Towards integration of urban ITS and traffic management systems in Europe
Contents

Welcome by Reading Borough Council 02
What is POSSE? 03
What are Open Specifications and Standards? 04
What are the benefits of Open Specifications and Standards? 05
OCA’s Initiative 07
UTMC’s Initiative 08
How do I go about implementing Open Specifications and Standards? 09
How transferable are the lessons from POSSE—Views of the Transfer Sites 11
Project Partners 14
Welcome by Reading Borough Council

Welcome to our POSSE (Promotion of Open Specifications and Standards in Europe) brochure which is aimed at all those involved in ITS and traffic management, whether a traffic manager or systems supplier or regional or national government.

As we have learned through our experiences in POSSE, how to use and promote the development of Open Specifications and Standards can be a difficult concept to understand for those not already familiar with their use. However, we are very keen to ensure that this is not a barrier to their development and implementation across Europe.

We have found that the opportunity to exchange knowledge between project partners with a very wide range of ITS systems, experiences and challenges has been very beneficial to all parties. Not only has it benefited the transfer sites but has also given ideas to the good practice initiatives on how they could develop in the future.

I hope that you find that this brochure gives you a good introduction to Open Specifications and Standards and it leads you to want to find out more.

Simon Beasley
Network Manager
What is POSSE?

The POSSE project has undertaken a range of activities to facilitate the exchange and sharing of knowledge and experience on how to develop, implement and maintain Open Specifications and Standards for Intelligent Transport Systems (ITS) as applied to urban road traffic management.

POSSE has developed good practice guidelines covering the processes and considerations required for the definition and implementation of open ITS systems specifications and standards, drawing on lessons learnt and tips from two existing Open Specification frameworks, namely UTMC and OCIT/OTS.

ITS covers a wide range of systems and services and the communications between them which are available to the network manager. Examples can vary from traffic signal controllers, roadside variable message signs and CCTV through to open data services for real time data.

POSSE is a 3 year INTERREG IVC funded knowledge-transfer project which commenced in January 2012.
What are Open Specifications and Standards?

Open Specifications and Standards have no restrictions on which suppliers can use them in the development of their products, and have no restrictions on which purchasing bodies can use them in the procurement of their systems or services. This does not necessarily mean that they are free of any financial cost to use.

There are two principal ways in which these technical standards can be developed. One ("de jure") is through formal, statutory Standards Delivery Organisations (SDOs), operating nationally or internationally (eg CEN). This approach is robust but can be time-consuming. Another ("de facto") is through more informal processes, for example under the control of an industry association. This approach is less robust but may be quicker and cheaper. As the term "standard" is sometimes reserved for those published by SDOs, the phrase "Open Specification" is often used to cover the broader sense of de facto, industry-developed protocols.

POSSE technical partners make use of both. In the UK, the UTMC initiative has strong input from industry and can therefore make effective use of de facto standardisation. Within the German OTS-Initiative, the OCA involves mainly the public sector, and focuses more strongly on de jure standards.
What are the benefits of Open Specifications and Standards?

There are several reasons why it is not always easy to capture in numbers the benefits of adopting an open systems architecture, such as UTMC and OCIT/OTS:

• Due to their flexible nature, users can choose which ‘parts’ of UTMC and OCIT/OTS to adopt.
• The different contextual situation of the users (eg, systems deployed, skills available, resources, etc).
• The market situation (eg, culture of cooperation).

More qualitative benefits have nonetheless emerged over the years and these have been confirmed in the interviews undertaken for the POSSE ‘End user study’. Benefits accrue for the customer (ie, transport authority), the supplier (ie, industry), as well as the road user. But there are also challenges for all.

Promoting innovation

• Open systems can open up opportunities for the market to grow and for new players to enter the market with innovative products and new business areas.
• An open systems framework provides a simple structure for the addition of new technology.
• By working together, local authorities can create enough market pull to drive industry developments, which is not achievable alone, except in the case of very large authorities.

More efficient traffic operations

Open Specifications and Standards allow a better integration of ITS which enable:

• A more holistic view of the traffic situation,
• A greater use of automatic responses during key events (concerts, football matches etc),
• A better understanding of how systems work together and how to resolve problems as they occur (introduction of distributed systems, avoidance of traffic information silos, etc),
• Greater flexibility in terms of mixing and matching solutions.

Most users agree that the main rationale behind UTMC and OCIT/OTS of creating a mixed vendor environment and reducing costs have been beneficial. However, in addition they also point to a number of other benefits including: more efficient traffic operations, simplified procurement, improved customer supplier relations, and future proofing investments. These benefits are listed below, mainly from the perspective of the customer (traffic authority) except where stated. It should be highlighted that not all benefits have been experienced by both UTMC and OCIT/OTS. This is mainly due to the different starting points, driving forces and market culture behind the respective initiatives.

Liverpool—UTMC Strategies are able to implement automated responses to event management combining data from a number of sources, managing area wide signals in response to this and the provision of traveller information.

Cambridge—Automatic dissemination of traveller information via twitter and Facebook through UTMC is an example of innovation delivered by new companies entering the market due to open systems.
Cost reductions

The impact of adopting open standards has been measured in financial terms within the OCIT/OTS community. A reduction in the cost of buying traffic signals of up to 80% has been recorded in the beginning in recent years. Typical savings are up to around 40%.

- Within the UTMC community, savings on capital investments and annual revenue costs have been estimated as follows:
  - Capital investment saving per authority for establishment of the core regional UTMC system is in the region of 30%,
  - Ongoing annual revenue saving per authority for maintenance of a UTMC system of around 40%,
  - Potential staff saving for operations in the region of 1.5-3.5 persons.

Simplified and structured procurement

- The technical specifications are open and readily available for use in procurement, which can simplify greatly the tendering procedures.
- Tendering procedures are common to all; therefore, an authority can, with approval, use another authority’s specifications and tendering document.

Greater marketplace stability and investment safeguards

- Open interfaces support the future proofing of systems and overcome the risk of legacy systems for the traffic authorities.
- Integrating products into client systems is easier as well as upgrading existing compliant products.
- The risks in deployment and integration have lowered significantly for suppliers.

Better customer-supplier relationship

- Traffic managers know what is technically reasonable and available and can better articulate the solutions sought from industry.
- Industry has a better understanding of the traffic managers’ needs.
- Clarity of technical requirements helps dialogue between buyer and suppliers – they can talk the same language in procurement specifications.
OCA’s initiative

OCIT (Open Communication Interface for Traffic Control System(s)) and OTS (Open Traffic Systems) use Open Specifications and Standards to enable interoperability of traffic systems in a number of German, Austrian and Swiss towns and cities.

The OCIT initiative was launched in 1999 by traffic signal system suppliers to replace the Local Authority specific standards with a single, open industry standard. OTS (Open Traffic Systems - www.opentrafficsystems.org) was initiated by an association of local authorities to include the wider domain of traffic management in the urban, inter-urban as well as the interface with public transport. The resulting 2009 OTS Framework is the conceptual foundation for the introduction of open distributed system architectures in the traffic domain. The Framework consists of several components, which include a guideline and a process model for the maintenance of OTS, as well as a meta-model for the architecture of urban ITS.

One element of OTS is the OTS data model which covers the traffic signal control domain and is based on the results of the OCIT initiative. For traffic management requirements that go beyond traffic signal control, OTS incorporates the DATEX II data model and extends this where needed.

What has OCA gained from its involvement with POSSE?

Involvement in POSSE is part of OCA’s strategy to raise its international presence and awareness, to liaise with similar communities (UTMC, Polis) and to keep in touch with the European Commission.

Through POSSE, transfer sites (Klaipeda, Burgos, Pisa, La Spezia, NPRA, CDV/Brno) were able to learn from OCA’s experience in using Open Standards and Specifications (i.e. OCIT, OTS, DATEX II) within their traffic management architectures. OCA was also able to obtain feedback from POSSE, mainly in relation to the specific views and needs of transfer sites, which has been useful to enhance and improve the standards used and the accompanying documentation, i.e. OCA’s OTS Guidance, the Procurement Model (OCA Process Model) and the OTS-System Model considering new technology. Collecting and digesting this experience as well as facing upcoming issues, i.e. contribution to international C-ITS standards or promotion of urban interests on international standardisation level (CEN/ISO) with regard to smart parking and open data, is part of OCA’s future steps.

"In terms of connecting Munich’s traffic data content centre to different external traffic information platforms the authority puts their trust in the OTS-Guideline and its good step-by-step approach."
UTMC’s Initiative

The UTMC (Urban Traffic Management and Control) initiative was created explicitly in order to capture, generate and distribute good practice among highways authorities. The role of Open Standards quickly became the core of the initiative and has formed the basis for all UTMC work since 1997.

Prior to UTMC, traffic management systems in the UK were bespoke: designed and manufactured by each supplier to its private specification. As a result, transport authorities were "locked in" to their specific suppliers, for system maintenance, upgrade and replacement.

The primary tool of UTMC, therefore, is its open systems framework: a continually-evolving set of specifications for interfaces between different systems. Unlike typical standards activities, it focuses on achieving practical solutions for present challenges and tomorrow’s anticipated problems, rather than an idealised solution for all contexts. The UTMC Technical Specification is freely available from the UTMC website (www.utmc.uk.com).

It covers many different functions and technology, including traffic signal management, variable message signs, CCTV, car park guidance, air quality sensors, and automatic number plate recognition. The range is continually expanding, as new technology industries align with UTMC. UTMC are currently extending the air quality specification to include a wider range of vehicle emissions data, and the incorporation of weather sensor data.

What has UTMC gained from its involvement with POSSE?

UTMC has been a UK-focussed activity for almost twenty years and has evolved technical standards, processes and community based on this. Through POSSE we have learned that many - but not all - of these can be adapted for other European countries, but that local coordination is key to gaining support of cities, suppliers and Government policymakers. There are substantial opportunities for technical alignment, whether using formal CEN mechanisms like DATEX II or in a more informal way.

By working towards this, we will be able to help cities across Europe gain access to simpler, more efficient, and more cost-effective procurements of ITS.
How do I go about implementing Open Specifications and Standards?

- Define the policy needs
- Set out current and proposed architecture

I want to procure ITS using Open Standards and Specifications (OSS)

- Identify where OSS would meet the policy needs - The Problem
- Are there existing standards which can be adopted?
- Produce draft functional requirements (vision) for the ITS solutions to be implemented

Option 1
- Use internal skills to develop detailed OSS technical specification

Option 2
- Procure OSS technical specification

Option 3
- Pilot / Demonstrator—call on industry to lead
- Establish working group with industry / local authorities

Option 4
- Use internal detailed OSS technical specification

Are there existing standards which can be adopted?

Is there an existing standards body which I can work with? Eg. UTMC

Can I work with other authorities / regions? I.e. How OCA started

Can I work with my National / supranational bodies—policy makers?

Do I have the in house capability to lead the development of the OSS, and scale of market to ensure that suppliers will be able to deliver to the specification?
This flow chart gives a simple overview of the key steps in the development of and implementation of Open Specifications and Standards and the actors involved whether you are just thinking of adopting existing specifications and standards or considering developing new ones. The colour coding of activities denotes five key stages. Further information can be found in the POSSE Good Practice Guide and on-line.
How transferable are the lessons from POSSE? Views of the transfer sites

Klaipeda

Do you expect to use Open Specifications and Standards differently as a result of POSSE, and how?

“Participating in the POSSE project was a valuable experience for Klaipeda City. As a result 3 different Open Specifications and Standards scenarios were prepared one of which will be considered for further development and implementation.”

How portable do you think the OCA/UTMC experiences are?

“The portability greatly depends on the city’s capability to invest, as well as politicians support in the need of developing ITS.”

Burgos

Do you expect to use Open Specifications and Standards differently as a result of POSSE, and how?

“POSSE has helped Burgos raise the discussion on Open Specifications and Standards to a national level, and not just for ITS but also for other topics such as pollution, energy and the environment. The knowledge from the POSSE partners is now helping to inform a national implementation plan.”

How portable do you think the OCA/UTMC experiences are?

“OCA/UTMC has helped significantly in raising the agenda of Open Specifications and Standards at national level. This included a workshop where stakeholders were able to learn directly from UTMC and OCA experts on the benefits and processes of OSS. Currently Open Data is a key focus and as such the Implementation Plan will concentrate on this area, although lessons learnt from the POSSE project will inform future implementations in the field of standards and Open Specifications.”
Pisa

Do you expect to use Open Specifications and Standards differently as a result of POSSE, and how?

“POSSE has helped Pisa move from an awareness of Open Specifications and Standards to a change of policy with the intention to embed them into all future procurements. POSSE has given Pisa the chance to expand the horizon of the use of OSS and to start designing new mobility infrastructures in accordance with Open Standards.”

How portable do you think the OCA/UTMC experiences are?

“A key barrier to the portability of the OCA and UTMC experiences is current vendor-lock in with the existing systems suppliers and the lack of money in the Municipalities to make any real changes to these systems in the short to medium term.”

La Spezia

Do you expect to use Open Specifications and Standards differently as a result of POSSE, and how?

“POSSE has provided a lot of useful experience for La Spezia and it is La Spezia’s intention to fix guidelines for future ITS development that can be included in the next Sustainable Urban Mobility Plan.

La Spezia’s challenge, working with Pisa, will be to start a real Italian movement in Open Specifications and Standards, although POSSE’s national workshop was a good starting point.”

How portable do you think the OCA/UTMC experiences are?

“La Spezia see both approaches being feasible although an approach along the lines of UTMC is more likely to be relevant in Italy.

An important aspect to gaining political support, particularly at a national level will be to bring Open Data together with Open Specifications and Standards.”
NPRA

Do you expect to use Open Specifications and Standards differently as a result of POSSE, and how?

“NPRA does not expect to see any significant changes to how NPRA uses Open Specifications and standards as NPRA was already aware of Open Specifications and Standards prior to POSSE. However, the opportunity to share and discuss the common challenges faced by NPRA, UTMC and OCA through the project are helping to shape the future development in Norway.”

How portable do you think the OCA/UTMC experiences are?

“NPRA main lessons learnt from the exchange of experiences is that UTMC and OCA have very similar challenges and experiences in the development and use of OSS. NPRA experience has also shown that tendering processes based on OSS can reduce product costs up to 40-50%.”

CDV / Brno

Do you expect to use Open Specifications and Standards differently as a result of POSSE, and how?

“The POSSE project has enabled CDV to start national work on the promotion of Open Specifications and Standards and set up a special national working group providing evaluation of the two different approaches to Open Specifications.

This has resulted in the production of basic requirements for 16 ITS areas regarding the real use of the DATEX II protocol. It has also helped in the production of a detailed draft of a smart on street parking standard, based on the OSS philosophy.”

How portable do you think the OCA/UTMC experiences are?

“The Czech market is very different to that of western Europe and hence some elements are transferable and others are not. For the Czech market UTMC is seen as too open and not prescriptive enough whereas the OCA OCIT model is seen as too prescriptive and hence the emerging OSS will take lessons from both.”
Project Partners

**Lead Partner** - Reading is a town of approximately 260,000 located in the Thames Valley to the west of London. It is a focus for high tech industry and has good transport connections. Reading was one of the 4 UTMC demonstrator sites in the UK and Simon Beasley (Network Manager) is also chair of the UTMC Development Group (UDG).

**Transfer Site** - Klaipeda Passenger Transport was established on 27 March 2003 by the Council of Klaipeda City. A resolution has been adopted in line with the main task of producing the strategic development plan of Klaipeda city. The main objective is to provide the community with a high quality service of passenger transportation taking into account social aspects.

**Transfer Site** - Burgos is city in the north of Spain with a population of approximately 175,000. Burgos has good sustainable urban mobility policies with only 27% of trips to the City Centre by car. Burgos is actively involved in a number of innovative projects and has a high profile at a national level through active engagement.

**Transfer Site** - The mobility department of La Spezia Municipality has the full responsibility of all the main urban transport developments. It has a strong programme of ITS developments and it has an aim to become a ‘living lab’ for the new ITS generation including concepts such as ‘cooperative systems’.

**Transfer Site** - Pisamo Spa is the leading urban authority of Pisa for traffic management and policies. A Smart City Plan integrates into a coherent framework all relevant projects, plans and regulatory instruments along four axes - city of quality of life; city of knowledge; accessible city; sustainable city.

**Transfer site** - Centrum Dopravního Výzkumu, v.v.i (CDV) is the Czech Ministry of Transport research centre. The Centre is responsible for undertaking research and development activities, deliver projects and services for the Ministry of Transport, as well as providing expert advice to both public authorities and commercial organisations.

**Project Dissemination Partner** - Polis is a network of European cities and regions working together for innovative transport solutions. Polis fosters cooperation and partnerships across Europe with the aim of making transport research and innovation accessible to cities and regions.

**Good Practice Partner** - UTMC is a UK-based initiative which has developed an open technical framework for traffic and transport management systems. It is managed by a publicly-owned, non-profit company, UTMC Ltd, and driven by a community group (the "UTMC Development Group", UDG) which represents local and national highways authorities, systems suppliers, and central Government.

**Good Practice Partner** - OCA is a voluntary organisation of local authorities from Germany, Austria and Switzerland with the aim of promoting the use of Open Specifications and Standards for public procurements. It is responsible for the harmonisation in the use of standards including the OCA developed OCIT and facilitating the development of new standards (OTS).

**Transfer Site** - The Norwegian Public Roads Administration (NPRA) is responsible for the planning, construction and operation of the national and major urban road networks including information services and all traffic management. Management of the national legal framework and recommendations for road transport are also the responsibilities of NPRA.
Contact

Simon Beasley
Network Manager,
Reading Borough Council
Simon.Beasley@Reading.gov.uk

Suzanne Hoadley
POLIS
SHoadley@polisnetwork.eu

For more information go to the POSSE website at:
www.posse-openITS.eu