ASECAP
ITS Objectives

INDEX

1. Introduction

This document results from the discussions held at COPER III meetings and contributions from its members.

During these months of activity, the dialog with ASECAP partners/"interlocutors" it hasn't been easy once ASECAP ITS directions are not yet defined.

The objectives presented in this document having the consensus of COPER III members should be a good basis to serve as orientation to the dialog with ASECAP partners/interlocutors while the answers and analysis of the ITS Questionnaire is under progress.

The objectives have been defined in three classes of services:
- Services to the Users;
- Operation Services; and
- Basic Infrastructure Services

The following points refer to each class of services and details the different services, analysing the current situation and eventual constraints, besides appointing specific objectives for each one.

2. Services to the Users

2.1. Variable Message Signs (VMS)

2.1.1. Services Supplied

The Variable Message Sign are nowadays one of the most effective tools used by the road operators in order to supply information, directly on the motorway, to the users in transit.

The information supplied to the users covers the area of the "safety" and "best use of existing motorways" through:
1. Information to the users on the actual state of the forward sections of the motorway;
2. Suggestion for the use of alternative itineraries (in case of activation of TMP);
3. Regulation of traffic (such as: use of the lanes, speed allowed, etc.)

2.1.2. Geographical/National Constraints

Across Europe there are different approaches to the choice of VMS and different national standards and provisions rule its use.

In southern European countries, Italy, France, Spain, Portugal, etc. the VMS are mainly used for disseminating information to the users, consequently, generally speaking, VMS are:
- Not compulsory;
- Composed by both pictograms and text.

On the opposite, the northern countries do use VMS mainly for the regulation of the traffic, through the use of pictograms only.

- Each country has its own development plan and that is why a Germanic country like Austria is now starting to integrate a number of informative panels in their deployment, while on the opposite side countries like Italy and Spain use VMS for some important local application of traffic regulation. Portugal is now deploying in a large scale the use of VMS with both information and traffic regulation objectives.

2.1.3. ASECAP Objectives

In order to find the best approach to focus the ASECAP policy on VMS, the reference point cannot be different from the point of view of the "European driver".

The focus should be on:
- What the driver can understand;
- The important situations for him, in terms of frequency, danger and utilization.

For this reason the _harmonized use_ of this kind of device become more and more useful in order to let the European road operators to be more and more understood and listened by the European drivers.

A careful consideration has to be devoted to the harmonizing of the overall approach to VMS due to the different application that is being used in each country.

The ASECAP action could be based on several sources: for instance we can remember the technical action promoted by Governments and Operators of Spain, Italy and France within the framework of the "Mare Nostrum project".

Directly and through members in the technical commissions, the following objectives could be pursued:

- Identify a common harmonized concept of use of VMS, and possibly a common format for the various different kinds of messages (danger and warning messages, informative messages, courtesy messages, etc.)

- Define a common set of pictograms and related keywords to be used by the different operators (harmonized use of pictograms and keywords for the most common road events)

- Agree on some preliminary common criteria for the message distribution/travellers' information strategies.

Another point that needs a particularly attention is to examine and analyse how the users perceive and understand the various communication by VMS and if there is a consequently different approach during the travel.

The results of such an evaluation could be a useful support for the development of the strategy and use of VMS, and also provide suggestion for the best management of the future network interoperability of the VMS.

The work to be developed should be supported on ASECAP member success examples through demonstration of those best practice cases.

2.2.   Call Box System

2.2.1. Services Supplied

The Call Box System is the oldest emergency communication system in operation on motorways.

The Call Box System provides voice communication at regular intervals on both sides of the motorway to the Operator's Communication Centre, be it a regional or a national centre.

Being a fixed infrastructure of the motorway Operator, typically additional services are included in the system, namely the immediately location of the call as well as the identification of all local assistance means and their emergency contacts for a fast intervention in case of accident.

2.2.2. Geographical/National Constraints

Concerning Call Box Systems there are no special constraints to consider due to geographical or special national rules or uses.

Southern countries all have this type of infrastructure, namely Italy, France, Spain and Portugal, and generally all other countries participating in ASECAP.

Nevertheless within e-Safety the e-Call Project is proposing new procedures that are going against the existing laws of different European countries once they do not recognise the obligations of the motorway operators before the local States and foresees procedures without their knowledge. From our point of view, it is not a question of not recognizing the existence of new technological developments that may create new procedures, but that those procedures must take into account the responsibilities as they are defined and do not forget important players of the grounds under consideration. One example being the generation of the e-Call, meaning that a driver may have a push button that when activated will automatically start a call to the 112 Service indicating the vehicle position based on the vehicle GPS, but without warning the motorway operator if the vehicle is within a motorway concessionaire limits. We recognise the good will of the ideas behind the procedure, but we can not agree on the exclusion of the motorway operator from the final procedure. It may not even be an automatic warning, as it should be advisable, but, at least, information through a phone call must be mandatory.

2.2.3. ASECAP Objectives

Currently, the integration of e-Calls, as defined by the e-Call initiative, should be studied, once different call box system technologies are being used across Europe and the establishment of a common interface could be an interesting solution to envisage.

The increasing number of possibilities of communication between the users and the emergency service providers (portable phones today and e-calls tomorrow) is more and more cutting the traditional channel of communication that traditionally link the user to the motorway operator. On the other hand the motorway operator, continuing to bear the responsibility for the overall process must keep itself real time updated on the events that are being developing on the motorway.

The consequence of that is the fact that the road operators must be part of the e-call process receiving real time all the information running in the network (to be an interested part in the process is the minimum acceptable).

2.3. Radio Broadcasting System

2.3.1. Services Supplied

Under this topic there are typically two different ways of disseminating information to motorway users:

- Directly through the motorway operator radio station; or
- Indirectly through radio stations that have special agreements for disseminating the information issued by the motorway operator concerning motorway incidents and current situation.

These two different ways of approaching this matter are used and effective to the objective to allow a good level of information to the users.

2.3.2. Geographical/National Constraints

The geographical/country constraints are related to the type of operation selected from the two above referred.

Nevertheless, there is a common moment in both types of operation when the information is made available to the Radio Broadcasting Stations.

2.3.3. ASECAP Objectives

The ASECAP objectives concerning this matter should concentrate on:

- The type, quality and speed of the information broadcasted; and
- The level of coverage of the radio signal on the motorway.

In this second point, one of the question to consider may be the study of mixing (isofrequency) FM diffusion program with satellite micro-cellularisation of the diffusion, in order to be able to create dedicated "on-spot" programmes for crisis management purposes (weather crisis, hazardous materials incident, major accident, blocking of consecutive motorway sections).

2.4. Call Centres

2.4.1. Services Supplied

Call centres are responsible for the first contact of the motorway operators with their clients/users.

Call centres also filter the different types of telephone calls and, by having prepared specific procedures, are able to answer to generic questions about the motorway or transfer the call to the correct service to supply the necessary information to the client/user.

2.4.2. Geographical/National Constraints

There are no geographical/national constraints because the difference will be in the specific procedure not in the general one.

2.4.3. ASECAP Objectives

The ASECAP objectives in this matter should be related to:
- The quality, speed and accuracy of the answer by the Call Centre for the information calls;
- The speed of the identification, gathering of the necessary data and transfer of the call and/or respective data to the Motorway Control Centre, for an emergency call.

Foster studies aiming at interfacing e-call driving (GSM) with existing "call box systems" of road operators, which comprise both precise location systems and management of operational incident management

2.5. Traffic Management Plans (TMP's)

2.5.1. Services Supplied

ASECAP operates a significant portion of the Trans European Network.

The ASECAP operators wish to operate their motorways using the state of the art technology, herein effective Traffic Management Plans (TMP) in order to improve the service of mobility on the TERN, also promoting, in the case of an emergency, the optimal use of the infrastructures and operation resources available.

The management of traffic, including traffic management plans, is a traditional issue of the motorways' operator job. The increasing efficiency of such a plan is a direct consequence of the progressive automation of the road and a consequence of the ever growing availability of computer systems and telecommunication resources that make:

- easier the contact between authorities and the road operators,

- more timely and sharp the diffusion of the information to the road users.

Besides, it is also evident, that the evolution of the traffic together with the availability of transport facilities can turn overloaded some links of the road network posing a stronger basis for the need of a more advanced management of the motorways, while waiting for the increasing of the road capacity.
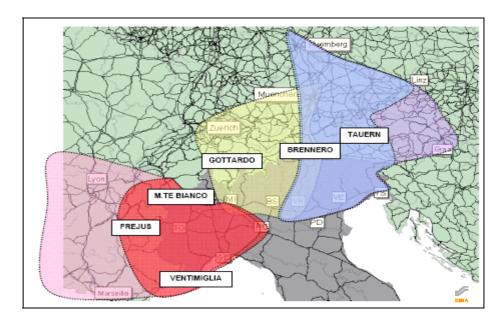
The aim of the Traffic Management Plan is to supply to authorities and operators, who manage the traffic and the infrastructures, an optimum coordination and intervention plans when a predictable event, like weather events, seasonal migrations and planned events or restrictions (border closure for religious feasts) can modify the normal traffic condition.

2.5.2. Geographical/National Constraints

In some cases, the transport on the ASECAP network in the cross border area between different Member States of the European Union is more difficult, due for instance to natural barriers, such as the Alps and the Pyrenees, where the limited number and capacity of road crossings make more strategic the dissemination of a proper information to the users promoting a better use of the existing infrastructural resources.

Actually, when implementing TMPs, the problems to be faced and solved are not only the technical ones, but are related to the organisation and the institutional framework at European and National level: formal procedures, authorities involved, cooperation agreements, exchange of information, etc.

TMP- example of cross border corridors through the Alps

2.5.3. ASECAP Objectives

ASECAP deem that traffic management plans are an issue strictly related to the ASECAP action field and the experience of ASECAP could be useful in order to provide both a common approach and a self-consistent solution with national and local rules.

ASECAP could also support the generalisation of national and cross-border TMP's for different situations.

To that extend a common methodology for the creation of TMP's could be defined and tools for computerise and evaluate TMP's could be developed.

2.6. Traffic Information Services (TIS)

2.6.1. Services Supplied

ASECAP Motorway Operators today already offer some services in this domain. In fact, it is relatively heterogeneous the situation of the different Concessionaires, once some have a reasonable number of services and others offer less services, but, nevertheless, it will be an area with important developments where we will see many services appearing in the future.

Generally all concessionaires supply information on on-going accidents and alternative roads.

Some concessionaires already inform estimates on travel times but still there are no standard ways of assuring the quality of the information supplied.

2.6.2. Geographical/National Constraints

There are no special national or geographical constraints on this domain except the global coherence of the messages in each country that creates an obligation for the concessionaires to agree in general with the conceding party the how to do.

2.6.3. ASECAP Objectives

The following points are important objectives for the ASECAP concessionaires:

➢ Foster studies aiming at creating real-time "travel time" information services from point to point

  o Feasibility studies for calculating travel times using different techniques: loops (speed analysis, speed+traffic flows analysis), DSRC, license plate recognition, floating car data: GPS, GSM located vehicles) through the share of best practices within a European operators' user forum

  o Create inter-operator or cross-border travel time services (ie mixing data sources from different operators on a same motorway stretch)

  o Evaluate existing services: performances, user surveys

  o Feasibility studies, based on simulation tools, aiming at creating medium-term (some hours) travel times predictions

  o Studies about "data fusion": how to ameliorate the "travel times" quality by mixing different data sources? (loops+GPS, DSCR+loops, …)

➢ Create inter-operable "web traffic information" services, available in real-time (NB: interoperable at national or international level)

➢ Studies for enriching the content of existing web traffic sites (integration of meteorological data, traffic data, VMS messages, traffic forecasts, travel times)

➢ Diversify real-time information sources using Internet based applications: mobile internet (WAP, SMS for real-time info or traffic

alerts), web screens on service/rest areas, TV diffusion programmes, HGV dedicated services (on freight centres)

➢ Studies for generating multimodal traffic information services (route planners taking into account real-time info, from point to point and mixing different operators' data bases)

3. Operation Services

3.1. Road Monitoring Infrastructure

3.1.1. CCTV Systems

3.1.1.1. Current Situation

Almost all motorway operators have fixed cameras along their networks and some already started to equip their networks with cameras with PTZ (Pan-Tilt-Zoom).

Within most dangerous places operators have started placing AID (Automatic Incident Detection) systems together with fixed cameras, as they were the ones that had good operating results. According with recent developments AID systems using PTZ cameras are already starting to supply correct information and so studies must be realized to confirm this fact.

3.1.1.2. ASECAP Objectives

Promote and cross-fertilize among its members the following objectives:

➢ Studies aiming at generalising AID systems, both on fixed cameras but above all on mobile (existing) equipments (performance studies).

➢ Create "open" system allowing exchange of video images between road operators "linked" on a continuous motorway stretch (for example: ESCOTA/ADF, ASF/ACESA, BRISA/Coruña and Sevilla DGT Control Centres images exchanges, on cross-border areas), for an improvement of "information sharing" and "road management efficiency" at national and/or international level.

➢ At this stage of development, the exchange of graphical traffic information - particularly video images - seems to be more an organisational and commercial issue, a matter of contractual agreement between neighbouring motorway operators, rather than a technical R&D issue… therefore, studies should address and pursue such commercial agreements.

3.1.2. Meteorological Systems

3.1.2.1. Current Situation

Presently some operators have meteorological stations spread along their network and use it to provide warnings to the motorways users of especially dangerous situations like pavement with ice or snow, strong lateral wind, reduced visibility due to fog or rain, etc.

3.1.2.2. ASECAP Objectives

The main ASECAP objectives for this area are the following ones:

➢ Studies aiming at improving weather information and alert systems: set up contracts with national meteorological institutes, for a "tailor-made" forecast and real-time alert system,

➢ generalise the use, at road operators' level, of meteorological radar images

➢ studies for interfacing/merging, in real-time, radar information (atmospheric level) with automatic weather stations (ground level), in order to pursue future data fusion, for a better quality of weather disturbances perception (location of the disturbance, intensity, evolution of the disturbance) and thus better road operations and road user information

3.2. Traffic Information System

3.2.1. Current Situation

The existing systems are the generally the classical double loops, though some operators already use some other technologies as the infrared or microwave radio, but the levels of accuracy are considered relatively different.

3.2.2. ASECAP Objectives

ASECAP Motorway Operators aims to perform:

- Make available for dissemination (Call Centre, VMS, Radio broadcasting, etc.) quick incident information within a defined delay according with the incident characteristics after incident notification
- Create travel time information service for accesses to major towns
- Create travel time information service to allow users travel planning
- Promote the use of standards to exchange data between motorways operators and data dissemination services
- Studies aiming at researching alternative traffic sensors to "classical double loops TCS": feasibility studies (performances), on-site tests of different devices: radar, infrared, ultrasound, … , deployment strategies related to these "new" types of sensors (with regards to existing "old" ones)
    - Share experience on this topic through road users forum
- Studies aiming at real-time locating service vehicles (patrol cars, snowplough convoys), with GPS (Galileo/Egnos) devices, for a better monitoring of road operations in case of incident/accident or weather crisis
- Studies aiming at reinforcing inter-operable "data exchange" systems between road operators (exp : Datex systems)
- Studies aiming at reinforcing traffic management at the interface between urban and interurban networks (i.e. creating interoperable systems between the different road operators surrounding city accesses)
- Investigate new "tactical management systems" for controlling traffic flows on highly congested areas : speed control systems, ramp metering, HGV overtaking areas
- Promote studies to define new ways to approach the motorway users supplying value added services

3.3. Fleet and Freight Management

3.3.1. Current Situation

Several Motorway Operators have GPS based systems to allow them to know the position of maintenance and road assistance vehicles in operation. These systems allow a better management of the resources in the execution of their normal tasks and also when an accident occurs, because the operator at the control centre knowing all the positions of the existing

available means is able to address the emergency tasks to the ones that are better located to drive the necessary assistance.

Currently there are not much systems aiming to give information on the traffic situation so that companies managing fleets and freight transport can be informed to plan with greater efficiency their activities.

3.3.2. ASECAP Objectives

ASECAP has the following objectives in this domain:

➢ Increase gradually the accuracy of the assistance vehicles' GPS positioning system until an online updated system is achieved

➢ Increase the use of GPS positioning to other maintenance vehicles, namely those that may be required in case of accidents

➢ Make mandatory the positioning of dangerous goods transport vehicles so that operators are aware of potential dangers within their roads

➢ Promote the deployment of in-car facilities, integrating location-based functionalities, in order to improve the communication of emergency situations

➢ Promote studies aiming at envisaging the interface between road and other transport means (train and metro stations, airports, ports, bus stations, etc.)

➢ studies aiming at developing logistic platforms

➢ creation of dedicated rest areas for HGV (outside motorway premises in some cases)

➢ develop ITS information services for HGV purposes : web, route planner, real-time information about parking places available on service areas (real-time calculation, computing, and diffusion of this information through radio, VMS, web), for a "tactical" management of the HGV traffic

(Some of these points may be new areas of business to develop by motorway operators)

3.4. Incident and Emergency Management

3.4.1. Current Situation

Nowadays the incident and emergency system existing is based on the call box system, the telephone networks, fixed and mobile, and the private radio network besides some specific software for procedures automation and fast identification of rescue means contacts.

3.4.2. ASECAP Objectives

Being one of the areas requiring more investment to give a better response to motorway users, ASECAP objectives will be the development of:

➢ Reduce the time between incident occurs and information is made available for rescue teams;

➢ Reduce the time between incident occurs and information is made available for road users;

➢ Improve procedures to allow a later analysis of incidents and actions taken to prepare for alternative solutions to solve similar situations;

➢ Promote the harmonisation of procedures for incident response among infrastructure operators;

➢ Fully integrate the communications functions, the incident registry and procedures and the different information dissemination means;

➢ Promote the development and general use of integrated incident response plans, joining information about road infrastructure, rescue teams and other instruments such telematics and communication services;

➢ Integrate the e-Call driving specification;

➢ Analyse the cellularization of Radio broadcasting to provide customized information to users;

➢ Studies aiming at real-time location and follow-up of hazardous goods lorries (via GPS or DSRC: example: pre-feasibility studies in the ARTS project);

➢ Studies aiming at developing "real-time alert services" from Traffic Control Centres to vehicles (equipped with on-board units): communication means to be investigated (GSM, with geo-location of vehicles, data transmission through RDS systems), as well as OBU (DSCR tags, GSM applications, navigation systems, etc.);

- Studies or tools, allowing to create "accident causation data bases" (or software), and computing techniques (statistical) allowing to determine and visualise "accident black spots";

- Studies or devices aiming at developing automatic speed and weight enforcement systems. For speed applications, one can consider as priority n°1 the specific point of the speed within "road works areas" and close to "accident areas" (both applications with instantaneous or average speeds calculation can be considered); and

- A common methodology, in order to determine and constitute a "regular observatory" of average speeds on the motorway system (and through this measure the efficiency of public policies, safety campaigns, vehicle equipments, etc.).

3.5. Enterprise Resource Planning

3.5.1. Current Situation

Generally the Motorway Operators have ERP's operating to give support to its own financial and administrative tasks, but not always are adequately integrated with the systems closer from the motorway operation.

3.5.2. ASECAP Objectives

Among others the following point is ASECAP objective for this domain:

- Study the possible integration of ITS systems with existing ERP systems in order to improve the process automation closer to the motorway users.

4. Basic Infrastructure Services

4.1. Multipurpose Private Network Infrastructure

4.1.1. Current Situation

Generally, all Motorway Operators are equipped with its own multipurpose private network infrastructure.

Nevertheless their multipurpose private network infrastructures are not directly fully compatible.

4.1.2. ASECAP Objectives

The ASECAP Motorway Operators have as an objective to promote:

➢ Studies for interconnecting road operators' network infrastructure (this interconnection shall support data exchanges between road operators both private and public)

➢ To facilitate telephone communication among neighbours road operators (tel. Conferences), in case of crisis management, for a better operational cooperation.

4.2. Private Mobile Radio

4.2.1. Current Situation

All Motorway Operators have its own private network or use a public radio network, usually a trunking type of network. The frequencies and the channel separation are not compatible.

4.2.2. ASECAP Objectives

The ASECAP Motorway Operators aim the concretisation of:

➢ Studies for a diversified use of private radio resources: creation of a «second» channel (parallel to the voice channel), for data

transmission purposes (real-time or off-line location of vehicles, activity code of service vehicles)

➢ Studies for computerising (and thus recording) voice transmission, for an optimised use (slight differed time) of the "radio information" in road operations

➢ Studies for interconnecting "private mobile radio" between different road operators' located on the same motorway stretch (private radio of motorway company A is heard on part of the network of motorway company B, and inversely)