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STRATEGIC DIRECTION SESSION “B”

DELIVERING INTEGRATED TRANSPORT MODES AND SERVICES TO CUSTOMERS

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1. STRATEGIC THEME B - IMPROVING PROVISION OF SERVICES

These topics, integrated transport modes and services to customer, often come in pairs. The trouble is that routing and navigation nowadays is easy inside of a car that is equipped with a personal navigation device. Once you get out and have to walk around, navigation especially in foreign areas can become really difficult. Good travel and routing information is available for the road network (the higher the level the better dynamic information usually gets), but it is not available for all modes of transport and it is not available for multimodal transports.

2. DELIVERING INTEGRATED TRANSPORT MODES

2.1. Terms of reference

In line with the 2001 White Paper of the European Commission the intermodal interconnectedness among member states is promoted within the framework of the 2008 „Action Plan“. Respective targets are included in the official programme of the Federal Government (November 2008). A successful implementation is to bring about a cut of national economic cost (accident cost, time loss, etc.) and also a reduction of capacity bottlenecks.

2.2. Strategy

ASFINAG has undertaken to elaborate a strategy and measures plan for an intelligent cross-linking of motorways, express ways and other carriers transporting goods and persons. The plan is agreed upon among the relevant transport carriers and within ASFINAG. The implementation is effected on numerous levels:

- Areal cross-linking is to contribute towards improved accessibility of interchange and turnover installations,
- Networking in the field of information services (e.g. dynamic signposting) in order to optimise intermodal transport processes as regards transport carrier specific system advantages,
- Networking in the telematics sector by means of transport management solutions in the form of cooperative and co-modal services aiming at the optimisation of e.g. transport chains involving goods and persons.
- Optimising transport routes and the turnover of goods in terms of time and space by means of an intelligent data concatenation – in particular by using vehicle installed data (GPS, Go-box) in the form of cooperative and co-modal technologies/innovations.(see item 5).

2.3. Reaching agreement with other transport carriers and institutions

Depending on the importance of cross—linking diverging cooperation and communication levels were selected by ASFINAG. As regards possible shift potentials cross-linking between rail and road presents a focal point to be specially considered by establishing a rail/road cooperation platform.

2.4. Concrete packages of measures

<u>Location plan for intermodal networking:</u>

Against the background of the continuously rising transport demand the optimum exploitation of transport carrier specific system advantages in the form of intermodal transport chains has become a must in order to compensate capacity bottlenecks (in particular on roads) not only by further expansions but also by networking measures adopted on sustainable basis. Locations offering special potentials for intermodal networking by intersecting existing networks and planned network extensions are assessed by ASFINAG and other transport carriers. A catalogue of measures will eventually offer the basis for an implementation at project level.

Rendering change points in passenger traffic more attractive:

In terms of areal considerations the following change functions were investigated by ASFINAG and developed accordingly.

- Park and Ride (P&R): improved intermodal connection at railway stations, Underground stations, tram and bus lines
- Improved accessibility of interchange installations
- Signposting at P&R locations in ASFINAG´s network
- Display of parking space capacities and time tables
- Cooperation in the telematics sector as regards traffic information and traffic management (see item 5)

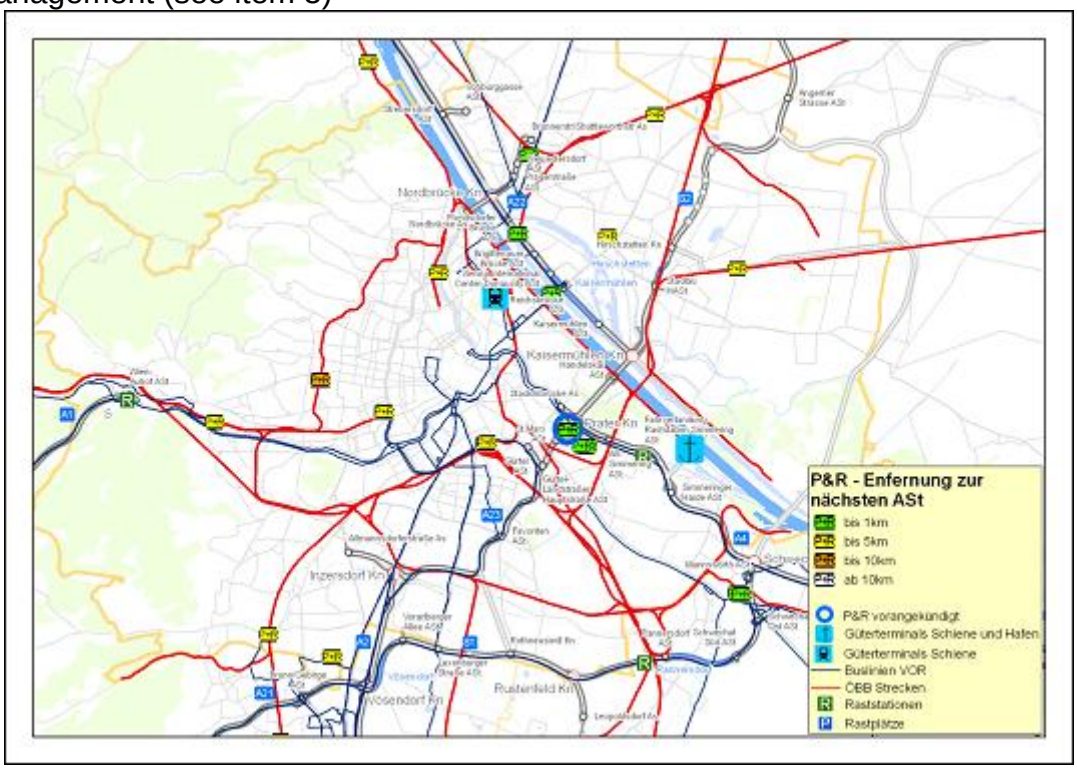

Figure 1: Networking locations in Vienna

Park&Drive (P&D): infrastructural measures for improving the occupation frequency in individual transport (commuters)

- Promotion of Park&Drive-installations
- Park&Drive on motorway rest areas and rest stations
- Utilization of motorway rest areas and stations as interchange points to regional express bus systems (”Motorway interchange station“).

- Functional expansion of Park&Drive-installations by means of interchange possibilities to regional express busses

2.5. Demand-oriented steering of goods transport

In order to avoid bottlenecks a demand-oriented shift of the share of goods transports between road and rail is aimed at. The advantage resulting from such shifting is increased volume for the railway and capacity and quality improvement for ASFINAG

In the course of this planning existing terminals in combined transport are examined for their average utilization and connection to the motorway network and optimization measures envisaged if required.
ROLA-Rollende Landstraße (The Rolling Road) represents a vital interface to ASFINAG in goods transport. In order to keep rest hours and to avoid traffic jams commercial vehicles are reloaded onto railway wagons for part of their journey. ROLA thus presents a sustainable bypass system on highly frequented axes such e.g.:

- Brenner-Axis
- Tauern-Axis
- Pyhrn-Axis
- Danube Corridor

In addition to providing a suitable connection of ROLA transfer stations to the motorway network improvement measures would encompass access steering at the primary roads network. Achievable results would be an accelerated goods flux and the abolition of peak traffic in congested areas and at neuralgic network sections. ROLA is thus a transport political instrument permitting a short term relocation of transports in transit traffic.

3. DELIVERING INTEGRATED SERVICES TO CUSTOMERS [MME]

3.1. ITS Vienna Region, unified road network description, eGovernment

All traffic modes are permanently updated for the entire Vienna Region. ITS Vienna Region is the traffic management project of the three Austrian provinces: Vienna, Lower Austria and Burgenland. The project was founded in 2006 as an independent project embedded in the public transport association of the Vienna Region (VOR). The main target of ITS Vienna Region is to develop high quality and always up-to-date traffic services based on traffic policies, city development and environmental policies. The services of ITS Vienna Region are designed to include and combine all modes of transport (Park & Ride, Bike & Ride). These services are now available for the public and free of charge on www.AnachB.at. Additionally, ITS Vienna Region supports the federal provinces and municipalities of the Vienna Region in optimizing their e-government and traffic management.

AnachB.at – GIP and traffic model ITS Vienna Region have created the new common network Graph Integration Platform (GIP), offering the digital picture of the traffic network plus additional information. GIP now serves as a reference system for ITS Vienna Region, the public transport association of Vienna (VOR), the Vienna city administration as well as the traffic administration of Lower Austria. The main advantage of GIP is to develop and use uniform administrative procedures, data models and e-government processes. GIP can be updated easily and decentralized via an interactive web client. Additionally, the GIP is much more detailed than commercially available graphs. With the GIP as a basis the traffic model of ITS Vienna Region combines all traffic data into a complete image of the

current traffic situation. All traffic data are filed so that the traffic model can generate forecasts for future traffic situations. GIP and the traffic model are the basis for the AnachB.at traffic infoservices.

Conventional traffic services are based on static traffic data and often provide suboptimal or even wrong traffic information. AnachB.at is linked with the dynamic traffic data pool which is supported by the numerous ITS partners and the new developed Graph Integration Platform GIP. Therefore AnachB.at is always up-to-date and more detailed than conventional traffic services: The AnachB.at routing planners offer optimal routes from A to B anytime – via public transport, bicycle, by foot or car or with an intermodal combination of these. Special routing planners are existing for Park & Ride and cycling with additional options.• The image of the traffic situation offers an instant overview of the best routes. Construction sites and traffic information are included and displayed separately. AnachB.at also offers a mobile application for all important phone families.

3.2. VAO – Verkehrsauskunft Österreich – Traffic Information Austria

Traffic Information Services are currently operated by different operators in Austria, covering only part of the overall traffic situation, both in terms of covered area as well as in terms of modes of transport. The current outcome from a user's perspective is disappointing and often an obstacle to flexible, efficient and ecologic mobility.

The VAO project thus aims at integrating existing traffic information

- for the whole area of Austria
- for all modes of transport
- on a standardized minimum quality level

The expected result is an integrated Traffic Information Data Pool and Services to be derived. At a first glance, when looking only at the technical requirements to be provided this appears simple to achieve. The real challenge lies within the institutional issues and a favourable competition among the partners required.

The project budget is EUR 4,7 Mio., 50% of these are granted by the Austrian "Klima- und Energiefond" (Climate and Energy Fund). Most relevant Austrian players in the consortium are:

- ASFINAG (national motorway operator)
- ÖBB Personenverkehr AG (national train operator)
- ITS Vienna Region (see above)
- Ö3 Verkehrsservice (national radio broadcaster)
- ÖAMTC (Automobile Association)
- 7 of 9 federal provinces (Burgenland, Carinthia, Lower Austria, Salzburg, Styria, the Tyrol, Vienna).

Furthermore associated partners are:

- Austro Control (Austrian Air Traffic Management and Aviaton Agency)
- ÖBB Infrastruktur AG (national railway infrastructure operator)
- Österreichische Arbeitsgemeinschaft für Rehabilitation (Austrian Association for Rehabilitation)
- ÖBB –Postbus GmbH (main public regional road transport operator)
- BMI (Federal Ministry of the Interior)
- Upper Austria (8th of 9 federal provinces)

To ensure barrier-free treatment of all internal partners and interested external partners a „Trusted 3rd Party“ was installed.

In addition to these partners within the consortium all further optional partners are invited to participate and integrate their data into the “Verkehrsauskunft Österreich” (Traffic Information Austria) framework. For this purpose standardized interfaces are defined. Tremendous improvements in quality of data and information services are expected to be achieved by means of a cross validation between different data sources and different sensor types.

3.3. Cooperative Systems – Coopers

It is common understanding within the ITS community that Cooperative Systems form a very promising perspective for future ITS solutions. The Austrian motorway operator ASFINAG has identified the potential and thus participated in COOPERS, a Research & Development Project funded by the European Commission within FP6. The COOPERS project has intensively investigated the demonstration of Cooperative Systems and Services. This new type of software applications offer precise, accurate and reliable safety-related traffic information in the car via an On-Board unit. This OBU can be customized to meet the need for different languages and personal preferences. The automated collection of data on the go will in future contribute to enhanced data quality and density, and lower cost. This applies especially to rural roads which often cannot be equipped with a roadside sensor infrastructure in a cost-effective way. But even for motorways that in Austria normally are well equipped with sensors and cameras, great improvements are to be expected from Cooperative Systems, both as regards data collection and the distribution of information.

39 partner companies worked together in COOPERS, which was carried out from 2006 to 2010 with a budget of approximately EUR 17 Mio. The role of ASFINAG within the COOPERS consortium was to define Cooperative Services and the required Cooperative Systems and to install a test site equipped with the required infrastructure, i.e. Traffic Control Centre, Traffic Information Centre, roadside installations and the On-Board Unitin the car. One main objective for ASFINAG was to investigate user acceptance. In these test runs existing traffic information, generated by ASFINAG, was processed centrally in the ASFINAG traffic control centre and converted into so-called “COOPERS Service Messages”. These service messages were then transmitted using gantries along a stretch of 18 km on the A 12 – Inntal motorway in the Innsbruck area. The gantries were equipped with CALM-IR (Infrared) devices transmitting the COOPERS Service Messages to passing vehicles. Vehicles equipped with the appropriate on-board unit received and displayed this information. The variety of the messages reached from simple information services, such as an incident or a congestion, to detailed weather warnings. Another main task of ASFINAG was the development of an on-board unit (OBU), to display these Service Messages in an appropriate way. The ASFINAG OBU was also transmitted to the other COOPERS test sites in Berlin, Bavaria, Northern Italy and France.

50 test drivers were invited to participate in an investigation of user acceptance of the COOPERS cooperative services. Their reaction to this information and their changes of driving behaviour were analyzed in detail. The users were questioned twice, before their test drives to record their expectations and afterwards on how these expectations were met. During the test drives physiological measurements like pulse measurement and eye-tracking were performed to detect the stress level of the test drivers. The final results clearly show that drivers would accept an operating system, that they would trust this type of information and that Cooperative Services consequently would contribute to traffic

safety. The components of the COOPERS framework (test stretch, communication infrastructure, on-board unit) are kept in operation and will be used for follow-up projects.

Figure 2: COOPERS on-board unit

3.4. Line Control Systems

The plans for implementing new Line Control Systems proved in some respects overambitious prior to 2008. A detailed analysis of costs and benefits was worked out in 2008/2009. The outcome is a reduced programme for the extension and a reorganisation of Traffic Management and Maintenance of Traffic Management systems. One main objective is to overcome the - in Austria - historic separation of tunnel, open road, operation and maintenance. Tunnel Monitoring Centres will be upgraded to regional Traffic Management Centres. Local presence of the operator – apart from the police - will help to speed up clearing accidents and subsequent closures. An important prerequisite for that is a clear assignment of tasks in case of accidents and closures with a focus on enhanced availability of the road network.

Further improvements are being achieved in the field of Traffic Telematics Infrastructure. ASFINAG has redimensioned the traffic control units (TCU) according to updated technical and operational requirements. The new TCUs will have new functionalities and a new design. They will, in addition, take into account future on-board Telematics Systems. New hybrid gantries allow for combining classic Traffic Telematics Infrastructure and Toll Units in one cross section.

3.5. National Rerouting on the Austrian Motorway and Expressway Network

In case of severe delays at road sections traffic can be diverted by means of adaptive signposting or broadcast information. In the Austrian motorway and expressway network all alternative routes were determined and evaluated. The evaluation was based on the definition of a rerouting criterion and on the calculation of the potential number of vehicles that are shifting to the alternative route. A cost-benefit-analysis was used as the method of evaluation, comprising time- and vehicle-operation-cost savings as well as a change in environmental costs. The investigation results will lead to defining the most important pairs of routes, considering their importance in relation to rerouting in the Austrian primary road network and a ranking according to priorities of realisation. The corresponding decision points were, or will subsequently be, equipped with the necessary infrastructure.

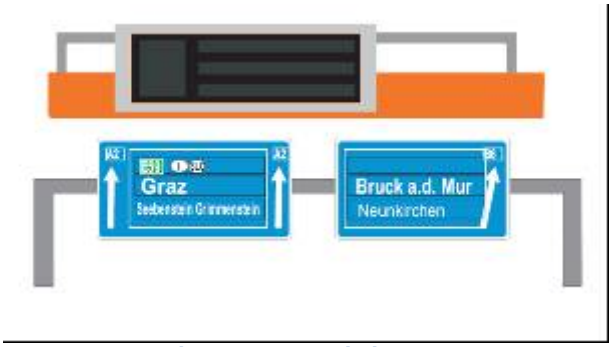

Figure 3: normal signage

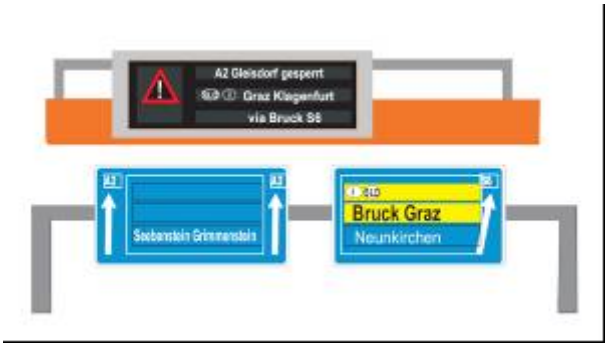

Figure 4: alternative signage for "Graz"

3.6. International Rerouting

As part of the Euroregional Projects (CONNECT, CORVETTE, EASYWAY) all transit links through Austria were analysed and cross border TMPs were worked out and put into action. TMPs exist for the Brenner, Tauern and Pyhrn corridors. Coordination is organized and prepared for every single event. Depending on the corridor Germany, Italy, Slovenia and Croatia are also included. For the links Salzburg-Maribor and Salzburg-Zagreb two equivalent corridors over the Alps exist, thus offering perfect conditions for mutual rerouting of cars travelling on these links.

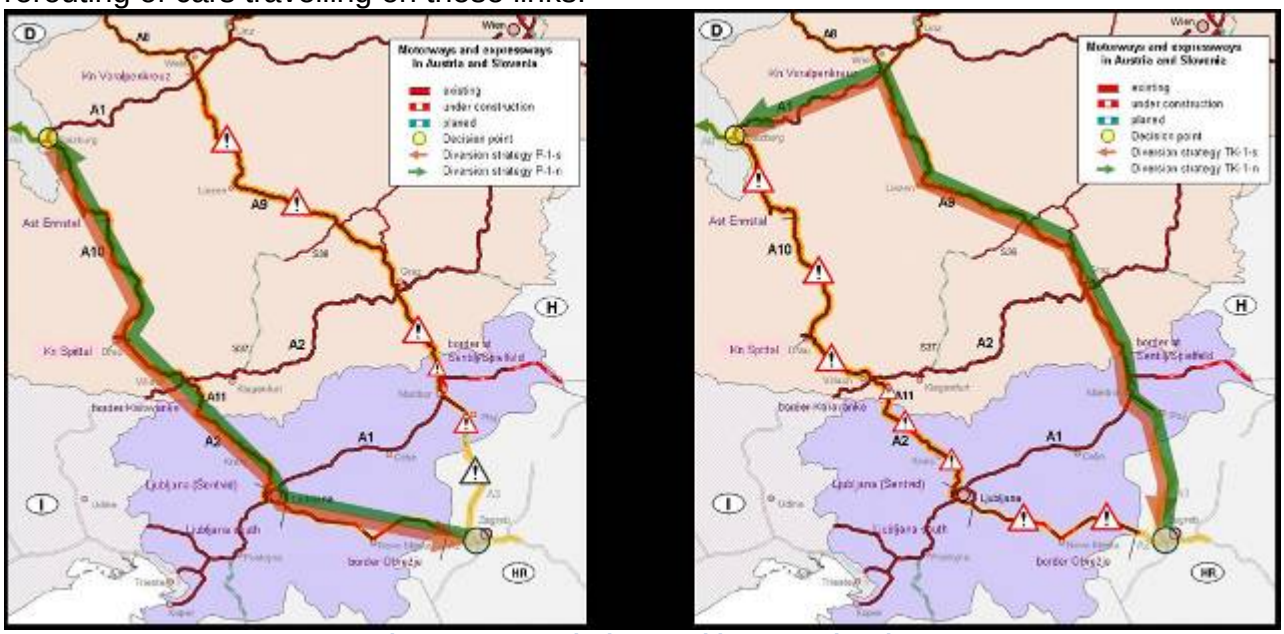

Figure 5: two equivalent corridors over the Alps

In spite of, at first glance, more sophisticated looking solutions for communication available on the market, it was commonly decided to use multilingual fax forms, which in the meantime proved to be a reliable solution meeting all requirements.

4. EXISTING AND FUTURE TARGET GROUPS

ASFINAG´s target groups are quite obviously widely spread and cannot be divided into existing and future ones. In principle, the following differentiation could be made::

Customers/users

- Customers/users of the traffic infrastructure as end customers of the network for persons and goods
- Transport carriers of the national and international traffic network with interfaces to the motorway and express way network of ASFINAG

Highest possible intermodal flexibility is guarantied for customers/users by creating and optimising reloading and interchange points – combined with a respective information management.

By jointly developing and offering co-modal services of all transport carriers a wide variety of positive effects can be achieved within ASFINAG´s network in respect of mobility, optimisation of goods transports, full capacity exploitation of the infrastructure, traffic safety und, finally, satisfaction of the user.