FINAL REPORT

Covering period from 1st Jan 2000 to 31st Dec. 2002

Report Version: Final Version (1.7)
Report Preparation Date: 20 Feb. 2003
Classification: Public
Contract Start Date: 01.01.2000 Duration: 31.12.2002
Project Coordinator: SSP Consult Beratende Ingenieure GmbH

Partners:
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Steleus (formerly NMG) (F),
Mentz Informatique, MI (F, since April 2001)
Final Report

Summary of this report

This report gives an overview on the project and its results.

Keywords

Mobility services, intermodal information systems, information for mobility-handicapped persons, employees' transport, congestion management, car-pooling.

Work packages contributing to the Deliverable

WP0 to WP 9

Funding, sponsoring, partners

The European Commission (IST Programme, 5th Framework Programme) co-funded the ISCOM Project No 11425//71425. Additional sponsors promote certain activities.

Project team

Co-ordinator: SSP (D), Main Contractors: mdv (D), Maior (I), VOR (A), Steleus (formerly NMG) (F), City of Stuttgart - AfU (D), City of Stuttgart - TR (D), NVBW (D), Steleus (formerly NMG) (F), MI (F, since April 2001); Associated Contractor: ATAC (I), Telal (F, until March 2001).

Issue Date

20 February 2003

Approval of this report

This deliverable version has been produced after approval by the Quality Manager of the ISCOM Project.
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1 Project Overview

Overall economic development and growth are connected strongly to mobility. The improvement of mobility by mobility services will help to make transport more efficient and reduce the use of resources (e.g. time, fuel). Particularly in big cities and high-density areas, congestion in road transport and capacity overuse in public transport during peak hours are limiting factors for social and individual welfare.

ISCOM consists in the development and demonstration of multimodal and intermodal transport information and services to raise quality of life in the daily experience and in mobility. Emphasis is paid to overcoming cross-border limitations in intermodal transport, reducing congestion, environmental pollution, energy consumption and accidents in road traffic.

From the beginning, the core or integrating element of the project consisted in the development, demonstration and validation of electronic timetable information and of corresponding intermodal information as well as in the set-up of mobility services. The sites involved cover the region South-Alsace composed of Départements du Haut-Rhin, Bas-Rhin, Territoire de Belfort and the Regio Tri-Rhena around Canton of Basle, the City of Mulhouse and southwest Baden-Wuerttemberg around Freiburg, the region of Baden-Wuerttemberg as well as the metropolitan areas of Rome and Vienna. The City of Stuttgart in Baden-Wuerttemberg additionally puts emphasis on the improvement of traffic management functions, especially congestion information and the extension of the mobility centre services by carpooling.

To this aim the different sites with particular problems have been selected - the regions with the cross-border aspect and the European capitals with the mass transport problem. The areas have partially operated mobility centres that offer a great variety of mobility services. The transport services on the digital network are accessible either by end users directly as a basic service, or by operators of mobility centres.

Figure 1-1 ISCOM sites
1.1 Main Achievements

The ISCOM Project contributed to mobility management in the EU by the development and demonstration of multimodal and intermodal transport information and services to overcome cross-border limitations in passenger transport, reducing congestion, environmental pollution, energy consumption and accidents in road traffic.

The systems and services developed build on recent achievements in national projects (BAYERNINFO, MOBILIST) and international projects (e.g. RUBIS, CARPLUS, QUARTET PLUS).

The main objectives of ISCOM are:

- Promotion of intermodal and trans-regional mobility
- Promotion of electronic media for mobility information
- Support of mobility centres and their services
- Support of persons with reduced mobility
- Improvement of transport efficiency

The main achievements are:
I. Intermodal information system (the EFA system\(^1\))

Development, adaptation and implementation of the intermodal information system, i.e. the development or adaptation of electronic timetable information and enhancements of EFA/DIVA//Flexy in view of

- Intermodal information (P+R, door-to-door, bike&ride, park&ride)
- Cross-border information to provide the data from Alsace and Switzerland in Baden-Wuerttemberg, and from Baden-Wuerttemberg in Alsace
- Specific information for mobility-impaired persons.

This includes:

- The database enlargement or update as a trans-national database with integration of GIS data available from Germany, Switzerland, France/Alsace and of intermodal information being available in three languages (German, French and English).
- The development of new platforms for an intermodal information system as done in Alsace (development platform for user interface and operational platform providing ISCOM services) and Rome.
- The development of new software tools for mapping addresses into coordinates, geographic referencing of public transport and private vehicle traffic data with regard to disabled transport in Rome and Vienna.
- The development of ISCOM interfaces for data exchange (data exchange formats, creation of data import programs and exchange of GIS data).
- The development of mobile access via SMS and WAP on GSM.
- The development of applications based on PDA information downloading of relevant travel information.
- The development of specific information associated to Points-of-Interest (photos of representative sites, airport information, etc).

II. Enlargement of traffic management functions - Development and implementation of congestion management modules.

The existing traffic management centre in Stuttgart has been enlarged by a system for congestion management and information, especially in case of big foreseeable events (e.g. big sports events, fairs etc). All relevant information are combined and processed here, and finally, these information or recommendations are provided to other authorities (i.e. City of Stuttgart – environmental protection office, local police) and, of course, to the end users. The information service is accessible via Internet ([www.iscom-scm.de](http://www.iscom-scm.de)), but it was also planned to distribute it by Digital Audio Broadcasting (DAB). This was planned in cooperation with the broadcaster SWR (South-West German TV and Broadcaster)\(^2\).

---

\(^1\) EFA – Elektronische Fahrplanauskunft (electronic timetable information system)

\(^2\) Distribution by DAB was planned in the project from the beginning. Due to administrative and technical reorganizations within the broadcaster SWR in July 2002 following a call for tenders of DAB frequencies (in 2001 the DAB frequencies were not available after June 2002 anymore. The distribution of congestion information by DAB could take place so far only in a test version and off-line. For the integration into the digital on-line service the new license conditions are being clarified at present on part of the broadcaster with the newly responsible exploitation corporation “Digital Radio Südwest”. The necessary distribution capacities are being clarified as well.
III. Extension of mobility centre services - Development and implementation of car-pooling software.

Extension of the already existing mobility centre Stuttgart by the car-pooling information and booking service. This service is available on the Internet site “Pendlernetz” (www.stuttgart.de/Pendlernetz), which has links to the ISCOM developments of congestion management information and intermodal/cross-border timetable information EFA Baden-Wuerttemberg.

IV. Testing of novel mobile services and media in the transport sector.

On the technological level, novel data fusion techniques to deal with inhomogeneous timetable information from various sources have been developed. The project has complied with the trend to establish generic service platforms that are independent of the underlying heterogeneous infrastructure. ISCOM has provided the opportunity to test novel mobile services in the transport sector and the application of different media to provide information and services to users (Internet, terminals, fixed and mobile phones, DAB, SMS and WAP messaging protocols).

V. Demonstration of the overall system.

The systems developed and implemented have been demonstrated in an integrative large-scale application on each site. The demonstration phase started in spring 2002 and was accompanied by supplementary user surveys to provide more practical experience for the acceptance and benefits of the systems and services. The results have been used for large-scale validation. In some cases the demonstration changed directly into regular operation (see below).

VI. Evaluation and Assessment.

The evaluation examined the user acceptance and the traffic impacts due to behaviour changes. Direct user benefits as well as traffic impacts were surveyed and assessed. To this purpose, user surveys were carried out before and after the implementation of the new systems and services.

Beyond the scope of the project, ISCOM has paved the way for future location-dependant transport services including access to the whole Internet world, prepaid services, direct ticket billing and e-commerce.

VII. Regular Operation

The intermodal information system (Baden-Wuerttemberg, Vienna) as well as the specific service for persons with reduced mobility have directly turned into regular operation already during the project lifecycle. The same applies for congestion management and car-pooling (Stuttgart). The possibility of regular operation at Cotral for regional transport operation in the Rome/Lazio area is being discussed at present.
1.2 Consortium Composition

The composition of the Consortium, involving public and private organisations like software developers, service providers, service and network operators, and public administrations, built an ideal platform to achieve the above-described objectives.

<table>
<thead>
<tr>
<th>Status</th>
<th>Part. No</th>
<th>Participant name</th>
<th>Participant short name</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1</td>
<td>SSP Consult Beratende Ing. GmbH</td>
<td>SSP</td>
<td>D</td>
</tr>
<tr>
<td>P</td>
<td>2</td>
<td>Mentz Datenverarbeitung GmbH</td>
<td>mdv</td>
<td>D</td>
</tr>
<tr>
<td>P</td>
<td>3</td>
<td>MAIOR</td>
<td>MAIOR</td>
<td>I</td>
</tr>
<tr>
<td>P</td>
<td>4</td>
<td>Verkehrsverbund Ostregion</td>
<td>VOR</td>
<td>A</td>
</tr>
<tr>
<td>P</td>
<td>5</td>
<td>TELAL SAEM (see 10)</td>
<td>TELAL</td>
<td>F</td>
</tr>
<tr>
<td>P</td>
<td>6</td>
<td>Landeshauptstadt Stuttgart, Amt für Umweltschutz</td>
<td>AfU</td>
<td>D</td>
</tr>
<tr>
<td>P</td>
<td>7</td>
<td>Landeshauptstadt Stuttgart, Technisches Referat</td>
<td>TR</td>
<td>D</td>
</tr>
<tr>
<td>P</td>
<td>8</td>
<td>Nahverkehrsgesellschaft Baden-Württemberg</td>
<td>NVBW</td>
<td>D</td>
</tr>
<tr>
<td>A</td>
<td>9</td>
<td>Agenzia per i Trasporti Autoferrotramviari del Comune di Roma</td>
<td>ATAC</td>
<td>I</td>
</tr>
<tr>
<td>A</td>
<td>10</td>
<td>TELAL SAEM (until March 2001)</td>
<td>TELAL</td>
<td>F</td>
</tr>
<tr>
<td>P</td>
<td>11</td>
<td>Steleus (since 2002, formerly NMG)</td>
<td>Steleus</td>
<td>F</td>
</tr>
<tr>
<td>P</td>
<td>12</td>
<td>Mentz Informatique (since April 2001)</td>
<td>MI</td>
<td>F</td>
</tr>
</tbody>
</table>

*C = Co-ordinator (or use C-F and C-S if financial and scientific co-ordinator roles are separate)
P - Principal contractor
A - Assistant contractor

Sponsoring Partners

Stuttgart/ Baden-Wuerttemberg:
- The SWR (South West German TV and Broadcaster)
- The Ministry of Environment and Transport Baden-Wuerttemberg

Alsace:
- Conseil General 68 (responsible for the Departement Haut-Rhin)
- Conseil General 67 (Responsible for the Departement Bas-Rhin)
- Conseil General 90 (Responsible for the Departement du Territoire de Belfort)
- TRAM: Bus company in the Mulhouse area (Mulhouse)
- TRACE: Bus company in the Colmar area (Colmar and environment)
- CTRB: Bus company in the Belfort area
- CTS: Bus and Tram company in the City of Strasbourg and surroundings
- The Council of REGIO TriRhena
- The Association de Developpement pour l'Alsace (ADA)
- The Association des Villes du Rhin Sud
- The Chambers of Commerce from Mulhouse, Colmar.
- Basle Transport Authority (BVB)

Rome:
- Trambus the main urban surface transport services operator in Rome
- Cotral bus transport operator in Lazio region.

1.3 Role of Partners Involved

<table>
<thead>
<tr>
<th>No</th>
<th>Partner</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>SSP</td>
<td>Project Coordinator (administrative and technical) and WP leader of WP1 (User Requirements), 7 (Evaluation) and 8 (Dissemination). Test site leader for Stuttgart/Baden-Wuerttemberg.</td>
</tr>
<tr>
<td>2.</td>
<td>mdv</td>
<td>Leader of WP 2 (Database) and WP 9 (Demonstration). Supply and support of all sites in their development, implementation and adaptation of the intermodal information systems.</td>
</tr>
<tr>
<td>3.</td>
<td>MAIOR</td>
<td>Leader of WP 3 (Specifications). Rome test site leader. Development and implementation of electronic timetable information in the region of Rome/Lazio.</td>
</tr>
<tr>
<td>4.</td>
<td>VOR</td>
<td>Leader of WP 4 (Implementation), Vienna test site for electronic timetable information system enhanced by information for mobility-handicapped users. Vienna test site leader.</td>
</tr>
<tr>
<td>5.</td>
<td>TELAL</td>
<td>Change of partner status during contract negotiation (see 10).</td>
</tr>
<tr>
<td>6.</td>
<td>AfU</td>
<td>Extension of Mobility Centre Stuttgart, car-pooling development for Stuttgart test site and Internet presentation of all mobility services offered including the ISCOM developments of congestion management information and cross-border timetable information.</td>
</tr>
<tr>
<td>7.</td>
<td>TR</td>
<td>Stuttgart congestion management development/test site. Improvement of congestion management. Congestion management and information enlarged the existing traffic management centre.</td>
</tr>
<tr>
<td>8.</td>
<td>NVBW</td>
<td>Baden-Wuerttemberg test site electronic timetable information system, cross-border demonstrator (Baden-Wuerttemberg, Alsace, Switzerland). This included the tri-lingual intermodal information system (German, French and English).</td>
</tr>
<tr>
<td>9.</td>
<td>ATAC</td>
<td>Assistant contractor to MAIOR, Rome test site. ATAC is operating public transport in the City of Rome and Lazio Region and acted as user and host of the electronic timetable information system.</td>
</tr>
<tr>
<td>10.</td>
<td>TELAL</td>
<td>Assistant contractor to NMG, Alsace test site (left project due to company closure in April 2001).</td>
</tr>
<tr>
<td>11.</td>
<td>STELEUS (formerly NMG)</td>
<td>Leader of WP 6 (Validation). Development, installation and validation of the Alsace platform. Further development of intermodal information system in the Alsace and Franco-German-Swiss cross-border region (Tri-Rhena). Experiments involving users equipped with mobile GSM handsets (SMS, WAP) as well as PDA downloading of internet information.</td>
</tr>
<tr>
<td>12.</td>
<td>MI</td>
<td>Leader of WP 5 (Mobility Centre set-up/Traffic Management Extension), took over the tasks of former partner TELAL, Alsace test site leader (cross-border demonstrator). Installation and extension of mobility centre services.</td>
</tr>
</tbody>
</table>

Table 1-1 Role of ISCOM Partners
2 Objectives

The aim was to provide a value-added service on digital communication networks with a broad range of services for transport actors and travellers.

The core or integrating element of the project consisted in the development, demonstration and validation of electronic timetable information and the set-up of mobility centre services. Stuttgart additionally emphasized the improvement and inclusion of congestion management as well as the car-pooling service.

The users' requests and the expert surveys at the beginning of the project resulted in the following table:

<table>
<thead>
<tr>
<th>Users’ demand for services</th>
<th>Alsace</th>
<th>Stuttgart</th>
<th>Vienna</th>
<th>Rome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timetable- and multimodal information:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timetable and tariff information</td>
<td>Partly E</td>
<td>E</td>
<td>E</td>
<td>Partly E (only few timetables)</td>
</tr>
<tr>
<td>Door-to-door information</td>
<td>I</td>
<td>I</td>
<td>E (for PT)</td>
<td>I</td>
</tr>
<tr>
<td>Routing information private car</td>
<td>I</td>
<td>E</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Intermodal/multimodal information</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td><strong>Mobility centre basic services:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car sharing (information)</td>
<td>NI</td>
<td>E</td>
<td>NI</td>
<td>NI</td>
</tr>
<tr>
<td>Car-pooling</td>
<td>NI</td>
<td>I</td>
<td>NI</td>
<td>NI</td>
</tr>
<tr>
<td>Park&amp;Ride</td>
<td>I</td>
<td>E</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Bike&amp;Ride</td>
<td>I</td>
<td>E</td>
<td>I</td>
<td>NI</td>
</tr>
<tr>
<td>Taking bikes along in PT</td>
<td>I</td>
<td>E</td>
<td>I</td>
<td>NI</td>
</tr>
<tr>
<td>Motorail train information</td>
<td>NI</td>
<td>E</td>
<td>I</td>
<td>NI</td>
</tr>
<tr>
<td>Cycling and hiking routes information</td>
<td>NI</td>
<td>E</td>
<td>I</td>
<td>NI</td>
</tr>
<tr>
<td>Car rental</td>
<td>NI</td>
<td>E</td>
<td>NI</td>
<td>NI</td>
</tr>
<tr>
<td>Bike rental</td>
<td>NI</td>
<td>I</td>
<td>NI</td>
<td>NI</td>
</tr>
<tr>
<td>Parking information</td>
<td>I</td>
<td>E</td>
<td>I</td>
<td>NI</td>
</tr>
<tr>
<td>Mobility costs calculation</td>
<td>I</td>
<td>E</td>
<td>NI</td>
<td>NI</td>
</tr>
<tr>
<td>Mobility consulting for firms, administration units, schools universities etc.</td>
<td>I</td>
<td>Partly E</td>
<td>Partly E</td>
<td>Partly E</td>
</tr>
<tr>
<td><strong>Congestion information</strong></td>
<td>NI</td>
<td>I</td>
<td>NI</td>
<td>NI</td>
</tr>
</tbody>
</table>

Legend: E = existed before ISCOM, I = to implement, NI = not to implement

Table 2-1 Demand for services in mobility centres - results of the user surveys
From this table noticeable differences show up both in the consisting configuration with service supplies and in the components to be completed for the individual sites. Although the mobility centre in Stuttgart already availed of the most varied services at the beginning of the project, a supplement requirement was seen in all other components, which finally lead to a broad service range. In particular the integration of congestion management and of the car-pooling system has to be emphasized here.

The Vienna and Alsace sites were to be seen on a different level. This concerns less the existing services at the beginning of the project (the services supplied were essentially limited here to timetable and tariff information) than those services to be implemented in the future. With the exception of some mobility basic services and the congestion information a range of services was targeted here by the users comparable to Stuttgart.

The following table indicates which systems and services are implemented at the end of the ISCOM Project.
### Mobility Consulting - Basic Services
- schools, companies
- consulting on tariffs of traffic association
  - congestion information

### Mobility Consulting - Extensions
- mobility analyses
- determination of mobility costs
- consulting for communities in transportation
- management of business trips
- Specific of customer needs
  - ISCOM
  - partly ISCOM

### Public transport - Basic Services
- schedule information (EFA, Internet)
- schedule information via mobile handsets (SMS, WAP)
- timetable information via PDA
- electronic ticket sale on the Internet

### Public transport/Travel agency - Extensions
- nation-wide schedule information
- specific user groups (mobility-impaired)
- international tickets
  - ISCOM
  - partly ISCOM
  - existing (only PT ISCOM (IT))

### Goods Transport - Basic Services
- luggage bus
- congestion information

### Goods Transport - Extensions
- building up of courier and delivery service
- procurement of courier services

### Diversification of Services - Basic Services
- information via Internet
- night buses information
- Bike & Ride
- bike carrying
- Walk & Ride
- Park & Ride
- shared-ride taxis
- Taxi & Ride
- Kiss & Ride
- dial-a-ride
- airport shuttles
- jitneys, commuter vans, shuttles
- vanpools, buspools
- car-pooling

### Diversification of Services - Extensions
- city sightseeing tours
- travel agency

<table>
<thead>
<tr>
<th>nutations</th>
<th>Alsace</th>
<th>Stuttgart/Baden-Wuert.</th>
<th>Vienna</th>
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<tr>
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<td>partly ISCOM</td>
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<td>existing</td>
<td>existing (WAP)</td>
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<td>existing</td>
<td>existing (basic version)</td>
<td>ISCOM</td>
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<tr>
<td>Diversification of Services - Extensions</td>
<td>Planned (TRASCOM)</td>
<td>ISCOM</td>
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</tbody>
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**ISCOM** = implemented within ISCOM

**Planned** = planned to be implemented after the end of the project

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Table 2-2 Overview on ISCOM services
3 Approach

The transport accomplishing information is a key issue to activate the existing capacity reserves and to achieve combined mobility control. The information means are described as pre-trip and on-trip information systems. They become an essential problem solution when provided in good quality, when a reliable database is available and when they are easy to access. The effort to obtain such a reliable database is underestimated proficiently.

Systems working stand-alone are already available in selected regions. In Germany, for instance, since approximately five years electronic timetable information available in the Internet has been implemented in some of the big public transport associations in Bavaria, Baden-Wuerttemberg, in the metropolitan areas around Mannheim and Frankfurt and in the business zones of North Rhine Westphalia. Routing information based on general digital maps are also available. With respect to the mentioned completeness of the database as a premise for successfully applying pre-trip and on-trip information the set-up of a combined mobility concept includes the extension of data collection to additional metropolitan areas and a technique for data exchange for cross-border traffic. Intermodal traffic can show its advantages when all sorts of transport modes are included. This embraces not only the classical transport means but also paratransit services. Shuttles as employer and developer sponsored services and pre-arranged services have been regarded as well.

ISCOM was a research and development project with a demonstration part. The project activities were organised as follows:
Since communication technology is nowadays available on a broad scale - like mobile radio communication and digital communication via Internet - it is reasonable to put efforts in constructing a comprehensive database, because a high demand is expected for the sketched services. In order to achieve a complete electronic timetable information for metropolitan and for regional areas with cross-border traffic a workpackage structure was envisaged that started with the identification of user groups and requirements.

**WP 1 User groups and their requirements** defined the criteria for generating a database with the necessary completeness. Current information can be given to the end user either directly by Internet access or via an operator having face-to-face contact to the end user in a mobility centre. The identification of user groups was done by a survey among public transport users and a survey of public transport organisations in the form of Internet questionnaires and direct surveys. As the Stuttgart site especially selected to provide current information on big events and congestion, the survey contained additional investigations among participants of the congestion management chain. For the car-pooling service interviews were conducted with the users of the Stuttgart mobility centre. The identification of user groups and their requirements also reflects the different types of application sites. This task needed a structure identifying participating public transport associations, administrations and other bodies and institutions. The outcome of WP 1 was the basis for the following work packages 2 Database and 3 Specifications.

**WP 2 Database** The database construction contains the definition of data amount and data requirements based on the user groups identified in WP 1. It embodies public transport information and information from the different tariff associations, information on transitions, information of pick-a-bag possibilities for bicycles in public transport, information about pedestrian trails.

The databases were compiled from public transport networks of the participating organisations, administrations of cities and regions and the various bodies and institutions involved in public transport operation. A dialogue-oriented timetable construction and information system is used which converts partial public transport networks into labelled stops, adds trip attributes to the links and uses digitised city maps including the co-ordinates of the residential houses and points of interests. Compiling the database in such a manner enables the systems to propose public transport connections and routing just by entering addresses into the system if the nearest public transport stop is not known. It is mainly a question of data fusion for a big variety of data sources with inhomogeneous premises, different time scales, different scales of graduation, different scales of being up-to-date, and different techniques for data completion and data substitution.

For the Stuttgart site-specific applications the SCM database is based on existing data from different physical sources that are transmitted and processed by suitable communication interfaces. The resulting specific traffic information are transmitted to the visualization platform in the Internet and to the mobile services (planned). The car-pooling data description consists of information about personal, communication and process data, the front-end and the back-end of the system.

**WP 3 Specification** The presentation of the electronic timetable information had to be specified with respect to output data structure, application modules, Internet access and operator access as well as respective indirect database links for updating and modifying it. The ISCOM System Architecture is the reference for all developments realised within the project. The architecture development is based on Converge Guidelines for the Development and Assessment of intelligent Transport System Architectures.

The specification regards the modular character of the intermodal information system. This was documented in D3 and serves as a manual for general requirements.

**WP 4 Implementation of electronic timetable information** included the implementation of main basic services like general timetable information, cross-border connections and data exchange. This was connected to an intermodal information system. In Rome and Vienna also an intermodal information system for mobility-handicapped persons was implemented. The Stuttgart Mobility Centre set-up an information tool for car-pooling in the region of Stuttgart.
WP 5 Mobility centre set-up and traffic management extension included the description of existing mobility services on each site, the access to these services and their technical implementation. The Traffic Management Centre was enlarged by requirements for congestion management and information exchange. This included all relevant sources on incidents (e.g. important fairs, sports events, social events), internal operating requirements and user side information channels. User-side congestion information is transferred to the mobility centre in Stuttgart and directly to the end user via Internet.

WP 6 Technical Validation included the installation of the electronic timetable information system, the congestion management and information system and the car-pooling system in two consecutive steps: Step 1 covered the technical and functional tests of the system components. Step 2 covered the operation and monitoring of the technical functions. For mobility centre services a stepwise installation consisted of functionality tests of basic services and of user acceptance and respective re-design of basic services. For the congestion management and information system, tests on functionality of the work place itself and of different communication links (Internet, internal administration) were carried out. The implementation of DAB had to be carried out by the broadcaster SWR, which was stopped after July 2002 due to new distribution of DAB frequencies. The validation plan (D6.1) and the validation report (D6.2) are the outcome of this workpackage. The technical validation for the car-pooling system was done in July and August 2002. User acceptance tests were carried out in the Intranet of the public authorities in Stuttgart. The car-pooling software was finally accepted in September 2002.

WP 7 Evaluation and Assessment The ISCOM Project has developed or advanced intermodal and multimodal transport information and services. These services were implemented, tested and evaluated during the project lifecycle. Next to the technical feasibility, which was investigated by the ISCOM partners, a focus was laid on the information services concerning user acceptance and traffic impacts.

The traffic impacts caused by the ISCOM information services were investigated and assessed during the demonstration phases. To this aim surveys were carried out to obtain information about the user behaviour. Wherever necessary the ISCOM database was improved by the results and data of other similar projects like, e.g. BAYERNINFO [1] and CARPLUS [5]. With the results of the assessments of the traffic impacts for the different ISCOM services an estimation model was built-up for the Stuttgart Region. By means of this estimation model the different ISCOM services were evaluated with regard to their traffic impacts. Simulated for the Stuttgart Region were the three ISCOM demonstrators:

- Stuttgart Congestion Management,
- EFA Baden-Wuerttemberg/cross-border information and
- Stuttgart Car-pooling.

The results of the estimation for the Stuttgart Region were transferred to Baden-Wuerttemberg and to the other ISCOM sites. Finally an assessment of the ISCOM traffic impacts was made for the European Union by transferring the ISCOM services to the 15 member countries of the European Union.

WP 8 Dissemination and Use Plan/Implementation lasted throughout the whole project period as a continuous activity. Main media were the project website (www.iscom-ec.de) and the project brochure. All project partners participated in various conferences with project presentations (papers or demonstrations). 3 press conferences were organized in Alsace, Vienna and Baden-Wuerttemberg on the occasion of service opening, a number of press releases were published during the 3 years of the project, reports and investigations have been given by broadcasters (radio and TV). Advertisements by video screens on the roads and information meetings with responsible persons from important public authorities and big companies have been done to promote car-pooling. One of the main events was the ISCOM Workshop organized by the consortium at the end of the project to communicate and to exchange the results and experience of the project with transport operators, service providers, municipal authorities, technical experts and end users. The outcome of this work package was the Dissemination and Use Plan, the Technical Implementation Plan and a Business Plan per partner (where applicable).
**WP 9 Demonstration** covered the actual demonstration phase in the last project year. Each of the ISCOM sites went on-line with the developed systems and services: Alsace with its intermodal information system (Trans-Rhena site), Stuttgart/Baden-Wuerttemberg with the Congestion Management system, the car-pooling system and the EFA Baden-Wuerttemberg/cross-border timetable information system; in Vienna the intermodal information system including information for mobility-handicapped persons, and the Rome intermodal information system including flexible services, i.e. information for mobility-handicapped persons and employees' transport. All demonstrations were accompanied by user surveys (Internet or direct interviews); the results are documented in a separate report D9.

Since combined mobility uses the system advantages of each transportation mode in each respective optimum application this concept seems the key to successfully coping with transport problems. Combined mobility props upon a complete database for timetable information of all public transport means in a metropolitan area or in adjacent regions as well as current routing information for individual traffic. Individual traffic must be divided in pedestrian, bicycle-riders and motorized traffic. Each of them may use own network and has its own bottlenecks.

Secondly, the commercialisation opens up new application sites having comparable structures like the metropolitan areas or regional areas with cross-border traffic, many of them in Euro regions between different European countries.
4 Results and Achievements

The following description of results and achievements is structured according to

- the technical and organisational results describing the main achievements in each ISCOM site,
- the demonstration results giving the main outcome from the on-line demonstration phase of each application in each ISCOM site and, finally,
- the evaluation results to measure the impact on user acceptance of the services (via various user surveys), to evaluate the performance of the platforms (via embedded performance counters), their benefits, economic assessment and transferability.

4.1 Technical and Organisational Results and Achievements

The core or integrating element of ISCOM is the intermodal information system that has been developed, adapted and implemented in each ISCOM site and the set-up of mobility services. The starting conditions were different for each site.

**Baden-Wuertt./Stuttgart Services Enhanced by ISCOM**

The **Stuttgart/Baden-Wuerttemberg site** improved the already existing electronic timetable system EFA Baden-Wuerttemberg - which also served as the basis for the developments on other sites - by **intermodal information** (P&R, footpaths, taxi, private car) and **cross-border trip information** between the regions of Alsace and Baden-Wuerttemberg and Basle. This involved the development of the trilingual Internet interface (German, English and French), mobile phone access is given by SMS and WAP.

The already existing mobility centre in Stuttgart extended its services within ISCOM by the **car-pooling information and booking service** available on Internet. The software automatically searches for partners and routes. Flexible (new matching for every trip) and static car-pools (same members and
routes for a longer period) are supported. Various features to visualise the route are available. An automatic massage that a car-pool was found can be transmitted via SMS and e-mail.

The existing traffic management centre in Stuttgart has been enlarged by the congestion management and information system (SCM) particularly designed for the use in case of big, foreseeable events. The system is available on the Internet and includes information on the current traffic situation, parking information and time/event-related traffic forecasts.

All systems are linked to each other on the Internet; SCM transfers partially known localisation data about origin and destination to EFA-BW; in case of overloaded road network the recommendation of the SCM system automatically refers to the links to EFA-BW and Stuttgart Car-pooling for alternatives. The trip data from the car-pooling system can be automatically transmitted to EFA Baden-Wuerttemberg to look for an alternative ride by public transport. A link to the congestion management system is implemented.

**Websites**

- Stuttgart intermodal information system: [www.efa-bw.de](http://www.efa-bw.de)
- Stuttgart congestion management: [www.iscom-scm.de](http://www.iscom-scm.de)
- Stuttgart car-pooling: [www.stuttgart.de](http://www.stuttgart.de) (Pendlernetz)

**Alsace Services Enhanced by ISCOM**

- Geographical information system
- Intermodal information system
- Cross-border information system
- Information of special events
- Internet
- SMS
- WAP
- PDA
- Print media
- Itinerary calculation

![Diagram](http://www.trans-rhena.net)

**Figure 4-2 Alsace situation before (blue) and after (red) ISCOM**

For the **Alsace site** it is the first time that a mobility information system, including intermodal trip planner, timetable information system, geographic information and cross-border intermodal trip planner is accessible for the end user via Internet and the Mobility Centre concept. This information system has been accessible since the beginning of April 2002 until the end of the ISCOM Project and covers the Regio Tri-Rhena area, including part of Baden-Wuerttemberg and Basle. The new service has been launched on a regional basis including the test of new mobile devices based on SMS, WAP and automatic data download to PDAs.

**Website:** [www.trans-rhena.net](http://www.trans-rhena.net)
Vienna Services Enhanced by ISCOM

In Vienna the mobility centre has been enlarged based on the existing electronic timetable information system. As a result of the user survey, particular emphasis was put on the improvement of services by door-to-door information, by providing intermodal information (information about transfers from one transport mode to another) and by providing multimodal information (information about the combined use of various transport modes). Moreover information for persons with reduced mobility has been established:

Integral part of the information system in Vienna is the description of all stations and stops with all access facilities (lifts, ramps, escalators) with particular consideration of mobility-impaired persons. In this connection, there is a feature in the information system, which enables the user to select specific parameters, and attributes for the journey, i.e. parameters that the user will not use, can be excluded. The system is based on geo-referenced material, which does not only represent the stations as a point in the map, but is divided into their individual areas. This principle provides the basis for the exact calculation of routes and distances from station to station as well as within stations.

Website: www.vor.at
It is the first time for public transport in the Rome site that end users are able to consult timetables of urban and regional lines for each stop. It is the first time that an integrated information service between urban and regional nets is available, using timetables from all involved nets. For some stops also information about disabled people accessibility are published.

This new service is an important step for relations between public transport companies and users in Rome: they are able to get better information on public service and can plan their trips with a regional and multimodal point of view. Absolutely not to be underestimated are the possible benefits for public transport companies’ image. Besides, ISCOM represents a presentation for activities of the raising mobility agency (ATAC) that has developed and supported the ISCOM project.

The Rome call centre operators have tested the Flexy system for planning flexible services: mobility-impaired people and employees’ transportation. The software allows operators to collect transportation requests and to create automatically vehicles schedules for meeting the requests. Operators use a cartographic interface to display and modify calculated solutions.

Website: [www.atac.roma.it](http://www.atac.roma.it)
4.1.1 The Intermodal Information System

All ISCOM platform architectures developed comply with the overall ISCOM architecture, as specified in WP3 (the detailed system architecture is in line with CONVERGE guidelines). The following description of the system architecture in this report is written in view of a more generic view.

The ISCOM applications make use of the EFA itinerary calculation system at the Data Processing Layer (DPL). A standardized interface (HTML/XML) between DPL (EFA) and Client Access Layer (CAL) allows extensions with enhanced processing functions on the DPL layer. The overall structure of the intermodal information system that has been developed and used for each site is shown by the following figure:

![Diagram of ISCOM overall architecture]

The highlights of the developed overall architecture are:

- Modularity and extensibility guaranteed at each layer. Independent testing facilities for each layer. Well-identified interfaces and common languages.
- Open for new modules. Main developments on project level are given in terms of:
  - Door-to-door information,
  - Cross-border trip information,
  - Congestion management information,
  - Car-pooling,
  - Information for mobility impaired persons,
  - Employees' transport.

Figure 4-5 ISCOM overall architecture
Geographic data are used in order to give complementary information to the user and to allow the computation of a door-to-door trip. Indeed, geographic data allow the footpath calculation, time and route. Additional information is given to the user like:

- General map of the trip,
- detailed maps: departure, arrival, connections, footpaths.

The **Regio South-Alsace platform** has been implemented and configured for trans-regional applications, therefore all the client access facilities are available in three languages (French, German and English).

![Figure 4-6 Example of a door-to-door itinerary by detailed map in Alsace](image)

1. Départ Colmar (France) Rue des Fleurs (milieu).
2. Rue des Fleurs 210 mètres.
3. tournez à gauche Avenue d’Alsace 220 mètres.
4. Arrivée arrêt Colmar Schickelé.
In order to be able to give cross-border trip information (between Alsace and Baden-Wuerttemberg and Basle region), the timetable database of Alsace, Baden-Wuerttemberg and Basle have been merged in a global trans-national database. This trans-national database is updated each time a national database is changed. The cross-border information is based on the trans-national database. This trans-national database is integrated in the existing EFA Baden-Wuerttemberg system and in the EFA Alsace system set up during ISCOM. The multilingual interfaces have been developed in German, French and English.

The following figure gives an example of a trip from Germany to France (Ludwigsburg Schorndorfer Tor to Colmar, rue Camille Schlumberger):
Figure 4-9 Example of a trip overview EFA Baden-Wuerttemberg

Figure 4-10 Example of a trip detail EFA Baden-Wuerttemberg
The “mere” cross-border trip information on the one hand is possible since the end of December 2001 and the multi-lingual version of EFA-BW including geographical information for trips on the other hand has been online since August 2002.

Figure 4-11 Example of a detailed map with footpath - EFA Baden-Wuerttemberg
Specific mobility information is provided for mobility-impaired persons in Vienna and Rome.

Figure 4-12 Example for timetable information for mobility-impaired persons – trip without usage of stairs (see map below)

Figure 4-13 Example for trip without mobility restriction (includes stairs)
In the following example a trip including Park&Ride is suggested by the Rome demonstrator. Origin of the trip is “Frascati”, street “Corso Italia” indicated; destination of the trip is Rome city centre, Termini station. The user takes the passenger car until the suggested transfer point (in this example “Arco di Travertino”), parks the car and walks to the metro station (walking distance 7 minutes using escalators). The trip is continued by metro.

In order to obtain this intermodal itinerary the extended dialogue (“ricerca avanzata”) was activated, Park&Ride and a maximum travel time of 60 minutes were selected.

Figure 4-14 Example for an intermodal itinerary Rome
The next example shows an intermodal itinerary from Vienna including walking, car, metro and rapid transit line.

Figure 4-15 Example for an intermodal itinerary VOR, Vienna
4.1.2 Stuttgart Congestion Management Information

The Stuttgart/Baden-Wuerttemberg Platform additionally includes information systems and services for 
congestion management and car-pooling.

The end user has the option of the following main representation contents by the Stuttgart Congestion Management system:

- Current traffic conditions,
- time-related traffic prognosis,
- event-related traffic prognosis,
- parking information,
- information on points-of-interest and places of events.

The Internet as widespread and further rising medium serves as visualisation and information medium (www.iscom-scm.de). An expansion of the information spectrum to mobile media (PDA, mobile telephone, etc) is reserved to further stages of development resp. to the re-arrangement of DAB frequencies by the broadcaster.
Figure 4-17 Stuttgart Congestion Management – current traffic situation (event area Stuttgart – Cannstatter Wasen)

Figure 4-18 Stuttgart Congestion Management - City centre with parking information
Figure 4-19 Stuttgart Congestion Management - Event-related traffic prognosis (event area Stuttgart – Cannstatter Wasen)
4.1.3 Stuttgart Car-pooling System

The Stuttgart mobility centre of the Environmental Protection Office of the City of Stuttgart has been extended by the car-pooling system. This new service is available via Internet (www.stuttgart.de, Pendlernetz) or, for users without own Internet access, via the Mobility Centre, for example by mail, phone or fax. The unregistered user can search for suitable car-pools. In order to receive the communication data of a potential partner or to offer own trips, the user has to register. The software automatically matches the trip data and searches for efficient car-pools. The user has to confirm the trip by contacting the partner personally. Additionally, the software provides a route planner and a map to visualise the trip.

![Figure 4-20 Car-pooling - Route planner and map “Pendlernetz”](image-url)
4.1.4 Flexible Services in Rome

The Italian platform was extended by including information and tools for managing flexible services: door-to-door transportation service for disabled people (provided by using low-capacity vehicles adapted to the specific needs of disabled people) and transport service for employees, taking them from their residence to the place of work.

Call centre operators use the **Flexy** system during every phase of flexible services planning: for collecting and geo-referencing users requests, for creating, studying and modifying transportation plans. The system provides automatic algorithms for calculating vehicles schedules based on user requests and available resources.

In planning transport service for employees, the customer is taken up from the place of residence or from a stop near the residence, or reaches a parking lot by car from where he/she takes a bus providing the service. Then the customer is unloaded directly to his/her final destination or near a stop of the public net connected in an efficient way with such a destination. Information concerning the public net is loaded from EFA.

Solutions can be displayed and modified directly on the city map. The call centre is accessible by phone: operators can check if an extemporaneous request can be inserted in planned trips.

Solutions can be displayed and modified directly on the city map. The call centre is accessible by phone: operators can check if an extemporaneous request can be inserted in planned trips.
The next figure shows the interface used by call centre operators for collecting and managing users requests.

Figure 4-22 Flexy – User interface, Rome
4.2 Results from Demonstration

The demonstration phase of ISCOM was carried out in Year 3. Each of the ISCOM sites went on-line with the developed systems and services. All demonstrations lasted at least 3 months and were accompanied by user surveys (Internet or direct interviews).

4.2.1 Alsace

The demonstration phase in the Regio South-Alsace covered two stages: Demonstration Phase 1: May to August 2002 and Demonstration Phase 2: August to November 2002.

4.2.1.1 Survey panels

Two categories of users were selected for the surveys: a panel of students at the Universities of Mulhouse (UHA/DESS/ESSAIM = Electronic High School), Colmar (UHA/IUT/GRTC = Telecom) and Belfort (UTBM = High School in Informatics and Networks) and a panel of employees from the private sector, working in the area of the Technopole de la Mer Rouge in Mulhouse.

Main characteristics:
The two panels of users, students and employees have some common characteristics:
- They are rather "technology" oriented, so they know the usage of modern communication devices such as Internet, mobile, SMS, etc.
- They are mainly located in urban areas where a large panel of transport possibilities are offered (bus, train, car)
- They mainly ask for short distance travel within a city or between cities. Few demands for trans-regional travel were identified.

Novelty:
For this population the "ISCOM System" is rather new (93.7% for the students, 68.6% for the employees) and the first approach is quite positive.

Performance evaluation:
- "Presentation of maps" and "completeness of information" are the most appreciated characteristics; because this type of information is not available on the sites of the transport operators.
- "response time" and "system reliability" have to be improved; especially the completeness of data is a weak point.

Final choice:
Finally the intent to switch to public transport (PT) according to this kind of information is:
- For the students: 60% (most of the students have no other choice).
- For the employees: 13% (private car remains the preferred transport mode).
4.2.1.2 Demonstration phases (May 2002 – November 2002)

6 demonstration phases were conducted based on well-identified platform characteristics and data contents.

A. Integration Phases 1 to 4: Version 1.0 to 2.1: Version on-line for testing purposes (October 2001 to May 2002). During these phases basic intermodal and cross border services were tested including itinerary calculation, maps display, etc…

B. Integration Phase 5: Version 2.2: Version on-line for Demonstration Phase 1 (May – August 2002). Specific attention was given to the testing of the telecom services (SMS and WAP), based on existing solutions. Only data WAP services were tested, excluding the display of maps.

WAP was tested in three steps:

- Step 1: simulation on PC (WinWap simulator).
- Step 2: simulation on-line.
- Step 3: test with real WAP terminal (Ericsson).

SMS forwarding was put in line based on "Mobimel" services.

C. Integration Phase 6: Version 2.3 on-line for demonstration Phase 2 (September – December 2002) and future versions. Following major modifications were implemented and tested during this phase:

- Modification of the remaining bugs.
- Consolidation and update of the data (especially inter-urban data).
- Improve the overall performance.
  - Access time (to the service, to data, to maps).
  - Availability and reliability.
  - Multi-access capabilities.
  - User manual

4.2.1.3 Recommendations for regular service

After finalisation of the ISCOM project, it is expected to maintain the operational platform on-line, so as to ensure a continuation of the service proposed. It is planned to operate the ISCOM platform at least until 2006, in the frame of an INTERREG project to be launched during the first quarter of 2003.

The ISCOM development platform will also be updated and enhanced within the framework of the TRASCOM (Travel Assistance for Combined Mobility in Rural Areas) Project. TRASCOM is a FP5 IST Project; its duration is planned from March 2002 until February 2004.

New functions will be included and tested, using the same validation procedures as experimented in ISCOM. These technical improvements include:

- Real-time assistance during travel,
- On-line ticket reservation, payment and control,
- Access to parking, taxis, car-renting, car-sharing and car-pooling services,
- Automatic positioning and location dependent services (based on Cell-ID, GPS and Location Server API),
- Full SMS service, enhanced by EMS and MMS,
- Proximity services based on Bluetooth and/or Wi-Fi (802.11b) radio protocols,
- full WAP service on GPRS,
- extension of data to the area covered by Jura (France and Switzerland),
- data updates with tariffs, parking places, taxi stations, etc.,
- extension to EuroAirport departure and arrival time-tables,

These new functionalities are planned to be demonstrated in 2003.

Mentz DV, Mentz Informatique and Steleus are the regional partners involved in these projects.

4.2.1.4 Measurements

Some real-time counters are embedded in the South-Alsace ISCOM platform and processed on the www.trans-rhena.net site. They are stored in an "ACCESS" database and transferred to EXCEL spreadsheets. They are exploited off-line, after filtering and classification, in graphical representations. These counters enable the processing of usability statistics to be issued by the Mobility Centre. The statistics produced will help the transport operators to manage their network and anticipate on new marketing actions: launch a new service, modify a line, a timetable etc. These measurements were conducted between beginning of May and beginning of September, for a period of 5 months. The data collected before are not relevant; they correspond to the initial tests before putting the site on-line.

Measurement results and related comments are summarized below:

![Figure 4-23 Number of accesses per week](image)

- **Approx. 3000 requests** were identified during the demonstration period.
- These requests correspond to an average value of **approx. 400 connections/month**.
- The 3 peaks correspond to dates of press conferences and published articles in local newspapers. (Les dernières Nouvelles d'Alsace, Le Monde, L'Alsace).
- Cross-border information was demonstrated by the realisation of trans-regional trips, as illustrated in the figure below.
- Conclusion: Most of the connections are due to a "curiosity" effects associated to this new media. Today, the South-Alsace site does not really have a real user pool.

![ISCOM Demos Alsace: Top origins & destinations](image)

**Figure 4-24 Top origins and destinations**

4.2.1.5 Project results

Regional transport authorities and transport companies agree on efficacy of implemented services in order to improve the usability of public transport. Two significant decisions have been taken by the transport authorities and the local ISCOM partners, and could be seen as significant project results:

- The regional authorities (CoCoat "Comité de Coordination des Autorités de transport") have decided to implement a regional Mobility Centre based on ISCOM specifications and results. A call for tender is foreseen for 2003. Transport services will be enlarged, like transport on demand for rural areas.

- German, Swiss and French partners have created a trans-national consortium in order to improve and exploit the cross border inter-modal information system, under the Interreg III; a programme that supports the European cross-border cooperation. A proposal has been submitted in September, final decision from the Interreg Group is expected beginning of 2003.
4.2.2 Baden-Wuerttemberg

4.2.2.1 EFA-Baden-Wuerttemberg (cross-border trip information)

As the cross-border trip information has been possible on EFA Baden-Wuerttemberg since the first delivery of the (validated) Alsace timetable data by Mentz Informatique, the demonstration phase in fact consisted of two different parts: the “mere” cross-border trip information on the one hand (which is possible since the end of December 2001) and the multi-lingual version of EFA Baden-Wuerttemberg including geographical information for trips on the other (which has been online since August 2002).

The demonstration showed that – in a technical point of view - it is possible to include timetable and geographical data from the Alsace region in EFA Baden-Wuerttemberg.

One of the direct consequences of this integration is, that EFA Baden-Wuerttemberg is not only able to give cross-border trip information (from France to Germany or vice versa), but EFA Baden-Wuerttemberg also proposes alternative routes via France to users who want to ride between Rhineland-Palatinate (which is located north of Alsace) to the southern part of Baden-Wuerttemberg (which is east of Alsace): in these cases, travelling time is often shorter when travelling via Alsace than when staying on German territory. This behaviour is well accepted by EFA Baden-Wuerttemberg users (as expressed in many emails from EFA-BW users).

The rising number of EFA Baden-Wuerttemberg users, who use exclusively the multi-language version, and the feedback of those users show that this system is well accepted; particularly the possibility to get maps of the surrounding area of the starting or the ending points of a trip and the routing from an address to a bus-stop or a railway station are appreciated by the users.

![Diagram showing measurements for EFA-BW](Figure 4-25 Measurements EFA-BW)
4.2.2.2 Stuttgart Congestion Management

The demonstration started in August 2002, with 300 – 400 visits per month. The SCM system as information system with traffic relevance was consulted essentially for the planning of leisure traffic (58%). This information is called-up from a mostly male user group (approx. 74%) consisting of employees (44%) and students (26%). Moreover, these user groups avail of a relatively high technical equipment level (telephone stationary/mobile: 90%/50%, Internet 75%, email 70%).

Concerning reaction time about 75% of the users stated the system to be medium up to fast. The substantial content-related evaluations were predominantly positive (medium to good/high). This concerns both the completeness of the Internet pages and their reliability and presentation. The direct benefit for their own behaviour was rated by approx. 30% as high. The presentation was evaluated altogether as mainly good.

The impact of the specified traffic-relevant information on the concrete user behaviour and/or the concrete change of user behaviour could be determined only to some extent. A differentiation has to be made here whether the system is used for information about the current parking conditions or on the current or prognosticated traffic conditions. A change in the parking behaviour due to the information of SCM is to be expected as more probable in relation to the change of the event destination. Altogether about 11% of the users indicated a change in their destination selection. About 13% of the users indicated a change to another means of transport. The trend in these cases is mainly to transfer from passenger car to PT or P+R. The reverse transfer was only very small. Changes of the travel route or the travel time were assessed as not reasonable by approx. 75% in each case.

The evaluation of the system by the asked experts of the City of Stuttgart as well as further institutions resulted in some useful suggestions and points of criticism (e.g. communication ways, speed) during the prototype phase that were converted during the demonstration phase. The requirements of expandability of the system regarding further information contents could be implemented satisfyingly. In connection with a further automation of the data provision and transmission to the SCM suitable measures are considered with the advancement of the urban measuring site network.

![Demo phases](Figure 4-26 Measurements SCM)
4.2.2.3 Car-pooling

The Stuttgart car-pooling service was officially opened on 13 September 2002. The validation of the software was done in July and August 2002. Today the mobility centre of the Environmental Protection Office of the City of Stuttgart can offer a comfortable and reliable service for all citizens searching for a car-pool. During the public demonstration the feedback from the users (feedback forms, demonstrations) have been used for further improvements. From September until December 2002 an average of 1,000 visitors per month accessed the site on the Internet.

To enhance the knowledge about the usage of the car-pooling system, a survey was done from mid September until mid November 2002. The system was mainly used for the trip to work and for leisure activities. Users mostly come from the region of Stuttgart and look for trips into the city of Stuttgart. As expected, commuters are the main target group of the system. The registered users entered their trip data once and rarely extended or modified them. Possibly a registered user does not use the system anymore, as soon as a partner has been found for a car-pool. The users rated the features of the system rather high. Only few problems with the handling of the system or software errors were mentioned in the feedback forms. On the other hand most users appreciated the idea and the features of the service.

To make the system better known, the Environmental Protection Office put big efforts in the promotion of the service including press conferences, workshops, Internet and Intranet links in various big institutions (Daimler-Chrysler, Evangelische Landeskirche, town of Nürtingen, town of Esslingen; interest has been shown by Baden-Wuerttemberg ministries, radio stations Antenne 1/SWR, Oberfinanzdirektion), TV and radio interviews, video boards (clips) at highly loaded streets as well as posters and information in public buildings (city hall, Adult Education Centre Stuttgart, University of Stuttgart). The more users and trips are in the system, the more it attracts further users. Additional promotion activities are on the way.

**Figure 4-27 Measurements Car-pooling**
4.2.3 Vienna

Between 12 July and 27 September 2002 a total of 173 questionnaires were filled on the VOR website with regard to the new version of the EFA timetable information system. The main results of the Internet questionnaire are:

- The major part of the Internet users knows the new EFA (test version) system already.
- Two thirds would also use a public transport mode without EFA.
- EFA shows a small influence regarding to the route and departure time.
- The system helps to reduce the number of transfers and to raise the comfort.
- The majority of schedule information was about journeys during leisure time.
- Most of the queries asked for stop-to-stop information.
- The customers favourably evaluated the new system.
- 200,000 accesses to the test version during the demonstration phase (6/02 – 9/02).

Questions regarding the choice for mobility-impaired passengers were only scarcely answered by the users of the Internet questionnaire. The EFA statistics shows another result: During the demonstration phase about 1,600 requests concerning impaired options were counted.

![Demo phases](image)

**Figure 4-28 Measurements Vienna**
4.2.4 Rome

Modules’ and data validation (during the first half of 2002) preceded the demonstration phase. Networks and timetables coming from public transport companies had been checked, joined and loaded on EFA. At the same time, the ISCOM site had been set up on the ATAC Internet server, managed by the ATAC Marketing Department. A link with the presentation and objectives of the ISCOM project was shown since the project start on the ATAC site; on the homepage of the site, a new link to the travel planner and system instructions was added.

![Accesses](image)

**Figure 4-29 Measurements Rome**

**Information system**

ATAC Internet users welcomed new services. Most of them already know and use travel planner systems for public transport in Rome. The ISCOM project has shown that the most required service for users in the Lazio region concerns multimodal information between regional and local public transport services (till now it has been impossible, as timetable information for public transport companies has not been collected, integrated and exploited).

Criticism concerns options for advanced search (which was not really used very much). Probably at the moment users are looking for basic information (timetables, transfers) rather than “sophisticated” information. Therefore the service to improve is information on regional transports, as e.g. inserting regional railway lines.

The ISCOM travel planner has increased the efficacy of public transport service: More than 50% of users have improved their knowledge about the transport service and 89% think that it can be useful to support the transfer from private to public transport.

**Flexible services**

Usage and evaluation of Flexy for flexible services planning has shown good results for the mobility-disabled people transport problem: all indicators for comparison have been improved using Flexy. It is important to underline how much the time necessary for providing a (better) plan has been reduced. As Trambus is planning to increase decidedly the fleet for mobility-impaired people transportation, Flexy
could be a valid tool for supporting the planning. The model should be improved in order to manage departure and back requests at the same time avoiding the “merging” phase.

Less positive is the result for the employees’ transport model. The provided solution has a better quality (for end users), but a worse resource usage. Finding reasonable travel times, as input data for models, has been the most evident problem for flexible services evaluation (a problem that arises in manual planning as well).

4.3 Results from Evaluation and Assessment

The ISCOM Project has developed or advanced intermodal and multimodal transport information and services. These services were implemented, tested and evaluated during the project lifecycle. Next to the technical feasibility, which was investigated by the ISCOM partners, a focus was laid on the information services concerning user acceptance and traffic impacts.

The traffic impacts caused by the ISCOM information services were investigated and assessed during the demonstration phases. To this aim surveys were carried out to obtain information about the acceptance and the user behaviour. Wherever necessary the ISCOM database was improved by the results and data of other similar projects like, e.g. BAYERNINFO [1] and CARPLUS [5]. With the results of the assessments of the traffic impacts for the different ISCOM services an estimation model of traffic impacts was made for the Stuttgart Region. Traffic impact estimations for the Stuttgart Region were carried out for the three ISCOM information systems and services:

- Stuttgart Congestion Management,
- EFA Baden-Württemberg/cross-border information and
- Stuttgart Car-pooling.

The results of the estimation model for the Stuttgart Region were transferred to Baden-Württemberg and to the other ISCOM sites. Finally, an assessment of the ISCOM traffic impacts was made for the European Union by transferring the results to the 15 member countries of the European Union.

Total transportation costs (except transportation infrastructure investment and maintenance costs) amounts to 9 billion Euro/a (public transport, private vehicle traffic and freight traffic) for Stuttgart Region in the Without-Case. About 65% of these costs are caused by private vehicle traffic and freight traffic, 35% are caused by public transport. For all three information systems together a reduction of the passenger transport performance in motorized traffic (public transport and private vehicle traffic) of 2.1% is estimated for the Stuttgart Region (comparison of full operational systems with the situation where none of these systems exist). This is a reduction of 512 million passenger km/a due to the behaviour changes caused by the three ISCOM information systems (e.g. change to public transport, change to car-pooling, travel renouncement). The travel time in the Stuttgart Region is reduced, too (3.2% in comparison to the Without-Case).

The total transportation cost savings with all three Stuttgart ISCOM systems running in parallel amounts to 2.1% (with reference to total transportation costs of public transport, private vehicle traffic and freight traffic; 190 million Euro/a). Around 1.5% (138 million Euro/a) is the amount of the cost reduction by the Stuttgart Congestion Management. This is the greatest share of total transport cost reduction of ISCOM information systems. The EFA information system for the Stuttgart Region results in a reduction of the total transportation costs by 0.4% (nearly 40 million Euro/a). The lowest impact results by Stuttgart Car-pooling information system. The car-pooling system leads to a reduction of the total transportation costs by 0.2% (13 million Euro/a).

The reduction of the passenger transportation costs in public transport alone amounts to 3 million Euro/a although there is an important shift from private vehicle traffic to public transport and a minor one in the opposite direction. The effect of saving travel time costs (positive cost reducing effect by EFA) in fact is higher than the effect of shifts from private vehicle traffic to public transport (negative cost producing effect due to the increase of passenger transportation performance and travel time costs).
Remarkable is the high concentration of Congestion Management (CM) and EFA Baden-Wuerttemberg (EFA-BW) in conurbation areas. In the Stuttgart Region the total transportation costs saving of the Congestion Management are three times higher (-1.5%) than for the European Union in average (-0.5%). The EFA information system creates also higher benefits in the conurbation Stuttgart Region (-0.4% of total transportation costs) than in the whole European Union (-0.2%).

For comparability the results are shown for all sites with the three ISCOM systems (CM, EFA and car-pooling) running in parallel. Among all ISCOM sites the highest impacts were assessed for the Rome site. The overall transportation cost reduction for the Rome site is 1.6% due to the use of the ISCOM information systems. The Vienna site follows with a reduction of the overall transportation costs by 1.4%. The overall transportation cost reduction for the Baden-Wuerttemberg site is 1.2%, and for the Alsace site 0.7%. For the European Union (EU15) the overall transportation cost reduction would be 0.9% due to a European-wide use of the three ISCOM information systems (CM, EFA and car-pooling).

Important for the cost-benefit relation is that there is a big difference in the investment costs for building up a complete new system in a new site. The Congestion Management needs a lot of decentralized hardware (e.g. traffic counters on the road network), which is expensive. The other two ISCOM services (EFA and car-pooling) do not need lots of decentralized hardware. These two systems are more software-orientated than the Congestion Management system.

All ISCOM information systems and services have positive impacts like the reduction of the total transportation costs, the reduction of the transport performance and the reduction of the travel times. Most of the ISCOM Services will be operated or probably advanced after the end of ISCOM.
4.4 Scientific/Technological Quality and Innovation

In order to provide the information kernel with the various timetable data all known timetable systems are transformed into a common structure. This structure is a dialogue-oriented timetable construction and information system integrating the timetable systems and the railway data. As specific component-based software engineering the integration methods have no restrictions with respect to data amount and network size.

Engineering of intelligent services

The mobility services need a specific engineering of programme modules that can be put together to form intelligent services. The chosen distributed architecture ensures that routing problems, dispatching and scheduling of special vehicle fleets and integration of different and inhomogeneous data bases are processed concisely. The programme modules are:

- Configuration
- Basic data server
- Administration of stops and stations
- Network administration (stops and partial routes)
- Administration of road co-ordinates
- Administration of assigning addresses/stops, single house co-ordinates
- Administration of assigning search tree/stops
- Traffic days
- Geographic reference
- Basic data of set of timetable book and timetable announcements
- Graphical presentation and construction of timetables
- Set of timetable book
- Timetable announcements
- Connection diagram

With these modules the following services are available:
- Integration of timetables of different sources, i.e. other timetable systems and railway data
- Connection of timetables and geographic data
- Construction and presentation of network plans
- Presentation of timetables in the form of books and announcements
- Data provision for electronic timetable information.

Methods and tools for intelligence and knowledge sharing

The electronic timetable information system shell integrates a series of sophisticated systems and resolutive algorithms. These algorithms cover all tasks necessary to provide public transport information for schedule details and vehicle dispatching from routing and timetables to vehicle and driver shift arrangements.

Value Added Services (VAS) based on mobile communications

Value Added Services (VAS) are now well established in the mobile services sector helping to grow traffic revenues and profit, providing the users with tangible benefits and opening up new markets. A second generation of Value Added Services is emerging on the horizon as technologies continue to push forward the frontiers and as user requirements become more clearly defined. As knowledge of the mobile user and the mass market becomes more and more important for future revenue growth, new players are moving into the Value Added Services market including: service providers, content providers, retail organisations, and advertisers. This augurs changes in the structure of the mobile industry as the power shifts to those players closest to the users.
While mobile telephony is one of the fastest developing industries in the world, its expansion is clearly matched by that of the Internet. The convergence of these two services over the coming years will result in access to vast amounts of information via mobile phones.

ISCOM provided the opportunity to test WAP technology in the transport sector. Beyond the scope of the project, ISCOM has paved the way for future location-dependant transport services including access to the whole internet world, prepaid services, direct ticket billing and e-commerce.

**Test beds for advanced networking and application experiments**

The project identified two different types of test beds for demonstrating digital network information services: (1) two major metropolitan areas (Vienna and Rome) with excellent coverage of public transport lines forming a complex system with respect to data amount and variety of public transport lines, and (2) adjacent regional areas (Baden-Wuerttemberg and Alsace) with problems of cross-border data exchange and services in different languages. Both test bed types are candidates to test intelligent infrastructures for data acquisition, processing, exchange and dissemination including different transport modes. Emphasis is placed on the data fusion in view of their adaptation for traffic surveillance and control. The test beds show media-independent and open architectures adapting digital network intelligence and terminals for optimum use.

Moreover, Stuttgart additionally improves congestion management and information for the urban area. Internally this includes tools for the operator in handling different data bases and sources of information, in predicting congestion due to foreseeable important events, in testing congestion management strategies, and in supplying congestion information and recommendations to intermediate (i.e. administration, broadcast, mobility centre) and end users (traffic participants, companies).

### 4.5 Community Added Value and Contribution to EU Policies

The project contributes to the Community's objectives especially on information society and common transport policy. User friendliness of public transport information has been increased at home or at stops/stations. Different sources of information, public transport and related services have been integrated and supplied e.g. by Internet. Citizens have more comfortable access to mobility information, starting with public transport timetable information enlarged by cross-border and door-to-door information, congestion management information and the car-pooling service.

Sustainable mobility is supported by the enlargement and improvement of mobility information and services. This includes services and entities, which are complementary to public, transport itself as park&ride, taxi&ride or bike&ride. Also information on public transport itself has been improved, especially for mobility-handicapped users in Vienna and Rome. Direct user benefits as access to information, accurateness, reliability, usefulness and comfort were assessed in the surveys during the demonstration phase.

### 4.6 Contribution to Community Social Objectives

The backbone is the creation of user-friendly applications of multimodal transport information and services. This encourages and enlarges the use of this information as well as the use of intermodal transport. Different kinds of media help to supply traffic information and services to more user groups, e.g. by Internet, terminals, phone, and DAB. The services of mobility centres and electronic timetable information have been extended through paratransit entities and activity-related information as well. This improves and eases the quality of life in daily experience. Direct benefits for the citizens are better and more comfortable information on trips, improved planning and flexibility in using public transport and related services, overcoming cross-border limitations in intermodal transport, and reduction of congestion, environmental pollution, energy consumption and accidents due to transport.

Specific traffic information and service for mobility-handicapped people have been included. This will help these groups to be more active and mobile, and to participate more in their social and economic environment. Improved mobility especially for these specific user groups will also create demand and
employment in these areas, where access is now possible, i.e. leisure time entities, cultural offers, shopping.

4.7 Economic Development and S&T Prospects

The improvement in intermodal traffic information and services as well as the efforts in congestion management make passenger transport more efficient in general, and thus help to reduce emissions in road traffic. The traffic impacts from the societal point of view (e.g. effects on delays or congestion, pollution, energy consumption, traffic safety) have been calculated for the Stuttgart site. This is based on changes in user behaviour and services, and on results from the technical tests. The following economic impacts from the introduction and improvement of mobility services are:

- Increased use of public and intermodal transport will directly reduce congestion problems.
- Increased use of public and intermodal transport will help to reduce costs for the individual traffic participant and for the society.
- Mobility centre activities will help to make better use of the specific advantages of each transport system and therefore to balance capacities within and between different transport systems.
- New Value Added Services will be created in the long-term based on Internet via mobile communications.
- The efficiency of the overall transport system has been improved.
- The planning and preparation of travels will become more efficient by the support of mobility centres and timetable information. The individual benefits from improved trip planning have been assessed by questionnaires (Internet, written, expert).

The assessment of direct economic impacts (direct costs, time) has been done with the existing traffic model already calibrated, using impacts from the evaluation (questionnaires, shift in demand etc.). Results from the detailed investigation have been transferred to the other sites. For details refer to the Evaluation Report (D7) and the Demonstration Report (D09).

Congestion management specifically contributes to the following economic objectives:

- Congestion management directly reduces individual and social costs of road transport (reduction of congestion, time, fuel, operating costs, etc.).
- Especially fleet and freight operators can optimise their logistics using current information.
- Traffic management of foreseeable big events (e.g. fairs, sportive or cultural events, big construction works) can create economic benefits for the events themselves by increasing the number of visitors or by improving construction works and related traffic. Internet surveys and expert surveys have been used to estimate the impacts.

Using traffic management to reduce negative impacts on the local population and economy can also support general acceptance of such events or constructional works.
## 5 Deliverables and Other Outputs

### 5.1 Deliverables

The table below lists all project deliverables produced during the ISCOM lifecycle.

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>D1 User requirements</strong></td>
<td>presents the results from Workpackage 1 considering user groups and user requirements. The identification of users and their requirements were firstly based on experience from corresponding projects and existing services or mobility centres for each site. An Internet survey of the users of electronic timetable information (Baden-Wuerttemberg, Vienna and Rome) was done by means of interactive questionnaires. The clients of the existing mobility centres were directly interviewed (Stuttgart). In those cases in which a mobility centre has not yet been existing, surveys among public transport users or public transport authorities were carried out (Alsace, Vienna and Rome). In principle, the user requirements’ investigations included all potential services, although only a set of them have been implemented within ISCOM.</td>
</tr>
<tr>
<td><strong>D2 Data Models and Data Exchange Formats</strong></td>
<td>describes the database structure used for trip planning, for car-pooling and the Stuttgart congestion management system (SCM) as well as the common understanding of the data models. The report describes the data used in the sites of Rome, Vienna, Alsace and Baden-Wuerttemberg. It gives a complete description of the common data interface. Detailed database structure information concerning timetable database, model of stops and interchanges and GIS data for routing and map creation is given. The car-pooling data description consists of information about personal, communication and process data, the front-end and the back-end of the system. The SCM system description consists of information about the IT networks, the current traffic information, the time-related traffic information and the destination-oriented traffic information.</td>
</tr>
<tr>
<td><strong>D 3 Specifications</strong></td>
<td>proposes the ISCOM System Architecture that is the reference for all developments in the project. The system architecture provides the basis for a working system. Architecture development is based on Converge Guidelines for the development and assessment of intelligent transport system architectures.</td>
</tr>
<tr>
<td><strong>D4 ISCOM Software Implementation</strong></td>
<td>gives an overview of the architecture and the implementation of the software in all ISCOM sites. The general ISCOM Architecture and specific implementation is explained: The implementation of the car-pooling software in Baden-Wuerttemberg (Germany), the implementation in Alsace, including a description of the GIS data, the web user interface, the interfaces for mobile users, cross-border information and statistics &amp; quality indicators in Alsace. An overview of the implementation in Rome is given as well as of the implementation in Vienna, including description of system overview, data collection and integration, GIS-Data, EFA server software, user interface and the information for mobility-handicapped persons.</td>
</tr>
<tr>
<td><strong>D5 Mobility Centre Set-up and Enlargement of Traffic Management Centre</strong></td>
<td>gives a clear view of the four sites involved in the project in terms of user groups, transport operators, geographic areas and pre-existing mobility services, and resuming the users’ requirements. The report describes in a first step an overview of mobility services provided by two kind of centres: Mobility Management Centres which manage road networks, and Mobility Service Centres which basically are established to provide public transport information, and deal with travellers as individuals and through personal contact. It reports on the ISCOM implementation of mobility services and mobility service centres by giving detailed information on</td>
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<td>Deliverable</td>
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<td>types of common services, i.e. services deployed in each site, types of dedicated services depending on the sites, the different means for accessing the services, the description of the technical implementation of the services and the information systems. A part of the report focuses on the enlargement of the traffic management centre in Stuttgart (congestion management).</td>
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<tr>
<td></td>
<td>D6.1 Validation Plan (2 updates in 3/2001 and 12/2001) proposes the ISCOM Validation Plan as the reference for all developments realised within the project. The Validation Plan describes the methodologies and tools requested to verify, step-by-step, the conformance of the modules, platforms and services developed, compared to the initial specifications. The validation process followed an ISO-like process, so as to ensure the quality of the work performed, and it followed the Converge Project TR 1101 Recommendations (Checklist for preparing a Validation Plan).</td>
</tr>
<tr>
<td></td>
<td>D6.2 Validation Report                                                                                                             describes the results of the validation campaigns, conducted on the ISCOM sites, and requested to verify, step-by-step, the conformance of the modules, platforms and services developed, compared to the initial specifications, and according to the methodologies and tools defined in DEL6.1, the Validation Plan, submitted to the Commission end 2001. The document contains a common Part A and specific “site reports” relating to Baden-Wuerttemberg (Cross-border deployment (NVBW), Stuttgart Congestion Management system (SCM), Car-pooling Management System (CPM)), Regio South-Alsace, Rome and Vienna.</td>
</tr>
<tr>
<td></td>
<td>D7 Evaluation and Assessment                                                                                                    documents the overall evaluation and assessment of the project including methodological approach, state-of-the-art of the basic traffic situation in the sites, the results from the demonstration phase up to the quantification of impacts for the Stuttgart/Baden-Wuerttemberg site and the overall evaluation (transfer of impacts).</td>
</tr>
<tr>
<td></td>
<td>D8.1 Dissemination and Use Plan                                                                                                  establishes the framework for dissemination and exploitation activities within the ISCOM project, describing the dissemination plan including the dissemination tools and channels. Chapter 3 gives the expected results of the Project in terms of market size, timing and estimated effort for exploitation.</td>
</tr>
<tr>
<td></td>
<td>D8.2 Technical Implementation Plan                                                                                               describes the expected and achieved results of the project in terms of exploitation and business plans.</td>
</tr>
<tr>
<td></td>
<td>D9 Report on Demonstrators                                                                                                      summarizes the demonstrations carried out on each site and gives the detailed results from the demonstration phase including measurements and surveys.</td>
</tr>
<tr>
<td></td>
<td>Consortium Agreement                                                                                                           (not foreseen as deliverable) among the consortium partners.</td>
</tr>
</tbody>
</table>

Table 5-1 Project deliverables
5.2 Other outputs

5.2.1 Patents

5.2.2 Participation in Industrial Exhibitions (selection)

<table>
<thead>
<tr>
<th>Industrial exhibitions</th>
<th>Date</th>
<th>Other information</th>
</tr>
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<tbody>
<tr>
<td>Pole Automobile, Conference Technopole Mulhouse</td>
<td>18 June 2002</td>
<td>ISCOM presentation and Trans-Rhena site demonstration</td>
</tr>
<tr>
<td>Fete de L’Internet 2000 -2001</td>
<td>17-18 March 2000</td>
<td>Internet presentation, documentation distribution</td>
</tr>
<tr>
<td></td>
<td>2 March 2001</td>
<td></td>
</tr>
<tr>
<td>Foire Internationale de Mulhouse</td>
<td>July 2001</td>
<td>3 days exhibition, Internet demonstrations, documentation distribution</td>
</tr>
<tr>
<td>Teleregion 2001 Mulhouse</td>
<td>Nov. 2001</td>
<td>1 day exhibition, Internet demonstrations, documentation distribution</td>
</tr>
<tr>
<td>Europolis, Bologna</td>
<td>7-10 Feb. 02</td>
<td>Exhibition of technologies for liveable city: traffic and circulation. Demonstration version of ISCOM presented.</td>
</tr>
<tr>
<td>Pole Automobile, Conference Technopole Mulhouse</td>
<td>18 June 2002</td>
<td>ISCOM presentation and Trans-Rhena site demonstration</td>
</tr>
</tbody>
</table>

5.2.3 Articles and Press Releases (Selection)

<table>
<thead>
<tr>
<th>Articles/press releases</th>
<th>Date</th>
<th>Other information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dernière Nouvelles d'Alsace 11/3</td>
<td>March 2000</td>
<td>Press conference and press release on ISCOM</td>
</tr>
<tr>
<td>Amtsblatt Stuttgart</td>
<td>26 June 2000</td>
<td>Article on traffic management referring to the ISCOM project in Stuttgart</td>
</tr>
</tbody>
</table>
| Amtsblatt Stuttgart      | 6 July 2000   | Article on "Computerprogramm für Fahrge-  
meinschaften" referring to ISCOM, the services of the mobility centre Stuttgart and the planned car-pooling service, incl. the EU funding of these activities  |
<p>| Stuttgarter Zeitung      | 13 July 2000: | Article on &quot;Wenn die S-Bahn bis zum Nürburgring fahren soll...&quot; referring to the ISCOM Project in Stuttgart.  |
| Amtsblatt Stuttgart      | 14 Sept. 2000 | Article on &quot;Intelligente Systeme für bessere Mobilität&quot; presenting among others the ISCOM Project |
| Internal news letter &quot;Des Nouvelles d'ISCOM&quot; | No. 1, Feb. 2000 | Published by Steleus (formerly NMG) and Telal |
| Observatoire des Télé-  | July 2000      | ISCOM article (<a href="http://www.telecomville./org">www.telecomville./org</a>).                                                 |
| communications dans la ville |             |                                                                                  |
| Fete de L’Internet 2001 | 2 March 2001  | Internet presentation                                                             |</p>
<table>
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<tbody>
<tr>
<td>Press conference</td>
<td>12 June 2002</td>
<td>Organized by VOR Vienna for the opening of the new timetable information system.</td>
</tr>
<tr>
<td>Press conference</td>
<td>13 June 2002</td>
<td>Press conference in Strasbourg organized by MI related to the launch of the Trans-Rhena site.</td>
</tr>
<tr>
<td>Press conference</td>
<td>13 June 2002</td>
<td>Press conference in Mulhouse organized by Steleus (formerly NMG) related to the launch of the Trans-Rhena site.</td>
</tr>
<tr>
<td>Demièrè Nouvelle Alsace</td>
<td>13 June 2002</td>
<td>Article on ISCOM/opening of the Trans-Rhena site.</td>
</tr>
<tr>
<td>Autoroute &amp; Mobilité, No 14</td>
<td>June 2002</td>
<td>Article on Trans-Rhena site.</td>
</tr>
<tr>
<td>La Tribune</td>
<td>14 June 2002</td>
<td>Article on ISCOM/opening of the Trans-Rhena site.</td>
</tr>
<tr>
<td>Autoroute &amp; Mobilité, No 14</td>
<td>June 2002</td>
<td>Article on ISCOM/Trans-Rhena site.</td>
</tr>
<tr>
<td>Le Monde</td>
<td>22 July 2002</td>
<td>Article on ISCOM/opening of the Trans-Rhena site.</td>
</tr>
<tr>
<td>Le Monde</td>
<td>11 Sept. 2002</td>
<td>Article on Alsace, ISCOM developments</td>
</tr>
<tr>
<td>Press conference</td>
<td>13 Sept. 02</td>
<td>Press conference in Stuttgart organized by Partner City of Stuttgart – AFU on the occasion of the public launching of the car-pooling service.</td>
</tr>
<tr>
<td>Stuttgarter Zeitung</td>
<td>14 Sept. 02</td>
<td>Article on the opening of the car-pooling service (“Pendlernetz”) of the Stuttgart mobility centre.</td>
</tr>
<tr>
<td>Stuttgart Nachrichten</td>
<td>14 Sept. 02</td>
<td>Article on the opening of the car-pooling service (“Pendlernetz”) of the Stuttgart mobility centre</td>
</tr>
<tr>
<td>Cannstatter Zeitung</td>
<td>14 Sept.02</td>
<td>See above</td>
</tr>
<tr>
<td>Amtsblatt Stuttgart/Reformkurier</td>
<td>19 Sept. 02</td>
<td>See above</td>
</tr>
<tr>
<td>Filder-Zeitung</td>
<td>26 Sept. 02</td>
<td>See above</td>
</tr>
<tr>
<td>Stuttgarter Zeitung</td>
<td>20 Oct. 02</td>
<td>Article on “Pendlernetz”</td>
</tr>
<tr>
<td>Television presentation (BTV)</td>
<td>18 Oct. 02</td>
<td>Presentation of the car-pooling service by R. Lüdert, AFU</td>
</tr>
<tr>
<td>Stuttgart Zeitung</td>
<td>29 Oct. 02</td>
<td>Article on “Pendlernetz”</td>
</tr>
<tr>
<td>Verkehr und Umwelt</td>
<td>Vol 5/2002</td>
<td>Article on „Verkehrsverbundtag“ Graz and ISCOM</td>
</tr>
<tr>
<td>Amtsblatt Stuttgart</td>
<td>28 Nov. 2002</td>
<td>Article on ISCOM Workshop, 19 Nov.02 in Stuttgart</td>
</tr>
<tr>
<td>Compass (ptv company newsletter)</td>
<td>Vol. 4/2002</td>
<td>Article on on-line car-pooling system “Pendlernetz”</td>
</tr>
<tr>
<td>Stuttgarter Zeitung online</td>
<td>17 Dec. 2002</td>
<td>On the occasion of public transport strike on 17 Dec. 02 recommendations by SSB to use the car-pooling system “Pendlernetz”.</td>
</tr>
</tbody>
</table>
### 5.2.4 Websites

<table>
<thead>
<tr>
<th>Site</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISCOM homepage</td>
<td><a href="http://www.iscom-ec.de">www.iscom-ec.de</a></td>
</tr>
<tr>
<td>Alsace site</td>
<td><a href="http://www.trans-rhena.net">www.trans-rhena.net</a></td>
</tr>
<tr>
<td>Stuttgart/Baden-Wuerttemberg site:</td>
<td></td>
</tr>
<tr>
<td>Stuttgart Congestion Management system</td>
<td><a href="http://www.iscom-scm.de">www.iscom-scm.de</a></td>
</tr>
<tr>
<td>Stuttgart Car-pooling system</td>
<td>[<a href="http://www.stuttgart.de">www.stuttgart.de</a> (Pendlernetz)]</td>
</tr>
<tr>
<td>EFA/cross-border timetable information system</td>
<td><a href="http://www.efa-bw.de">www.efa-bw.de</a></td>
</tr>
<tr>
<td>Vienna site</td>
<td><a href="http://www.vor.at">www.vor.at</a></td>
</tr>
<tr>
<td>Rome site</td>
<td><a href="http://www.atac.roma.it">www.atac.roma.it</a></td>
</tr>
</tbody>
</table>

The following companies and institutions installed the car-pooling link (Pendlernetz):

- Daimler Chrysler AG Stuttgart
- Handwerkskammer Region Stuttgart
- Robert Bosch GmbH
- Evangelische Landeskirche Baden-Wuerttemberg
- Bischöfliches Ordinariat Rottenburg
- Gemeinde Neckartenzlingen
- Gemeinde Hildrizhausen
- Stadt Esslingen
- Stadt Nürtingen
- Stuttgarter Zeitung online
- Schwäbisches Tagblatt online
- Ministry for Environment and Transport Baden-Wuerttemberg
- Southwest Broadcaster SWR

### 5.2.5 Conference Participation and Presentations (Selection)

<table>
<thead>
<tr>
<th>Conference name</th>
<th>Date</th>
<th>Other information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inauguration with regional politicians at Steleus (formerly NMG)</td>
<td>25 Feb. 00</td>
<td>ISCOM presentation</td>
</tr>
<tr>
<td>User group meeting of electronic timetable information</td>
<td>14-16 March 00</td>
<td>ISCOM presentation</td>
</tr>
<tr>
<td>Fete de L’Internet in Mulhouse</td>
<td>17 – 18 March 2000</td>
<td>ISCOM presentation</td>
</tr>
<tr>
<td>Telegeo 2000</td>
<td>10-12 May 00</td>
<td>ISCOM poster presentation</td>
</tr>
<tr>
<td>EC-GIS 2000</td>
<td>Lyon, 23-24 May 00</td>
<td>ISCOM presentation</td>
</tr>
<tr>
<td>Presentation to the different committees of the City of Stuttgart/municipal council incl. public audience</td>
<td>12 Sept. 00</td>
<td>ISCOM presentation</td>
</tr>
<tr>
<td>IST Concertation meeting</td>
<td>1 Feb. 01</td>
<td>Participation and presentation of ISCOM on mobility services, validation issues</td>
</tr>
<tr>
<td>Regio-TriRhena Congress</td>
<td>24-27 May 01</td>
<td>Exhibition and conference at the Foire Internationale de Mulhouse (40,000 to 50,000 visitors). Alsace platform with a first set of trans-regional data and access to the Alsace web portal (in German, French and English languages) was presented, access to the TRAM data via WEB and SMS.</td>
</tr>
<tr>
<td>IMAGE WORKSHOP, Finland</td>
<td>26 March 02</td>
<td>Presentation of ISCOM on the clustering event of the IMAGE user group workshop.</td>
</tr>
<tr>
<td>ECUMN Conference Colmar</td>
<td>April 2002</td>
<td><a href="http://iutsun1.colmar.uha.fr/ECUMN02.html">http://iutsun1.colmar.uha.fr/ECUMN02.html</a></td>
</tr>
<tr>
<td>Conference name</td>
<td>Date</td>
<td>Other information</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>EuroPA</td>
<td>10–13 April 02</td>
<td>Annual meeting of local authorities in Rimini, Italy</td>
</tr>
<tr>
<td>Gothenburg conference</td>
<td>May 01</td>
<td>Preparation of information material for booklet publication</td>
</tr>
<tr>
<td>Forum for local authorities in Rome</td>
<td>May 02</td>
<td>Presentation of ISCOM together with Cotral</td>
</tr>
<tr>
<td>Leitprojekte Mobilität in Ballungsräumen</td>
<td>28 – 29 May 02</td>
<td>Expert conference of the German Ministry for Education and Research, Berlin.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presentation by the City of Stuttgart on the integrated traffic control centre Stuttgart.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presentation of information material on ISCOM (stand).</td>
</tr>
<tr>
<td>ASSTRA</td>
<td>6–8 June 02</td>
<td>Annual meeting of national association of PT companies in Naples, Italy.</td>
</tr>
<tr>
<td>Visit of Delegation of Dutch Transport Ministry in Stuttgart</td>
<td>21 June 02</td>
<td>Presentation of ISCOM and ISCOM site-specific applications in Stuttgart to Dutch delegation of transport ministry (12 persons).</td>
</tr>
<tr>
<td>Regional Conference in Karlsruhe</td>
<td>22 June 02</td>
<td>On the occasion of the 50th anniversary of Baden-Wuerttemberg, exhibition and presentation of Trans-Rhena site.</td>
</tr>
<tr>
<td>Karlsruhe Conference</td>
<td>21 – 23 June 02</td>
<td>Cross-border event (exhibition and presentation on ISCOM specialised on the Trans-Rhena site application).</td>
</tr>
<tr>
<td>ASSTRA, Naples</td>
<td>July 02</td>
<td>Presentation ISCOM results at ASSTRA conference to transportation companies.</td>
</tr>
<tr>
<td>Inform Norden, Oslo</td>
<td>5–6 Sept. 2002</td>
<td>Presentation</td>
</tr>
<tr>
<td>TELEREGERION 2002</td>
<td>24–27 Sept. 02</td>
<td>Presentation</td>
</tr>
<tr>
<td>UTP Congress, Grenoble</td>
<td>9 – 11 Oct. 02</td>
<td>Presentation of ISCOM data</td>
</tr>
<tr>
<td>IGV Congress (6. Verkehrsverbundtag 2002), Vienna</td>
<td>14–16 Oct. 02</td>
<td>Presentation of the new intermodal timetable information system developed within ISCOM.</td>
</tr>
<tr>
<td>DIVA/EFA User Group</td>
<td>29–31 Oct. 02</td>
<td>Presentation</td>
</tr>
<tr>
<td>ISCOM Presentation</td>
<td>13 Nov. 02</td>
<td>Presentation of the car-pooling service at the Ministry of Environment and Transport Baden-Wuerttemberg to representatives of big companies and public authorities.</td>
</tr>
<tr>
<td>ISCOM Workshop, Stuttgart City Hall</td>
<td>19 Nov 02</td>
<td>Final presentation of ISCOM results to operators, users and experts on international level.</td>
</tr>
</tbody>
</table>
5.2.6 Workshops (International and Local Presentations)

The final ISCOM Workshop presented the results of the project to a broader public involving external transport operators, experts and end users. The Workshop took place on 19 Nov. 2002 in Stuttgart.

On the national and local level a number of workshops mainly with the local transport operators and authorities took place, especially in those sites that newly built-up the electronic timetable information system as in Alsace and Rome.

On the occasion of the various conferences and workshops a lot of information brochures and posters have been produced:

- ISCOM brochure (available in English and German, site-specific ISCOM brochures available in German, French and English),
- Trans-Rhena site (posters),
- “Pendlerentz Stuttgart” (20,000 car-pooling flyers and 300 posters produced by the City of Stuttgart – Amt für Umwelt on the occasion of the launching of the car-pooling service),
- “Pendlerentz” video clip.
6 Project Management and Coordination Aspects

SSP Consult carried out the project management. This included the coordination of all financial, administrative and contractual matters on the one hand, as well as the co-ordination and monitoring of the technical work progress as defined in the contract and the quality control, final editing and submission of the project reports.

The composition of the consortium, which consisted of software developers, transport operators and municipal authorities, was seen as an ideal basis for the successful realization of the project from the beginning. This was, however, a challenge too, to integrate the different positions in a common project.

Many formal obstacles were to overcome, as e.g. the need for official approval by city administrations involved. A lot of negotiations were needed to obtain the permission for the use of data from various transport companies, particularly in Rome and Alsace, where there are many transport companies without integration.

All partners integrated well on a personal level, which helped problems solving and, the completion of the project objectives.

Problems encountered and solved.

Great difficulties were caused for the project in Year 1 due to the big delay of the advance payment for the French partners.

A reorganization of the working resources in Alsace was necessary in the middle of Year 2, following the withdrawal of the Partner Telal (closure of company). The continuation of the work in Alsace was, however, solved thanks to the strong dedication of the partners. The new company of Mentz Informatique (MI) was founded and took over the tasks of Telal. STELEUS (formerly NMG) and MI agreed for a new distribution of the work, in order to improve effectiveness of their site.

Difficulties have emerged concerning the refunding of non-used resources by TELAL (26.127,30 Euro), that are remaining from the advance payment, and which are still outstanding. Efforts by the Coordinator and the Commission for repayment of the outstanding money to the Consortium are still ongoing.

In Rome the lack of cooperation from the regional transport company in the Lazio region (once called COTRAL -Consortium-, then LiLa, and finally COTRAL-S.p.A.) had lead temporarily to unavailability of data for the ISCOM project. Data had been individuated and collected, but not integrated due to denied permission from COTRAL. The Rome site coordinator had been in touch with Dr. Salinari and sent a formal request to COTRAL to fully use their data within the ISCOM project, which was finally successful.

Similar problems were found on the Alsace site, were many efforts were necessary to obtain the permission of data use from various transport operators, e.g. SNCF.
7 Outlook

The following chapter gives a short description on how the results and achievements of the project have benefited each partner and how the partners intend to use and exploit these further.

The project identified contracted partners as:

- **Intermediate users**: City of Stuttgart, SSP (Stuttgart), NVBW (Baden-Wuerttemberg), VOR (Vienna), ATAC (Rome).
- **Technology and service developers**: Mdv (German), MAIOR (Italy), Steleus (France), MI (France).
- **Sponsoring partners**: major operators and service providers in the related regions (associations for regional transport, trans-regional associations, Chambers of Commerce, municipal authorities, transport ministries, see Chapt.1.2).

7.1 Exploitation by the Technology Developers

Exploitation by the technology developers concerns:

- Preparation of future mobile-Internet convergence applications allowing 2G to 3G evolutions (GPRS and UMTS) and convergence towards proximity networks (Bluetooth, Wi-Fi, Swap).
- Test of novel software components: SW modules for multi-language user interfaces, Virtual SW system for time-table design, travel planning and flexible transport services, trans-national database, enhanced POIs management.
- Test and validation platform for future technological evolutions as region-wide deployed demonstration tool and modular and evolutive system architecture.

7.2 Exploitation by the Service Developers

Exploitation by the service developers concerns:

- Deployment of basic ISCOM services in enlarged regions.
- Testing and deployment of enhanced services, e.g.:
  - The Alsace site was enhanced by new services: Location-based, Welcome, Alerting, Push, E-commerce, Infoguide, etc.).
  - Interconnected Congestion Management and Car-pooling services in Baden-Wuerttemberg.
  - Set-up of Mobility Centres in Rome, Vienna and Alsace.
- Opportunities for new transport business in Alsace:
  - Creation of Mentz-Informatique Sarl (MI) in Strasbourg,
  - Creation of SwapTec-France in Mulhouse,
  - and approach of relating market areas.
- Deployment of ISCOM-like systems in other countries & regions through
  - the deployment in the regions of Jura, Somme (F) and Wallony (B) via the TRASCOM follow-up project and
  - the further involvement in combined transport projects in Europe/USA.
7.3 Exploitation by the Intermediate Users

This is related to improve the basic services by:

- An intensive use of public transport,
- an alternative (or a complement) to private car transport,
- a high-level of service quality,
- the satisfaction of the passengers,
- a high-tech image of the service providers and regional authorities,
- a powerful tool for territory transport organization plans

and to propose new applications:

- Information systems for specific communities of service providers: museums, restaurants.
- Information systems for specific events: fairs, conferences, sport events.
- Information systems for urban planning: route simulation, travel simulation.

7.4 Exploitation by Sites and Benefits for the Partners

7.4.1 Baden-Wuerttemberg

- Congestion Management and Car-pooling offer future complementarity between public and individual transport.
- The Stuttgart Congestion management system is planned to be integrated in the Traffic Management Centre.
- Continuation of Car-pooling operation until 9/03 (at least).
- The Car-pooling application is planned to be deployed in other regions.
- Door-to-door information and enlarged access to cross-border information will also be provided by the new EFA-BW system.
- Continuation of regular operation of new EFA Baden-Wuerttemberg by NVBW.

Benefits for the partners:

SSP:

- Gathering data of user requirements and acceptance of intermodal traffic information systems for design of traffic information systems.
- Evaluation and assessment of intermodal traffic information systems the assessment of other telematic/IT systems and in the consulting business area.
- Use for the assessment of other telematic/IT systems and in the consulting business area.

City of Stuttgart, TR and AfU:

- Creation of SCM tool for integration into the Traffic Information Centre (TIC) and Traffic Management Centre (TMC) for event traffic management.
- Extension of the services of the Stuttgart Mobility Centre with the car-pooling service. Involved companies will transfer the results and experiences to other regions and countries, as the car-pooling software developed is unique in Europe.
Mdv:
- Display of mdv technology in Baden-Wuerttemberg, Vienna, Alsace and Italy.
- Acquisition of further projects of similar content in these countries.
- References for national and international offers of intermodal journey planning systems.

NVBW:
- Extension of the region covered by EFA Baden-Wuerttemberg.
- Multi-language user-interface for EFA Baden-Wuerttemberg.
- Project to maintain and update the timetable-data of Alsace within EFA Baden-Wuerttemberg for at least 4 years (Interreg III funding requested).

7.4.2 Regio South-Alsace
- Demonstration of public transport intermodality is quite new in Alsace.
- Trans-regional and cross-border intermodality is a new concept in Europe.
- Usage of mobile technology will provide the user with more friendly access to the system and should boost the services.

Benefits for the partners

Steleus:
- Further R&D work via TRASCOM Project, including assistance during travel, car management (car-pooling, car-parking, car-renting, taxis management) and more accurate accesses via GPRS, UMTS, Blue tooth and Wi-Fi mobile terminals. TRASCOM is basically based on the ISCOM architecture. Most of the procedures delayed for the ISCOM project will also apply for TRASCOM: specifications, validation, evaluation, and demonstration.
- Project to maintain and update the ISCOM Trans-Rhena platform for at least 4 years (Interreg III funding requested)
- Extend Steleus offers in mobile value added services for the transport sector (transportation of passengers and transportation of goods – fleet management, etc).

MI:
- Technological display of MI/MDV knowledge in Inter-modal information system and Mobility services especially at regional and cross border level.
- Further R&D work via TRASCOM Project.
- Cross-border platform via an Interreg III project (trans-national cooperation between Germany, France and Swiss).
- Planned exploitation of a regional database and Mobility Services via a regional call of tender expected in 2003.
7.4.3 Vienna

- Deployment of enlarged services, including intermodal information.
- Information and automatic selection of transport modes for mobility-impaired people.
- Switch from non-ISCOM to ISCOM services.

Benefits for the partners

**VOR:**

- Extension of multimodal and intermodal services, information service for mobility-impaired persons.
- Regular operation of VOR/road users.

7.4.4 Rome

- Integration of regional and local public transport facilities.
- Transport-on-Demand (ToD) services for impaired people will offer new alternatives for public transport (PT).
- To propose combined solutions (ToD + PT) for employees, integration of data on a single server.

Benefits for the partners

**MAIOR** to become an expert company for mobility services to local authorities.

- Main authorities/transport companies testing the system:
  - Regione Emilia Romagna
  - Transport Agency in Rimini
  - Transport Company in Bologna (only for time-table printing)
  - Planned: Conerobus (Ancona), AMI (Urbino), ATCM (Modena).

**ATAC:**

- The process of collection and maintenance of PT data coming from the different operators has been experimented. A new web travel planner (based on timetable, instead of frequency) for the distribution of multi-modal information has been experimented. Design of a regional system for the distribution of integrated intermodal PT information.
<table>
<thead>
<tr>
<th>Item (extracts from ISCOM TIP)</th>
<th>Targeted intermediate users</th>
<th>Targeted end-users</th>
<th>Time of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile based Value Added Services</td>
<td>30</td>
<td>3000 000</td>
<td>immediately</td>
</tr>
<tr>
<td>Consulting in transport services</td>
<td>12</td>
<td>/</td>
<td>immediately</td>
</tr>
<tr>
<td>Consulting in mobile services</td>
<td>12</td>
<td>/</td>
<td>immediately</td>
</tr>
<tr>
<td>Virtual S/W for time-table design, etc…</td>
<td>200</td>
<td>/</td>
<td>immediately</td>
</tr>
<tr>
<td>Advanced car-pooling in Stuttgart</td>
<td>3</td>
<td>750 000</td>
<td>immediately</td>
</tr>
<tr>
<td>Stuttgart Congestion management System</td>
<td>2</td>
<td>600 000</td>
<td>2Q 2003</td>
</tr>
<tr>
<td>Cross-Border trip information via mobile</td>
<td>25</td>
<td>10 500 000</td>
<td>1Q 2004</td>
</tr>
<tr>
<td>Tri-National Data-Base</td>
<td>&gt;10</td>
<td>4600 000</td>
<td>1Q 2004</td>
</tr>
<tr>
<td>Mobility Centre in Vienna (ISCOM updates)</td>
<td>1</td>
<td>2500 000</td>
<td>December 2002</td>
</tr>
<tr>
<td>Mobility Centre in Rome (generi)</td>
<td>2</td>
<td>1 500 000</td>
<td>1Q 2003</td>
</tr>
<tr>
<td>Mobility Centre in Rome (for impaired people)</td>
<td>2</td>
<td>2000</td>
<td>1Q 2003</td>
</tr>
<tr>
<td>Trans-Regional Mobility Centre (Upper-Rhine)</td>
<td>25</td>
<td>4660 000</td>
<td>Mid 2003</td>
</tr>
</tbody>
</table>

Figure 7-1 ISCOM results – Quantified data
8 Conclusions

The scope of ISCOM was to develop and to improve intermodal and multi-modal passenger information systems and services. This has been realized successfully and partly already put in full operation (EFA systems, car-pooling). Benefits on individual as well as on transportation level have been proven. Ongoing activities of the project partners will push market penetration e.g. in the cross-border area or possibly in France. Some software products and services will be enlarged in the follower project TRASCOM, e.g. by localization and customizing features.

Finally the project has been very successful in view of the EU objectives to support

- transport management,
- intermodal transport.
- user-friendly interfaces
- effectiveness through adaptation of existing electronic timetable software

as well as the users and the partners' business strategies.

The demonstration phase and subsequent evaluation showed:

- All ISCOM systems have a high user acceptance.
- Local citizens positively assessed all ISCOM systems.
- Behaviour changes caused by ISCOM systems were identified.
- Most of the systems and services will be in operation and improved after the ISCOM lifecycle.
- Interests for cross-border information systems were identified.

In the long run there are activities to embed the systems developed into a platform for passenger traffic, covering also long-distance transport.