ACTMAP

Actual and dynamic MAP for transport telematic applications

**Funding:** European (5th RTD Framework Programme)
**Duration:** Apr 2002 - Nov 2004
**Status:** Complete with results

**Background & policy context:**

Up-to-date map data are a must for current and future in-vehicle ITS applications, mainly Advanced Driver Assistance Systems (ADAS) and navigation applications. Today there are more than 4 million in-vehicle navigation systems in Europe that are using a digital road map on a CD or DVD. As the real world changes every day, an important challenge is to keep these onboard maps as up-to-date and as accurate as possible. Today a typical map update takes place via the distribution of a new map CD once every 6-12 months.

The EC-funded ActMAP project (Apr. 2002 - Nov. 2004) has developed strategies and mechanisms for the dynamic update of digital map databases. This represents an important milestone for the quality of the map databases for future in-vehicle applications. The project has built a test environment to validate the mechanisms. The test sites include advanced navigation applications and ADAS applications (curve speed assistance and Predictive Cruise Control with speed adaptation).

ActMAP developed a solution to increase the frequency of the updating cycle and improve its content by using technologies already available today (See Figure 1).

It is our vision that future navigation and advanced driver assistance systems will require an on-board map database much more up-to-date and dynamic than what is available today. This will improve the navigation experience and enable new applications in the area of driver safety. As the number of safety systems is expected to significantly increase over the next years, there is a strong need for a standardised process to update the onboard maps.

**Objectives:**

The main goal was to investigate and develop strategies for the dynamic update of digital map databases, especially standardized exchange format for facilitating the interaction between different parties in the whole map updating chain, i.e., map providers, location-based content providers, service centres, and in-vehicle map database. By doing so, the consortium hoped to build a wider market for the provision of map updates opening the doors to location-based content providers and their dynamic or static added-value data. This should increase the potential of the emerging applications for in-vehicle end-users.

**Methodology:**

The project has built a test environment to validate the map data & dynamic update mechanisms. The test sites included advanced navigation applications and ADAS applications (curve speed control and Predictive Cruise Control (PCC) with speed adaptation). After validation, the proposed mechanisms were submitted to the relevant standardisation body (ISO TC204/WG3).

Each test site has selected complementary aspects of the ActMAP framework, which were examined and assessed jointly. In order to verify the feasibility of the framework, a set of indicators was set up and each test site evaluated a subset of these indicators.

**Parent Programmes:**

FP5-IST KA1 - Systems and services for the citizens

**Institute type:** Public institution

**Institute name:** European Commission, DG Information Society
Funding type: Public (EU)

Partners:
ERTICO (project co-ordinator)
Tele Atlas N.V.
Siemens VDO Trading B.V.
BMW Forschung und Technik GmbH
DaimlerChrysler AG
NAVIGON GmbH
C.R.F. Società Consortile per Azioni (Fiat)
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Key Results:
The ActMAP specification is a major output of the ActMAP project. It specifies the strategies and the technical specifications for online incremental updating of in-vehicle digital map databases resulting from the prototyping and validation.

An important part of the specification is the ActMAP update exchange format. It represents a standardised intermediate format based on XML designed for exchanging map updates between the proprietary formats of the map update suppliers and the map update users.

Besides the multiple links to standardisation and other EC-funded projects, ActMAP has created a Forum opened to anyone willing to implement or use dynamic map actualisation in their applications/services. The received feedback will be used to consolidate the specified actualisation method. Organisations having an interest in the ActMAP approach are invited to contact the Act-MAP coordinator and join the forum.

Technical Implications
The ActMAP project, carried out by an industry consortium of car manufacturers, navigation system suppliers and digital map providers, has investigated the technical feasibility of online delivery of incremental map updates to in-vehicle applications. The main conclusions based on extensive prototyping and validation are [7]:

1. Current map-based in-vehicle applications such as navigation will significantly benefit from online incremental updating their digital map databases.
2. The availability of online up-to-date map databases in the vehicle is seen as a necessary condition for the successful implementation of map-based ADAS.
3. Incremental updates of in-vehicle map databases in general and the ActMAP approach in particular are feasible from a technical point of view.
4. The ActMAP approach is also feasible for attaching a variety of location-based contents to in-vehicle maps. These can be static or dynamic information.
5. The update delivery using a standardised XML format in conjunction with state of the art compression techniques results in reasonable amounts of data to be transferred.
6. Current Physical Storage Formats (PSF) have been optimised for compactness and fast access, while not considering requirements for online incremental. Depending on the proprietary PSF used by the system provider, the processing of incremental updates can be very complex, if possible at all.

Policy implications
The standardization process of ActMAP core specifications has started. The consortium believes that an open standard will ease the way the maps are distributed as compared to today’s time- and resource-
demanding process. As a major consequence for the end-users, the price of maintaining an up-to-date map database in the vehicle shall decrease dramatically. On the other hand, the baseline maps published by the map providers do not need to be published at the same rate as today, i.e., every 6-12 months. Instead end-users shall be able to access the latest updates on-line. The ActMAP framework will allow incremental updates related to layers and partitions, which means that only updates related to the visited regions will update.

Documents:
- ActMAP Final Report

STRIA Roadmaps:
Cooperative, connected and automated transport, Network and traffic management systems

Transport mode: Road transport
Transport sectors: Passenger transport, Freight transport
Transport policies: Digitalisation
Geo-spatial type: Other