



# Intelligent Railways via Integrated Satellite Services (IRISS)

## Integrated Applications Promotion European Space Agency

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European Space Agency

## Integrated Application Promotion (IAP) aims to:

- **Incubate sustainable services that benefit society**
  - addressing global/novel challenges
  - listening to **needs of users**
  - partnering with stakeholders
- **Increase societal demand for satellite services**
  - integration of **multiple space assets** yields new opportunities
  - assessment of added value

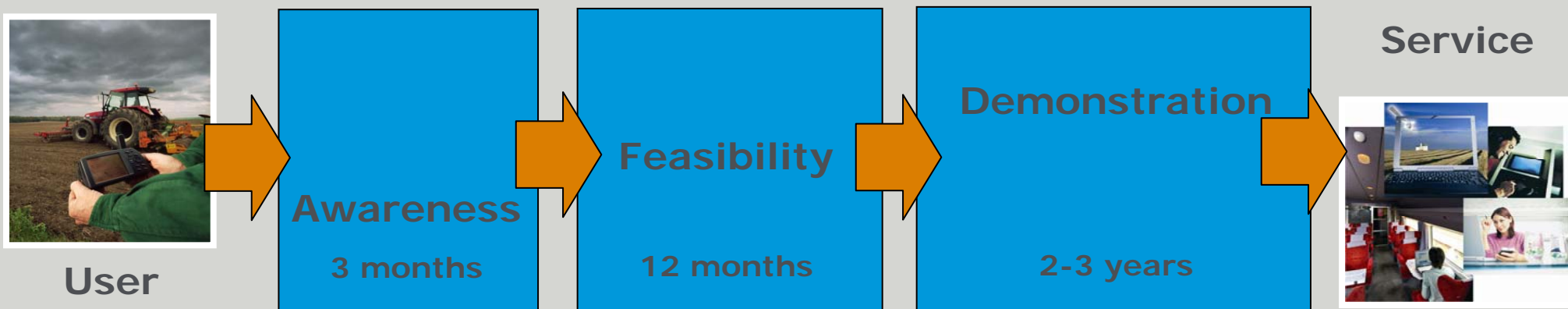
### Some IAP Themes

- Health
- Energy
- Transport
- Safety
- Agriculture
- Environment
- Education, Development
- Entertainment



## IAP Program Structure

- **Awareness Activities**
  - Understand, foster and organize user demand for service solutions
- **Feasibility Studies**
  - Assess technical and economical viability of these services
- **Demonstration Projects**
  - Implement pre-operational services
  - 50% co-funding by stakeholders



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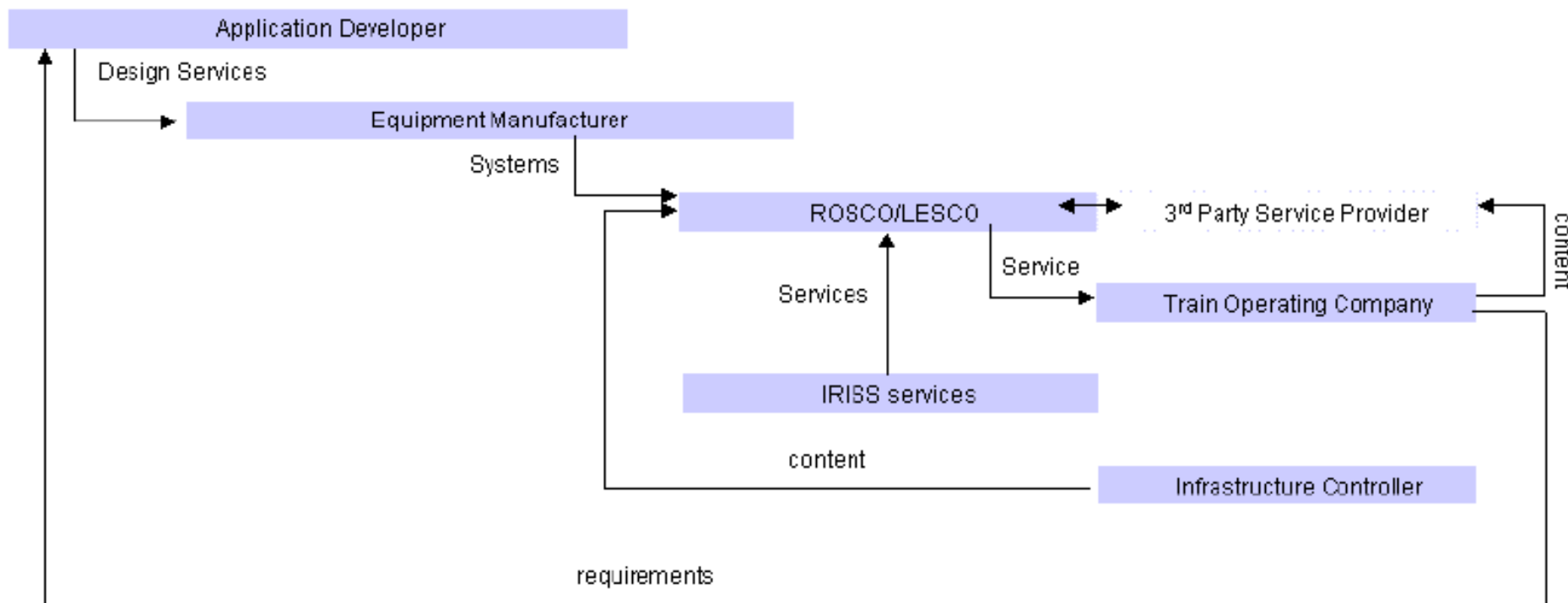


## THE FOUR C'S IN THE RAIL SECTOR

- Cost
- Carbon
- Capacity
- Customer Satisfaction



## Servicing chain in the UK rail



System Lifecycle

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## Goal of the study

- To develop and validate a viable and robust business model for the introduction of satellite navigation and satellite communications services within the UK rail transport sector.



This capability will allow train operators to:

- communicate with their assets irrespective of location and status
- enable data to be uploaded and offloaded in real time, thus
- facilitating decision making processes and
- improving the management of operations and incidents.

## Stakeholders involved

- Prime: Nottingham Scientific Ltd (NSL, UK)
- Sub: Avanti (UK)
- Train Operator (East Midland Trains)
- Rolling Stock Companies, Rolling stock manufacturer, Infrastructure Operator (Network Rail)



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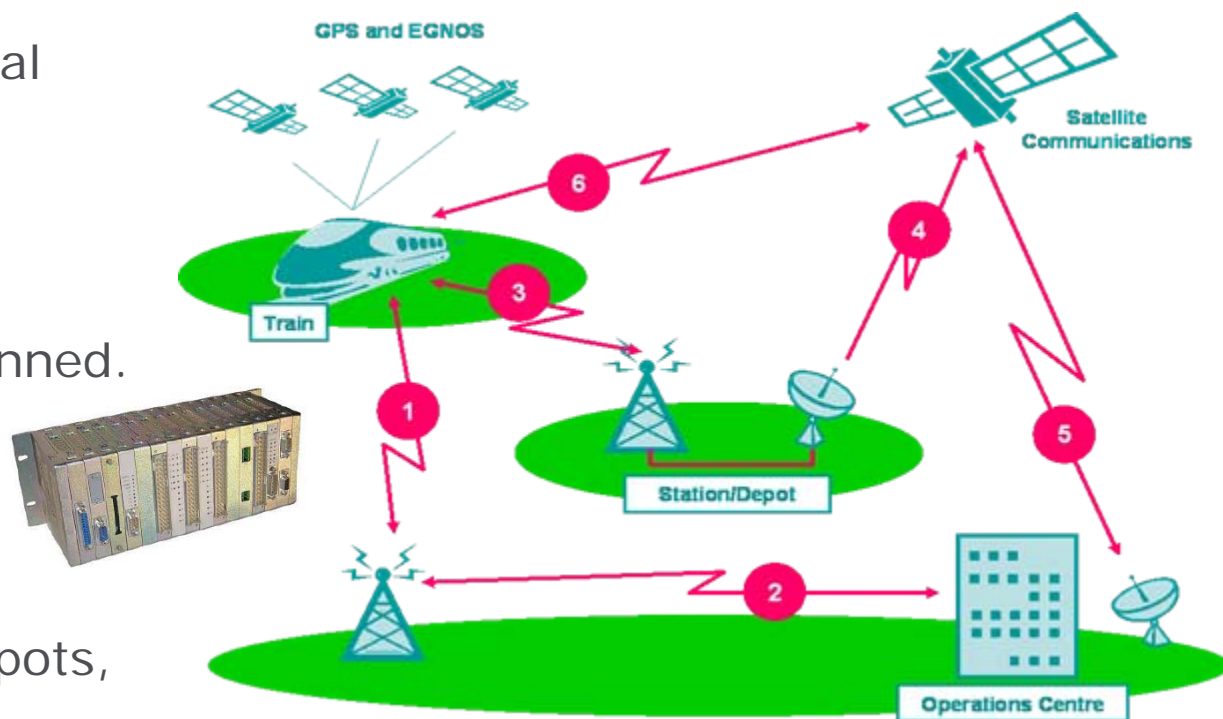


## Feasibility Study results

The TITAN system has been developed and extensively demonstrated on both a rural and a high speed train.

Tracking via GPS, GLONASS, EGNOS. INS integration planned.

Seamless communication integrating GPRS, 3G and SatCom. At stations and depots, Wifi is also used for video download.

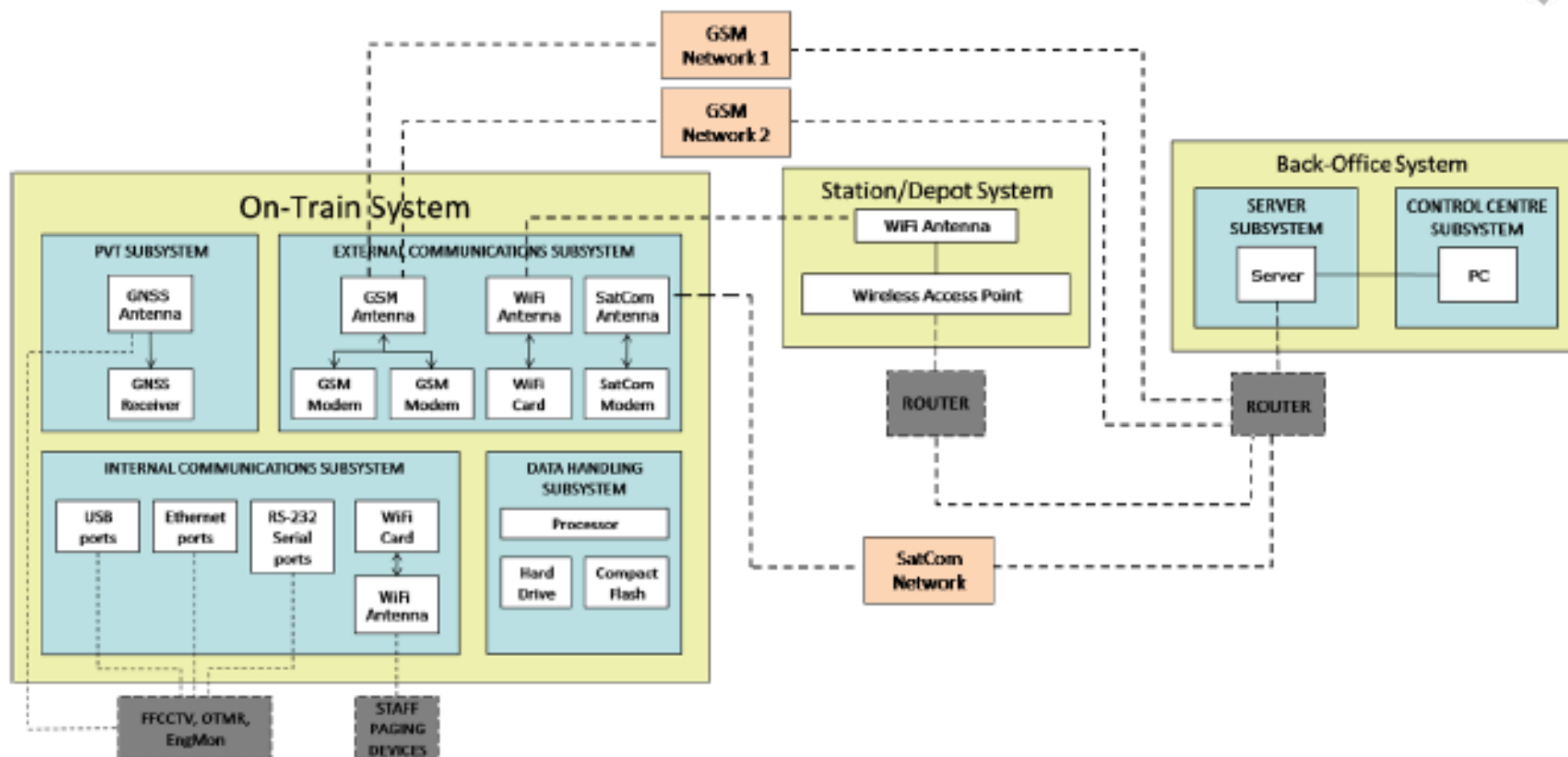




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## Feasibility Study results



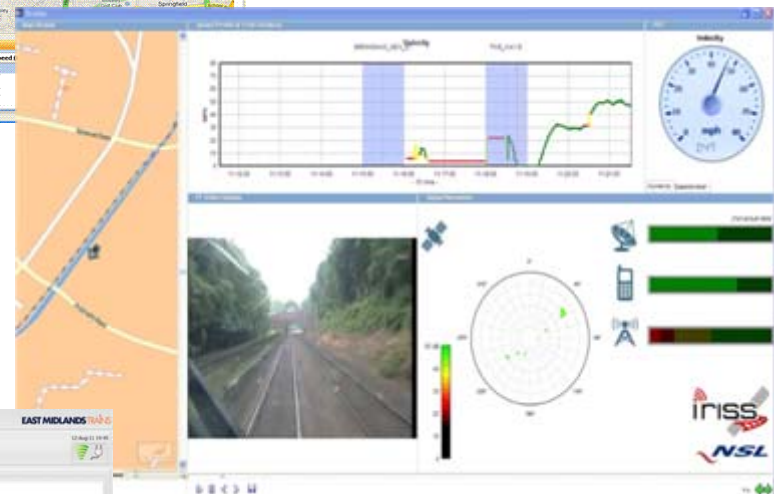
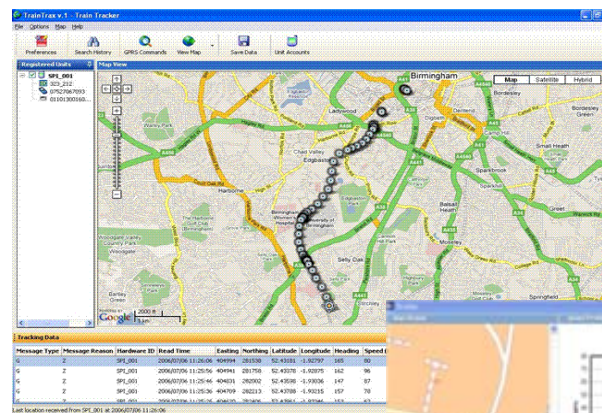
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## Feasibility Study results

Via a control center and a webserver, the user receives train monitoring, tracking and communication services:

- Train metering and monitoring download
- CCTV download, image extraction
- Train tracking & geofence alerting
- Driver training/energy management using trip replay service (OCULUS)
- Paging/messaging to train staff
- GNSS tagging of train data



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## Proof of Concept

