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Advanced search go

sections

- Log in / Register
- News
- Industry Index
- Events
- Feature articles
- Products
- Our latest Issue
- Press releases
- Marketing services
- Subscriptions
- About us
- Contact us
- Portal / Links



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16 September 2010

Sport setting

Maurizio Tomassini, Isis, and Monica Giannini, Pluservice, detail the STADIUM project, which is intended to provide those responsible for planning major international events with a blueprint for success

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STADIUM draws on three major international sporting events, which were deliberately chosen to allow the project's partners to study ITS's potential in both developed and developing countries. London's 2012 Olympic Games will develop visual scene analysis tools



STADIUM is a European Union (EU)-funded project, part of the Seventh Framework Programme. It started in May 2009 and involves partners from Europe (including Transport for London (TfL) and the London Olympics 2012 team), South Africa (host nation of the FIFA World Cup 2010) and India (host nation of the Commonwealth Games in October 2010).

Such events are very much aimed at a worldwide audience. Event managers have to deal with the mobility of VIPs, players and performers, huge influxes of visitors and large numbers of staff involved in event management and general logistics. Quite often, local ambitions and objectives (sustainability, a desired post-event legacy and so on) can dictate mobility management strategies. Finally, special consideration has to be given to ensuring adequate security.

Hosting a large event is both a major challenge and a great opportunity. It offers an occasion to improve both infrastructures and services in order to bring the host location to a higher level of efficiency beyond the event's and project duration. Challenges come from the exceptional rise of resource allocations in a limited time due to unexpected event-related impacts and attempts to coordinate out-of-the-ordinary and pre-existing transport systems.

Transport is always one of the most complicated, critical and sensitive aspects of large events. The exact level of complexity depends on the specific event. Summer Olympic Games are the most challenging due to the high numbers of participants, staff, press and spectators present over a limited period of time and at multiple venues across the same city. The Winter Olympics and Commonwealth Games, even if the lower number of disciplines significantly reduces the overall people involved, also present significant challenges. Football (soccer) events such as the World Cup and European Championship involve more cities in a country, each coping with a limited number of games over a longer period and, generally, in a single venue.

World Exhibitions are another type of event relevant for host cities. These are held every five years and last a minimum of six months. In such cases, the impact on the transport system is less acute, yet it still is a key element for overall success.

Most of the complexities derive from the obligations set by the relevant international bodies for the Local Organising Committee (LOC). LOCs are themselves large bodies; the team responsible for the Winter Olympics in Turin in 2006 had over 1,200 employees, while that responsible for the Summer Olympics in Athens in 2004 employed about 5,000 at its peak.

Transport divisions within LOCs have the complex mission of networking multiple venues with transport services dedicated to single client groups such as athletes, media, VIPs and staff. The ultimate objective of the STADIUM project is to provide LOCs with a set of implementation guidelines and specific tools, in particular for advanced information and communication technologies.

First steps

STADIUM implements a first step of technologies that can then be perpetuated beyond events' duration for the benefit of local citizens: dynamic traffic management systems and real-time traffic information for metropolitan areas; public transport (tracking and tracing, fleet management, demand-responsive transport, integrated ticketing and information, and other ITS applications); inner-city public transport services along major axes, with links to district hubs, modal interchange points and other centres; tools to optimise operational transport plans according to historic and real-time demand data; web-based systems to integrate public transport and traffic management operations and provide sources of data for delivery to mobile users; traveller services based on mobile communications for real-time traffic and public transport service information, mobile payment, special event information and booking; and fleet management mechanisms to ensure good practice in terms of safety and security.

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Diversity of characteristics

The three demonstration sites and related events (South Africa's Soccer World Cup 2010, India's Commonwealth Games 2010 and London's Olympics 2012) are characterised by a diverse range of features in terms of types of Local Public Transport (LPT), traffic supervision and management of extraordinary incidents. The partners in STADIUM were faced with different aspects in the management of the organisation and planning of smart applications to implement during the events.

South Africa

South Africa's transport system is based on the taxi industry which supports unorganised and inefficient public transport. Minibus taxis have become the transport mode used by about 70 per cent of passengers in South Africa. They are mainly used by lower-class/poor citizens who do not have access to private vehicles. Nevertheless, South African cities have serious traffic and pollution problems. The widely diffused use of minibus taxis, the lack of organisation, the competition in obtaining the highest number of passengers and the lack of rules on fleet maintenance are a national issue.

For the South African demo, it was necessary to consider the financial model of the taxi industry. Drivers do not receive public benefits for their mobility service and only derive income from passenger fees. That implies long working shifts and competition on routes with higher frequency. It is very common to see overcrowded minibus taxis proceeding at high speed in order to perform more trips, transporting a higher number of passengers (vehicles are often modified to carry more people), and honking to catch the attention of potential clients. Shifts, vehicle maintenance and areas of competence are neither regulated by law nor respected by common sense rules.

In such a context, the introduction of an ITS system imposing regulations (scheduling, routes, pick-up and drop-off points) becomes rather difficult as the system appears to be unsustainable and incompatible with drivers' and passengers' habits.

The gradual introduction of ITS systems into a portion of the taxi fleet to provide the basis for integration with the LPT systems was developed within STADIUM. The Demand-Responsive Transport (DRT) system generates partial vehicle scheduling and leaves the drivers 'free' at other times of the day. This allowed the gradual testing of a computer-based system, and comparison of the system efficiency and service quality on the same vehicles and with the same drivers at different times during the day (and without the support of the DRT system).

Delhi

Delhi's transportation system is strongly based on minivans; para-transit is responsible for more passenger kilometres than all other mass transit systems. However, the bus system will also play a large role during the Commonwealth Games. To ensure success, para-transit will remain the main backbone once streamlined and properly integrated with the bus network. In the latter, managed by the Delhi Transport Corporation, 200 buses have been equipped with onboard GPS localisation systems. The number of buses to be equipped with onboard GPS systems will grow substantially in the next two years. However, service planning and statistical analysis is not supported by significant ITS applications.

Taking into account how mass transit systems are presently organised as well as what ITS infrastructure is available to manage urban transport needs, the Delhi demonstration shall address primarily the planning of public transport services (particularly bus transport and its integration with feeder services consisting of auto rickshaws) and supervision of buses and feeder services (para-transit), interfacing with available GPS localisation systems for information to passengers, both before and during trips, using multimedia web-based applications and mobiles.

London

In the London demonstration, TfL proposes to develop visual scene analysis tools to support the monitoring of localised passenger and vehicle congestion and the propagation of congestion across and within multi-modal transport networks, in order to have elements deployed to a number of locations within a cross-section of the TfL transport system. The demonstrator system will tap into existing TfL camera networks to help monitor the level of occupancy (or congestion) of areas of interest across multiple networks and in a variety of situations.

The demonstrator concept and implementation will also support security requirements on station platforms, at bus stops and traffic intersections, on major pedestrian paths, road interchanges or within vehicles (train carriages, buses). 'Snapshot' from various cameras will be processed locally and measured against a zero-occupancy state for that location and the level of congestion calculated. Monitoring of congestion levels over a protracted period may illustrate trends, which may be used for network planning, staffing and safety measures during and after the event.

Final outcomes

The ultimate objective of this project is to provide local authorities responsible for transport in candidate cities with a set of guidelines and specific tools with which to implement the required traffic management system. Such a tool, or Handbook, will feature the functions of an interactive database as a decision support system at different stages of the decision, planning and implementation process.

The handbook will propose solutions, primarily geared to ITS applications, for the management of mobility during large events. The following process will lead to its production: architecture design (to coincide with web tool build-up); content development; and testing validation and contents integration.

The Handbook's content will be developed in several ways.

Analysis of past events, specifically UEFA 2000, SOG 2004, WOG 2006, FIFA 2006 and including UEFA 2008 and SOG 2008 will look at the organisational issues, the overall performances of the multi-layered transport system and assess supporting ITS applications. The review will be accompanied by a specific evaluation activity to derive a set of high-level indicators for benchmarking and target setting.

Analysis and formalisation of the requirements arising from the events that will occur during the project's lifetime will take place. For each of these events ITS applications will be designed, deployed and demonstrated, so as to test in real life the viability of such technologies in less-developed environments (South Africa and Delhi) and foster innovations in more advanced contexts (London).

The results of demonstrators will be evaluated, allowing benchmarking of the events and their overall indicators.

Content acquired by the previous actions and organised according to the Handbooks architecture will be designed to support future users in terms of knowing what to do but a fourth action will supply the detailed information needed to select, design, deploy, test and put into operation the most appropriate ITS applications.

The Handbook will be available as an online searchable web tool, as an integrated part of the STADIUM website. It will also be made available as a professionally edited and printed book, with 100 copies made available. By October 2010, a first draft (for internal use and not for public consumption) will be produced, while final publication is expected in 2012 after completion of the project's demonstration activities.
stadium-project.eu

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