ESESA EGNOS Service Extension to South Africa

Last R&D GSA funded projects of the Galileo 2nd Call

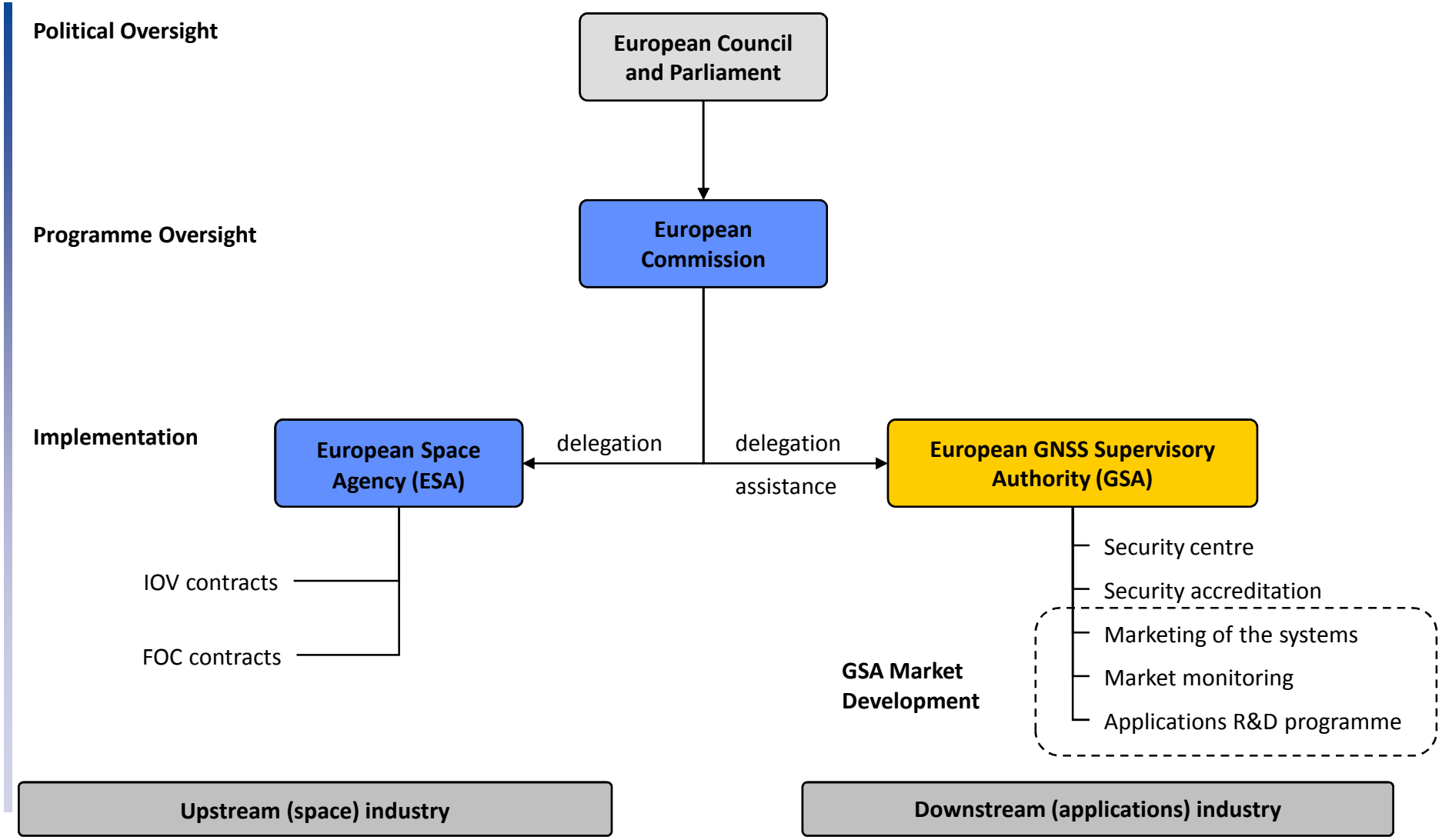
ESESA 2nd Workshop 2nd – 3rd March 2011

ESESA is a project co-funded by the EU 7th FP and South Africa

Agenda

- Introduction
- Road : SCUTUM
- Surveying : ASPHALT
- Maritime : SAFEPORT
- Rail : GRAIL-2
- Agriculture

GSA manage FP7 funds delegated by the EC



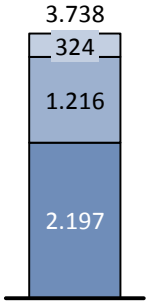
GNSS Work Programme 2011
OVERALL OBJECTIVES

- Increase competitiveness of European GNSS industry
- Accelerate adoption of GNSS
- Prepare markets for Galileo and EGNOS
- Support EU policies
- Support GNSS action plan

Courtesy of GSA

Portfolio of measures to achieve EGNOS adoption

Cost Benefit Analyses



Navaids

CFIT (Controlled flight into terrain)

DDC (Delays, Diversions and Cancelations)

EGNOS Data Access Service Test and expansion

Marketing Material

EGNOS co-marketing

Events

EC EGNOS portal

There are results for EGNOS as of End of 2010

Segments

AVIATION

- 75 procedures ready, awaiting EGNOS signal certification
- EGNOS benefits demonstrated for Regional, Business and General aviation operators (three CBAs)
- Proven helicopter benefits trigger industry interest (Oil & Gas UK, Helicopter Emergency Services)
- EGNOS enabled aircrafts (Pilatus, Airbus, Dassault)

ROAD

- 1 leading service provider & 1 major road operator willing to adopt EGNOS for next generation of Road pricing system based on GNSS
- 4 Public Authorities are aware of EGNOS added-value for Road Pricing
- Major Electronic Tolling SP now acknowledge the EGNOS potential
- Early EGNOS adopter: major oil & gas company, thanks to FP project

AGRICULTURE

- First ever analysis on market size, showing EGNOS potential to become the leading solution in Agriculture
- 50% EGNOS market share achieved
- Co-marketing deals with leading tractor & receiver brands
- Leading brands decided to introduce new EGNOS products to portfolio

Services

EDAS

Beta test successfully concluded with 50+ users

- Service improvement recommendation
- Market research identifying potential in diferent market segments
- Service model and way forward elaborated

EDAS

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SCUTUM SeCUring the EU GNSS adopTion in the dangeroUs Material transport **UM**

© scutum

FP7 2nd Call

Total budget :	2,2 M€
Grant Budget :	1,4 M€
Start date:	February 2010
Duration :	21 months
Leader :	Telespazio

TELESPAZIO
A Finmeccanica / Thales Company

SCUTUM

Consortium

Telespazio Italy IT
Comité Européen de Normalisation BE
Telespazio France FR
Interporto Bologna S.p.A IT
European Union Road Federation BE
EC Joint Research Centre BE
Elsacom S.p.A. IT
Brimatech Services Gmbh AT
European Intermodal Association BE
Italian Ministry of Transports IT
French Ministry of Transports FR
ENI S.p.A. IT

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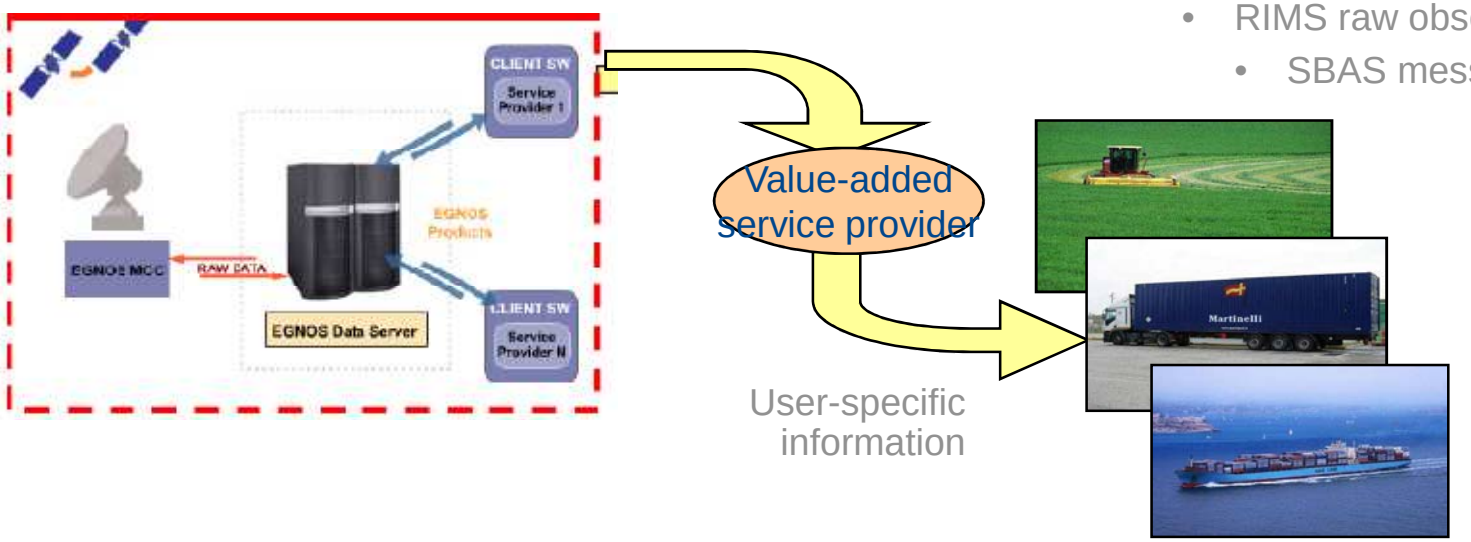
SCUTUM SeCUring the EU GNSS adopTion in the dangeroUs Material transport

- Objectives
  - ✓ EU-wide introduction of EGNOS use in the transport management of hazardous goods
  - ✓ Perform a large-scale adoption of EGNOS in the freight transport market and in Europe.
- Concept
  - ✓ Evolution from prototype to standardised products.
  - ✓ Enhance existing solutions to use EGNOS CS.
  - ✓ Initiate a technical standardisation related to EGNOS-based services
  - ✓ extensive large-scale trials in real-life cases refining service definition, and operative procedures

SCUTUM : EGNOS CS/EDAS

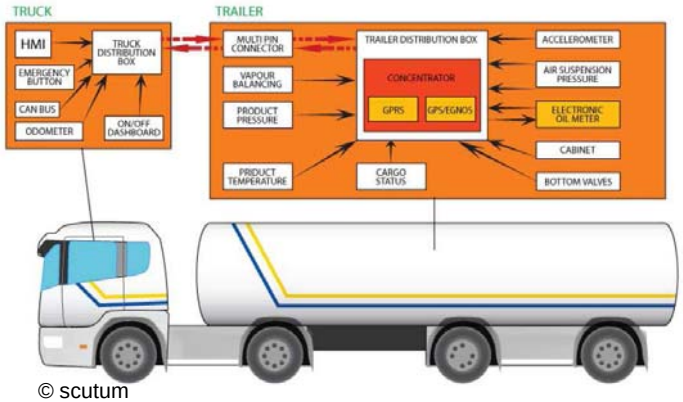
EGNOS data (real-time):
- RIMS raw observations
- SBAS messages



- EDAS distributes EGNOS raw data to VAS SPs connected to it, in real-time, within guaranteed delay and controlled access

- VAS SPs implement solutions/ create products built on EGNOS data (such as delivering of EGNOS data via different telecommunication means and value added services exploiting EGNOS integrity)

SCUTUM EGNOS OS for dangerous goods transports



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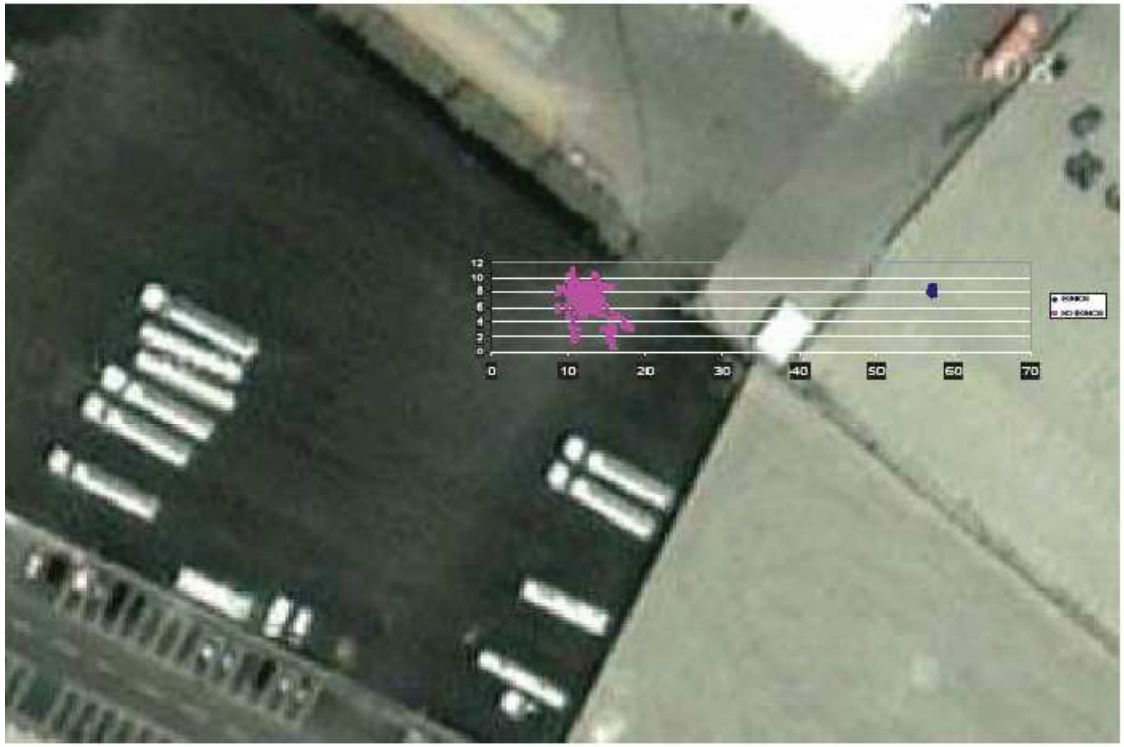
- **ENI considered EGNOS enhanced stability and accuracy interesting features for operational uses**



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SCUTUM EGNOS CS/EDAS - based services

- **Processing Algorithm is an EGNOS CS/EDAS product**

- **Provided services are:**
  - ✓ **Protection level (exploitation of the integrity) →confidence on the position to be**
  - ✓ **SBAS corrections in case of difficult environment →enhanced availability of the EGNOS augmentation**

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SCUTUM: Outcomes

- **Upgrades eni operational system from EGNOS OS to EGNOS CS/EDAS**
- **EGNOS CS/EDAS to track 225 operating vehicles (first 100 vehicles by end of November 2010**
- **Extends it on a cross-border basis, operating vehicles in Italy, France and Austria**
- **Starts a EU-wide technical standardization for EGNOS CS/EDAS based services (CEN Workshop SCUTUM)**

- For more information
  - ✓ www.scutumgnss.eu
  - ✓ **email: antonella.difazio@telespazio.com**

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Advanced galileo navigation System for asPHALt fleeT machines

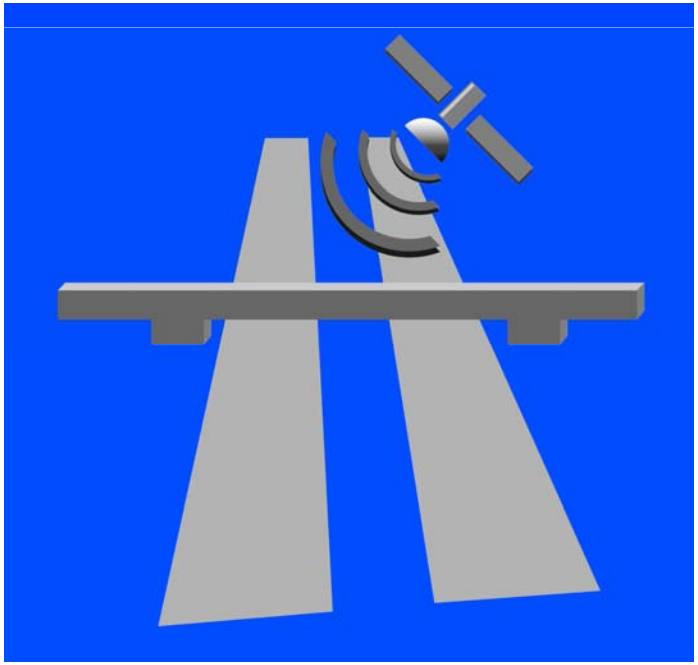
Courtesy of MOBA

FP7 2nd Call

Total budget :	1,35 M€
Grant Budget :	1,0 M€
Start date:	February 2010
Duration :	24 months
Leader :	MOBA

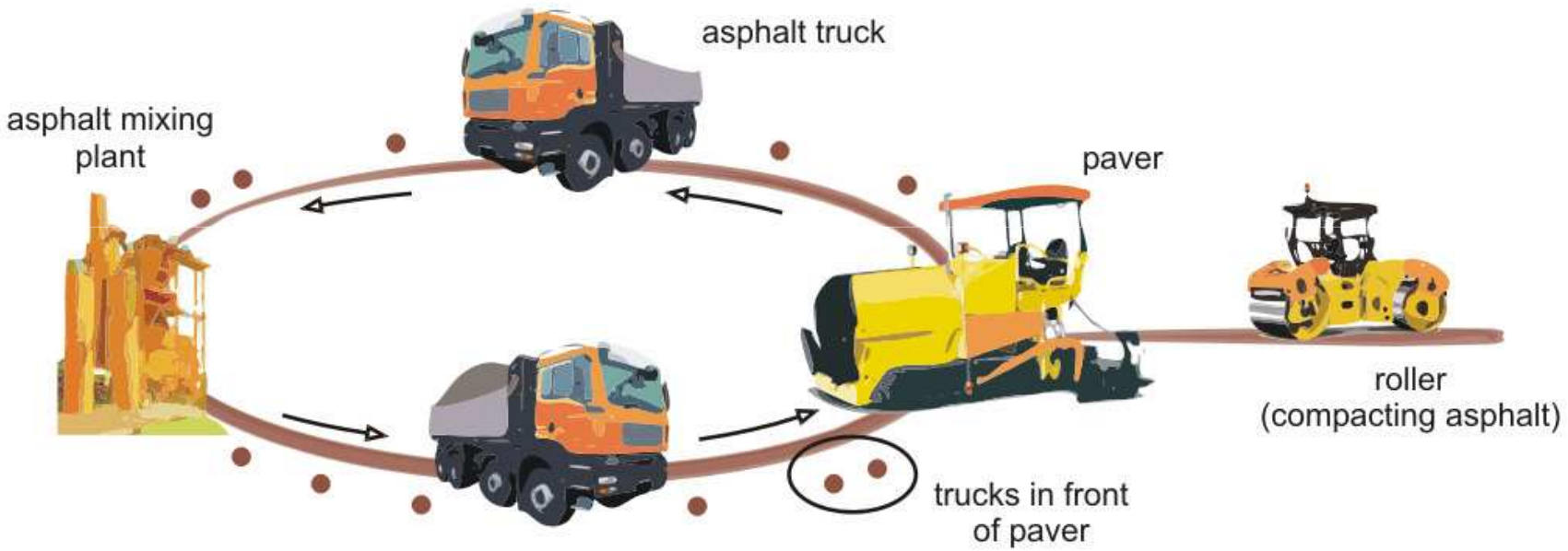
Consortium

MOBA DE
Fraunhofer IIS DE
TeleConsult Austria AT
inposition gmbh CH
DKE Aerospace Lux LU
Dynapac Nordic AB SE



Courtesy of MOBA

ASPHALT : Supply Chain for Asphalt Construction

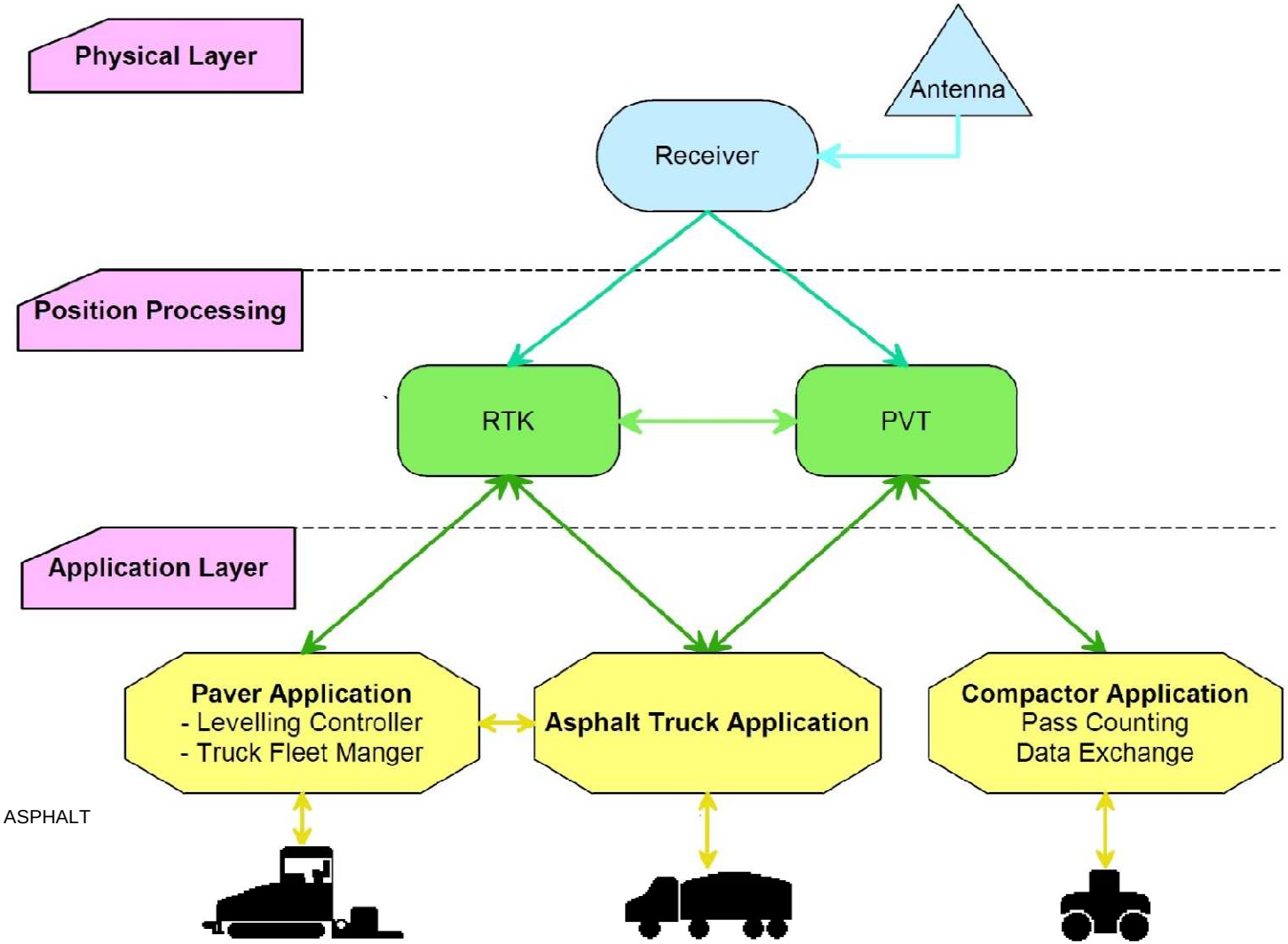


Courtesy of ASPHALT

ASPHALT Objectives

- **Objectives**
  - ✓ Development of high precision applications in road construction, fleet management and logistics in the construction just-in-time process chain
  - ✓ Development of a cost/precision optimized solution taking the advantage of GALILEO/EGNOS and EDAS positioning technology
- **Description**
  - ✓ Develop a **GNSS receiver** bases on a 3 frequency approach combining the following signals:
    - E1/L1 GALILEO/GPS/EGNOS
    - E5a/L5 GALILEO/GPS
    - E5b GALILEO
  - ✓ Focus on a **Multi-band E1/L1/E5a/L5/E5b RTK antenna**
  - ✓ Integrate a combined discrete **RF Frontend** for all frequency bands
  - ✓ Include a **Digital Signal Processor** which processes signals of the three frequencybands
  - ✓ Implement **RTK high accuracy position solution** exploiting the measurementson the different frequencybands
  - ✓ **PVT Interface to EGNOS /EDAS** to provide reliable position solution
  - ✓ Filter the different position solutions in combination with application sensor to a combine solution meeting application requirements

ASPHALT SYSTEM OVERVIEW



Courtesy of ASPHALT

ASPHALT : Project Results and Outcomes

- **Project results**
  - ✓ Target market will be the road construction business
  - ✓ The following prototypes are planned to be available and tested:
    - Pass counting system on roller
    - Temperature scanning system on paver
    - Steering system on paver
    - Evenness and thickness control on paver
    - On board computer to supervise the whole build-in process
    - Mass flow control between asphalt truck and paver

- **Primary benefits of the outcomes of ASPHALT**
  - ✓ increasing quality of the road;
  - ✓ decreasing maintenance costs;
  - ✓ A potential road lifetime extension by 10% would result in cost savings of EUR 4.5
  - ✓ billion per year.

For more information : www.asphalt-fp7.eu

Contact

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Agenda

- Introduction
- Road : SCUTUM
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SAFEPORT:Safe Port Operations using EGNOS SoL Services

Courtesy of BMT

FP7 2nd Call
Total budget : 2,75 M€
Grant Budget : 1,93 M€
Start date: March 2010
Duration : 24 months

Leader : BMT group Ltd

Consortium
BMT Group
Dublin Port
Kongsberg Norcontrol IT
Universities of Glasgow and Strathclyde - The Ship Stability Research Centre
Marimatech
NEXT Ingegneria dei Sistemi SpA
Istituto Superiore Mario Boella
Port Authority of Gijón

Courtesy of BMT

SAFEPORT Objectives

- **Objectives**
  - ✓ to develop and demonstrate an Active Vessel Traffic Management and Information System (A-VTMIS) to manage vessel movements within their jurisdiction.
  - ✓ develop a pilot aid (SafePilot) which will ensure that harbour pilots can safely and efficiently navigate the courses provided by the A-VTMIS;
  - ✓ Implemen authentication mechanisms to support identification and safe recognition of assets, cargo, ships, etc
- **Description**
  - ✓ feasibility study,
  - ✓ Development of an A-VTMIS, capable of actively managing all vessels
    - system will use GNSS authentication mechanisms to identify and locate assets securely.
    - vessels will be optimally assigned berths
    - feasible failsafe paths validated using a manoeuvring model;
  - ✓ Development of a portable pilot aid
    - will exploit the EGNOS CDDS and SoL services to achieve the very high accuracy required to safely follow the guidance of the A-VTMIS and dock large vessels, and ensure the availability of a failsafe.

SAFEPORT Outcomes

- **First prototypes of the A-VTMIS and SafePilot expected in June 2011**

- **Training programmes will commence with the final system being demonstrated and evaluated in early 2012.**
  - ✓During this evaluation period, the reduction in waiting time and the number of near misses will be quantified.

- **Both systems will be demonstrated and evaluated at Gijon and Dublin ports and will involve**
  - ✓real vessels following paths suggested by the A-VTMIS,
  - ✓real pilots performing precision docking manoeuvres on real ships.
  - ✓Harbour masters, VTMIS operators .

For more information contact
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GRAIL-2 : GNSS based Enhanced Odometry for rail

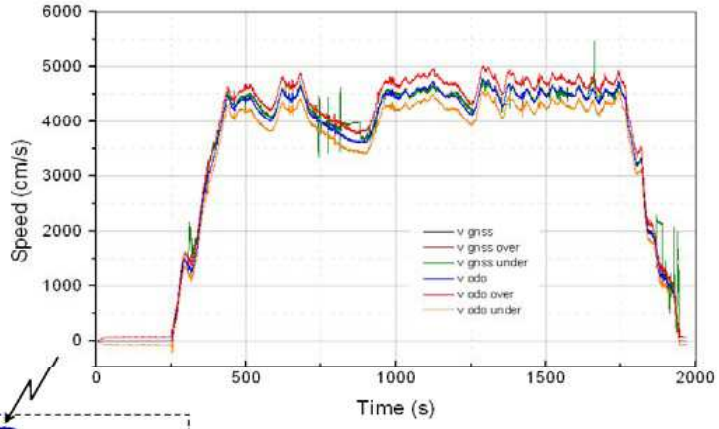
FP7 2nd Call

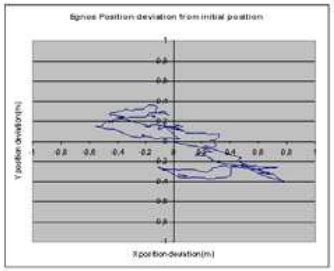
Total budget :	2,05 M€
Grant Budget :	1,27 M€
Start date:	September 2010
Duration :	24 months
Leader :	INECO TIFSA

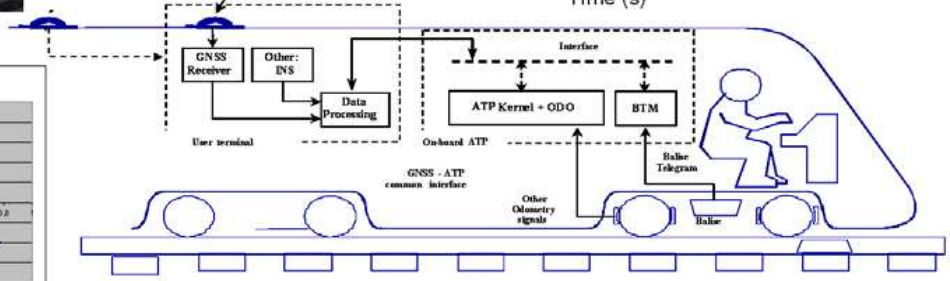
<u>Consortium</u>
INECO TIFSA ES
Ansaldo STS ES
TAS-I IT
ADIF
NSL UK
Alstom FR
Renfe ES
AZD
iQST
REFER
Aena Int ES

GRAIL–2 Background

- Based on the results of the GRAIL Project (Galileo FP6) which were to develop Specifications for GNSS-based ETCS applications
  - ✓ Development and initial testing of one implementation
  - ✓ Complementary studies (CBA, Legal, Safety Studies, Local Elements)







Courtesy of INECO

GRAIL-2 Objectives

- **Objectives**
  - ✓ Definition of user and system requirements. From the work done in GRAIL, requirements for the system components shall be reviewed, adapted and completed
  - ✓ Development of a GNSS-based EO system prototype.
  - ✓ Validation of the prototype by means of an extensive test campaign. The focus of the test campaign is put on the demonstration that the required functionality and performances are met.
  - ✓ Demonstration that the safety requirements for the application can be met by the system, by means of simulation, testing, modelling, etc.
  - ✓ Roadmap towards certification.

GRAIL–2 Outcomes

- Testing, validating and approaching the certification of a GNSS subsystem that acts as an additional sensor to the ETCS Odometry to solve existing odometry problems in current high speed lines where ERTMS is already operational.
  - ✓ Defining the adequate solutions in order to achieve the required performance and safety levels - Carrying out an extensive test campaign.
  - ✓ Validation process to be undertaken in GRAIL-2 would not be limited to the comparison between the test results and the system requirements (design validation).
  - ✓ Complete validation process in compliance with CENELEC EN50126 norm and in close relationship with the safety activities in the project will be applied and carried out in a real environment
- From a technological point of view, the main innovations of GRAIL-2 include:
  - ✓ Development of the GRAIL-2 User Terminal and its interface to the onboard ETCS equipment via PROFIBUS (development of functional, physical requirements?).
  - ✓ Development of the ETCS OBU adapted to the new functions.

For more information contact

Project Coordinator

Alvaro Urech - INECO

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AGRICULTURE

More information on

- **EGNOS Useful links**
  - ✓ http://egnos-portal.gsa.europa.eu/
  - ✓ http://www.gsa.europa.eu/go/egnos/edas
  - ✓ http://ec.europa.eu/enterprise/policies/satnav/galileo/index_en.htm
  - ✓ http://www.essp-sas.eu/
  - ✓ http://www.esa.int/esaNA/egnos.html