Satellite-based navigation for efficient use of road infrastructure

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Growing mobility demand and pressure on budgets

1. 10% of Europe’s roads are congested; mobility demand continues to grow
2. Pressure on national budgets to build or scale up roads
3. Costly economic and environmental externalities

The road infrastructure needs to be better used

Source: GSA/UNECE
Higher efficiency, less negative externalities

Coping with growing mobility requires:

1. Balancing traffic to eliminate congestion points: from "road saturation" to "network saturation"
2. Increasing the net value of externalities (e.g., socioeconomic benefits)
3. Improving the fairness of cost-sharing (e.g., pay-per-use)

Environment and national budgets are the big winners. Benefits are reaped across the economy and society.
SatNav: high FLEXIBILITY, low cost

1. **Flexibility** to quickly adapt to traffic evolution (and policy changes)
2. **Cost efficiency**: virtual vs. capital-intensive toll gate infrastructure
3. **Holistic approach** to traffic management (network vs. road)
4. **Interoperability** (European vs. national/regional)
5. **New business opportunity** for Value Added Services
Getting on board

SatNav-enabled vehicles in Europe* (2010-30)

Users have already decided

Source: GSA / LECG

* projection for EU27
What policy makers should know

Total monetized benefits (2010-30)

- Cost savings due to congestion reduction per avoided accidents
- Cost savings due to severity decrease of injuries/accidents
- Climate change
- Air pollution
- Fuel consumption
- Travel time

Reaping all the benefits requires an universal approach

Source: GSA / VVA
The preferred solution for interoperability

- The interoperability directive 2004/52/EC lays down the conditions for the interoperability of electronic road toll systems in Europe:
  - SatNav is a preferred technology and is recommended for new systems
- EU is pushing for the adoption of the European Electronic Toll Service (EETS):
  - SatNav enables the Value Added Services that will enhance the EETS Providers’ business model
- EETS is moving forward:
  - Applicable to heavy vehicles in 3 years and to all vehicles in Europe in 5 years
## New business opportunities through Value Added Services

<table>
<thead>
<tr>
<th>Fleets/ Freight management</th>
<th>Traffic management</th>
<th>Vehicle manufacturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fleet management</td>
<td>• Road status, usage and other statistics</td>
<td>• Remote diagnostics</td>
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<tr>
<td>• Dangerous goods tracking</td>
<td>• Traffic information</td>
<td>• Maintenance</td>
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<td>• Driver performance</td>
<td>• eCall</td>
<td>• ADAS</td>
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<td></td>
<td>• Road assistance</td>
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### SatNav OBU

<table>
<thead>
<tr>
<th>Insurance companies</th>
<th>Road operators</th>
<th>Personal services</th>
</tr>
</thead>
<tbody>
<tr>
<td>• PPU Insurance</td>
<td>• Toll collection</td>
<td>• Voice, e-mail, SMS, MMS, Internet</td>
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<tr>
<td>• Lost/stolen vehicle</td>
<td>• Information and support services</td>
<td>• LBS</td>
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Early adopters: the success of Germany

**Facts & Figures 2008:**
- > €14b revenues in 4 years
- > 650,000 installed OBUs in trucks from Germany and 20 different countries

The German toll collect system is reaching the goals set by the government:
- traffic reduction, with 15% decrease of the number of empty runs
- environmental effects, with businesses starting investing in clean vehicles
Slovakia is implementing

- The Slovakian road traffic authority (NDS) signed a €863m agreement with SkyToll, at the beginning of 2009, for the installation and operation of the SatNav based system.

  - The system will apply to:
    - All trucks and buses weighing 3.5+ tons
    - over 2,400km of roads

  - Implementation has already started: OBUs are already being provided.
The Netherlands’ universal scheme

- The Netherlands is implementing the ABvM, the first universal scheme (all vehicles, nationwide) based on SatNav:
  - a price per kilometre in all roads, that varies according to time, place and environmental vehicle characteristics
  - introduction for trucks in 2012 and extension to other vehicles by 2016.

- The estimated effects are:
  - Increase of road safety: 13%
  - Decrease in CO²: 19 %
  - Decrease in fine dust: 21%
France eco-tax scheme

- Eco-tax to apply to 13,000 km of roads
  - 10,500 km non-conceded State Road Network
  - 2,000 km of local roads to prevent traffic shifts
  - Conceded highways excluded
- 8,000 trucks with OBUs installed
  - 6,000 domestic; 2,000 foreign
- Expected revenue: €1b
- Technology will be chosen during the ongoing competitive tendering
SatNav opportunities in Europe

- No road toll/ toll only on specific sections
- Combined/ DSRC-based road toll
- SatNav already adopted/ decision taken
- SatNav under evaluation
Do we need to wait for Galileo?

EGNOS, it’s there. Use it.

- EGNOS is the first European SatNav system
- EGNOS improves the accuracy of position measurements by transmitting signals that correct GPS data and provide information on its reliability
- EGNOS is available and free of charges

<table>
<thead>
<tr>
<th>Technology</th>
<th>Accuracy</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS</td>
<td>10m</td>
<td></td>
</tr>
<tr>
<td>GPS + EGNOS corrections</td>
<td>2m</td>
<td>Increased accuracy + Integrity</td>
</tr>
</tbody>
</table>
Are you ready?

Frequently cited barriers:

- Patchwork of existing schemes and scheme owners
- Several political decision levels (and policy-making inertia)
- Data privacy issues
- Switching costs
- Maturity of the technology
- Issues linked to the “Free Flow” concept (e.g., enforcement)
What we are doing to get barriers down

- **Awareness campaign**, at different decision levels (e.g., national authorities, road operators), to increase knowledge of the SatNav potential and of the European GNSS’ (EGNOS and Galileo) value added.

- **Cost-Benefit Analysis** to demonstrate the cost-efficiency advantage

- Field **trials** (with EGNOS) to increase the perception of maturity

- **R&D projects** to fill the gaps and leverage on the EGNOS/Galileo’s differentiators (e.g., integrity, authentication)
FP7 projects in Advanced Road Applications

- **GINA** - GNSS for INnovative road Applications
  - Large scale demonstrator of SatNav technical and commercial feasibility (100 cars, consistent with Dutch road strategy)

- **GSC** - GNSS-enabled Services Convergence
  - Standard platform for SatNav-based road charging and valued added services (VAS)

- **COVEL** - COoperative VEHICLE Localization for Efficient Urban Mobility
  - Cooperative vehicle localisation system based on EGNOS/ Galileo/ EDAS for traffic management in urban areas

- **GNSSmeter**
  - SatNav-based metering for vehicle applications and value added road services
SatNav is an option NOW!

Seize first-mover advantages
Don't be overtaken!

EGNOS, it’s there. Use it.

www.gsa.europa.eu