SUMMARY

This study is one of the ten area studies within the ACTIF project. It has been carried out in three phases over four months, between November 2000 and March 2001. The phases are reflected in the document structure: assessment of the current situation, analysis of solutions and variants, consequences for the ACTIF architecture and recommendations. The appendices may be found in a separate document.

The study concentrates essentially on the functional area in the framework architecture named "Provide Traveller Journey Assistance", but the link with other users (traffic operators, fleet manager, etc) is considered in phase 3. Remember that ACTIF's objective is not to specify and produce any given system, but "simply" to find a coherent framework which integrates all of the different architecture variants imaginable. This framework must allow a future ACTIF user to choose and implement a solution adapted to his needs and constraints.

Based on interviews and an analysis of the literature, phase 1 (assessment of current situation), states the problem by reviewing the wide variety of actors involved, traveller needs, existing or desired data, and information service supplier constraints. Whilst the transport operators initially assured the offer mainly from their own data, increasingly this is becoming the business of information service suppliers.

The traveller wishes to have access to reliable, multimodal, personalised information, including unplanned events and incidents, via a range of media (paper, telephone call centre, Web, Minitel, mobile telephone, information points, etc.). Before travelling, he wants to know the routes, timetables and tariffs. During his journey, he wishes to be informed of perturbations and to be provided with alternative transport if the incident is a lengthy one.

The information required for route computation may come from a multitude of suppliers and as a wide range of data, many of which are deemed to be blocking (crucial data are non-existent or impossible to obtain), especially public transport timetables and fares (a fortiori in real time); as for other data, they are not without problems (data which are heterogeneous, difficult to obtain, of dubious quality or in a format which is unsuitable for optimised route computation).

While the information and route systems must interface with many other systems or actors to exchange a mass of different sorts of information, there are hardly any standards or norms to cover such exchanges. In addition, those which are identified are not adapted for the data exchanges involved in optimised route computation.

Many obstacles are cited by the actors, but all agree that they are above all institutional, rather than technical. The institutional problems relate mainly to the refusal to supply existing information, for a variety of reasons. As for the technical problems, these relate mainly to the collection, update and merge of information coming from several sources. The development of systems which merge data originating from several actors implies fundamental work on the definition of information supply "contracts" and the creation of data definition standards, before proceeding with implementation.

Phase 2 emphasises the link between the physical architecture (the distribution of functions in each actor's systems) and the logic of grouping organisations by business (or transport mode) and by geographical area: using 5 information services "use cases", three complementary variants of the implementation are analysed, which go some way towards multimodality by handling several data sources: centralisation of data from several suppliers, on-line access to

data from several suppliers, request to route computation suppliers. For the same functional requirement, the technical, organisational, and institutional constraints will allow comparison between possible solutions.

The determining factor in creating a multimodal service for a given geographical or "business" coverage is to identify whether it will use information from actors who prefer to allow their information to be integrated into the service supplier's databases (variant A), who provide the data on-line (variant B), or who do not authorise copying of the data in order to create other services, and require that access to the information is achieved through its route computation service (variant C). Each service will be based on a combination of these 3 possible variants, adapted to its constraints. Another important, more technical, factor in the choice is the compromise between the number of data access request and the frequency of updates. There will be little value in centralising information which is only rarely used by a service supplier to respond to customer requests, yet which is updated quite frequently (this is typically the case with door-to-door route computation in Europe, but other less extreme cases surely exist!). The grouping of different sources by geographical area and/or by mode (or business) may be achieved in different ways: several grouping levels may co-exist but it will be useful to interconnect the corresponding services, and the physical architecture of route optimisation systems in ACTIF must reflect this diversity and openness.

In phase 3, details are given of how the described architecture may be included in the ACTIF model and enhancements are suggested for functional area 6, 'Provide Traveller Journey Assistance', in ACTIF's logical architecture. The method consists of ensuring that the actors, needs and data identified during the current review are indeed included in the ACTIF architecture, in the form of "Terminators", "User Needs", "Functions", "Datastores" and "Dataflows" respectively. In addition, the ACTIF architecture is compared with the outline functional architecture produced in the phase 2 use case study.

The major feed back for the actors involves including several actors, already existing elsewhere, in the relevant functional area, and specifying their descriptions. As for needs and functions, there are too many different needs related to the same low-level function, making it difficult to understand: it is necessary to limit a function's list of associated needs, so as to target the scope of functionalities covered more effectively. In order to improve the handling of modes other than "road", and intermodality requirements, it may be necessary to break down the journey preparation function (6.2.5). To enhance intermodality, it seems important to include the management of exchange platforms (car parks, stations, airports, ports, etc.) in a separate function. Finally, it will be necessary to create around two thirds of the dataflows identified in the current review, and create new datastores for static data collected in non-real time and for directories. In short, the architecture is currently very 'road-oriented' and intermodality is only partially dealt with.

As ACTIF's physical architecture "version 0" is not complete, it has been difficult to propose changes, but it can be assumed that the impacts of this new functional area on the physical architecture will be limited.

The study concludes with proposals for actions following discussions with the actors interviewed, and the contributions of the High Level Group members which piloted and steered the study.

There are several ways of improving the route optimisation function and use of the associated data, at different timescales and to respond to additional objectives such as improving access

tools to the existing data, making access to new data mandatory or contractual (e.g. in case of possibly existing, but difficult to obtain data), and, in the longer term, improving the service suppliers' information offer by taking account of traveller needs: directory, alternative door-to-door multimodal route proposals, integration of modes (road, park and ride and public transport, etc.), integration of tariffs and real time, etc.

The recommendations have been classified under five headings: standardised access to basic data, standardised access to information services, building on experiments and projects, global handling of contractual and legal problems, and improved architecture in ACTIF/2.

It is obvious that these recommendations are complementary, and in the main can be linked to the PREDIM programme, to be launched in 2001. It can also be seen that if these recommendations are implemented, it would be necessary to co-ordinate them and to monitor them constantly. Even though this should not be a reason for delaying the first real actions, it seems advisable to assume a timescale of 5 or even 10 years; even if this means starting immediately and in a practical manner, then formalising a more systematic programme later. No cost estimation are given for the proposed actions, as their dimension could be adapted depending on the available resources to be spent on this application domain.

It will be the responsibility of the Steering Committee and the ACTIF High Level Group to decide on the next steps.