Intelligent Transport Systems and Services - Innovation Platform (ITSS IP)

Now and the Future: Type 1 and Type 2 TDP-related projects

Rachel Jelly
What is an Innovation Platform?

• A new approach to stimulating innovation
• A focused way of working on a specific issue
• It addresses a major policy and societal challenge, by...
  – understanding how Government plans to use regulation and procurement to address the challenge
  – engaging with business and the research community to identify appropriate responses and development needs
  – supporting programmes to deliver innovative solutions
What are the current ones?

• **Pilots** (launched 11/2005)
  – Intelligent Transport Systems and Services
  – Network Security

• **Phase II** (launched 09/2007, 11/2007 and 05/2008)
  – Low Carbon Vehicles
  – Assisted Living
  – Low Impact Buildings

• **Phase III**
  – Under construction
ITSS IP our history

• The ITSS IP was launched by the DTI as a pilot Innovation Platform alongside the Network Security Innovation Platform in November 2005.

• In response to the Rod Eddington Transport Study, which places an economic value on congestion and makes predictions on the projected costs to business as congestion increases.
Current response / activity

- First Intervention was: Future Intelligent Transport Projects (FITS)
- 3 projects – the concepts came via an "ideas factory" or sandpit.
- The projects under this challenge are co-funded by DfT and EPSRC.
Current response / activity

- Second intervention was: Time Distance Place – held in Summer of 2007.
- Focused on road charging
- Format was a more conventional call process
- Split into two parts:
  - Type 1 – Sub-system & technology (component)
  - Type 2 – Road user and/or Telematics service providers (end to end system).
Innovation Platform : ITSS Projects

• Results were 6 successful Type 1 projects and 4 successful Type 2 projects.
• Type 1 - £2.95 million in Grant funding, total projects value of £6 million
• Type 2 - £2.2 million in Grant funding, total projects value of £4.7 million
Type 1

Sub-system & technology (component)
TDP: Type 1 Projects – ANPR camera project

- Project: ANPR Camera project
- Led by PIPS Technology Ltd.
- Aims to integrate York University's advanced image recognition capabilities into the PIPS camera technology.
- Object is to make additional metrics available for road user charging.
TDP : Type 1 Projects – Trusted Driver

• Project : The Trusted Driver Model for Privacy and Accountability of TDP Road Pricing.
• Led by : Kizoom Ltd
• Project addresses the problem of privacy by ensuring that location data and identity are linked only within the vehicle's on-board telematics unit
TDP : Type 1 Projects – Trusted Driver

• Ideally and RUC scheme needs to be able to charge for specific route usage at specific times. However tracking the locations of vehicles to do this raises key issues of privacy
• The Government is well aware that addressing the privacy issue is of paramount importance if a national road pricing scheme is to be acceptable to the public.
• Charge records which contain both location data and vehicle ID inherently allows the movements of motorists to be reconstructed.
TDP: Type 1 Projects – Trusted Driver

• The Trusted Driver Project makes the system private.
• The approach adopted by the "Trusted Driver" project preserves privacy by ensuring that location data and identity are linked only within the vehicle's on-board telematics unit (OBU).
• The OBU communicates with two separate servers, in different transactions.
TDP : Type 1 Projects – Trusted Driver

• The Trusted Driver consortium is keen to offer its technology to RUSP and Compliance providers.
• The web service architecture means makes it possible to integrate the Trusted Driver technology easily into other TDP Demonstrations
• Trusted Driver Program provides the solution to the privacy problem that will otherwise make TDP road pricing politically impossible.
TDP : Type 1 Projects – TRU EP

- Project: Trusted Road Usage & Emissions Profiling (TRU EP)
- Led by Trakm8 Ltd
- To expand Trakm8’s current in-use fleet management "Road User Service Provider" system to provide a suite of services bundled into an efficient low cost in-vehicle device.
TDP: Type 1 Projects – TRU EP

- Trakm8 believe congestion charging will only be successfully sold to the British public if it can be sold on its benefits to the road user.
- TRUEP is project which is focused primarily on developing on-board vehicle units (OBU’s) which drivers and fleet users will accept.
- The on board unit will be able to host a suite of services such as emissions and fuel monitoring, location, driver feedback and fleet management services.
TDP : Type 1 Projects – Integrated Mapping

• Project : Integrated mapping systems to underpin road pricing by zones / location / time bands / vehicle type
• Led by ESRI Ltd (Aylesbury)
• An effective road user charging process relies on the aggregation of large quantities of geocoded data covering the road network and vehicle positions.
TDP: Type 1 Projects – Integrated Mapping

• This project has established a baseline set of traffic management data.
• Identified the main geographic areas / time slots where road pricing / road charging may be considered as a option to improve traffic flow.
• Demonstrated support of a variety of viable pricing models in a rapid response / scalable systems architecture.
• Provided the core functionality to handle large data volumes.
TDP : Type 1 Projects – Integrated Mapping

• A journey planning tool with the ability to deliver a complete selection of high-quality routing alternatives
• Influenced by all the available historic and real-time data.
• **Limitations of the Traditional Routing approach**
  – Lacks wisdom
  – Doesn’t exploit “The Knowledge”

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Driving Innovation

Good Alternative Routes

- Not simply “minor” variations of “optimal” route
- Each route has its own special characteristics
  - Time, distance, fuel consumption, CO₂ emissions and cost
- Alternative Routes put you back in control

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Driving Innovation

Route Selection in an Enterprise

When you have to be there as quickly as possible regardless of cost, take the lowest congested route.

When you need to keep moving for security reasons, take the lowest congested route.

Need to reduce operating costs and cut CO2 emissions on every journey wherever possible.

Select routes according to your business priorities.

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TDP : Type 1 Projects - Occutek

- Project : Occutek
- Led by HW Communications Ltd
- Objective is to investigate and validate the use of mobile phones to verify declared vehicle occupancy levels, to promote ride sharing through occupancy related discounts to road user charging.
TDP : Type 1 Projects - Occutek

• The Occutek device within the vehicle detects the number of verified mobile phones which have approached and entered the vehicle.
• The driver confirms the occupancy level via the HMI in the vehicle.
• The OBU would transfer driver declared vehicle occupancy to the host computer.
• The verified levels would be then transmitted to the RUC Service provider for Stage 3 trial billing purposes.
TDP : Type 1 Projects - Occutek

OccuTek Applications:

• Road User Charging with high vehicle occupancy credits/discounts.
• Adaptive Traffic Management based upon Occupancy.
• Intelligent-Emergency Call
TDP : Type 1 Projects – 3RSE

- **Project:** 3GRSE
- **Led by:** telent Communications Ltd
- **To develop:** 3rd Generation Road Side Equipment using an innovative approach to platform software to enable TDP technologies utilising existing infrastructure.
- **Proposal is structured around:** a vehicle signature, image processing, and an ANPR system.
Type 2

Road user and/or Telematics service providers (end to end system).
TDP : Type 2 Projects - VEER

• Vincenzio in End to End road user charging schemes (VEER)
• Led by Avanti Communications Ltd
• Object is to demonstrate how an existing concept from Avanti involving communications satellites can be integrated in to an end to end road user charging scheme, with the emphasis on security, availability, and robustness of the system.
TDP : Type 2 Projects - VEER

• Phase 1 : Analysis of existing schemes & new initiatives, to ensure VEER is compatible.
• Phase 2 : VEER system demonstrator will show how the system can be integrated into an end to end RUC scheme
• Innovation is from the ability of low cost satellite systems to collect transaction information from multi-functional car mounted On Board Units.
TDP : Type 2 Projects - VEER

- Continuation project
- Designed to co-operate with future GALILEO,
- VEER project looks at how a satellite comms system can fit within an end to end RUC system
- Synergy with S-band services
- Design based on 3 satellites in Molniya orbits
Orbits for satellite communication
Technology Strategy Board
Driving Innovation

Elevation Angles
TDP : Type 2 Projects - BT

• BT Intelligent Transport Solutions, TDP development.
• Led by BT Plc
• Objective to develop Value Added Services based on assured Time, Distance, Place location technologies to benefit road users by providing costed options for journeys into urban areas.
TDP : Type 2 Projects - BT

• Combines real time information feeds with location information from a GPS ‘on board unit’
• The value in TDP data lies in BT’s ability to ‘mash’ this with many other real time information feeds,
Technology Strategy Board
Driving Innovation

Project schematic

<table>
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<tr>
<td>Route 3</td>
<td>25 mins</td>
<td>£3.50</td>
<td>green</td>
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Preferences
Journey plan

Alerts
Directions

Location
Congestion

Occupancy
Location time

Assurance

LDAT
Location & rules
TDP : Type 2 Projects - CEDAR

• CEDAR - Charging Electronically by Distance And Road
• Led by Thales Transport & Security Ltd
• Project is a technology trial of distance based road charging in Southern England. Aims to provide business with services which will improve transport logistics, congestion and pollution in a scalable, accurate and secure manner.
TDP : Type 2 Projects - CEDAR

• Provide assurance on charges
• Reduce costs of collection by reducing OBU & communication costs using the "thin client" approach.
• This will ensure maps in the Back Office will be kept up-to-date and do not need to be up-loaded.
TDP : Type 2 Projects – Consumer telematics

• Consumer telematics project
• Is satellite tracking the most cost effective way to provide TDP based road charging across the UK?
• Objective is to provide a bundle of products that provide real benefits in the areas of environmental awareness, safety, ancillary services and measurable financial benefits.
TDP: Type 2 Projects – Consumer telematics

- Consumer telematics will attempt to satisfy a wide range of needs.
- The bundle of features and services may provide consumers benefits in areas such as:
  - Environmental awareness
  - Safety
  - Motoring cost reduction
  - Entertainment
  - Social networking
  - Productivity
  - Improved navigation
  - Ancillary services
  - And be road user charging compatible
TDP: Type 2 Projects – Consumer telematics

- Project has been constructed in 3 phases:
  - consumer research
  - research, development, test and production
  - market trial
Innovation Platform: What next?

Intervention 3a

• Human behaviour is the key to the process
• Need to understand how we change human behaviour
• Understand the social science behind the decision making process
• How do we encourage people to make the right social, environmental and responsible travel choices?
Innovation Platform : What next? Intervention 3b

- Informed Personal Travel
- Currently open for EOI’s (Nov 10th until Dec 18th)
- Co-funded by ESRC & SEEDA total £11m
- Accelerating the right technology
  - Cost, quality, ease of use, accessible, second nature
- The stepping stone to behaviour change
  - Push technology boundaries
  - Encourage risk
- [www.innovateuk.org](http://www.innovateuk.org)