interchange (e.g. delays while waiting for luggage);
- inadequate provision of local transport services (e.g. no fast public transport from an airport to city centre);
- local transport services exist but do not serve the needs of connecting long-distance travellers (e.g. timetables are uncoordinated, nearest bus stop requires a long walk);
- inadequate provision of information; or
- unavailability of integrated tickets (covering the local as well as the long distance parts of the journey).

The toolkit itself is then presented as a matrix containing all 94 solutions against the agreed set of assessment criteria, together with instructions on how best to use the toolkit. In this way the toolkit can help policymakers address the problems outlined above. The assessment criteria employed in the toolkit matrices are:

- Indicative cost of implementing the solution
- Technical feasibility
- Financial feasibility
- Organisational/legal feasibility
- Acceptance by users
- Other aspects of political acceptability (in addition to expected acceptance by users)
- Impact on users' door to door travel time
- Impact on users' door to door travel cost
- Initial impact on comfort or convenience of the users' journey
- Any detectable increase in users' safety
- Any detectable increase in users' personal security
- Any detectable increased access for people with reduced mobility

For each solution a rating score is given for each of the assessment criteria allowing the key characteristics of the solutions to be presented effectively. For further information, each solution is then described in the text section of the deliverable with reference to the problems it addresses, its applicability, and its performance in achieving good interconnectivity according to the assessment criteria. The toolkit, which is publicly available through the project website, thus provides an excellent resource for policymakers interested in implementing good practice in interconnectivity.

| Section | Title                              | Cost   | Tech. feas. | Fin. feas. | Org. feas. | User accep. | Polit. feas. | D2D time | D2D cost | Comf. & conv. | Safe. | Secu. | Mob. |
|---------|------------------------------------|--------|-------------|------------|------------|-------------|--------------|----------|----------|---------------|-------|-------|------|
| 3.1     | Robust schedules                   | €      | 0           | X-√        | XX-0       | √           | 0            | X-√      | 0        | √√            | 0     | 0     | √    |
| 3.2     | Integrated timetabling             | €      | X           | 0          | X          | √           | 0            | √        | 0        | √             | 0     | √     | 0    |
| 3.3     | Regular interval timetabling       | €      | 0           | 0          | X          | √           | 0            | X-√      | X-√      | 0             | 0     | 0     | 0    |
| 3.4     | Adding short 'spokes' to a hub     | €      | 0           | 0          | 0          | X-√         | 0-√          | X-√      | X-√      | √             | 0     | 0     | 0-√  |
| 3.5     | Higher service frequency           | €-€€€  | 0           | XX-√       | XX-0       | √           | 0            | 0-√√     | √        | √√√           | 0-√   | 0     | 0-√  |
| 3.6     | Service re-routing                 | €      | 0           | 0          | 0          | X-√         | 0            | √        | 0        | √             | 0     | 0     | X-√  |
| 3.7     | Direct shuttle or express services | €-€€   | X-0         | X-√        | X-0        | √           | 0            | √√√      | 0        | 0-√√          | 0     | √     | √    |
| 3.8     | Addition of intermediate stops     | €      | 0           | 0-√        | X-0        | X-√         | 0            | X-√      | 0        | 0-√           | 0     | 0     | √    |
| 3.9     | Demand-responsive bus service      | €      | 0           | X-√        | 0          | √           | 0            | X-0      | √        | √√√           | 0     | √     | √    |
| 3.10    | Dedicated shared-ride taxi service | €-€€   | 0           | X-√        | 0          | √           | 0            | X-0      | √        | √√√           | 0     | √     | √√   |
| 3.11    | Link into general bus lines        | €      | 0           | 0          | 0          | √           | 0            | X-√      | √        | √             | 0     | 0     | √    |
| 3.12    | Shuttle bus between interchanges   | €      | 0           | X-√        | 0          | √           | 0            | X-√√     | √        | √             | √     | √     | √    |
| 3.13    | Provision of short feeder flights  | €€-€€€ | 0           | X-√        | 0          | √           | 0-√          | √√       | √        | √√            | √     | 0     | √    |

Figure 2-1 Example of the toolkit matrices: improved local public transport services

## 2.4 WORKPACKAGE 4 IN-DEPTH ANALYSIS THROUGH CASE STUDIES

### 2.4.1 Work Undertaken in WP4

There were three tasks in workpackage 4 that defined the areas of work undertaken:

- Review of case studies and methodology
- Identification of problems and good practice
- Applicability of potential solutions

#### *Review of case studies and methodology*

Before the start of the project a list of potential case studies had been identified and early in the project a methodology was developed to select the exact case studies to be pursued in the project. The methodology took a set of criteria and scored each possible case study so that the final list of 13 case studies analysed in INTERCONNECT could be drawn up. This process of case study selection was reported in two milestones. The selected case studies are shown below and described in more detail in section 2.4.2 below.

- Frankfurt Airport Interconnections
- Catalan airport system interconnections
- Milanese airport system interconnections
- Scottish airport system interconnections
- Interconnectivity of rail at Leeds railway station
- The Milan railways node
- The dual-mode railway system: the Karlsruhe model
- Train-Taxi and feeder bus services
- Amsterdam ferry services
- Lisbon ferry services
- Helsingborg ferry terminal
- Rostock ferry terminal
- Tri-City Gdansk / Sopot / Gdynia

Also at this stage of the project a common approach to the execution of each study was developed, reported as a milestone and circulated to all partners carrying out the case study analyses.

#### *Identification of problems and good practice*

This was achieved as the examples of good and bad practice in interconnectivity represented by each of the case studies was investigated. This was reported in the first instance in a milestone report on interim progress in the case studies, and later in D4.1, *Factors Affecting Interconnectivity in Passenger Transport*, described in the following section. Each case study report at this stage gave an overview of the key issues addressed and a general description of existing conditions – location, transport modes covered, transport network characteristics, travel patterns and passenger statistics, and existing barriers to, and opportunities for good interconnectivity. Each case study report then introduced the solutions to be analysed. The case studies are described briefly in Table 2.2.

Table 2-2 Case studies analysed and reported in public deliverable D4.1

| Case Study Title                                          | Brief Description                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frankfurt Airport Interconnections</b>                 | Analysis of how the airport is interconnected with urban, regional and long distance rail services and with the road network. A case of good interconnectivity with, for example, the incorporation of the airport into the system, and co-operation between air and rail operators for through ticketing.                                                                                                                             |
| <b>Catalan airport system interconnections</b>            | Analysis of the interconnections of Reus, Barcelona, Girona and Lleida airports with regional transport networks and also with their corresponding city centres. Investigation of interconnection of airports to high-speed rail network (planned and achieved)                                                                                                                                                                        |
| <b>Milanese airport system interconnections</b>           | Analysis of interconnectivity in the airports of Malpensa, Linate and the low-cost airport of Orio al Serio, looking at connections with Milan and the rest of the region, connections airport to airport, and links with the long distance national network. Currently an example of poor interconnectivity.                                                                                                                          |
| <b>Scottish airport system interconnections</b>           | Analyses of the competition between the three Scottish airports, and the connections between them, and their connections with the cities of Glasgow and Edinburgh. Currently largely an example of poor interconnectivity.                                                                                                                                                                                                             |
| <b>Interconnectivity of rail at Leeds railway station</b> | Analysis of the interconnectivity of rail in one of Britain's major railway stations, focusing on the interface between national, regional and local rail networks within a framework of increased competition and fragmentation of the rail industry.                                                                                                                                                                                 |
| <b>The Milan railways node</b>                            | Analysis of the current level of interconnectivity of rail networks in Milan and the existing plans concerning future connections with the new high speed rail services.                                                                                                                                                                                                                                                               |
| <b>The dual-mode railway system: the Karlsruhe model</b>  | Analysis of the interconnectivity solutions established in Karlsruhe where the urban tram system is integrated with the suburban railway network, constituting a case of good practice in interconnectivity.                                                                                                                                                                                                                           |
| <b>Train-Taxi and feeder bus services</b>                 | Analysis of different concepts developed in an attempt to encourage travellers to take the train instead of the car in long distance and inter-regional journeys, through services that help these travellers to overcome a key barrier in the <i>final few miles</i> of a journey, corresponding to access and egress to and from train stations.                                                                                     |
| <b>Amsterdam ferry services</b>                           | Analysis of the efforts being made in the Netherlands to increase the interoperability of different transport services and to co-ordinate and synchronise tariff and ticket systems to overcome barriers to interconnection.                                                                                                                                                                                                           |
| <b>Lisbon ferry services</b>                              | Analysis of the driving forces that have maintained the ferry services in the Tagus river, even after the construction of bridges which brought significant competition from road and rail traffic. There are several elements of good practice which explain the survival of ferries.                                                                                                                                                 |
| <b>Helsingborg ferry terminal</b>                         | Analysis of the strategies which have made the ferry services between Helsingborg and Elsinore a competitive means of transport, even after the construction of the Øresund bridge, focusing on the central terminal for all modes of public transportation that has been developed in Helsingborg to facilitate direct and rapid interchange between the ferries and all modes of public transportation. An example of good practice. |
| <b>Rostock ferry terminal</b>                             | Analysis of Rostock as an example of a ferry terminal where interconnectivity of transport networks for non-motorised passengers has for a long time been disregarded and where little investment has been made to improve conditions for the non-motorised segment of travellers to the terminal. Currently an example of poor practice.                                                                                              |
| <b>Tri-City Gdansk / Sopot / Gdynia</b>                   | Analysis of the many interconnectivity challenges that the Tri-City region is currently facing, with identification and analysis of potential solutions already envisaged.                                                                                                                                                                                                                                                             |

### Applicability of potential solutions

A number of *test bed* analyses looked in more detail at a small number of solutions in specific settings, modelling the potential applicability of these solutions to other situations. These were reported in a milestone report, which is not publicly distributed, although the test beds are described in presentations of the project E-Conference, available on the website, and are discussed in the final conclusions in deliverable D5.4, *Conclusions and Recommendations from the INTERCONNECT Project*. Each test bed report first set the scene with an overview of the characteristics of the test bed: its location, transport infrastructure, current travel patterns, transport service users and stakeholders, and the identification of solutions for interconnectivity to be modelled. The test bed reports then outlined modelling tools and approaches to be used and identified the scenarios to be tested. The modelling results allowed an assessment of the effectiveness of solutions tested and their applicability elsewhere, summarised in a stakeholder-effects matrix. The test beds are described briefly in Table 2.3.

**Table 2-3 Test beds for the analysis of the applicability of selected solutions**

| Test Bed                                                                                       | Brief Description                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Catalan Airports Interconnections: Girona and Reus</b>                                      | Test of the performance of high-speed rail solutions for airport access                                                                                                                                            |
| <b>Barcelona Airport Internal and External Rail Interconnections in the Llobregat Platform</b> | Analysis of the performance of rail interconnections to the airport (HSR, regional and suburban rail) in a proposed future configuration tested against the two alternative solutions to improve their performance |
| <b>Frankfurt Airport Interconnections Applied to the Airport of Stuttgart</b>                  | Assesses the effect of rail connections implemented at Stuttgart, to test if the solutions implemented at Frankfurt can be transferred                                                                             |
| <b>Milan Railways Node Interconnections</b>                                                    | Assesses the impact of potential measures to improve rail and metro connections between Milan city and the airports at Linate and Malpensa                                                                         |
| <b>Edinburgh-Glasgow Airport Interconnections</b>                                              | Investigates how the airports could be linked with each other and with the cities they serve, and how these links could improve interconnections                                                                   |

### 2.4.2 Scientific and Technical Results from WP4

The main output from WP4 is the public deliverable D4.1, *Factors Affecting Interconnectivity in Passenger Transport*, that presents the analysis of selected solutions in a number of case study locations presented in Table 2.2 above. D4.1 runs to almost 450 pages and forms a significant resource in the study of interconnectivity. As a public deliverable, D4.1 is available on the public website – each case study report may be viewed/downloaded individually.

As well as the individual case study reports, D4.1 contains an introduction with an overview of the current state of interconnectivity in European transport networks, and an investigation into intermodality and interconnectivity based on analysis using TransTools and multi-modal graphs developed in INTERCONNECT.

Each case study report then introduces the solutions that are to be analysed (whether these are already in place or are planned for the future) and the performance of these solutions in that particular case, against the criteria for success identified in WP3 in the development of the toolkit, is analysed in detail. The case studies then reach conclusions on the solutions investigated, with comments on their transferability to other situations.

The contents and conclusions from each case study are summarised below.

The **Frankfurt airport interconnections** case study analyses the state of land interconnections at Frankfurt airport, how the airport is interconnected with urban, regional and long distance rail services and with the road network. It especially deals with the fact that besides the rich interconnection with the highway network, the incorporation of the airport into the high speed railway system has been a big step forward to increase intermodality at the airport, together with the co-operation between air and rail operators for through ticketing, thus constituting an element of good practice. This case study argues that the improvement of the rail-airport

interconnection and operator co-operation has resulted in substantial rail demand in the airport, allowing liberation of slots from no longer necessary feeder flights to be used for other long-haul flights, therefore improving transport co-modality.

The **Catalan airport system interconnections: Barcelona, Girona, Reus and Lleida** case study discusses the interconnections of Reus, Barcelona, Girona and Lleida airports with regional transport networks and also with their corresponding city centres. All airports are located within 200 km of each other, and the new HSR line will pass within reach of all of them. The interconnection of airports to the HSR is intended to create a network of specialised airports, with small airports being able to provide the capacity that Barcelona will lack sooner or later. But the interest and feasibility of these rail connections have always been under debate and now they are just partially achieved. This case study concludes that it is difficult to plan optimal solutions in a multiple stakeholder framework and a highly populated territory. It has also pointed to the fact that designing optimal interconnections requires adhoc solutions for choosing best transport modes in each case. Territorial impacts beyond optimisation of travel times and travel costs should be taken into account in long-term impact appraisal.

The **Milanese airport system interconnections: Malpensa, Linate and Orio al Serio** case study looks at the condition of interconnectivity in the airports of Malpensa, Linate and the low-cost airport of Orio al Serio. All are located around Milan within a radius of 60 km, at the core of the densely populated Lombardy region. The case study analyses the typology of air traffic in the airports, their connection with Milan and the rest of the region, their connections airport to airport, and their links with the long distance national network. The case study concludes that the lack of adequate planning has resulted in poor interconnections in the Milan area, with long-distance rail network connections missing in Malpensa, an absence of reserved road infrastructure for public transport even when accesses to airports in Milan is congested, and missing passenger facilities at terminals that could potentially increase interconnection quality. Additionally, the completion of planned infrastructures is affected by great uncertainty.

The **Scottish airport system interconnections: Edinburgh, Glasgow and Prestwick** case study analyses the issues concerning the competition between the three Scottish airports, and more crucially, the connections between them, their connections with Scotland's major population centres. Of the three airports studied only Prestwick has a direct rail connection, and the three are only interconnected by very busy motorways. The case study concludes that even if infrastructure costs are not likely to be recovered rail services serving airports may be profitable, while bus services can attract large patronage. It will also note that intermodal ticketing strategies help attract users to public transport in airport to city trips.

The **Leeds railway station** case study deals with the interconnectivity of rail in one of Britain's most significant railway stations, which in the past decade has seen a number of enhancements designed to, or having the effect of, enhancing interconnectivity via the improvement of access and egress. The case study concludes that while passenger figures grew at Leeds rail station over the last 10 years, there is a lack of evidence that the observed growth is related to the enhancements undertaken at the station, while it is not clear whether or not competition promotes interconnectivity or detracts from it.

The **Milan railways node** case study analyses the current level of interconnectivity of rail networks in Milan and the existing plans concerning future connections with the new high speed rail services, providing useful elements concerning good and bad practice from several points of views, in particular with the issues regarding interconnection at stations, accessibility of stations, services for the airports and integration of fares. Milan is a key node of the rail network in northern Italy, linking long distance routes to the regional network (operated by two separate companies on two independent infrastructures), to the local transit system of the main business metropolitan area in Italy and, in principle, also to the Milan airports. Continuous efforts have been made for improving the interconnections with local public transport as well as with the underground network, so that the main rail stations are currently reachable by at least one metro line and by bus or tramway. On the other hand, the lack of harmonisation between the services of the multiple providers, a minimum-stage ticketing integration and the lack of user information and scarcity of facilities to reduce transfer times at interchange points leaves room for improvement in the future.

The **dual-mode railway system: the Karlsruhe model** case study analyses the solutions of interconnectivity established in Karlsruhe concerning the urban tram system and its integration on the suburban railway network, constituting a case of good practice in interconnectivity. Karlsruhe trams run on the urban light rail

system and on the heavy rail tracks of the German Railways, allowing for tramway and suburban rail networks to operate together with relatively moderate investment requirements. In addition to the technical aspects concerning the tracks and the vehicles, this case study analyses the advantages, limitations and shortages of the model, concluding that it fits mostly in medium-sized urban areas with non-centrally located rail stations, resulting in important growths of passenger figures - including substantial catchment from private modes- and providing excellent cost-benefit ratios and helping relieve deficits of public transport.

The **train-taxi and feeder bus services** case study focuses on different concepts developed in an attempt to encourage travellers to take the train instead of the car in long distance and inter-regional journeys, by providing information and services that would help these travellers to overcome a key barrier, the “final few miles” corresponding to access and egress to and from train stations. This case study concludes that while relatively inexpensive services to operate such as UK’s T-T and Plusbus have been successful in the past, high costs have made Dutch T-T system difficult to sustain, resulting in a 65% offer reduction in the last 15 years. Large scale network coverage is generally required for these schemes to be functional and attractive to customers.

The **Amsterdam ferry services** case study focuses on the efforts that are being made in the Netherlands to increase the interoperability of different transport services and to co-ordinate and synchronise tariff and ticket systems. A mobility card has been introduced allowing seamless transfer between modes to overcome barriers to interconnection, and provides at the same time new technological possibilities to assess and manage mobility. The top-down approach in the process of transport integration has resulted in the need for a synchronisation between large numbers of parties, but there seems to be a high notion of co-operation between these parties towards a single goal. This case study concludes that ticketing in Amsterdam is moving from a modal or operator led approach towards a “mobility” approach, but it is not clear who is the overall beneficiary of the new system, even when integration and interconnection between operators bears the potential to increase services and to expand the reach of the transport network.

The **Lisbon ferry services** case study explores the driving forces that have maintained the attraction of ferry services in the Tagus river, even after the construction of bridges which brought significant competition from road and rail traffic. Lisbon has an intensive network of ferry services across the river, despite the imposing Ponte 25 de Abril bridge which links the two sides of the city and carries both rail and road traffic. Even a car ferry service has survived the arrival of the bridge, unusual in such circumstances. The case study identifies diverse elements of good practice which can help explain the survival of ferries, among them the co-operation (and finally merging) of the two operating ferry companies, the improvement of terminals for easier interconnection to other means of transport, the investment in boat renewal, which has resulted in decreased travel times, and the introduction of smart cards to overcome a complex fare system.

The **ferry terminal of Helsingborg** case study focuses on the strategies which have made the ferry services between Helsingborg and Elsinore a competitive means of transport, even after the construction of the Øresund bridge. In the 1980s a decision was made to create a central terminal for all modes of public transportation in Helsingborg, located right at the port, facilitating direct and rapid interchange between the ferries and all modes of public transportation. The terminal incorporates two former train stations, the central bus station and the ferry terminal, and currently serves local, regional and national trains and buses to and from Helsingborg, and boat services to Elsinore. This case study concludes that the project was only possible due to intense institutional co-operation and understanding, and identifies additional elements of good practice such as the driving concept of terminals which has forced designs specifically targeted to easy interconnectivity, and the co-operation of ferry operators to take account of each other’s timetables and increase service quality.

The **ferry terminal of Rostock** case study analyses the case of Rostock as an example of a port where interconnectivity of transport networks for non-motorised passengers has for a long time been disregarded as the majority of passengers travel by car or bus. This case study argues that the lack of investments made to improve conditions for the non-motorised segment in the terminal have led to decline and poor conditions of access to and egress from the terminal. The case study explores solutions that have been more recently implemented or which are being planned for the future to improve this situation. For example, a shuttle bus link connecting the passenger terminal with the city centre and the rail station is planned, saving non-motorised passengers at least 20 minutes of travelling and waiting time.

The **Tri-City: Gdansk / Sopot / Gdynia** case study focuses on the discussion of the many interconnectivity challenges that the Tri-City region is currently facing, identifying potential solutions already envisaged. Two Pan-European transport corridors run through the region and although there are two major seaports in Gdansk and Gdynia, ferry links are not very well developed. Lech Walesa airport operates domestic connections to Warsaw and direct international links to European airports served by 13 airlines; a new terminal and airside constructions are underway and fixed rail link to the airport is planned. Urban public transport requires improvement to increase efficiency, as do the rail and the road networks. The case study shows that interconnectivity is a priority for local and central administrations, having a clear vision that there is a need to improve services to increase regional attractiveness. Financial constraints are the most important barrier to improvement, with rivalries between the two major cities of Gdansk and Gdynia also a barrier.

In the light of the case studies' major findings and other evidence supported by strategic studies conducted at national and European level, D4.1 concludes with a proposed set of final hypotheses to be further validated.

- On *infrastructure planning*, interconnections typically involve significant resources, so that integrated planning and management of interconnections is a key element to achieving social and economic profitability of investments and positive network effects, especially in small and medium sized terminals.
- On *service management*, there is a need to favour co-modality through serving interconnections with the most efficient travel modes in each case, considering specific solutions for different situations.
- On *organisational issues*, it is noted that institutional complexity and contradictory stakeholders' goals need often to be overcome in order to achieve good interconnections.

## **2.5 WORKPACKAGE 5 CONCLUSIONS AND RECOMMENDATIONS**

### **2.5.1 Work Undertaken in WP5**

There were three tasks in workpackage 5 that defined the areas of work undertaken:

- Conclusions from case studies
- Test with EU model
- Final conclusions and recommendations

#### ***Conclusions from case studies***

This work was reported in D5.1, *Impacts of Interconnectivity on a European Scale*, analysing the implications for EU policy that can be drawn from the case study analyses and reports, as well as the transferability of findings on interconnectivity to other situations. There was also an investigation into the modelling tools currently available for modelling interconnectivity at a European scale and the potential need for improved modelling tools, thereby building on the work into the review of available modelling tools from WP2.

#### ***Test with EU model***

This work investigated the requirements for good modelling tools to model interconnectivity in transport networks, proceeded with the development of multi-modal graphs to analyse interconnectivity, the development and validation of the IC module, and preliminary work on the meta-model for evaluation of interconnectivity. D5.2, *Meta-models for the Analysis of Interconnectivity*, reports further on the meta-model. D5.3, *Modelling Module for Interconnectivity*, reports further on the IC module.

#### ***Final conclusions and recommendations***

Although some preparatory work had been ongoing throughout the project, the work of this task was concluded right at the end of the project in May 2011, with careful study of all the project outputs and reflections, from all partners, on what had been learned and what recommendations could be made.

The resulting public deliverable D5.4, *Conclusions and Recommendations from the INTERCONNECT Project*, is not a long document. It is concise and clear and readable and presents an excellent synthesis of project conclusions and some very pertinent recommendations in certain topic areas within interconnectivity.

### 2.5.2 Scientific and Technical Results from WP5

The results of work undertaken are reported in four public deliverables, described below.

D5.1, *Impacts of Interconnectivity on a European Scale*, outlines the background EU policy on interconnectivity and then analyses each case study in terms of EU policy objectives. In this way the report outlines implications for EU policy that can be drawn from the case study analyses and reports, and for the transferability of findings on interconnectivity to other situations. D5.1 then investigates the modelling tools currently available for modelling interconnectivity at a European scale and the potential need for improved data inputs and modelling tools.

Some recommendations that emerged from the policy analysis of the case studies:

- There is a need to further optimise the interfaces between transport networks and modes, addressing aspects related to design of interchanges, planning and services.
- There is a need for interchanges to be a core and functional part of the network as a whole since accessibility itself is not enough.
- Voluntary agreements and/or cooperation schemes where operators see win-win situations might be the solution that allows different transport actors to achieve a common strategy while maintaining the possibility to act independently.
- There is a need to incorporate from the very beginning interconnections between short- and long distance trips and their related land-use developments at the heart of the planning approach.
- There is a need to secure consistency of timing and scheduling between the responses from the public authorities and the investment choices made by private actors.

Recommendations for improved modelling of interconnectivity are:

- The use of a network-based representation of alternative routes and modes within the transport model, where the network model should employ appropriate multi-path algorithms to construct alternative routes through the network between origin-destination pairs.
- The transport model should employ some form of choice model which estimates the demand on each mode combination/route based on the generalised costs of the different alternatives.
- The generalised cost formulation used in the transport model should include an explicit representation of costs of modal transfer.
- The review of available statistics on long-distance travel indicates that very few surveys have recorded detailed information about multimodal journeys. Furthermore, when available, this data differs to a large extent from country to country as to quantity and level of detail and hardly contains information on travellers' characteristics.
- This lack of data, reflected in the absence of relevant Eurostat statistics, poses strong limitations on the development of passengers' multimodal transport modelling at European level.

Modelling work was further reported in two deliverables: D5.2, *Meta-models for the Analysis of Interconnectivity*; and D5.3, *Modelling Module for Interconnectivity*.

A new module (the IC Module) was implemented to assign TRANSTOOLS trip matrices onto a single multi-modal transport network which specifically includes interconnections. This integrated modal split and assignment module allows testing the impacts of different interconnection costs. A meta-model was programmed to produce interconnectivity indicators from results of the IC module and to carry out sensitivity analyses with the purpose of tracking the most promising scenarios to be later fully modelled with the IC module.

D5.2 *Meta-models for the Analysis of Interconnectivity* builds on the results obtained in task 5.2 to test the impact of improving interconnections. The implementation of the IC Module on modal split and traffic assignment is reported in deliverable D5.3 *Modelling Module for Interconnectivity*. The IC MSA Module screenshot in Figure 2-2 below shows the global European level with a zoom showing connections between networks.

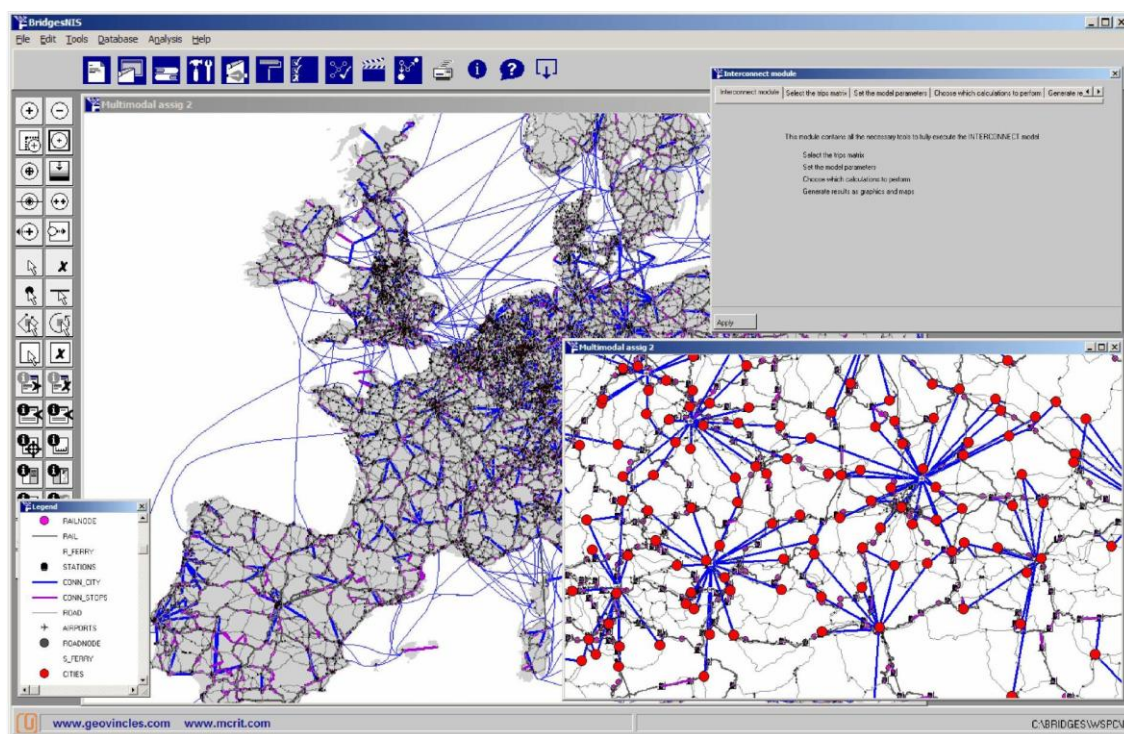


Figure 2-2 Screenshot from the IC MSA Module

D5.2 presents a large number of conclusions from this work, split into three major categories:

- conclusions on the geography of interconnections (how travel behaviour takes place in Europe today in relation to the use of uni-modal and multi-modal chains, and subsequently, on the relevance of interconnectivity in the transport system);
- conclusions on the impact of improving interconnections (changes in modal split, traffic volumes, trip lengths, CO<sub>2</sub> emissions and transport costs due to the improvement of interconnections); and
- conclusions relating to the general interest of improving interconnections from a policy point of view.

Finally, D5.4, *Conclusions and Recommendations from the INTERCONNECT Project*, presents project findings in summary. The report first presents an overview of the current situation of interconnectivity in Europe, then describes examples of good practice uncovered in the case studies and the critical issues in identifying best practice, provides an overview of current planning policy with regard to interconnectivity and recommendations for improvements, introduces the INTERCONNECT toolkit, and then outlines the requirements for good modelling tools to reflect the benefits of interconnectivity. The findings of analysis carried out using the IC module, showing the impacts of improved interconnectivity are then presented. D5.4 concludes with some brief recommendations for the future.

Project conclusions have been summarised as follows:

- The statistical documentation concerning interconnectivity and long-, medium- and short-distance passenger transportation is not sufficient. There is a need for uniform principles in the EU for key definitions, surveys and gathering of statistical evidence. The car is the dominant transport mode for passenger transport in the range of 100 - 400 km. However, in Switzerland rail carries nearly a quarter of all trips between 100 - 400 km, and in France, with its high-speed rail network, rail already carried nearly a quarter of all trips above 400 km in 1993. It is argued that the fundamental problem areas of interconnectivity can be categorised as relating to legal, organisational, technical and financial issues.
- The documentation of the case studies is a prime source of information for stakeholders working in the development of good interconnections. Some cases distinguish themselves as being particularly good examples with a significant reproduction potential in either methods applied and/or the tools used. The

Frankfurt airport and the Helsingborg ferry terminal are examples of very different terminal purposes to be served, but in both several transport modes are interconnected in a comprehensive and innovative fashion, leading to substantial benefits for passengers and society.

- The present EU policies and recommendations to the member states were analysed revealing that there is a need to further optimise the interfaces between transport networks and modes, addressing aspects related to design of interchanges, planning and services. In addition, stronger attention is needed to ensure a higher degree of adherence to the EU policies on the promotion of intermodality.
- National and EU strategic planning has been reviewed and analysed. There is a need for the EU to function as a driver of the development of better interconnections both at a strategic and a more practical level. Without a more active role of the EU and possibly the use of political instruments such as EU directives, this development will not ensure a coherent and cross-national strategic EU policy in passenger interconnections, safeguarding the integration and development of the EU, and ensuring the mobility needs of the EU citizens.
- A comprehensive “toolkit” has been assembled following a systematic analysis of problem areas related to interconnectivity. The “toolkit” consists of 94 potential solutions to the identified problem areas systematised in seven solution categories.
- The possibilities to use modelling in the analysis of interconnections at an EU scale have been investigated, and the requirements for the development of such a tool have been elaborated. Following this analysis a specific modelling tool has been developed based on the TransTools model and used to take the analysis of interconnectivity further with a look into a possible future.
- This exercise revealed some interesting issues and holds promise for further development. One key finding was that lowering the cost associated with an interconnection can, under certain conditions, lead to an increase in CO<sub>2</sub> emissions, and under other conditions (e.g. if favouring rail as transport mode) to a decrease in CO<sub>2</sub> emissions. This is an interesting result because it underlines the importance of proper analysis of the consequences related to an interconnection, and also brings information on environmental and climate issues to the decision makers.

This has allowed a set of recommendation for the future to be developed, as described below.

#### *Statistical evidence and data collection*

Both in analysis of the present situation and in the project's work on modelling, the importance and need for a higher quality of empirical data and statistics covering the key elements of interconnection, have been underlined. Specifically, there is a need for better data on multimodal journeys, a better coverage of all EU countries, and data generated in accordance with uniform common EU standards. This would allow a much fuller analysis of the current status of multimodal travel than is currently possible, enable comparisons between countries, make calibrations of models significantly easier and improve overall quality and reliability of results.

#### *Future research and development*

A few of the most interesting and most promising areas for future research and development are detailed below:

- Infrastructure planning plays a significant role in the development of interconnections. However, the present tools and knowledge available cannot answer questions on how infrastructure planning as a process in a political system could contribute to an improved interconnection.
- Organisational issues have proved to be of importance in the development of interconnection, sometimes leading to success and in other examples leading to failure. A better understanding of organisational behaviour and the structural elements in organising interconnections in complex political and economical structures is needed.
- Financial and economic issues have been found to often interact with organisational issues and to create complicated barriers to improved interconnection, as problems at different political, organisational and economic levels need to be solved by actors with conflicting interests. Possibly, a better understanding of such situations could lead to guidance and/or general solutions or models, which could be implemented in the EU.

- In some case study reviews it has been observed that a combination of passenger-related elements of a technical, commercial and practical nature seems to have a reinforcing and complementary potential, which can significantly contribute to the success of a terminal and/or interconnection project. A better knowledge of this could lead more successful interconnection projects and an optimising of resources in relation to effects.
- Intelligent Transport Systems and the possibilities of using new information technology, mobile- and smart-phones as an active element supporting interconnection, holds a promising potential to become a driver for the development of interconnection. Research and development in this area also has potential for the ITS and IT industry in Europe to develop new products and/or systems to be used and exploited as business opportunities in the rest of the world.

#### *The potential for the EU to act as a driver for future development*

The results of the INTERCONNECT project have highlighted the possibility for the EU to function as a driver for the development of interconnectivity at different scales across Europe. At the strategic level the analysis has revealed that there is an overall lack of focus in national strategic policy documents, perhaps calling for a more active role for the EU, and highlighting the potential for more formal and authoritative strategic policy decisions binding for the member states, in order to ensure a coherent and cross-national strategic EU policy in passenger interconnections, safeguarding the integration and development of the EU, and ensuring the mobility needs of the EU citizens.

At a more practical level the EU has an important role to fulfil through the creation of common EU standards to facilitate technological development, for example in passenger ticketing, passenger information and passenger reservation systems. Another example could be to set up minimum standards for the intermodal connection terminals important to cross-national passenger movements as well as for interconnections of national importance, thereby creating a feeder system facilitating international passenger mobility.

#### *Implementation and maintenance of the INTERCONNECT results*

The INTERCONNECT output has the potential to be used as a policy and knowledge lever. The toolkit reported in D3.1, *An Analysis of Potential Solutions for Improving Interconnectivity of Passenger Networks*, will remain accessible through the project website at [www.interconnect-project.eu](http://www.interconnect-project.eu).

Stakeholders and policymakers in interconnection projects have never before had direct access to such resources on the problems and solutions of interconnectivity as presented in the public outputs of INTERCONNECT.

Therefore, the results and documentation of the INTERCONNECT project will be kept accessible over the coming years. However, the continued usefulness of the toolkit could potentially be improved by an annual update reflecting the experience generated by the practical use of the toolkit and the possible developments in the facilities and function of the terminals and new emerging solutions.

## 2.6 OVERVIEW OF SCIENTIFIC AND TECHNICAL RESULTS

The main results from the project are reported in the public deliverables submitted and now available to download from the project website, as shown in Table 2.4 below and described above.

**Table 2-4 Main outputs from INTERCONNECT: key public deliverables**

| Deliverable number | Deliverable Title                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------|
| D2.2               | The Role of European and National Policies in Improving Interconnectivity for Passengers               |
| D4.1               | Factors Affecting Interconnectivity in Passenger Transport (case study reports)                        |
| D3.1               | An Analysis of Potential Solutions for Improving Interconnectivity of Passenger Networks (the toolkit) |
| D5.1               | Impacts of Improved Interconnectivity on a European Scale                                              |
| D5.2               | Meta-models for the Analysis of Interconnectivity                                                      |
| D5.3               | Modelling Module for Interconnectivity                                                                 |
| D5.4               | Conclusions and Recommendations from the INTERCONNECT Project                                          |
| D6.4               | Final Dissemination and Use Plan (Public)                                                              |

### 3 POTENTIAL IMPACT AND MAIN DISSEMINATION ACTIVITIES

#### 3.1 POTENTIAL IMPACT

Through the dissemination activities described in more detail below, and in the Final DUP (D6.4) the aim has been to distribute the findings from INTERCONNECT to key stakeholders, that is to practitioners and policymakers who are promoting interconnectivity in policy and practice, as well as to interested researchers. The toolkit in particular (D3.1) provides a key resource for transport policymakers, as it contains a comprehensive list of solutions to promote good interconnectivity, together with instructions on their applicability in different situations. The case study reports also provide a reference on the real-world implementation of interconnectivity solutions, illustrating both good and bad practices.

The main target groups relevant for INTERCONNECT include infrastructure owners, transport operators and planners, local or regional authorities, passenger organisations, strategic national and European decision makers and lobby groups, as well as the research community. The key stakeholders are the centre of the project's attention. In order to ensure a wide distribution of the findings and results of the INTERCONNECT all consortium partners made an effort to identify relevant stakeholders. The consortium's joint list of relevant stakeholders (approximately 140 stakeholders) has been used to check initial findings and to get input on draft results and have shown interest in the final outputs.

#### 3.2 MAIN DISSEMINATION ACTIVITIES

The objectives for the dissemination initiatives have been:

- involvement of stakeholders in the current and potential interconnectivity field;
- provision of information to current researchers in the interconnectivity field; and
- raising awareness among those researchers who could play a role in future interconnectivity research.

The main dissemination activities INTERCONNECT, discussed in more detail below, have been:

- The INTERCONNECT website
- The project presentation leaflet
- Project deliverables
- Stakeholder consultation
- The final E-Conference

Dissemination plans also include:

- Presentation of INTERCONNECT at national and international conferences
- Scientific articles in relevant national and international journals
- Contributions to the newsletters of the CLOSER project, and participation in the workshops held by the CLOSER and HERMES projects

#### *INTERCONNECT project website*

The project website, at [www.interconnect-project.eu](http://www.interconnect-project.eu) and shown in the screenshot in Figure 3.1, has continually been updated and now provides a very useful resource for dissemination of project results. All public deliverables are posted on the website. A special section of the website contains all presentations prepared for the INTERCONNECT E-Conference – giving a very thorough overview of the work of INTERCONNECT and the findings on interconnectivity that can be viewed by any policymaker or researcher interested in good interconnectivity. The website will remain live after the end of the project.

The public area of the website currently (July 2011) contains the following pages:

- Home page: a general overview of the project

- E-conference: all presentations from the INTERCONNECT E-conference
- About the project: an introductory page with the main aims and expected results of the project
- Consortium: listing and contact info of partners
- Project deliverables: a download facility for the public deliverables of the project
- Links
- Contact details



Figure 3-1 INTERCONNECT website screenshot (www.interconnect-project.eu)

### Project presentation leaflet

The project presentation leaflet, was initially prepared and submitted in September 2009. As the project progressed, four further versions were produced and circulated at key points, so that five versions in total were prepared and circulated. All versions of the leaflet gave an outline of the main aims and foreseen results of the project, project objectives and approach to the work, as well as contact information for partners and the co-ordinator.

The leaflet was prepared as double-sided A4 format and was printed out on good quality thin card. The leaflet used the same signature project graphics as used in the project website. The final version (V5) of this double-sided leaflet is shown in Figure 3.2 below.



Figure 3-2 INTERCONNECT project presentation leaflet

### Project deliverables

The public deliverables of the project, as described in section 2.7 above, are available to download from the project website, and form a key output of the project.

In terms of the impact of the project on key target groups, the most important deliverable is D3.1, which contains the project toolkit. The toolkit is a compendium presenting existing good practice, potential solutions and promoting the take-up of best practices. The toolkit targets practitioners and policy makers alike, and provides state-of-the-art experience on how to promote interconnectivity in policy and practice.

The INTERCONNECT toolkit of solutions to improve passenger interconnectivity is of particular importance as a mean of dissemination of findings from INTERCONNECT. The toolkit is also presented as part of the E-Conference, described below.

### Stakeholder consultation

INTERCONNECT stakeholders have been used to ensure targeted and direct dissemination of the findings and results of INTERCONNECT and to check preliminary results and to get input on draft conclusions and recommendations. The involvement of the stakeholders aimed to get relevant and qualified thematic input to the proposed solutions to improve passenger interconnectivity and to the draft conclusions and recommendations from the project, and to ensure strategic dissemination of the main results of the project directly to the relevant key stakeholders, thus ensuring that the research results from INTERCONNECT will be put into use.

Two stakeholder forums were held to present the preliminary solutions and the draft conclusions and recommendations of INTERCONNECT. The first forum took place at WCTR 2010 in Lisbon in July 2010 in the form of a half-day workshop. The second forum took the form of a web-based stakeholder consultation conducted in autumn 2010. A large number of proposed solutions to the problems of poor interconnectivity

had been identified at this stage. The partners' networks of national and European stakeholders were consulted using a web-based questionnaire in order to refine the proposed preliminary solutions.

### Final E-Conference

Originally planned as a traditional one-day event, the final project conference took the form of a virtual E-Conference, with presentations posted on the project website, as shown in Figure 3.3. The objective of the E-Conference was to present and debate the draft conclusions and recommendations from INTERCONNECT with national and European stakeholders and researchers interested in improving interconnectivity between short and long-distance passenger transport networks.

E-Conference presentations covered:

- introduction to the INTERCONNECT project;
- the INTERCONNECT "toolkit" of solutions to improve passenger interconnectivity;
- the main results from the INTERCONNECT case studies, surveys and test beds; and
- draft conclusions and recommendations from the project.

Stakeholders could have downloaded PowerPoint presentations with audio commentary until 9th of May 2011. During this period they were able to send comments and questions regarding these presentations to the consortium. Afterwards, members of the consortium discussed and responded directly to all feedback received. In all the E-Conference had approximately 100 external hits from 2nd to 9th May 2011, which illustrates the number of visitors to the E-conference. The presentations will stay online and available to download on the project website for at least one year beyond the end of the project as they are part of the main results of INTERCONNECT.



Figure 3-3 INTERCONNECT E-Conference screenshot (www.interconnect-project.eu)

## 4 WEBSITE, LOGO AND CONTACT DETAILS FOR THE CONSORTIUM

### 4.1 WEBSITE ADDRESS

The project website address is:

[www.interconnect-project.eu](http://www.interconnect-project.eu)

### 4.2 COORDINATOR CONTACT DETAILS

Project Leader: Christiane Bielefeldt

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### 4.3 PROJECT LOGO



### 4.4 LIST OF ALL BENEFICIARIES WITH THE CORRESPONDING CONTACT NAMES

Transport Research Institute (TRI), Edinburgh Napier University, U.K.  
Contact: Professor Christiane Bielefeldt

Mcrit sl, Barcelona, Spain  
Contact: Dr Andreu Ulled

MKmetric Gesellschaft für Systemplanung mbH, Karlsruhe, Germany  
Contact: Dr Benedikt Mandel

Tetraplan A/S, Copenhagen, Denmark  
Contact: Rasmus Gravesen

TRT Trasporti e Territorio, Milan, Italy  
Contact: Claudia de Stasio

Institute for Transport Studies (ITS), University of Leeds, U.K.  
Contact: Professor Peter Bonsall

Uniwersytet Gdanski, Poland  
Contact: Dr Monika Bak