



USING ITS TO MANAGE
EUROPE'S BUSIEST ROADS

CENTRICO 2003 OTAP DEMONSTRATOR

Functional description of the OTAP demonstrator

Final report on Work Package 2 (User needs)

5 June 2003



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0 Introduction

Work Package 2 of the OTAP demonstrator project aimed at getting insight in the user requirements and the feasibility of the OTAP concept. For this reason questionnaires were sent out to participating Traffic Information Centres and Service Providers. The results of the questionnaires were used to set up this document. This document contains a functional description of the OTAP demonstrator and has been discussed in a Centrico OTAP workshop on the 28th of April 2003 in Brussels and endorsed on the plenary meeting of OTAP participants on 4 June 2003.

The structure of the document is as follows. Each chapter contains an aspect of the OTAP demonstrator and decision points on it. Chapter 1 is on the general concept of OTAP and the scope and duration of the OTAP demonstrator project. Chapter 2 concerns the traffic information to be made available by the participating Traffic Information Centres. Chapter 3 discusses the information to published on the OTAP website. Chapter 4 is on the agreements, conditions and procedures which are needed to start up the transfer of traffic information between TIC and SP. Chapter 5 concerns the technical requirements and chapter 6 gives an overview of all adopted decision points.

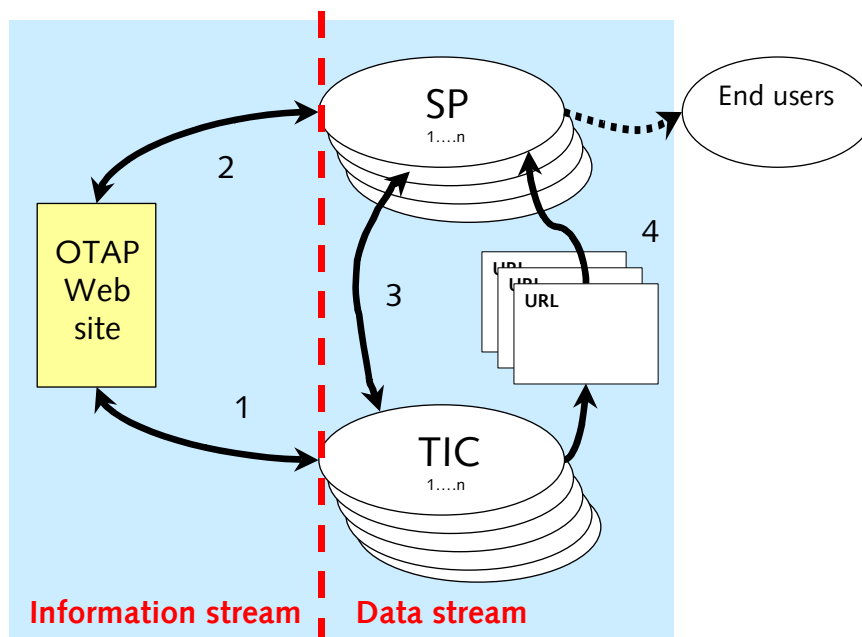
We would like to stress that the focus of this document is the OTAP **during the demonstrator phase**. Little attention is given on how to deal with the several aspects in the longer term (i.e. operational phase), for evaluation should provide more tangible results on this.

1 The OTAP concept

1.1 Elaboration of the concept

For a good understanding and for equal expectations a description of the general OTAP concept is given below. Description of the process:

- Step 1:
TICs provide general information on their product on the OTAP website.
- Step 2:
Service Providers contact the OTAP web site to get general information on the TICs involved, the traffic information provided and its attributes.
- Step 3:
Service Provider and TIC come to an agreement on the transfer of traffic information, with or without direct contact between parties involved.
- Step 4:
TIC provides traffic information through OTAP via internet on several URLs, where Service Providers can have access to it.



Decision point 1:

TICs and Service Providers agree on the elaborated process of transfer of traffic information from TIC to Service Providers through OTAP during the demonstrator phase.

1.2 Scope and duration of the OTAP demonstrator

The objective of the OTAP initiative is to stimulate traveller information services by Service Providers through:

- setting up a common access point on the internet
- of (all) traffic information providers in the Centrico area
- where Service Providers can contact the public information providers of which they want to receive information
- and establish a transfer of real time traffic information
- under agreed conditions
- via standard technologies and common formats.

The **demonstrator project** is set up to show that an Open TIS Access Point is feasible and its **scope** contains the specification and building of an entry level OTAP, to be operational during a demonstrator period of 12 months. After 6 months an evaluation study will be done on service, quality, content and technical aspects of the OTAP demonstrator, in order to see whether the demonstrator is successful or not. The demonstrator period will start from the moment a complete and functional OTAP system is in operation. The demonstrator period does not include a period of initial testing.

Decision point 2:

TICs and Service Providers agree to the scope and duration of the demonstrator project.

2 Traffic information to be delivered through OTAP

The OTAP demonstrator project aims at creating an entry level OTAP within a limited period of time. For this reason the traffic information offered by the TICs via OTAP during the demonstrator phase will be the traffic information they currently can provide. If any TIC extends its service during the demonstrator period this extension should be made available through OTAP as well.

2.1 Traffic information provided through OTAP during the demonstrator phase

Network type:	Motorways	Main Roads	Urban roads
Information type:			
Flow information	TIC Hessen, TIC Netherlands, Centre Perex, GIE, QMiss	TIC Hessen, TIC Netherlands (for N-roads < 300)	--
Incidents	TIC Hessen, TIC Netherlands, Centre Perex, GIE, QMiss	TIC Hessen, TIC Netherlands, Centre Perex	--
Road works	TIC Hessen, TIC Netherlands, Centre Perex, GIE, QMiss	TIC Hessen, TIC Netherlands (for N-roads < 300), Centre Perex	--
Traffic related weather information	TIC Netherlands, Centre Perex, GIE	TIC Netherlands, Centre Perex	--
Special events that affect traffic	TIC Hessen, TIC Netherlands, Centre Perex, GIE	TIC Hessen, TIC Netherlands	TIC Netherlands
Traffic related public transport information¹	TIC Netherlands	TIC Netherlands	--
Traffic related parking information²	TIC Netherlands	TIC Netherlands	--
Travel times on link level	TIC Netherlands, GIE	--	--
Raw detection equipment data	Qmiss		--
Predictive/forecast information	--	--	--

¹ Traffic related public transport information concerns public transport problems influencing traffic. For example: no trains between two major cities for more than a day will cause an increase of traffic on the roads connecting these cities.

² Traffic related parking information is aggregated information on parking problems. If no parking places are available in a city, due to for example an exhibition, it will influence congestion around the city on all roads including motorways.

For England the data available will be provided by the Highways Agency's Qmiss database. After January 2004, TiS, the TCC company, will be in a position to provide services. More data on more of the network will then come available.

2.2 Geographical coverage

The participating TICs have indicated that they will try to provide as much information through their OTAP server as they can. Especially the geographical coverage of the OTAP services is larger than the region where the TIC collects data on. In this paragraph an indication is given of the geographical coverage of the TICs in the OTAP Demonstrator.

Q-Miss in the UK

	Geographical coverage	Available at start of Demonstrator	Date available
Flow information (congestion)	English motorways	Yes	
Incidents	English motorways	Yes	
Road works	English motorways	Yes	
Raw detection equipment data	English motorways	Yes	

TIC Hessen in Germany

	Geographical coverage	Available at start of Demonstrator	Date available
Flow information (congestion)	Germany (traffic messages)	yes	
Incidents	Germany (traffic messages)	yes	
Road works	Hessen (road works information system)	yes	

GIE in France

	Geographical coverage	Available at start of Demonstrator	Date available
Flow information (congestion)	85 % of the French toll motorway network + 5 % of non toll motorway network + city of LYON and MARSEILLE (November)	Yes	
Incidents	same	Yes	
Road works	same	Yes	
Traffic related weather information	same	Yes	
Special events that affect traffic	same	Yes	
Travel times on link level	500 KM off toll motorway	Yes	
Predictive/forecast information	4000 km of toll motorway	Yes	

Centre Perex in Belgium

	Geographical coverage	Available at start of Demonstrator	Date available
Flow information (congestion)	Wallonia - motorways	Yes	
Incidents	Wallonia - motorways and main roads	Yes	
Road works	Wallonia - motorways and main roads	Yes	
Traffic related weather information	Wallonia - motorways and main roads	Yes	
Special events that affect traffic	Wallonia - motorways	Yes	
As PEREX agreed to play the role of OTAP point for Flanders, Flemish data should also be available at the start of the demonstrator.			
Flow information (congestion)	Flanders - motorways	Yes	
Incidents	Flanders - motorways and main roads	yes	
Road works	Flanders - motorways and main roads	yes	
Traffic related weather information	Flanders - motorways and main roads	yes	
Special events that affect traffic	Flanders - motorways	yes	

TIC Nederland in The Netherlands

	Geographical coverage	Available at start of Demonstrator	Date available
Flow information (congestion)	Netherlands	Yes	
Incidents	Netherlands	Yes	
Road works	Netherlands	No	1-12-2003
Traffic related weather information	Netherlands	Yes	
Special events that affect traffic	Netherlands	Yes	
Traffic related public transport info	Netherlands	Yes	
Traffic related parking information	Netherlands	Yes	
Travel times on link level	Netherlands motorways	Yes	
Predictive/forecast information	Netherlands	No	1-12-2003

For the provision of traffic information during the **operational phase** of OTAP, evaluation should take into account what use the Service Provider make of the information available during the demonstrator phase. New developments on the TIC side should be taken into account as well.



Decision point 3:

- a. TICs commit to deliver the traffic information as indicated during the OTAP demonstrator period.
- b. In case TICs extend their service to new types of traffic information during the demonstrator period, this will be made available through OTAP as well.

Decision point 4:

Service Providers agree on the traffic information made available by the TICs through OTAP during the demonstrator period.

3 General information on the OTAP web site

In the OTAP demonstrator the OTAP web site serves as an information point where Service Providers can get information which is of importance to their procurement process. A list of proposed items to be published on the OTAP website is depicted below.

General items	Description	Unit/Options
General information on the TIC	Information on how and who to contact within the TIC concerned	Name, address, phone numbers etc.
Procedure	Description of how and who to contact for coming to an agreement on the transfer of traffic information from TIC to SP	Steps to be followed
Conditions	Either a summary of the basic conditions or a downloadable standardized contract	
Geographical coverage	The geographical area on which traffic information is provided	Area on a map
Network coverage	The type of road network on which traffic information is provided	<ul style="list-style-type: none"> ○ motorway network ○ main roads and/or ○ urban roads

The website should also provide information on the traffic information available per TIC and its attributes. Proposed attributes are:

Attribute	Description	Unit
Type of information	A full list of types of information should be provided including a unambiguous description of the type	--
Technical information	Product description, geographical representation, static data, network description, location table, datex dictionary	
Accuracy	The exactness of the traffic information provided as a representation of the real world	<ul style="list-style-type: none"> ○ accuracy of location information and queue length: hectometres ○ accuracy of other parameters: % of deviation of real world



Actuality	Timeslot between real world occurrence and the inclusion of the situation (and changes in it) in the traffic information flow towards the Service Provider	minutes
Exhaustiveness	Level of detail of the situations described in the traffic information to be transferred	<ul style="list-style-type: none">○ only main parameters○ all traffic related parameters○ all details
Thresholds	Minimum levels of impact on traffic (delay, duration, queue length) for traffic information to be included in the snapshot of the road	various units

Decision 5:

- a. TICs agree to the items to be published on the OTAP website.
- b. TICs deliver the information needed and are responsible for keeping the information to be exposed up to date.

Decision 6:

Service Providers agree to the categories of information to be published on the OTAP website

Based on the results above and discussions an outline for the website on OTAP has been set up.³

³ See document: Outline of the OTAP website, Functional specification of the OTAP web portal. Deliverable from work package 2, Centrico, may 2003.

4 Agreements, conditions and procedures

It is assumed that some kind of agreement, either formal or informal, is needed to start up the transfer of traffic information from TIC to Service Provider in the OTAP demonstrator phase.

There are two important aspects:

- the conditions/obligations for both parties in the demonstrator phase
- the procedure of coming to an agreement

4.1 Conditions during demonstrator phase

Based on the results of the questionnaires and bilateral discussions there seem to be opportunities for harmonization of conditions **for the demonstrator phase**. The demonstrator provides an excellent possibility to test a harmonized, standard contract and gain experience with this approach. However, no rights/claims can be based upon it for future phases.

A summary of proposed basic conditions for the demonstrator period is given below:

Conditions on:	Description:
Service Level of TICs	In principal the TICs will be able to deliver a 24 hours a day, 7 days per week service. However, no guarantees will be given by the TICs as to quality, continuity and availability of the service. The TICs commit to a best effort to be given during the whole period of the demonstrator.
Liability	Excluded
User rights and obligations	Service providers are prohibited to resell the traffic information provided through the OTAP during the demonstrator phase. Traffic information through OTAP can solely be used for testing the new device and setting up a demonstrator service. Data is available in standardized formats. No specific development will be made for any Service Provider.
Reimbursement	Traffic information through OTAP during the demonstrator phase will be provided free of charge by all TICs.
Period of agreement	6 months (duration of the demonstrator)
Termination	procedures and legitimate reasons (e.g. material breach by one of the parties) for termination of the contract

The harmonized conditions will be laid down in a standardized contract for the demonstrator phase. This standard contract should leave some room for TIC-specific items to be arranged.

For the **GIE** it is very likely that different arrangements will be considered, due to their special position as a private traffic information provider.

Decision point 7:

TICs agree to strive towards a standardized agreement with conditions harmonized as far as possible

Decision point 8:

TICs and Service Providers agree to the proposed principals for the conditions for the demonstrator phase and endorse a further elaboration of a standardized agreement.

4.2 Conditions for operational phase

Evaluation of the OTAP demonstrator should point out which Service Level (i.e. availability, quality and continuity) can be delivered by providing TICs. After the demonstrator a new set of conditions should be set, for which a common structure and format is preferred. This work should be initiated during the demonstrator phase.

4.3 Procedure during demonstrator phase

No strong preference for any of the suggested procedures was identified or no response was received, this holds for both SPs and TICs. In the questionnaire two options were offered; either through: 1. contacting the TIC and proceed according a TIC-determined process to come to an agreement; or 2. downloading a standardized contract provided by the TIC concerned, signing it and sending it to the TIC for approval.

Important issues for Service Providers concerning the procedure are:

- the principle of non-discrimination between SPs; equal treatment of each SP by the TICs
- the possibility to negotiate on terms and conditions (which can be in conflict with the first one).

One Service Provider stated that the OTAP concept should be a proven concept first before procedure will be discussed.

The proposed procedure to come to an agreement is as follows:

Description of step:	
1.	Service Providers should in all cases be offered the possibility to contact the TIC concerned directly, so contact information from all TICs should be made available on the website.
2.	A standardized contract will be made available on the OTAP website for Service Providers to download.
3.	If Service Providers agree to the conditions laid down in the contract they can sign it and send it to the TIC concerned.
4.	The TIC concerned does a final check, whether or not with a direct contact to the Service Provider involved, and finalizes the agreement.
5.	The transfer of traffic information starts.

Decision point 9:

TICs and Service Providers agree to the proposed procedure to come to an agreement.

5 Technical functional requirements

In this chapter several functional requirements with technical impact are addressed. These issues were covered within the questionnaire, here we will summarize the results and propose how to deal with them in the OTAP demonstrator.

5.1 Data communication

The concept of OTAP is based on the exchange of traffic information using the internet. In the questionnaire it has been asked whether fall back facilities in case of disruption of the internet connections should be available. Most Service Providers require such a fall back facility and most TICs do not offer this. For the operational phase it should be considered to deliver such a facility, but for the Demonstrator phase it is not feasible to realize this.

Decision point 10:

TICs and Service Providers agree to not include the implementation of any fall back facility for internet disruption in the scope of the OTAP demonstrator project.

5.2 Location information

As language independent publication of the traffic information is the basis of OTAP and DATEX, the available traffic information will be published in coded messages. Coding of the situation on the road and of the exact locations of a situation are the main issues in this. For coding the description of WHAT is the situation the Datex Data Dictionary will be used. For coding the description of WHERE is the situation a location referencing method has to be used. The questionnaires showed the following results:

All TICs except for GIE indicated that the location information is provided by TMC codes. Some TICs stated that the XY coordinates of TMC locations in TMC table are available. Presently this goes for TIC Netherlands and Qmiss. Centre Perex will be able to provide this from October 2003. It is not clear yet what can be done to solve the GIE problem.

On the Service Provider side, all parties indicated that location information should be available in TMC codes. SPs stated additional requirements:

- Only one SP asked for inclusion of textual representation of the location-names in the message. Therefore this will not be a requirement;
- XY coordinates are required by most SPs;
- On the fly location-coding is only required for urban areas. As these are not covered by the participating TICs, the on the fly location coding is not a requirement for the OTAP demonstrator.

Decision point 11:

- a. TICs agree to do provide location information in TMC codes for the demonstrator phase.
- b. Where possible/available, TICs will provide XY coordinates for TMC locations with the TMC table.
- c. Where possible/available, TICs will give their best effort in providing geo-information by means of the Centromap.

Decision point 12:

Service Providers agree on location information being provided in TMC codes and where available with XY coordinates.

5.3 Filtering

Filtering on the TIC server side will not be feasible within the framework of the OTAP demonstrator. The OTAP concept assumes a mean and lean system and SP specific filtering on the server side is too complex within this framework. The questionnaire shows that most parties, both TICs and SP's, consider filtering the responsibility of the SPs. All but one Service Providers indicated to require static filters on road network type, geographical filter and traffic information type.

Filtering on traffic information type is facilitated by the functionality of publication of information types (see 5.4).

Decision point 13:

Service Providers agree that the static filters based on network type, geographical location and traffic information type is their own responsibility for the duration of the demonstrator period.

5.4 Publication of information types

As the amount of data can become quite large, the way information is published is relevant. Especially when travel-time information is published (TrafficStatus information of the roads covered, describing main traffic parameters every 3 minutes) the amount of data will become quite large. Four out of the six TICs stated that it is possible for their system to make a distinction between the traffic information types in order to publish them on a different (functional) place, of which three indicated to be able to make a distinction on road network level.

Three out of six Service Providers require publication of different traffic information types on different places, of which one requires the distinction on road network level.

As distinction on road network can be done by the SP himself, based on the meta-information for filtering purposes, this distinction is not supported by OTAP.

Proposal:

The catalogue to be published on the OTAP web site contains information on the distinction in traffic information types made per TIC.

Different traffic information types will be published in separate files or on separate webpages, in order to enable SPs to collect only the information types they require and to spare bandwidth.

The traffic information types, which by all means have to be published separately:

- raw data
- travel times as status information
- forecast information / information on future (planned/expected) traffic situations
- actual traffic situations (including a. Flow; b. Incidents; c. Road works; d. Weather info; e. Traffic related special events; f. Traffic related public transport; g. Traffic related parking info)
- X-urgent messages (to enable a more frequent download and prevent unnecessary increase of latency)
- Road works

Decision point 14:

TICs agree to publish different traffic information types in separate files/webpages, according to the structure given.

5.5 Update mechanism

In general there are two ways for the publication of event driven situations descriptions (TRAVIN) (congestions, road works, etc.). All information together is called the snapshot of the road.

- The first way to publish the information is event driven (as most DATEX/TRAVIN implementations support). This means that a message is published with the change in the snapshot of the road. The client has to incorporate this message into his version of the snapshot of the road.
- The second way to publish the information is cyclic. Once every x minutes the complete snapshot of the road is generated and published, replacing the previous version.

The assumption made within the development of OTAP is that the complete snapshot of the road is published by the TIC. The required update mechanism varies between Service Providers. A slight preference can be identified for the on occurrence publication of changes in the Snapshot of the Road.

Some TICs have requirements on the timelines of processing of extreme urgent information (e.g. ghost driver warning) by service providers who have real time in-car information services in the area of that TIC. This issue has to be addressed by WP 4!

Decision point 15:

- a. TICs agree to maintain and publish a complete snapshot of the road, which will be updated at least every 3 minutes.
- b. TICs agree to give their best effort to publish updated snapshots with a higher frequency than once per 3 minutes. If possible, TICs will generate the actual complete snapshot of the road on demand (for example when SP asks for it by addressing the webpage).
- c. TICs will publish the update interval and/or publication method on the OTAP website.

5.6 Information flow

For the information flow two options are available for a Service Provider:

- Pull: the Service Provider collects the data from the OTAP servers
- Push: the OTAP servers deliver the information on the SP's system

Half of the SPs stated a preference for a pull system, half of them stated a preference for a push system. One SP required to be able to configure this depending on applications, which means both systems should be available. In the conceptual description of OTAP it was proposed that the OTAP services would be client pull.

Decision point 16:

TICs and Service Providers agree on the OTAP being a client pull service



5.7 HTTP or FTP

Question is whether the information available will be published on http pages or in files to be downloaded via ftp.

The questionnaire shows a slight preference for ftp, however from the perspective of a dynamic development of the OTAP services http is considered to be more suitable.

Decision point 17:

TICs and Service Providers agree that the OTAP services will publish their information in http pages, to be downloaded by the Service Providers.

6 Decision points

Decision point 1: TICs and Service Providers agree on the elaborated process of transfer of traffic information from TIC to Service Providers through OTAP during the demonstrator phase.

Decision point 2: TICs and Service Providers agree to the scope and duration of the demonstrator project.

Decision point 3:

- a. TICs commit to deliver the traffic information as indicated during the OTAP demonstrator period.
- b. In case TICs extend their service to new types of traffic information during the demonstrator period, this will be made available through OTAP as well.

Decision point 4: Service Providers agree on the traffic information made available by the TICs through OTAP during the demonstrator period.

Decision point 5:

- a. TICs agree to the items to be published on the OTAP website.
- b. TICs deliver the information needed and are responsible for keeping the information to be exposed up to date.

Decision point 6: Service Providers agree to the categories of information to be published on the OTAP website.

Decision point 7: TICs agree to strive towards a standardized agreement with conditions harmonized as far as possible.

Decision point 8: TICs and Service Providers agree to the proposed principals for the conditions for the demonstrator phase and endorse a further elaboration of a standardized agreement.

Decision point 9: TICs and Service Providers agree to the proposed procedure to come to an agreement.

Decision point 10: TICs and Service Providers agree to not include the implementation of any fall back facility for internet disruption in the scope of the OTAP demonstrator project.



- Decision point 11:**
- a. TICs agree to do provide location information in TMC codes for the demonstrator phase.
 - b. Where possible/available TICs will provide XY coordinates for TMC locations with the TMC table.
 - c. Where possible/available, TICs will give their best effort in providing geo-information by means of Centromap
- Decision point 12:** Service Providers agree on location information being provided in TMC codes and where available with XY coordinates and geo-information.
- Decision point 13:** Service Providers agree that the static filters based on network type, geographical location and traffic information type is their own responsibility for the duration of the demonstrator period.
- Decision point 14** TICs agree to publish different traffic information types in separate files/webpages, according to the structure given.
- Decision point 15:**
- a. TICs agree to maintain and publish a complete snapshot of the road, which will be updated at least every 3 minutes.
 - b. TICs agree to give their best effort to publish updated snapshots with a higher frequency than once per 3 minutes. If possible, TICs will generate the actual complete snapshot of the road on demand (for example when SP asks for it by addressing the webpage).
 - c. TICs will publish the update interval and/or publication method on the OTAP website.
- Decision point 16** TICs and Service Providers agree on the OTAP being a client pull service.
- Decision point 17:** TICs and Service Providers agree that the OTAP services will publish their information in http pages, to be downloaded by the Service Providers.