EUROPEAN COMMISSION

DG RESEARCH

SEVENTH FRAMEWORK PROGRAMME

Theme 7 - Transport

Collaborative Project – Grant Agreement Number 234127

STADIUM

Smart Transport Applications Designed for large events with Impacts on Urban Mobility

D2.1 State-of-the-Art Report

Project Start Date and Duration	01 May 2009, 48 months
Deliverable no.	D2.1
Dissemination level	PU
Planned submission date	30-November 2009
Actual submission date	30 May 2011
Responsible organization	TfL with assistance from IMPACTS

Document Title: State of the Art Report				WP number: 2
Document History	**Version**	**Comments**	**Date**	**Authorized by**
	Version 0.1	Revised SOTA	23/05/11	IJ
	Version 0.2			
	Version 0.3			

Number of pages:	81
Number of annexes:	9

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Peer Rewiew	Partner	Date
Version 0.1	**ISIS**	**27/05/11**

Approval for delivery	ISIS	Date
Version 0.1	**Coordination**	**30/05/11**

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List of Abbreviations

Abbreviation	Explanation
AI	Artificial Intelligence
ATM	Asynchronous Transfer Mode
ANPR	Automatic Number Plate Recognition
CCTV	Closed-circuit television
CEP	Complex Event Processing
ESA	European Space Agency
EU	European Union
ICT	Information and Communication Technologies
ITS	Intelligent Transport Systems
IOC	International Olympic Committee
EDGE	Enhanced Data Rates for GSM Evolution
EDM	Enterprise Decision Management
FIFA	Fédération Internationale de Football Association
FOC	Freight Operating Companies
GIS	Geographic Information System
GPS	Global Positioning System
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
HTTP	Hypertext Transfer Protocol
IBOCS	Intelligent Bus Operation and Control System
INGRID	Integrated Incident Detection
IP	Internet Protocol
LAN	Local Area Network
LOCOG	London Organising Committee for Olympic Games
JTMS	Journey Time Measurement System
MPLS	Multiprotocol Label Switching
NFC	Near Field Communication

ODA	Olympic Delivery Agency
PT	Public Transport
PTM	Public Transport Management
PTMS	Public Transportation Management System
RFID	Radio Frequency Identification
SCOOT	Split Cycle and Offset Optimisation Technique
SEP	Simple Event Processing
SIM	Subscriber Identity Module
SMTP	Simple Mail Transfer Protocol
TCC	Traffic Control Centres
TCP	Transmission Control Protocol
TOC	Traffic Operation Centres
TMCC	Traffic Monitoring and Control Centre
UEFA	Union des Associations Européennes de Football
UITP	Union Internationale des Transports Publics
UTC	Urban Traffic Control
VMS	Variable Message Signs
VSA	Visual Scene Analysis

1. REFERENCE DOCUMENTS

The present document refers to the following STADIUM documents:

No	Document Title	Report No.	Published By
R1	Stadium Process Model	0-00-10(0)	TfL
R2	SOTA Event Characteristics	Annex 0-00-00(10TH)	TfL
R3	ITS Definition Paper	STAD-DEL-WP2-1800	TfL

2. ANNEXES

No	Document Title	Published By
1	2006 Winter Olympics Turin	TfL
2	2008 Summer Beijing Olympics	TfL
3	Event Characteristics	TfL
4	2006 Melbourne Commonwealth Games	TfL
5	2000 Belgium UEFA	TfL
6	UEFA 2008 Austria & Switzerland	TfL
7	Live 8 London, Paris, Rome, Philadelphia, Moscow and Canada	TfL
8	2006 FIFA World Cup Germany	TfL
9	2004 Summer Olympics Athens	TfL

3. EXECUTIVE SUMMARY

3.1. Context

The Stadium Project analyses the mobility management implications for the organisation and execution of large events, with a special focus on Intelligent Transport Systems (ITS). It includes both the state of the art aspects and the user needs analysis. The appraisal of the mobility requirements coming from the user needs of past, current and future large events provides the basic information needed for the organisation and implementation of the project activities.

3.2. This Report

The State-of-the-Art Report aims to provide a comprehensive review of the use of Intelligent Transport Systems (ITS) in supporting large events to date and to indicate the potential use of ITS in support of future large events.

The Report addresses all stages of the life cycle (from the requirements analysis all the way to post event evaluation) of both Events and Intelligent Transport Systems.

The main challenges experienced have been assessed (both at the level of individual ITS applications and for what concerns their integration in the overall transport system), as well as the measures adopted to overcome them and their consequences on the performances achieved.

Crucially, the analysis of requirements of past events supports other work packages that identify evaluation criteria ('indicators of performance') which will serve as the basis for the benchmarking activity and the appraisal of the use of ITS for current events.

3.3. Lessons Learnt

There are a few key messages which emerge from the study. These are:

- **Planning.** Plan well and start planning far enough in advance to achieve the goals, however lofty the goals may seem when they first start to take shape. Identify all the necessary roles and responsibilities and establish effective channels of communication between the bodies carrying out those tasks. Coordination efforts should not be underestimated and will continue to bear legacy benefits long after the event.

- **Slogans for communicating the strategy.** Use simple and clear slogans if you have a need to communicate ideas to large numbers of people. Remember that language is a major barrier and devise effective visual displays for signage, route guidance and way finding that is language independent (e.g. use colour coding and pictorial displays).

- **Public buy-in.** Achieving public support for a large event is essential. China was very successful in this for the Beijing Olympics. One would need to go deep into the countryside to find someone who did not have an awareness of or interest in this major national undertaking.

- **Resources.** Provide adequate resources for the project. About $40 billion dollars was invested in the Beijing Olympic Games by the Chinese. Great planners, architects, engineers, administrators and professionals of all types were brought in or consulted on all aspects of the Games.

- **Sufficiently developed infrastructure.** The lesson here is to ensure that there is sufficient infrastructure in place for there to be no lack of suitable facilities for whatever is to be accomplished. China provides an extreme example. Along with new railways, airports and roadways, the whole nation's plumbing system was reworked as part of the preparations for the Games. Entire river systems were altered with water, sewage and industrial wastewater pollution standards substantially upgraded.

- **Select appropriate ITS solutions.** For many events the creation of new ITS solutions will not be appropriate. Most major cities will have existing mobility platforms that offer the necessary support to those managing mobility at a large event. Events with a long lead time will offer an opportunity to extend the range of applications, or increase the scope of existing tools. Rarely will a new ITS solution be available *off the shelf,* as customisation to the character of the city will be needed, or to the specifications of existing systems it must link to.

3.4. Applicable Technologies

The SOTA research has been devoted to identification and assessment of applicable ITS technologies for mobility management at large events. The assessment of those systems presented here will help define a set of guidelines and specific tools that makes the optimal use of ITS a practical goal. The research addresses all stages of the life cycle (from the requirements analysis all the way to post event evaluation) of both *Events* and *Intelligent Transport Systems*.

Within the main body of the report consideration is given to:

- An analysis of local mobility management solutions including:
  - Transport Mobility Provision;
  - Ticketing Provision;
  - Information Provision; and
  - Command and Control.
- An analysis of existing guidelines for the management of mobility at large events as specified by such organisations as FIFA and IOC (in the case of football and the Olympics).
- The ITS implementation cycle.

Terminology

One of the most significant results of this research has been a distillation of the roles and responsibilities that combine to deliver a successful event. The importance of this should not be underestimated. There are two distinct communities to consider:

- The Event Community; and
- The Hosting Community.

Our focus is upon the needs of the Hosting Community as they bid to hold large events and subsequently plan the successful delivery of them. To clarify the boundaries of the main thrust of the Stadium Project, a 'Mobility' community has been identified within the 'Hosting' community.

Within each of these communities logical roles can be identified. Tasks from the Process Model can be assigned to these roles giving a very comprehensive definition of who is responsible for what in achieving good integration and co-ordination between the Event, its Hosting and the Mobility provided by the hosting city (the municipality).

The actual *municipal* mobility planning will be undertaken within the Mobility Community. The Municipal Mobility Coordinator must ensure that all Event mobility requirements are covered off either within the Event Community or within the Mobility Community in an integrated manner providing an interface between requirements and delivery. The role must, at a minimum, be aware of:

- Transit Co-ordination;
- Public Transport Provision;
- Traffic Control;
- Travel Experience co-ordination;
- Freight Transport Provision; and
- Private Transport Provision.

ITS and Event Lifecycle

The terms 'ITS' and 'Lifecycle' are used frequently within the STADIUM project in the context of the end to end process of Large Event Management. ITS applications that might be used by event hosting cities to manage mobility issues are diverse. Our research indicates that while there are some 'off the shelf' applications, much ITS functionality needs to be customised for integration into a host cities existing transport infrastructure.

The following areas of functionality can be identified:

- Automated Traffic Management;
- Transport Operations;
- Demand Management;
- Traveller Information;
- Fleet Management;
- Freight Management;
- Payment Collection;
- Situation Management; and
- In Vehicle Systems.

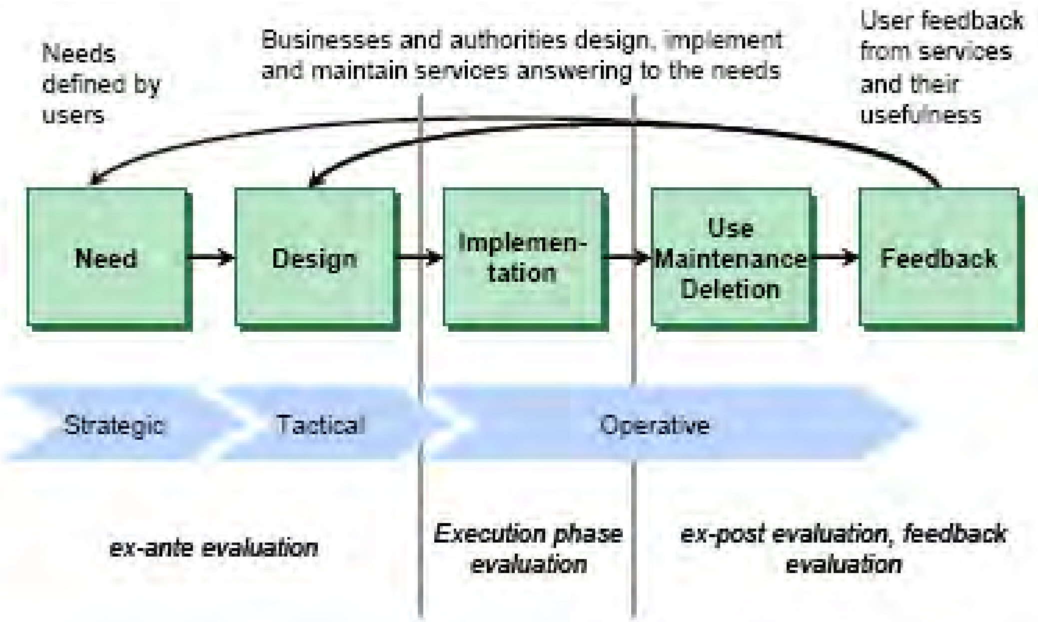
The above ITS functionality can be supported by and integrated with:

- Communications Systems;
- Ticket Systems;
- Booking Systems;
- Parking Systems; and
- Security Systems.

Many tasks within the Large Event Management Lifecycle must be undertaken with standard planning tools, standard operational systems and a lot of experience that will be shared through the STADIUM handbook. The Large Event Management Lifecycle is the overarching end to end process to be considered for each event. Conceptually the lifecycle of the event, its hosting and each ITS goes through the same phases:

- Control & Planning.
- Creation.
- Operation.

The STADIUM study takes into account all stages of the implementation lifecycle from requirements analysis to ex-post evaluation. This has been interpreted in Evaluation Methodologies as shown in the following diagram.



ITS Systems

Many forms of ITS technology have been used to manage the impact of events specifically on mobility. Within this research we concentrate on those systems that Host Cities can deploy and control. These include:

- Automated Traffic Management Systems – such as Urban Traffic Control for continuous monitoring of traffic conditions;
- Transport Operations Systems - for PT management and demand management;

- Traveller Information Systems – based where possible on real-time information delivered to the hosting community and the public;
- Road Usage Payment Collection Systems;
- Situation Management Systems – that automatically detect, classify, diagnose and resolve incidents;
- Parking Management Systems – so that where Park & Ride facilities are provided for the event analysis of occupancy data can be used to direct vehicles to appropriate Park & Ride facilities that are not yet full;
- Safety Systems – such as collision avoidance systems based on autonomous-vehicle, autonomous-infrastructure and cooperative communication systems that together potentially address the full set of incidents;
- Security Systems - including technology that helps control access (ticketing) or surveillance (camera technology);
- Ticketing and Access Systems – including recent advances in smart card, RFID and contactless tickets combining both event entry and public transport payment;
- Communication Systems - ICT tools can be used to find, explore, analyse, exchange and present information responsibly and without discrimination. These encompass a range of telecommunication media including telephones & mobiles, broadcast media, Internet and emails;
- Camera Technologies – in particular CCTV and ANPR for security, enforcement and traffic flow data for input to route guidance systems;
- Positioning System - a mainstay of transportation systems worldwide, providing navigation for aviation, ground, and maritime operations;
- Traffic Management Technology – a broad range of systems used in urban traffic management control that allows previously disparate data from multiple sources such as ANPR cameras, Variable-message sign, SCOOT Loops, car parks, traffic signals, air quality monitoring stations and meteorological data, to be amalgamated into a central console or database; and
- Visual Scene Analysis – to improve safety and security by providing decision support management capabilities.

3.5. Event Analysis

Most large events for which mobility management is a significant concern relate to sports (e.g. the football championships of FIFA and UEFA, or athletics events such as the Olympic Games). These events are a dominant factor because their large scale and regular frequency lends itself to the need for guidelines that cities might adopt to improve planning at future events. The study, however, has not constrained its investigation to sporting events, but has considered other events such as music concerts, political gatherings and Papal visits which are typically large scale short duration activities that nevertheless impact upon mobility in a host city.

It is important to understand that major events are global brands and that the owners of those brands impose strict conditions upon hosting cities across all aspects of event management and mobility considerations are amongst these. A host city, therefore, does not have a free hand in respect to mobility management for an event, but must abide by minimum standards and undertake to meet those at the bidding stage.

For pragmatic reasons our attention has to be concentrated on events where the time involved in the event lifecycle and the scale of the undertaking enable a city to react. Even by evaluating only a small number of these large events it is possible to identify examples of almost every currently utilised ITS application and to assess their relative merits and comment on the added value of using such systems; both as standalone and packaged solutions.

Amongst the main events studied are:

- UEFA football championship 2000 jointly hosted by Belgium & The Netherlands;
- Summer Olympic Games 2004 hosted by Athens;
- Live 8 2005 hosted in London, Paris, Rome, Philadelphia, Moscow and Canada;
- Commonwealth Games 2006 hosted by Melbourne;
- Winter Olympic Games 2006 hosted by Turin;
- UEFA football World Cup 2006 hosted in Germany;
- UEFA football championship 2008 jointly hosted by Austria & Switzerland; and
- Summer Olympic Games 2008 in Beijing.

To keep this report to a manageable size and make it easily accessible in a readable form further details on the assessment of individual events and technical functionality are contained in separate annexes.

To further develop the research and bring in aspects of ITS and mobility management being planned for future events the study will produce another report considering those events.

As a complementary exercise an initial assessment of event characteristics has also been performed as a part of this study and is documented in the SOTA Event Characteristics Annex.

Planning

The scope for planning mobility aspects of large events is very much dependent upon the lead time between bidding to host the event and its delivery. Where this extends over several years (as is the case with the Olympics and Football championships) cities have an ideal opportunity to consider adoption of new ITS solutions to enhance the perception of the event and to add value to the permanent infrastructure of the municipality.

Our research has defined a set of roles and responsibilities that need to be accommodated in the planning and delivery of events. Whilst some common elements exist between planning teams for the events studied it is not evident from our research that all cities have explicitly considered the full range of mobility planning roles and responsibilities identified earlier in this report in their management of past events. Guidance could be offered on this aspect in the STADIUM Handbook.

For all events a mobility plan is essential and where the event is multisite this might best be termed a National Mobility Plan to ensure it covers cross border flows and intercity movements. Coordination between agencies is imperative to deliver a successful mobility strategy and integration of ITS applications underpins that objective.

Examples of successful planning structures, roles and responsibilities are given in the main report. These have shown remarkable consistency of form over the years even though the sophistication of ITS solutions and mobility management platforms have increased.

Adoption of ITS in Major Events

Our research has found that in the vast majority of cases events do not create a specific need for new ITS technology; though they are an occasion where experimental ITS solutions might be trialled. More often major events require consideration of the arsenal of conventional ITS solutions already available to determine what additional measures might be introduced to optimise mobility during the event; and preferably maintain that improvement post the event. That is not to say ITS solutions can be plucked off the shelf and implemented as a plug and play tool. In every instance we see the solutions being customised to the specific needs of the host city, or type of event.

Mobility managers for large events do not start with a clean sheet on which to draft a wish list of ITS applications. They have sophisticated ITS applications already deployed to manage a cities transport network and will need to give consideration to enhancement of those systems; either in geographic coverage, or by filling gaps with new applications. A large event is the ideal opportunity for the planners to identify applications which can be justified in cost-benefit terms that might not otherwise become politically possible to implement; generating lasting legacy benefits for normal day-to-day mobility.

The increased adoption of ITS at events is clear to see as cities build on the greater availability of solutions and a more developed background deployment from normal operations. The sophistication of solutions has also increased offering future adopters more flexibility to integrate systems and coordinate mobility management. We have observed the evolution of ITS in the last decade and consider its growing application as technology solutions become more powerful and universally accessible through mobile communication devices. Based on these observations we are confident in predicting the role of ITS in future mobility plans will be a paramount factor in delivering successful events.

All events rely on appropriate operation centres that cover both transport infrastructure management and public transport operations. Experiences from all events studied support the fact that maximising the available capacity of the road and public transport networks is essential. Traffic management measures help to fulfil that objective for all modes, including pedestrians and for both public transport and private transport. Coordination of these interventions is achieved with effective with Traffic Operation Centres (TOC) and Traffic Control Centres (TCC).

Across all the events studied TCCs and TOCs have demonstrated their value. Enhancements and adaptations to these for an event are common. They demonstrate the value of using traffic count data from both infrastructure devices (road sensors, cameras, vehicle counters, occupation rates of parking areas, etc.) and vehicle based devices (e.g. GPS tracking) to improve route guidance; with variable message signs being added to filter and divert traffic to venues or Park & Ride sites.

In Geneva the GIS based application (AGIRE) for real time traffic management was given wider geographic coverage; specifically to meet the needs of the event, but with a lasting benefit for the city.

In Athens the Olympic Transport Operation Centre (OTOC) provided high level centralised transport command and control to facilitate global intervention for traffic and security functions. The games benefited from use of new technologies (upgrading the signalization system and traffic control centers, machine vision, variable message signs, etc.).

In Beijing a satellite GPS system linked to a network of cameras enabled the Traffic Management Bureau to issue daily traffic forecasts, guide drivers to their destination via electronic traffic signs, answer real-time traffic queries, and provide vehicle location services. The Beijing Traffic Management Bureau also implemented a further 10 intelligent traffic management systems to ensure road safety and the smooth flow of traffic during the Olympic Games. Post event evaluations document substantial improvements in air quality and traffic flows as a result of these measures.

In the same way that applications of ITS in Traffic Management Centres have improved the general operation of the highway network the public transport operations in cities benefit from deployment of intelligent operation centres. The Beijing Olympics offers a good example of how ITS can be deployed to manage and regulate bus operations both during an event and with lasting benefits thereafter. An Intelligent Bus Operation and Control System (IBOCS) was developed to provide a public transportation management system.

Rome offers another example of successful public transport operations with its automatic vehicle monitoring system (AVM) connected to a mobility management centre as a fundamental tool for the integrated management of urban mobility. The system offers: vehicles monitoring, the collection of service data, distribution of information to passengers, support to planning, organising, maintaining and operating the service. The Mobility Control Centre calculates the time of arrival of a bus at the bus station and transmits it to an electronic display that shows it in “real time”.

Coordination between host city management teams and transport operators (both within the city and the wider region/internationally) is critical to success. Collecting real time information on movements and transmitting it to all concerned in the chain of command and between modes aids optimisation of mobility.

In a drive to create “Greener” events, mobility managers have used of Park & Ride facilities in an attempt to increase public transport use and to keep private cars away from the Stadiums. Our study identified the benefits of these facilities and their application as a way of channelling rival spectator groups to and from Stadiums to support security actions. There is, however, evidence that planned provision of Park & Ride tends to be excessive. In Switzerland during the UEFA Championships in 2008 route guidance via VMS smoothed traffic flows, but all sites were underutilised. On average only 40% of the free temporary parking spaces provided for spectators at the outskirts of Geneva were filled.

A successful application of ITS at the Turin Winter Olympics in 2006 included a Park & Ride system that filtered traffic. Three parking areas were set up on the approach roads to cater for those travelling to the mountain events by private car. ‘Progressive’ filters were established to avoid congestion on the narrow mountain roads. These regulated car access to the Olympic resorts. When the car parks nearest the sites were full, a filter was activated and private cars directed to the ‘upstream’ parking area.

A key consideration in directing traffic to and between venues and to Park & Ride sites is the provision of language independent signage for drivers and pedestrians alike; a factor shown to be important at the UEFA 2000 Championships in Belgium and The Netherlands and further verified at UEFA 2008 in Austria/Switzerland. Information empowers the traveller. Dissemination of information about alternative mode choices, schedules, ticket prices and journey times should commence before the individual leaves their home with supportive internet sites and broadcast media announcements. Several cities have found route signage to venues can be colour coded and be linked to parking and spectator seating zones. Today this signage might utilise VMS, but static signs can still have legacy value decades after an event.

Walking and Cycling are becoming a factor in delivering sustainable transport for large events. With the growth in Fan Zones and Fan Villages large gatherings of spectators are generated that need to be managed with Wayfinding solutions, signage and bicycle parking or hire facilities. Berlin demonstrated the value of bicycle parking facilities and hire schemes at the 2008 World Cup. With the growing development of city cycle hire schemes that utilise ITS technologies to locate hire sites and the manage cycle distribution there is an increasing potential for this mode of transport to play a large role in future events.

Internet based information dissemination has been found to be important both pre-event and during the event to promote Public Transport use and to make visitors aware of mobility options. In Beijing the multi language website was especially useful. These types of journey planner system are common now and are relevant even for the short duration large events such as the multi city Live8 concerts in 2005 where other bespoke ITS solutions were inappropriate.

The sophisticated traveller information platform used during the Turin Winter Olympics provided real-time information on road traffic conditions, public transport, parking status and pollution levels. The information was distributed via the Internet and SMS (text messages).

Advances in technology are making information delivery to mobile devices a real option for mobility planners. Personal digital devices are a rapidly expanding option for host cities to disseminate information to visitors. In particular, the growth in web enabled mobile phones makes it possible to develop a service that can display maps of real-time traffic conditions superimposed on a road map. This was deployed in Beijing where the Olympic subway - Line 5 – was even fitted with wireless communication to ensure mobile coverage.

Not only can ITS help smooth awareness of mobility options for spectators it is increasingly becoming a practical solution to the problems of event and transport ticketing. In evaluation reports following the UEFA 2000 Championships in Belgium and The Netherlands public transport operators expressed a strong recommendation that travel be included in Stadium tickets at future events. Today this is a real option using ITS solutions based on Smart Cards, RFID chips, etc.

The great success story of the transport concept put in place the 2008 UEFA European Football Championship (Euro 2008) jointly hosted by Austria and Switzerland was the ticketing system. The “Kombiticket” made it possible for public transport to have an exceptionally high modal share of spectator travel, with public transport modal share of long distance travel on match days reaching 67% against the target of 60%.

Further advances in public transport contactless smart card ticketing systems are opening up the long held recommendation of host cities that event and transport tickets should be integrated. An example of the benefits of this technology was observed at the UEFA Champions League Final 2009 in Rome. For the first time in Rome the event ticket was integrated with the public transport ticket (chip-based smart card), providing spectators with a single media to access both the public transport system in Rome and the access to the Stadium: for security purposes related to the entrance at the Stadium, personal data were uploaded in the electronic ticket in advance, allowing smooth operations.

Earlier at the Turin Winter Olympics (2006) Smartcards and RFID had been used to great effect. Vehicles were for the first time equipped with an on-board unit and an electronic smartcard to pay for special lanes on the tolled motorway approach to the city. The same smart card was used to pay for both parking and public transport systems and gain access to Winter Olympic events.

Another field in which ITS applications are finding acceptance is for event security and surveillance. One of the main security issues at all events relates to the management of flows in the Stadium area; both traffic and pedestrian. The usual procedure is to separate the two supporters groups, in order to avoid any possible contact with zones defined that provide increasing levels of access limitations as spectators get closer to the Stadium.

Designated route networks for officials, athletes, etc. and access controls for vehicles further support security measures. ITS offers enforcement solutions to back up the route guidance provided.

ITS solutions based on CCTV, and Visual Scene Analysis (VSA) are emerging as a valuable means of enhancing these security processes, as is the integration of personal information into tickets and the combination of event and transport tickets. VSA in particular looks like a big step forward for future events with its capability to support decision making and to help identify potentially dangerous situations (e.g. overcrowding on platforms or waiting zones).

4. INTRODUCTION

4.1. Purpose and Scope

The overall aim of the Stadium project is to improve the performance of transport services and associated Intelligent Transport Systems (ITS) deployed by major cities when hosting large events. With this aim in mind the project was structured to initially:

- Gather information from past and current events on the utilisation of ITS;
- Compare and assess those ITS applications for suitability in future events; and
- Provide a state-of-the-art report on ITS which feeds into the design and development of a handbook for local authorities and organisations responsible for transport operation in major event candidate cities.

The objective of this report is, therefore, to document and appraise the use of Intelligent Transport Systems within the mobility aspects of large event management. The assessment of those systems presented here will help define a set of guidelines and specific tools that makes the optimal use of ITS a practical goal. The research addresses all stages of the life cycle (from the requirements analysis all the way to post event evaluation) of both *Events* and *Intelligent Transport Systems*.

To further develop the research and bring in aspects of ITS and mobility management being planned for future events the study will produce another report considering those events.

The scope of this report includes:

- An analysis of local mobility management solutions including:
  - Transport Mobility Provision;
  - Ticketing Provision;
  - Information Provision; and
  - Command and Control.
- An analysis of existing guidelines for the management of mobility at large events as specified by such organisations as FIFA and IOC (in the case of football and the Olympics).
- The ITS implementation cycle.

The study has not constrained its investigation to sporting events, though these are a dominant factor given their large scale and regular frequency which lends itself to the need for guidelines that cities might adopt to improve planning at future events. Amongst the main events studied are:

- UEFA football championship 2000 jointly hosted by Belgium & The Netherlands;
- UEFA football World Cup 2006 hosted in Germany;
- UEFA football championship 2008 jointly hosted by Austria & Switzerland;
- Summer Olympic Games 2004 hosted by Athens;
- Live 8 2005 hosted in London, Paris, Rome, Philadelphia, Moscow and Canada;
- Commonwealth Games 2006 hosted by Melbourne;

- Winter Olympic Games 2006 hosted by Turin; and
- Summer Olympic Games 2008 in Beijing.

To keep this report to a manageable size and make it easily accessible in a readable form further details on the assessment of individual events and technical functionality are contained in separate annexes.

4.2. Terminology

One of the most significant results of this research has been a distillation of the roles and responsibilities that combine to deliver a successful event. The importance of this should not be underestimated.

There are two distinct communities to consider:

- The Event Community; and
- The Hosting Community.

Our focus is upon the needs of the Hosting Community as they bid to hold large events and subsequently plan the successful delivery of them. In planning a large event the Hosting Community must respond to objectives, strategies and requirements defined by the Event Community. Unfortunately, Event Communities (those who hold the rights to the event e.g. FIFA, IOC, etc) are generally wanting in their acquittal of this responsibility and do not provide operational guidance to match the grand designs.

Much of the previous documentation in this arena, such as the UITP Checklist, is itself unclear about roles and responsibilities. While many of the responsibilities are identified they are not clearly associated with roles within communities, leaving the reader to deduce who should do what.

There are four other communities to consider:

- Participant Community;
- Sponsor Community;
- Media Community; and
- Third Party Suppliers.

Since the Participant, Sponsor, Media Communities and Third Party Suppliers are outside the terms of reference of the STADIUM project, their responsibilities are not considered in this section and no requirements have been collected in the Requirements Inventory.

To clarify the boundaries of the main thrust of the STADIUM Project, a ‘Mobility’ community has been identified within the ‘Hosting’ community.

Within each of these communities logical roles can be identified. Tasks from the Process Model can be assigned to these roles giving a very comprehensive definition of who is responsible for what in achieving good integration and co-ordination between the Event, its Hosting and the Mobility provided by the hosting city (the municipality).

Excluding third party suppliers the roles and processes conducted by these communities can be visualised in a simple event process flow diagram.

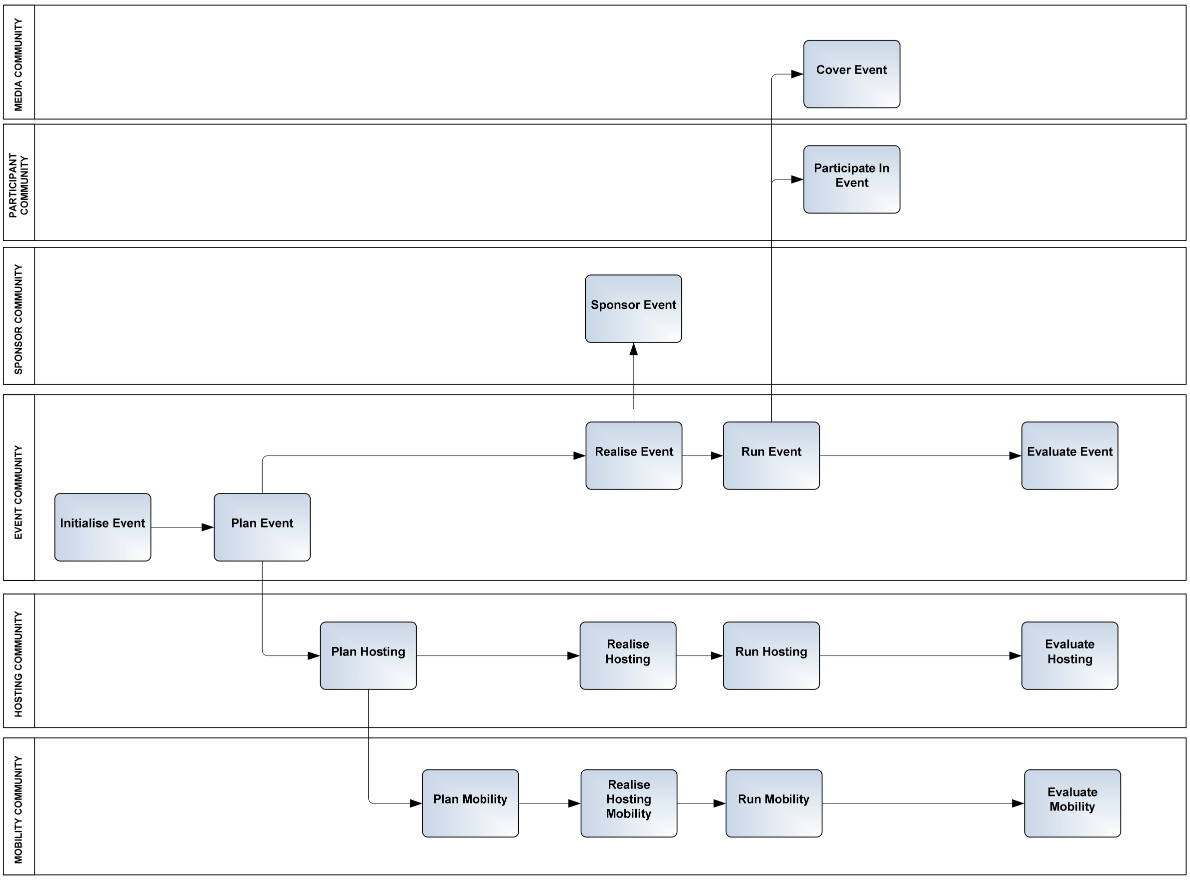


Figure 4.1 Roles and Processes

The Host Community is concerned with the impact of the event on the municipality and the supporting activities required of the municipality to 'get the show on the road'. This role requires a lot of co-ordinating activities. We have identified several components of that community:

- Hosting Coordinator;
- Municipal Controller;
- Municipal Service Provider;
- Hosting Evaluator; and
- Hosting Developer.

The Hosting Coordinator and the Municipal Controller roles are pivotal in ensuring that all aspects of the large event are integrated and run seamlessly. Liaison between those fulfilling the tasks is essential.

The Hosting Coordinator role overseas several activity areas that in practice will be fulfilled by a team comprising:

- Municipal Mobility Coordinator;
- Municipal Information Coordinator;
- Municipal Security Coordinator;
- Municipal Safety Coordinator;
- Municipal Health Coordinator;
- Municipal Situation Coordinator;
- Municipal Environment Coordinator;
- Municipal Finance Coordinator;
- Municipal Operations Coordinator;
- Municipal Customer Services Coordinator.

The actual *municipal* mobility planning will be undertaken within the Mobility Community, but it is the responsibility of the Municipal Mobility Coordinator to ensure that all Event mobility requirements are covered off either within the Event Community or within the Mobility Community. It is then the responsibility of the Municipal Mobility Coordinator to ensure that the event and municipal mobility functionality is integrated. The role must, at a minimum, be aware of:

- Transit Co-ordination;
- Public Transport Provision;
- Traffic Control;
- Travel Experience co-ordination;
- Freight Transport Provision; and
- Private Transport Provision.

Transit Coordination must embrace a consideration of all transit modes (Road, Rail, Water and Air) and it may be worth considering 'Pedestrians & Cyclists' as separate modes to ensure that their requirements are adequately catered for.

Within the host city organisation a Mobility Coordinator will provide an interface between requirements and delivery. Depending on the scale of the undertaking this could be a single person or a whole team or, as in London, a whole organisation.[1] The role encompasses:

- Mobility Traffic Coordinator;
- Mobility Ticketing Coordinator;
- Mobility Route Coordinator;
- Mobility Situation Coordinator;
- Mobility Information Coordinator;
- Mobility Operations Coordinator;
- Mobility Finance Coordinator;
- Mobility Security Coordinator;
- Mobility Safety Coordinator; and
- Mobility Technology Coordinator.

[1] Transport For London (TfL)

ITS and Event Lifecycle

The terms 'ITS' and 'Lifecycle' are used frequently within the STADIUM project. Before embarking upon the results of this study these terms must be clearly understood and their usage must be understood in the context of the end to end process of Large Event Management.

ITS applications that might be used by event hosting cities to manage mobility issues are diverse. Our research indicates that while there are some 'off the shelf' applications, much ITS functionality needs to be customised for integration into a host cities existing transport infrastructure.

The following areas of functionality can be identified:

- Automated Traffic Management;
- Transport Operations;
- Demand Management;
- Traveller Information;
- Fleet Management;
- Freight Management;
- Payment Collection;
- Situation Management; and
- In Vehicle Systems.

The above ITS functionality can be supported by and integrated with:

- Communications Systems;
- Ticket Systems;
- Booking Systems;
- Parking Systems; and
- Security Systems.

An overview of the relevance, functionality and technical capabilities of ITS is considered in Chapter 5 followed in Chapter 6 with a review of the application of these ITS systems at major events where we examine the extent to which those planning and delivering the events have found such tools to be useful.

The Lifecycle of an event (including the event itself, the hosting of the event and the design & build of ITS) is defined in the STADIUM Process Model [Ref R1]. This provides a comprehensive conceptual view of the Large Event Management Process identifying Roles and Responsibilities, Dependencies and Conditionality and details of tasks. Some tasks may seem to be duplicated, but owing to the lack of transport integration in most cities transport needs to be considered 'by mode' to ensure that any modes are not inadvertently omitted from the plans.

It should be clearly understood that one or more Intelligent Transport Systems cannot cover the entire requirements of managing a large event. Many tasks within the Large Event Management Lifecycle must be undertaken with standard planning tools, standard operational systems and a lot of experience that will be shared through the STADIUM handbook.

The Large Event Management Lifecycle is the overarching end to end process to be considered for each event. The ITS Development Lifecycle is twofold:

- The Development Lifecycle for each individual ITS; and
- The Development Lifecycle for the integrated ITS Components for a specific event.

Conceptually the lifecycle of the event, its hosting and each ITS goes through the same phases:

- Control & Planning.
- Creation.
- Operation.

The planning phase incorporates the function of Control which before, during & after operations manages the evaluation of the success of the undertaking.

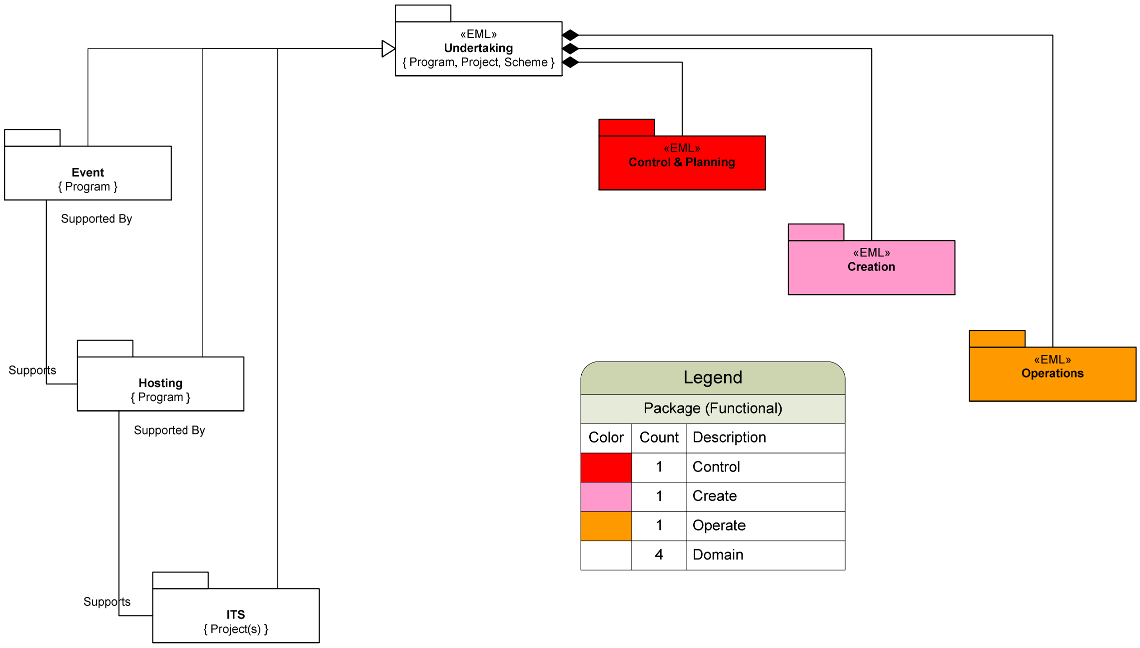


Figure 4.2 Lifecycles

When the lifecycle is expanded to show the functionality contained within each phase a rudimentary methodology for realising the lifecycle is created:

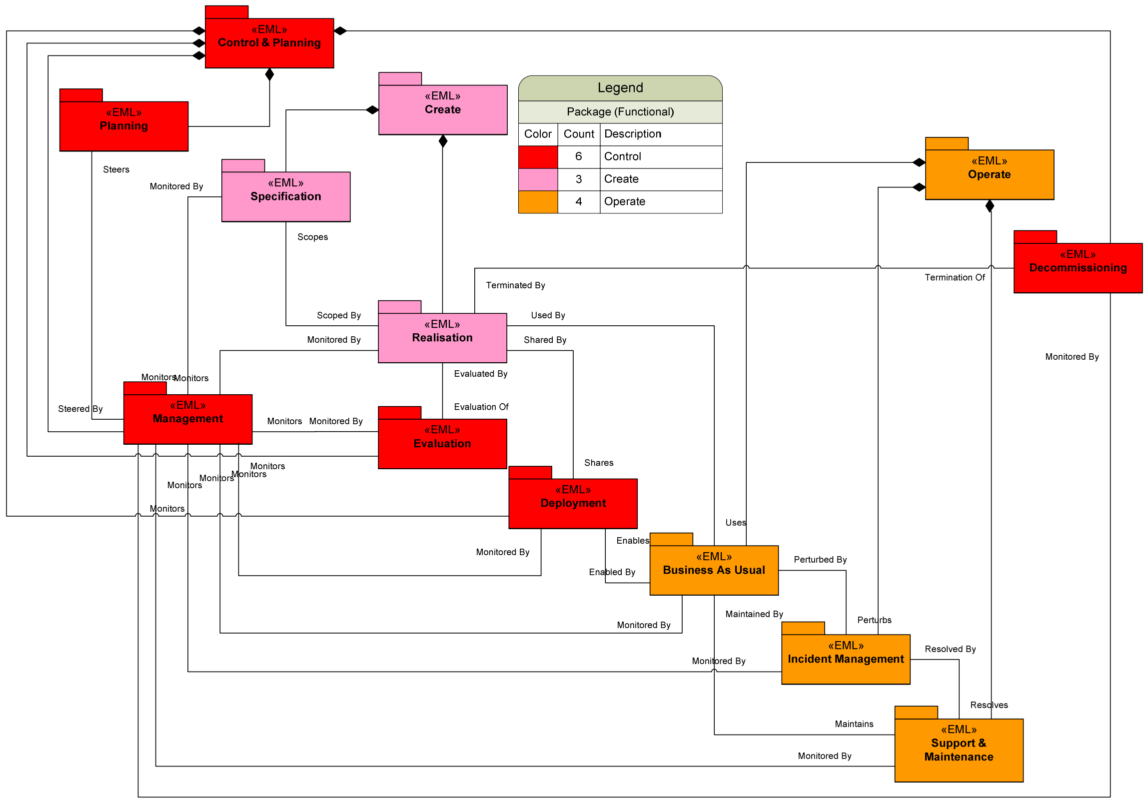


Figure 4.3 Methodology

The Development Lifecycle for a single ITS is identical, at the highest level, with any system development lifecycle, and can be viewed as an extension of the generic lifecycle.

a) Planning

- Initialisation

b) Creation

- Requirements Gathering
- Analysis & Design
- Build & Test

c) Control

- Deployment
- Evaluation

d) Operations

- Business As Usual
- Maintenance
- Incident Management

There are some similarities between this lifecycle and the individual ITS lifecycle but the objectives are slightly different:

a) Planning

- Initialisation (Within the Large Event Management Project)

b) Creation

- Requirements Gathering (For overall ITS Usage)
- Analysis & Design (For the Integration)
- Integration & Test

c) Control

- Deployment
- Evaluation

d) Operations

- Business As Usual
- Maintenance
- Incident Management

The STADIUM study takes into account all stages of the implementation lifecycle from requirements analysis to ex-post evaluation. This has been interpreted in Evaluation Methodologies as shown in the following diagram:

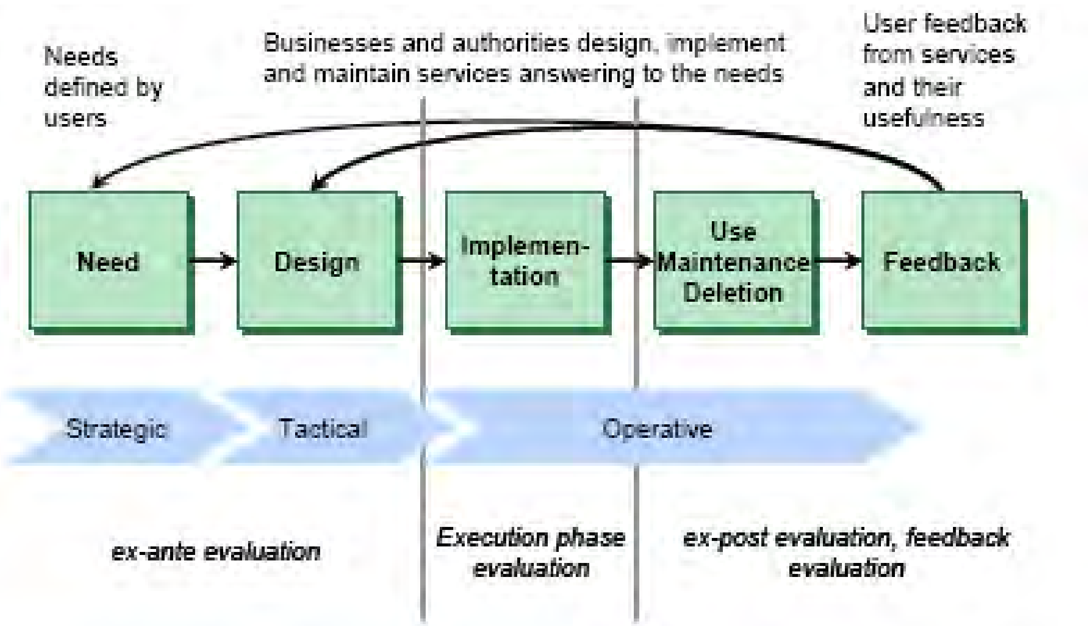


Figure 4.4 ITS Development Lifecycle

Moving towards the Process Model the Lifecycle/Methodology can be interpreted as a set of tasks:

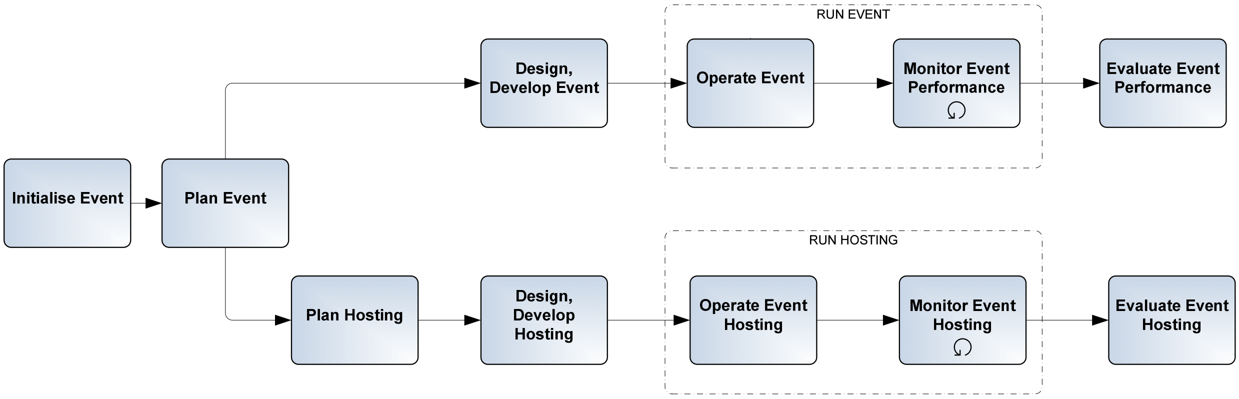


Figure 4.5 The Lifecycle Expressed as Process Tasks

This diagram shows that although the planning process starts with the Event Definition and Event Planning the activity then branches into two separate but linked streams, one for the Event Community and the programme of work required to realise the Event and the other for the Hosting Community and the realisation of all the many features (including Mobility) that are required to support the Event. It will be noted that the evaluation of the Event and the Evaluation of the Hosting are separate activities. These separate activities each follow the same lifecycle/methodology but will be measuring different sets of benefits.

4.3. Challenges of Large Events

The scale of large international events creates numerous challenges associated with mobility management. They include:

- **Growth** - Any city that has a significant growth factor will be experiencing increased demand for transportation services. The balance between this, planned transport development and the demands of a large event will always be a serious challenge.
- **International Traffic** - As a by-product of growth, there are increased demands for international traffic resulting in a need for increased facilities for international transport arrivals and transport departures. This also has an impact on border policing. A Large Event with an international flavour will put extra pressure on both of these aspects of international traffic.
- **Freight Expansion** - Events generate venue specific freight traffic that can disrupt normal traffic flows. Therefore, the need for integrated transport planning becomes even more pressing.
- **Safety and Security** - With the increased transportation demands identified above, the potential for more accidents is an obvious corollary. The safety of visitors to the city during a large event is of paramount importance to the reputation

of the city. Coupled with this are concerns over security on the transport system which large events entail.

- **Pollution** - The increased volumes of traffic creates a potential for there to be increased levels of pollution from emissions and noise. A city with high levels of pollution will not be favoured in any bidding process for hosting a large event. Large events often stimulate the adoption of “Greener” transport through promotion of sustainable modes, increased use of public transport and travel demand management measures (which ITS can support) that achieve environmental benefits.

5. OVERVIEW OF ITS TECHNOLOGY APPLICABLE TO EVENTS

5.1. ITS Systems

Many forms of ITS technology have been used to manage the impact of events specifically on mobility. Within this research we concentrate on those systems that Host Cities can deploy and control. Categories of ITS that are not included cover:

- Fleet Management – *because this is under the control of Transport Operating Companies (TOCs)*;
- Freight Management - *because this is under the control of the Freight Operating Companies (FOCs);* and
- In Vehicle Systems - *because this is under the control of vehicle manufacturers.*

The remainder of this section provides an overview of the types of ITS and their areas of application.

5.1.1. Automated Traffic Management Systems

Urban Traffic Control (UTC)

Urban Traffic Control delivers continuous monitoring of traffic conditions and can implement a fully adaptive control strategy. The Traffic Signal plans (cycle length, offset and stages duration) can be dynamically optimised to minimise the overall travel time for private traffic and give priority to public transport. Places where multiple travel/transport modes intersect (such as Level Crossings) can be managed in the same way.

Most cities operate a UTC System that can deliver the above functionality.

Priority Management

Where dedicated event lanes and priority routing paths have been provided Priority Management can ensure the effective dynamic allocation and control of these features. Some aspects of priority management are administered by UTC and Public Transport Management (PMT). A need exists to co-ordinate all traffic prioritisations.

5.1.2. Transport Operations Systems

Public Transport Management

Public Transport Management improves the regularity of bus/tram/train services. It compares the actual position of PT vehicles with their planned schedule and can give priority at intersections to those behind schedule (and special priority vehicles).

Data gathered during this process can form the basis for some of the traveller information services and trip planning operations.

Demand Management Systems

Demand management has a very human focus in that controlling demand is a strategic issue supported by the appropriate information to publish the messages intended to change behaviours. However, it is wrong to say that Information systems are demand management systems.

Another system view of Demand Management is the control of traffic flow. In pure terms this is only controlling the demand for transport infrastructure space (such as road space) – it is not really controlling the demand for travel. The demand is still there but it is diverted or halted. This can cause its own problems. This aspect of ‘demand management’ is often implemented through dedicated lanes and through public transport improvement coupled with public awareness. Here again the lane management systems are really traffic management systems, not Demand Management Systems.

The ultimate Demand Management system is a Decision Management System that can trigger the other ITS systems to take action in response to a disruption, or flag up an issue for operator action.

5.1.3. Traveller Information Systems

Information Collection

As a by-product of, and as a necessary input to the ITS indicated above the collection of information (much of which needs to be ‘real-time’) is a significant consideration. Techniques using Global Positioning Satellite (GPS) and Visual Scene Analysis (VSA) are a powerful means of collecting much valuable information.

GPS is vital in the identification of vehicle location/proximity which feeds into PT Management and provides real-time service schedules for travellers which can be disseminated via Mobile Phones, VMS, Websites etc.

VSA can be used to monitor a variety of event aspects:

- Volume Monitoring;
- Availability Monitoring; and
- Activity Monitoring.

Volume monitoring for congestion and flow monitoring recording and analysing should be applied to both traffic and travellers. This area consists of:

- Flow Monitoring;
- Monitor Traffic Flow (Vehicles);
- Monitor Customer Activity;
- Congestion;
- Monitor Traffic Flow (Vehicles); and
- Monitor Customer Activity.

Availability monitoring covers:

- Vacant Unreserved Seating;
- Monitor Venue Coordination;
- Empty Parking Spaces;
- Monitor Movement Co-ordination;
- Taxis at a Taxi Rank; and
- Monitor Movement Co-ordination.

Information Dissemination

Dissemination channels fall into three ownership categories:

- *Hosting Community* – this includes the City's Public & Private Mobility Management and also the Event Management. VMS, fixed signage and printed publications technologies could be used and may be owned by the *municipality* or by the event.
- *Public Community* - Internet, radio and television technologies may be used. There is a slight conflict of definition here since the internet itself may be public, but websites exposed on the internet are *privately* owned. Event and transportation websites are the commonest mechanisms for sharing information during a Large Event (and at non event times as well).
- *Private Community* - this refers to the ownership of the device rather than the content. Mobile phone these days often have web access, so the situation described about websites is true of this category as well. However, the recipient does not need to be in front of a fixed PC. Nevertheless, mobiles phones can also receive dedicated SMS messages directly (on subscription) from the Event Organiser or the Mobility co-ordinator. Furthermore, dedicated applications can be provided for mobile phones (either downloaded or from the *application cloud*) to help the user navigate through all the available information. Sophisticated applications could also provide an 'Avatar' or 'Angel' as you personal guide.

5.1.4. Road Usage Payment Collection Systems

Enforcement is accomplished by a combination of a camera which takes a picture of the car and a radio frequency keyed computer which searches for a driver's window/bumper mounted transponder to verify and collect payment. The system sends a notice and fine to cars that pass through without having an active account or paying a toll.

Factors hindering full-speed electronic collection include significant non-participation, entailing lines in manual lanes and disorderly traffic patterns as the electronic- and manual- collection cars "sort themselves out" into their respective lanes; problems with pursuing toll evaders; need, in at least some current (barrier) systems, to confine vehicles in lanes, while interacting with the collection devices, and the dangers of high-speed collisions with the confinement structures; vehicle hazards to toll employees present in some electronic-collection areas; the fact that in some areas at some times, long lines form even to pass through the electronic-collection lanes; and costs and other issues raised when retrofitting existing toll collection facilities.

5.1.5. Situation Management Systems

Situation Management Systems must be able to support all stages of situation resolution:

- Situation detection and recording;
- Classification and initial support;
- Investigation and diagnosis;
- Resolution and recovery;
- Situation closure.

Situation detection can be automated using equipment monitoring systems that can detect when an equipment failure has or is likely to lead to a transport situation. Detection can also be automated using Visual Scene Analysis systems that can identify activities or behaviours that are likely to lead to a transport situation.

Classification can be partly automated by the definition of business rules applied to the activities that are recorded either automatically or manually. However, there is likely to be a high degree of human intervention. Automated classification and diagnosis can be achieved through Enterprise Decision Management (EDM) technology, but the effectiveness of this is governed by the business rules encapsulated within the system.

Classification & analysis (Investigation and diagnosis) can be speeded up by the use of Complex Event Processing technology, but as with EDM this is dependent upon the event analysis that feeds the business rules.

Resolution and recovery is twofold:

- Resolve the Episode;
- Resolve the Situation.

The Episode is the cause and the Situation is the effect. Neither of these resolutions can be totally automated. However, in both sets of resolution information to staff and information to travellers is paramount. This can be automated. The resolution to the situation usually precedes the solution to the episode and once the episode is resolved the resolution to the situation usually needs to be rolled back to allow situation closure.

5.2. Other Systems

5.2.1. Parking and Enforcement Systems

Parking Management

Parking Control monitors the use of parking areas, calculates occupancy forecasts and can provide an advance booking service. Current and forecast occupancy data can be included in information dissemination.

Where Park & Ride facilities have been provided for the event analysis the this data can help in the direction of vehicles to appropriate Park & Ride facilities that are not yet full.

Enforcement

Whilst maybe not a *positive* aspect of ITS to ensure that the provisions delivered are not abused, violations need appropriate penalties. Through the use of collected data the Penalty Charge Notices (PCNs) for such penalties can be administered automatically.

- Red Light Enforcement;
- Bus Lane Enforcement;
- Automatic Speed Enforcement;
- Toll Collection;
- Congestion Pricing.

5.2.2. *Safety & Security Systems*

Health

From a technological perspective it is possible to acquire meteorological and environmental data from detection stations and process it, together with traffic-related data and vehicle emission estimates from the UTC system. It is then possible to calculate forecasts of air pollution for the short and medium terms. The forecasts can be used for the calculation of situation strategies.

Road Safety

Intersection collision avoidance systems can help save lives by preventing intersection related crashes. A combination of autonomous-vehicle, autonomous-infrastructure and cooperative communication systems can potentially address the full set of intersection crash problems.

Intersection collision avoidance systems use both vehicle-based and infrastructure-based technologies to help drivers approaching an intersection understand the state of activities within that intersection:

- Vehicle-based technologies and systems - *sensors, processors, and driver interfaces within each vehicle*
- Infrastructure-based technologies and systems - *roadside sensors and processors to detect vehicles and identify hazards and signal systems, messaging signs, and/or other interfaces to communicate various warnings to drivers*
- Communications systems - *dedicated short-range communications (DSRC) to communicate warnings and data between the infrastructure and equipped vehicles.*

Security

Security activities that can be supported by technology fall into two main categories:

- Access - *Ticket/pass technology*
- Surveillance - *camera technology*

5.2.3. *Ticketing and Access Systems*

Access Management

Access to vehicles and venues is often via some sort of ticket or pass. There are now many advanced technologies to facilitate the use of a single 'smart' ticket to provide access to multiple venues and multiple vehicle journeys. Where such technology is used the ticket gate and/or card reader can collect valuable statistics concerning actually routing and actual attendance.

Ticketing

Ticketing systems need to be able to deliver end to end functionality including:

- Ticket sales/issue;
- Control of Access to vehicles and venues (See Access Management);
- Refunds & Cancellations;

- Top-ups of Smartcard Tickets; and
- Analysis of ticket holder activity.

Calypso

Calypso is an international electronic ticketing standard for microprocessor contactless smartcards, originally designed by a group of European transit operators from Belgium, Germany, France, Italy and Portugal. It ensures multi-sources of compatible products, and makes possible the interoperability between several transport operators in the same area.

Calypso is based on two main technologies:

- The microprocessor smartcard, widely used in many monetary transactions;
- The contactless interface ensuring both remote powering and communication between the reader and the card.

A Calypso card, whatever its form (card, watch, mobile phone or other NFC object...) has a microprocessor which contains all the information related to its owner rights for the application, and which implements the Calypso authentication scheme for security. This makes a difference with other e-ticketing system, such as London's Oyster card, where the card is only a memory chip with no processing capabilities.

5.2.4. Communications Systems

Information and communication technologies are generally referred to as ICT. ICT tools can be used to find, explore, analyse, exchange and present information responsibly and without discrimination. ICT can be employed to give users quick access to ideas and experiences from a wide range of people, communities and cultures.

Telecommunication can be subdivided into the following areas:

- Telephone;
- Broadcast Media (Radio and television);
- The Internet;
- Web Pages;
- Email;
- Local area networks.

5.3. Technologies

5.3.1. Camera Technology

Cameras fall into two main categories:

- Still Cameras - *Main usage: Speed Cameras*[2] *(Traffic Enforcement Cameras) but modern digital technology has made it possible for the same device to provide still and moving images.*
- Video Cameras – *CCTV, Often fitted with Automatic Number plate recognition (ANPR)*

CCTV

Closed-circuit television (CCTV) is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors. It differs from broadcast television in that the signal is not openly transmitted, though it may employ point to point wireless links. CCTV is often used for surveillance in areas that may need monitoring such as banks, casinos, airports, military installations, and convenience stores.

CCTV systems may operate continuously or only as required to monitor a particular event. A more advanced form of CCTV, utilising Digital Video Recorders (DVRs), provides recording for possibly many years, with a variety of quality and performance options and extra features (such as motion-detection and email alerts).

Surveillance of the public using CCTV is particularly common and its increasing use has triggered a debate about security versus privacy.

ANPR

Automatic number plate recognition (ANPR) is a mass surveillance method that uses optical character recognition on images to read the licence plates on vehicles. As of 2006, systems can scan number plates at around one per second on cars travelling up to 100 mph (160 km/h). They can use existing closed-circuit television or road-rule enforcement cameras, or ones specifically designed for the task. They are used by various police forces and as a method of electronic toll collection on pay-per-use roads and monitoring traffic activity, such as red light adherence in an intersection.

ANPR can be used to store the images captured by the cameras as well as the text from the licence plate, with some configurable to store a photograph of the driver. Systems commonly use infrared lighting to allow the camera to take the picture at any time of the day. A powerful flash is included in at least one version of the intersection-monitoring cameras, serving both to illuminate the picture and to make the offender aware of his or her mistake. ANPR technology tends to be region-specific, owing to plate variation from place to place.

Concerns about these systems have centred on privacy fears of government tracking citizens' movements and media reports of misidentification and high error rates. However, as they have developed, the systems have become much more accurate and reliable.

[2] Speed cameras are often referred to as Safety Cameras

Traffic Enforcement Cameras

A traffic enforcement camera is a system, including a camera and a vehicle-monitoring device, used to detect and identify vehicles disobeying a speed limit or some other road legal requirement. Examples include:

- Speed cameras - *for identifying vehicles travelling over the legal speed limit. Many such devices use radar to measure a vehicle's instantaneous speed. Sets of multiple cameras with number-plate recognition software which can check the average speed of a vehicle between two points.*
- Red light cameras - *to detect vehicles which cross a stop-line or designated stopping place after a red traffic light shows.*
- Bus lane cameras - *for identifying vehicles travelling in lanes reserved for buses. In some jurisdictions, bus lanes can also be used by taxis and/or vehicles engaged in car pooling.*
- Toll-booth cameras - *for identifying vehicles proceeding through a toll booth without paying the toll.*
- Level crossing cameras - *for identifying vehicles crossing railways at grade illegally.*
- Congestion charge cameras - *for recording vehicles inside the chargeable area.*
- Double solid line cameras - *for identifying vehicles crossing these lines.*
- High-occupancy vehicle lane cameras - *for identifying vehicles violating the occupancy requirements.*
- Turn cameras - *at intersections where specific turns are prohibited on red. This type of camera is mostly used in cities or heavy populated areas.*
- Parking Cameras - *which issue citations to vehicles which are illegally parked or which were not moved from a street at posted times*

There are systems that are combinations of the above; for example, some systems detect both red-light and speed infringements.

Existing traffic cameras, as well as special purpose ANPR cameras, can also be used for non-traffic-enforcement related activities, notably for mass surveillance of motorists by government agencies.

5.3.2. Positioning Technology

GPS

The Global Positioning System (GPS) is a space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth.

GPS is made up of three segments: Space, Control and User. The Space Segment comprises 24 to 32 satellites in Medium Earth Orbit and also includes the boosters required to launch them into orbit. The Control Segment is comprised of a Master Control Station, an Alternate Master Control Station, and a host of dedicated and shared Ground Antennas and Monitor Stations. The User Segment is comprised of hundreds of thousands of U.S. and allied military users of the secure GPS Precise Positioning Service, and tens of millions of civil, commercial and scientific users of the Standard Positioning Service. GPS satellites broadcast signals from space that GPS receivers use to provide three-dimensional location (latitude, longitude, and altitude) plus precise time.

GPS has become a mainstay of transportation systems worldwide, providing navigation for aviation, ground, and maritime operations.

Galileo

Galileo is a global navigation satellite system (GNSS) currently being built by the European Union (EU) and European Space Agency (ESA). The project is an alternative and complementary to the U.S. Global Positioning System (GPS) and the Russian GLONASS. It should be operational by 2013-2014. When in operation, it will have two ground operations centres, one near Munich, Germany, and another in Fucino, east of Rome, Italy.

Galileo is intended to provide more precise measurements than available through GPS or GLONASS. Galileo will be accurate down to the metre range, including the height above sea level, and better positioning services at high latitudes. The political aim is to provide an independent positioning system upon which European nations can rely even in times of war or political disagreement, since Russia or the USA could disable use of their national systems by others (through encryption). Like the US GPS, use of basic (low-accuracy) Galileo services will be free and open to everyone. However, the high-accuracy capabilities will be restricted to military use and paying commercial users.

5.3.3. Traffic Management Technology

The Urban Traffic Management Control or UTMC programme is the main initiative of the UK Department for Transport (DfT) for the development of a more open approach to Intelligent Transport Systems or ITS in urban areas.

UTMC systems are designed to allow the different applications used within modern traffic management systems to communicate and share information with each other. This allows previously disparate data from multiple sources such as ANPR cameras, Variable-message sign (VMS), SCOOT Loops, car parks, traffic signals, air quality monitoring stations and meteorological data, to be amalgamated into a central console or database. The idea behind UTMC is to maximise road network potential to create a more robust and intelligent system that can be used to meet current and future management requirements.

Although UTMC is a UK initiative there are many UTC (Urban Traffic Control) systems across Europe providing similar functionality.

Scoot (Split Cycle and Offset Optimisation Technique)

SCOOT is an adaptive traffic control system. It coordinates the operation of all the traffic signals in an area to give good progression to vehicles through the network. Whilst coordinating all the signals, it responds intelligently and continuously as traffic flow changes and fluctuates throughout the day. It removes the dependence of less sophisticated systems on signal plans, which have to be expensively updated.

Information on the physical layout of the road network and how the traffic signals control the individual traffic streams are stored in the SCOOT database.

Any adaptive traffic control system relies upon good detection of the current conditions in real-time to allow a quick and effective response to any changes in the current traffic situation.

SCOOT detects vehicles at the start of each approach to every controlled intersection. It models the progression of the traffic from the detector through the stop line, taking due account of the state of the signals and any consequent queues.

When a vehicle passes the detector, SCOOT converts the information into a "link profile unit" (lpu), a hybrid of link flow and occupancy. This is the unit used by SCOOT in its calculations. "Cyclic flow profiles" of lpu's over time are constructed for each link.

A SCOOT network is divided into "regions", each containing a number of "nodes" (signalled junctions and pedestrian crossings that all run at the same cycle time to allow co-ordination). Nodes may be "double cycled" (i.e. operate at half of the regional cycle time) at pedestrian crossings or under-saturated junctions. Region boundaries are located where links are long enough for lack of co-ordination not to matter.

SCOOT sends out instructions to the "on street" equipment using dedicated telephone lines. These instructions are interpreted and acted upon by traffic signal equipment at the roadside. The equipment replies to the central computer confirming the acceptance of instruction, or detailing a fault condition.

The information from the model is used to optimise the signals to minimise the network delay.

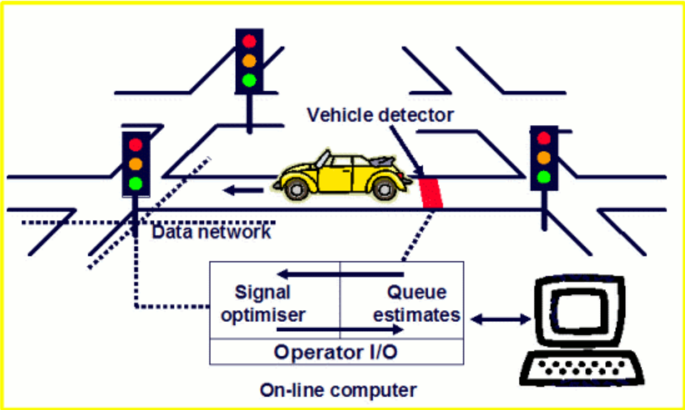


Figure 5.1 SCOOT at a Typical Junction

- Bus Priority - *SCOOT has a facility to integrate active priority to buses or other public transport vehicles. The system is designed to allow buses to be detected either by selective vehicle detectors or by an automatic vehicle location (AVL) system.*
- ASTRID - *Automatic SCOOT Traffic Information Database. ASTRID is a database designed to take information from SCOOT and to process and store it for later retrieval and analysis.*
- INGRID - *INteGRated Incident Detection. INGRID is a system operating in real time that uses information from the SCOOT detectors together with historic data from ASTRID to automatically detect incidents.*

JTMS (Journey Time Measurement System)

It is possible to demonstrate tangible evidence of traffic-reduction measures is having a positive effect through the use of a Journey Time Measurement System (JTMS) using Automatic Number Plate Recognition (ANPR).

Traditional Urban Traffic Control systems have always been able to provide an indication of congestion and journey times, but the use of Automatic Number Plate Recognition (ANPR) technology provides a better, more accurate mechanism for monitoring journey times to provide a meaningful measure of overall network performance.

The integration of journey time information into a UTC system can provide incident detection capabilities to the operator in the control room. By comparing the current 'live' journey time with a historical profile, the system can automatically alert operators to abnormal conditions, allowing prompt action to be taken. JTMS is proving to be a multi-faceted solution, enabling traffic managers to report back on long-term performance and justify spending to councillors and the public.

5.3.4. Communication & Telecommunication Technology

Telecommunication is the assisted transmission of signals over a distance for the purpose of communication. Telecommunication can be subdivided into the following areas:

- Telephone
- Broadcast Media (Radio and television)
- The Internet
- Web Pages
- Email
- Local area networks

Telephone

In an analogue telephone network, the caller is connected to the person he wants to talk to by switches at various telephone exchanges. The fixed-line telephones in most residential homes are analogue. Increasingly telephone service providers are transparently converting the signals to digital for transmission before converting them back to analogue for reception. The advantage of this is that digitized voice data can travel side-by-side with data from the Internet and can be perfectly reproduced in long distance communication (as opposed to analogue signals that are inevitably impacted by noise).

Mobile phones have had a significant impact on telephone networks. Mobile phone subscriptions now outnumber fixed-line subscriptions in many markets. Increasingly these phones are being serviced by systems where the voice content is transmitted digitally such as GSM or W-CDMA.

Global System for Mobile communications (GSM: originally from Groupe Spécial Mobile) is the most popular standard for mobile phones in the world. Its ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs from its predecessors in that both signalling and speech channels are digital call quality, and so is considered a second generation (2G) mobile phone system. This has also meant that data communication was built into the system using the 3rd

Generation Partnership Project (3GPP). GSM also pioneered a low-cost alternative to voice calls, the Short Message Service (SMS, also called "text messaging"), which is now supported on other mobile standards as well.

Newer versions of the standard were backward-compatible with the original GSM phones. For example, Release '97 of the standard added packet data capabilities, by means of General Packet Radio Service (GPRS). Release '99 introduced higher speed data transmission using Enhanced Data Rates for GSM Evolution (EDGE).

GSM is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity. Time division multiplexing is used to allow eight full-rate or sixteen half-rate speech channels per radio frequency channel. The transmission power in the handset is limited to a maximum of 2 watts in GSM850/900 and 1 watt in GSM1800/1900.

There are four different cell sizes in a GSM network:

- Macro;
- Micro;
- Pico;
- Umbrella cells.

The coverage area of each cell varies according to the implementation environment. Macro cells can be regarded as cells where the base station antenna is installed on a mast or a building above average roof top level. Micro cells are cells whose antenna height is under average roof top level; they are typically used in urban areas. Pico cells are small cells whose coverage diameter is a few dozen meters; they are mainly used indoors. Umbrella cells are used to cover shadowed regions of smaller cells and fill in gaps in coverage between those cells.

Indoor coverage is also supported by GSM and may be achieved by using an indoor pico cell base station, or an indoor repeater with distributed indoor antennas fed through power splitters, to deliver the radio signals from an antenna outdoors to the separate indoor distributed antenna system. These are typically deployed when a lot of call capacity is needed indoors, for example in shopping centres or airports. However, this is not a prerequisite, since indoor coverage is also provided by in-building penetration of the radio signals from nearby cells.

One of the key features of GSM is the Subscriber Identity Module (SIM), commonly known as a SIM card. The SIM is a detachable smart card containing the user's subscription information and phonebook. This allows the user to retain his or her information after switching handsets. Alternatively, the user can also change operators while retaining the handset simply by changing the SIM. Some operators will block this by allowing the phone to use only a single SIM, or only a SIM issued by them; this practice is known as SIM locking, and is illegal in some countries.

GSM Network Structure

The network behind the GSM system seen by the customer is large and complicated in order to provide all of the services which are required.

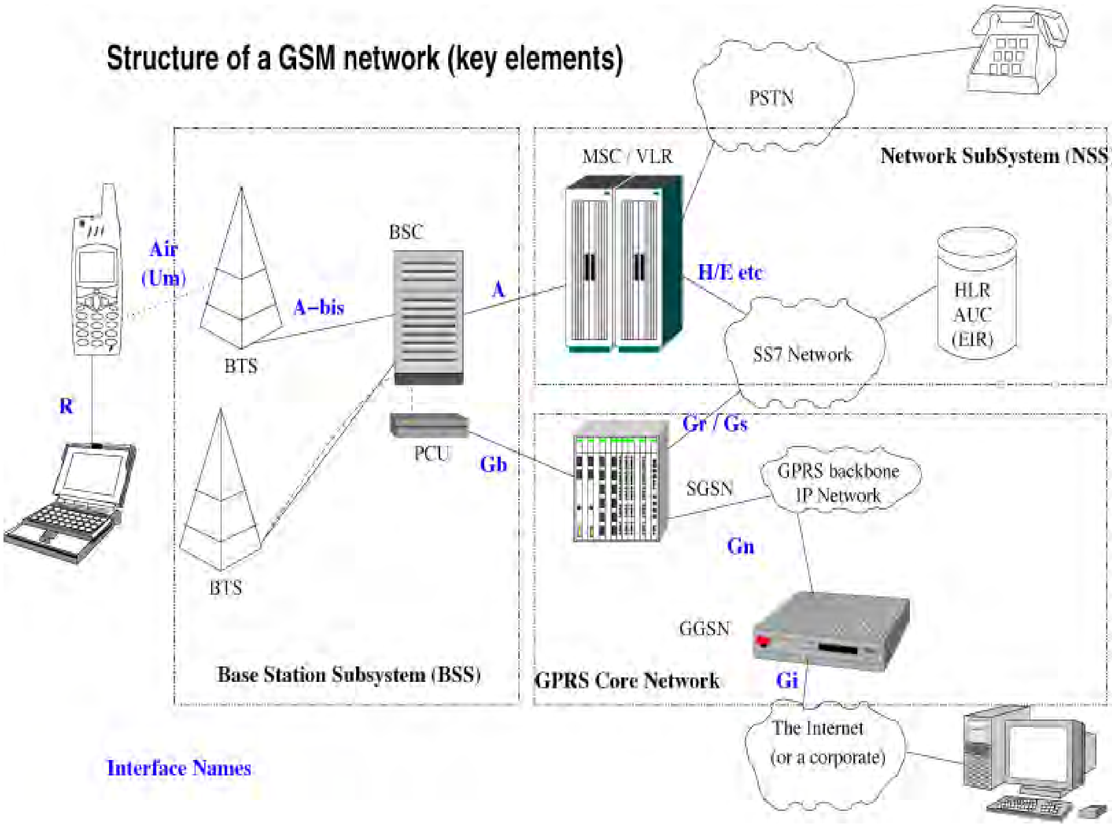


Figure 5.2 GSM Network Structure

Broadcast Media (Radio and Television)

In a broadcast system, a central high-powered broadcast tower transmits a high-frequency electromagnetic wave to numerous low-powered receivers. The high-frequency wave sent by the tower is modulated with a signal containing visual or audio information. The antenna of the receiver is then tuned so as to pick up the high-frequency wave and a demodulator is used to retrieve the signal containing the visual or audio information. The broadcast signal can be either analogue (signal is varied continuously with respect to the information) or digital (information is encoded as a set of discrete values).

The chief advantage of digital broadcasts over analogue broadcasts is that digital broadcasts prevent a number of complaints with traditional analogue broadcasts. For television, this includes the elimination of problems such as snowy pictures, ghosting and other distortion. Digital transmission overcomes this problem because digital signals are reduced to discrete values upon reception and hence small perturbations do not affect the final output.

In digital television broadcasting, there are three competing standards that are likely to be adopted worldwide. These are the ATSC, DVB and ISDB standards; the adoption of these standards thus far is presented in the captioned map. All three standards use MPEG-2 for video compression. ATSC uses Dolby Digital AC-3 for audio compression, ISDB uses

Advanced Audio Coding (MPEG-2 Part 7) and DVB has no standard for audio compression but typically uses MPEG-1 Part 3 Layer 2. The choice of modulation also varies between the schemes.

In digital audio broadcasting, standards are much more unified with practically all countries choosing to adopt the Digital Audio Broadcasting standard (also known as the Eureka 147 standard). The exception being the United States which has chosen to adopt HD Radio. HD Radio, unlike Eureka 147, is based upon a transmission method known as in-band on-channel transmission that allows digital information to "piggyback" on normal AM or FM analogue transmissions.

The Internet

The Internet is a worldwide network of computers and computer networks that can communicate with each other using the Internet Protocol. Any computer on the Internet has a unique IP address that can be used by other computers to route information to it. Hence, any computer on the Internet can send a message to any other computer using its IP address. These messages carry with them the originating computer's IP address allowing for two-way communication. In this way, the Internet can be seen as an exchange of messages between computers.

Most intercontinental communication will use the Asynchronous Transfer Mode (ATM) protocol (or a modern equivalent) on top of optic fibre. This is because for most intercontinental communication the Internet shares the same infrastructure as the public switched telephone network.

With respect to the 7 OSI[3] layers that define network communications it is probably only the top layer (Application Layer) that may be relevant to this study:

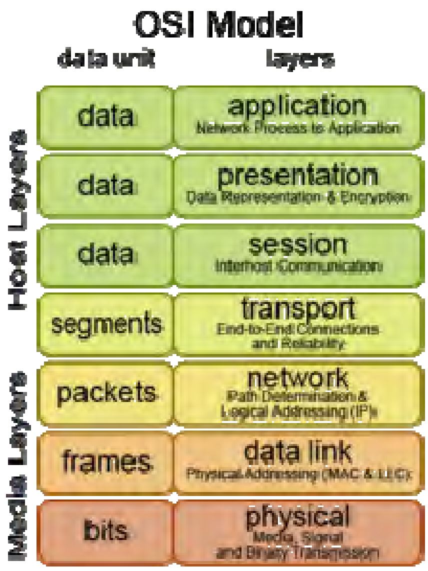


Figure 5.3 OSI Layers

[3] Open Systems Interconnection

At the application layer, there are many of the protocols Internet users would be familiar with such as HTTP (web browsing), POP3 (e-mail), FTP (file transfer), IRC (Internet chat), BitTorrent (file sharing) and OSCAR (instant messaging).

The internet will be a mechanism that will provide a delivery channel for Real Time Travel & Recreation Information to many customers.

Web Pages

A Web page or webpage is a resource of information that is suitable for the World Wide Web and can be accessed through a web browser. This information is usually in HTML or XHTML format, and may provide navigation to other web pages via hypertext links. Web pages may be retrieved from a local computer or from a remote web server. The web server may restrict access only to a private network, e.g. a corporate intranet, or it may publish pages on the World Wide Web. Web pages are requested and served from web servers using Hypertext Transfer Protocol (HTTP). Web pages may consist of files of static text stored within the web server's file system (static web pages), or the web server may construct the (X) HTML for each web page when it is requested by a browser (dynamic web pages). Client-side scripting can make web pages more responsive to user input once in the client browser. A web page is a type of web document. The self serve aspect of the Customer Service Integration Programme (CSIP) uses Web Pages to capture Situation Information from customers and to display a variety of information to customers.

Email

Email, short for electronic mail is a store and forward method of composing, sending, storing, and receiving messages over electronic communication systems. The term "e-mail" applies both to the Internet e-mail system based on the Simple Mail Transfer Protocol (SMTP) and to X.400 systems, and to intranet systems allowing users within one organization to e-mail each other. Intranets may use the Internet protocols or X.400 protocols for internal e-mail service supporting workgroup collaboration. Email is often used to deliver bulk unsolicited messages, or "spam", but filter programs exist which can automatically delete some or most of these, depending on the situation. Whilst 'Travel Alerts' can currently be delivered to Customers from Journey Planner via SMS or Email there is no specific channel to receive Situations via email. However, CSIP does support an email incoming channel and some of the content received via this channel may be relevant to situations.

Local Area Networks

Despite the growth of the Internet, the characteristics of local area networks (computer networks that run at most a few kilometres) remain distinct. This is because networks on this scale do not require all the features associated with larger networks and are often more cost-effective and efficient without them.

Today networks are mostly dedicated to the TCP/IP protocol. TCP/IP is also known as the Internet Protocol Suite built from Transmission Control Protocol (TCP) and the Internet Protocol (IP).

The move to TCP/IP was helped by technologies such as DHCP that allowed TCP/IP clients to discover their own network address. It is at the data link layer though that most modern local area networks diverge from the Internet. Whereas Asynchronous Transfer Mode (ATM) or

Multiprotocol Label Switching (MPLS) are typical data link protocols for larger networks, Ethernet and Token Ring are typical data link protocols for local area networks. These protocols differ from the former protocols in that they are simpler (e.g. they omit features such as Quality of Service guarantees) and offer collision prevention. Both of these differences allow for more economic set-ups.

Internal TfL customers will largely send and receive Real Time Travel & Recreation Information via the in-house LAN.

Additional Considerations

Wireless communication is the transfer of information over a distance without the use of electrical conductors or "wires". The distances involved may be short (a few meters as in television remote control) or long (thousands or millions of kilometres for radio communications). When the context is clear, the term is often shortened to "wireless". Wireless communication is generally considered to be a branch of telecommunications.

It encompasses various types of fixed, mobile, and portable two-way radios, cellular telephones, personal digital assistants (PDAs), and wireless networking. Other examples of wireless technology include GPS units, garage door openers and or garage doors, wireless computer mice, keyboards and headsets, satellite television and cordless telephones

- Wireless networking - *is used to meet many needs. Perhaps the most common use is to connect laptop users who travel from location to location. Another common use is for mobile networks that connect via satellite. A wireless transmission method is a logical choice to network a LAN segment that must frequently change locations. The following situations justify the use of wireless technology:*

    1. *To span a distance beyond the capabilities of typical cabling,*
    2. *To provide a backup communications link in case of normal network failure,*
    3. *To link portable or temporary workstations,*
    4. *To overcome situations where normal cabling is difficult or financially impractical, or*
    5. *To remotely connect mobile users or networks.*

    Wireless communication can be via:

    1. *radio frequency communication,*
    2. *microwave communication, for example long-range line-of-sight via highly directional antennas, or short-range communication, or*
    3. *infrared (IR) short-range communication, for example from remote controls or via Infrared Data Association (IrDA).*

- WiFi - *Wi-Fi (for wireless fidelity) is a wireless LAN technology that enables laptop PC's, PDA's, and other devices to connect easily to the internet. Technically known as IEEE 802.11 a,b,g,n, Wi-Fi is less expensive and nearing the speeds of standard Ethernet and other common wire-based LAN technologies.*

- Bluetooth - *is an open wireless protocol for exchanging data over short distances (using short length radio waves) from fixed and mobile devices, creating personal area networks (PANs). It was originally conceived as a wireless alternative to RS-*

232 data cables. It can connect several devices, overcoming problems of synchronization.

Radio Frequency Identification (RFID)

Radio-frequency identification (RFID) is the use of an object (typically referred to as an RFID tag) applied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader.

Most RFID tags contain at least two parts. One is an integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, and other specialized functions. The second is an antenna for receiving and transmitting the signal.

There are generally three types of RFID tags: active RFID tags, which contain a battery and can transmit signals autonomously, passive RFID tags, which have no battery and require an external source to provoke signal transmission, and battery assisted passive (BAP) which require an external source to wake up but have significant higher forward link capability providing great read range.

RFID has many applications, for example, it is used in enterprise supply chain management to improve the efficiency of inventory tracking and management. The technology can also be implanted within a ticket.

Near Field Communication (NFC)

Near Field Communication or NFC, is a short-range high frequency wireless communication technology which enables the exchange of data between devices over about a 10 centimetre (around 4 inches) distance. The technology is a simple extension of the ISO/IEC 14443 proximity-card standard (contactless card, RFID) that combines the interface of a smartcard and a reader into a single device. An NFC device can communicate with both existing ISO/IEC 14443 smartcards and readers, as well as with other NFC devices, and is thereby compatible with existing contactless infrastructure already in use for public transportation and payment. NFC is primarily aimed at usage in mobile phones.

5.3.5. Analytical Technology

Visual Scene Analysis (VSA)

This is also known as Video Mining which is a specialism of Data Mining. Its application in crowd management and mobility scenarios is growing.

The goal of data mining is to discover and describe interesting patterns in data. This task is especially challenging when the data consist of video sequences (which may also have audio content), because of the need to analyze enormous volumes of multidimensional data. The richness of the domain implies that many different approaches can be taken and many different tools and techniques can be used such as clustering and categorization, cues and characters, segmentation and summarization, statistics and semantics.

There has been a lot of research into interpreting ‘movies’ in this way; and there are companies marketing techniques that analyse customer reaction to advertising in store and general kinetic movement around a store concerning the placement of facilities and products on sale.

Artificial Intelligence

Artificial intelligence (AI) is the intelligence of machines and the branch of computer science which aims to create it. Textbooks define the field as "the study and design of intelligent agents," where an intelligent agent is a system that perceives its environment and takes actions which maximize its chances of success.

AI research is highly technical and specialized, deeply divided into subfields that often fail to communicate with each other. Subfields have grown up around particular institutions, the work of individual researchers, the solution of specific problems, longstanding differences of opinion about how AI should be done and the application of widely differing tools. The central problems of AI include such traits as reasoning, knowledge, planning, learning, communication, perception and the ability to move and manipulate objects.

In many respects, the ultimate aspiration of ITS is for AI.

Decision Management

Enterprise Decision Management, commonly abbreviated "EDM", entails all aspects of managing automated decision design and deployment that an organization uses to manage its interactions with customers, employees and suppliers. Computerization has changed the way organizations are approaching their decision-making because it has enabled "information-based decisions" - decisions based on analysis of historical behavioural data, prior decisions, and their outcomes.

Enterprise decision management is described as an "emerging important discipline, due to an increasing need to automate high-volume decisions across the enterprise and to impart precision, consistency, and agility in the decision-making process." EDM is implemented "via the use of rule-based systems and analytic models for enabling high-volume, automated decision making."

Organizations seek to improve their decision yield (the value created through each decision) by deploying business processes and software solutions that better manage the tradeoffs between precision, consistency, agility, speed, and cost of decision-making within organizations. The concept of decision yield focuses on five key attributes of decision-making: more targeted decisions (precision); in the same way, over and over again (consistency); while being able to adapt “on-the-fly” (business agility) while reducing cost and improving speed, is an overall metric for how well an organization is making a particular decision.

Complex Event Processing

Complex Event Processing (CEP) is a new technology for extracting information from distributed message-based systems. This technology allows users of a system to specify the information that is of interest to them. It can be low level network processing data or high level enterprise management intelligence, depending upon the role and viewpoint of individual users. It can be changed from moment to moment while the target system is in operation.

These concepts are increasingly being applied to Enterprise Decision Management. When evaluating a solution for the potential usage of CEP there are three main considerations:

- Situational Awareness.
- Sense and Response.
- Track and Trace.

If the solution requires any of these functions CEP should be seriously considered. Intelligent Transport Systems require all three of these functions.

A good way to understand the CEP approach is to compare it with normal or Simple Event Processing (SEP). SEP is Synchronous Events being managed by workflow. To manage the process, the system must wait for the next event that drives the process on. CEP is Asynchronous Events being managed by Business Rules. While the definition of these rules should not be underestimated, the result of this approach is to remove much of the latency generated by the workflow approach.

When considering Event Processing the concepts of Positive Events (things have happened when they should and as they should) and Negative Events (things have not happened when they should or as they should) need to be understood as each forms a critical role in defining the rules to be applied to sets of events or complex events.

6. EVENT ANALYSIS

6.1. Event Characteristics

Most large events, especially those in the sports context have certain characteristic in common:

- They are cyclical;
- They have an international governing body;
- They have a bidding process to identify the hosting city;
- They involve international participants; and
- They involve International spectators.

For all such events mobility concerns extend beyond the hosting city, to the hosting country and to international transport hubs. Our research has concentrated upon events organised by FIFA and UEFA in respect to football competitions and the IOC and Commonwealth Games for more general athletics and associated sports. An assessment of event characteristics for these organisations has been performed as a part of this study and is documented in the SOTA Event Characteristics Annex [Ref R2].

It is important to understand that these events are global brands and that the owners of those brands impose strict conditions upon hosting cities across all aspects of event management and mobility considerations are amongst these. A host city therefore does not have a free hand in respect to mobility management for an event but must abide by minimum standards and undertake to meet those at the bidding stage.

In addition to the well known major sporting events (e.g. Football World Cup, or Olympics) other events have been identified which place similar mobility demands upon host cities. Such events include Papal visits, Music Concerts (e.g. Live 8), Political Summit meetings (e.g. G20 Summits), etc. What characterises these events and makes them different from Sporting championships is the duration of the event and the reduced level of demand made upon a host city by the event organiser (owner). These events may well create substantial disruption to the day-to-day mobility of a host city, but it is probably only for one or two days and generally will not involve infrastructure building; certainly not on the scale of the Olympics, which modifies mobility and travel demand across wide areas – on a semi permanent basis.

Short duration events nevertheless demand great attention to detail in planning the mass movement of spectators, participants and media representatives; much the same as for an Olympic Games. From a host city perspective though these events will probably be characterised by a short lead time in which to adapt normal mobility plans and certainly will not justify budgets to implement new ITS solutions to optimise mobility.

Political events can have very short lead times and are more likely to be security focussed in terms of their impact on mobility patterns. As such a host city will be unlikely to introduce any specific ITS solution for the event and may have only limited control over the impact of police and security demands for temporary traffic restrictions and pedestrian movement. For this reason we have not focussed attention within the study on these events.

Although short duration events have not been our main focus the STADIUM Handbook will still contain useful guidance for host cities to consider based upon experiences from other events. For pragmatic reasons our attention has to be concentrated on events where the time involved in the event lifecycle and the scale of the undertaking enable a city to react. Even by evaluating only a small number of these large events it is possible to identify examples of almost every currently utilised ITS application and to assess their relative merits and comment on the added value of using such systems; both as standalone and packaged solutions.

Legacy

The concept of an events "legacy" has to be considered. Where new stadiums or transport infrastructure are built there has to be close consideration of the environmental and land use impacts of developments. These should be considered at the planning stage. New ITS solutions can be added to the mix at the planning stage to mitigate detrimental impacts upon day-to-day city transport operation after the event. A major event should be considered by a host city as a chance to review ITS provision generally; as legacy effects may well form a rare opportunity to justify expenditure with a demonstrably positive benefit: cost ratio.

6.2. Planning

The scope for planning mobility aspects of large events is very much dependent upon the lead time between bidding to host the event and its delivery. Where this extends over several years (as is the case with the Olympics and Football championships) cities have an ideal opportunity to consider adoption of new ITS solutions to enhance the perception of the event and to add value to the permanent infrastructure of the municipality.

It is not evident from our research that all cities have explicitly considered the full range of mobility planning roles and responsibilities identified earlier in this report in their management of past events. Certainly the sophistication of the approach to planning has grown in the last decade and can now be seen to split functions between delivery of infrastructure (e.g. a responsibility carried out by the ODA for the London 2012 Olympics) and delivery of the event on the day (e.g. a responsibility of LOCOG for the London 2012 Olympics).

Looking back a decade to the UEFA 2000 Championship in Brussels we see a simple (but effective) model being used that relied upon collaboration between relevant agencies in host cities (and across national borders) coordinated through a central/national management team which created a National Mobility Plan. It should be noted that for UEFA 2000 there was no significant infrastructure development as stadiums and transport systems were in place. What was needed was coordination of transport modes with ticketing, security and traffic management. Information dissemination was a paramount concern and this was largely taking place at a time when Internet use was still in its early stages and broadcast messages relied on media coverage.

The national mobility plan was carried out with the collaboration of the federal authorities, regional and local authorities, the services of gendarmerie and police force, the operating companies of public transport (national, regional and local) and the airport and maritime authorities. Its success was due to the efforts of approximately 200 people. The following diagram illustrates the coordination group structure in Belgium.

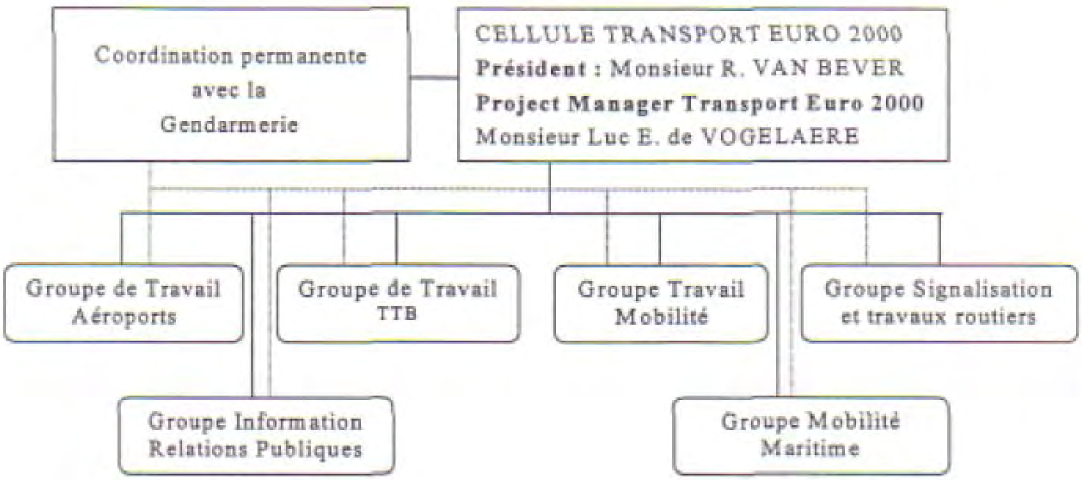


Figure 6.1 Belgium Planning Organisation Structure EUFA 2000

Eight years later a similar approach was still being applied for UEFA 2008 co-hosted by Austria and Switzerland. The host cities each took control of the way they organised transport in keeping with the national concept. To accomplish their mission successfully, the Canton of Geneva appointed CITEC transport engineers, who were involved with the transport work group, led by a State delegate and attached to the general organisation of EURO in Geneva.

The work group had the advantage of bringing together events mobility specialists who were used to working together on events. The general organisational diagram of the coordination system put in place for Euro 2008 is shown below.

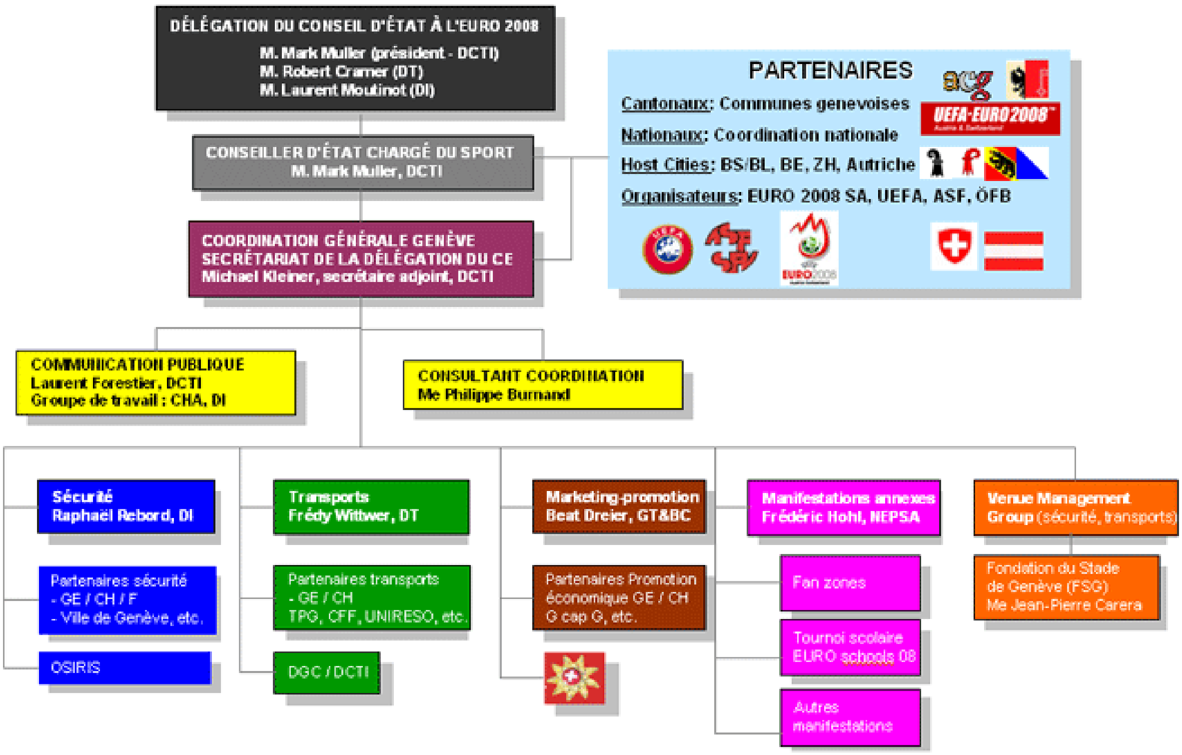


Figure 6.2 Mobility Planning Structure EUFA 2008 Geneva

Effort expended in planning always generates benefits and should not be under estimated. Evaluations of successful events invariably single out the importance of planning and the collaborative links between agencies that it creates often continue.

The need to use the long lead time to carry out detailed planning and testing was validated by experience at Euro 2008. Test events in Geneva enabled the plans to be refined which contributed towards the success of hosting the Championship. Experiences gathered from the EURO2004 in Portugal and the 2006 Football World Cup in Germany also helped planners validate estimated traffic flows relevant to planning needs.

6.3. Adoption of ITS in Major Events

Our research has found that in the vast majority of cases events do not create a specific need for new ITS technology; though they are an occasion where experimental ITS solutions might be trialled. More often major events require consideration of the arsenal of conventional ITS solutions already available to determine what additional measures might be introduced to optimise mobility during the event; and preferably maintain that improvement post the event. That is not to say ITS solutions can be plucked off the shelf and implemented as a plug and play tool. In every instance we see the solutions being customised to the specific needs of the host city, or type of event.

Major events tend to occur in major cities and as such we can expect to find sophisticated ITS applications already deployed. What influences the impact of those ITS applications upon the mobility management of the event is both the geographic scope of the application across the city (or region) and the mix of applications in place. A further consideration is the extent to which applications are integrated into an overall mobility management system to maximise benefit.

The greater the amount of real time information that is collected and disseminated the more chance there is that the transport system will withstand the strain of additional event generated traffic. Information fuels ITS systems. It empowers the mobility planners and when processed and communicated to the public can greatly improve the perception of a successful event and efficient city.

What is the place of ITS in an event mobility plan?

Intelligent Transport Systems (ITS) is a generic term used internationally that covers diverse technologies and applications used in all modes of transport. ITS aims to achieve efficient, safe and secure travel and transport using new information technology for simulation, real-time control and communications. It is applies to systems deployed onboard vehicles and the transport infrastructure.

The European Commission has been keen to see ITS developed and deployed to meet its objective of achieving efficient, clean, safe and seamless travel and is pressing forward with measures to support the use of interoperable ITS applications and services including:

- Data concerning road transport;
- Traffic data;
- Safety and security systems in vehicles and the road infrastructure; and
- Information between vehicles and road infrastructures.

ITS can provide:

- The supply of information and vehicle guidance before and during the journey;
- Improvements to the management, monitoring and regulation of both urban and interurban traffic;
- The large-scale application of high-performance telematics to electronic payment and reservations;
- The development of public transport applications, more particularly for ticketing services, vehicle positioning systems, operational support systems covering bus timetabling or maintenance, real-time customer information services (public terminals, electronic guides);
- The introduction on the market of advanced safety and vehicle control systems such as stand-alone speed regulators or the automation of intermittent traffic; and
- Improved safety and efficiency of commercial vehicles by monitoring and locating goods consignments electronically and making greater use of electronic recording systems, such as electronic tachometers, smart driving licences and continuous customs clearance.

ITS technology facilitates a number of systems that can improve mobility, increase safety and security, including:

- Surveillance mechanisms (camera technology);
- Automatic Number plate recognition (ANPR);
- Speed Cameras;
- Close Circuit Television (CCTV);
- Navigational and Global Positioning Systems (GPS, SatNav);
- Traffic Signal Mechanisms;
- Wireless Communications;
- Artificial Intelligence;
- Decision management support systems;
- Complex event management support systems;
- Inductive Loop Measurements (SCOOT);
- Near Field Communication (NFC);
- Visual Scene Analysis (VSA); and
- Radio Frequency Identification (RFID).

Some of the process oriented features that are potential components of ITS include:

- Transport Efficiency

  i) Traffic Signal Timing;
  ii) Traffic Flow Monitoring;
  iii) Dynamic Traffic Flow Control;
  iv) Capacity Management;
  v) Ticketing Management; and
  vi) Origin & Destination Monitoring.

- Transport Safety

  i) Traffic Signals;
  ii) Red Light Monitoring and Enforcement;
  iii) Bus Lane Monitoring and Enforcement;
  iv) Level Crossing Control;
  v) Automatic Speed Enforcement; and
  vi) Collision Avoidance.

- Congestion Avoidance

  i) Toll Collection;
  ii) Congestion Pricing;
  iii) Crowding Management;
  iv) Dynamic Re-routing; and
  v) Signage.

- Infrastructure and Environment Safety and Security

  i) Parking Management;
  ii) Weather Information Management;
  iii) Travel & Transport Information Management;
  iv) Security Surveillance (to improve Crime & Disorder Management; and
  v) Safety Surveillance (to assist Venue Management);
  vi) Way Finding & Signage.

Examples of ITS Usage at Major Events

An appreciation of a variety of ITS systems that have been implemented at major events is provided in the matrix set out in Figure 6.3. This is based on a sample of events and indicates those ITS applications for which information have been readily available. However, we believe that the sample represents a sound foundation for assessment of the necessary ITS functionality required and an illustration of the way in which systems have been used in a package to support event mobility.

The STADIUM Handbook will offer guidance on the applicability of these and other emerging applications.

	2008 Summer Olympics Beijing	2008 UEFA Championship Austria and Switzerland	2008 Live 8 London, Paris, Rome, Philadelphia, Moscow and Canada	2006 Winter Olympics Turin	2006 Commonwealth Games Melbourne	2006 FIFA World Cup Germany	2004 Summer Olympic s Athens	2000 UEFA Championship Belgium
Traffic Operation Centre	✓	✓		✓	✓	✓	✓	✓
Park & Ride Information Systems		✓		✓	✓	✓		✓
Public Transport Information Systems	✓	✓		✓	✓	✓	✓	✓
Adaptive traffic light control	✓	✓		✓	✓	✓	✓	
Public transport priority	✓	✓		✓	✓	✓	✓	✓
Public information systems (e.g. VMS, SMS, Internet, radio, etc)	✓	✓	✓	✓	✓	✓	✓	✓
Traffic management (e.g. re-routing)	✓			✓	✓		✓	
Parking control		✓		✓	✓	✓		✓
Environmental monitoring				✓				
Route Guidance	✓	✓		✓		✓		✓
Ticketing (including contactless cards, parking integrated with public transport])	✓			✓				
Event & Transport integrated ticketing	✓			✓	✓	✓	✓	✓
Onboard smartcards system for toll road payments				✓				
Surveillance cameras	✓	✓	✓	✓	✓	✓		✓
Floating Car GPs real-time traffic information	✓							
Personal Digital Devises [mobiles]	✓							

Figure 6.3 ITS Applications at Major Events

The increased adoption of ITS at more recent events is clear to see as cities have built on the greater availability of solutions and a more developed background deployment from normal operations. The sophistication of solutions has also increased in the last 10 years offering future adopters more flexibility to integrate systems and coordinate mobility management.

Our assessment of mobility management at each individual event is summarised in annexes covering:

- 2000 UEFA Championship Belgium;
- 2004 Summer Olympics Athens;
- 2006 FIFA World Cup Germany;
- 2006 Winter Olympics Turin;

- 2008 Live 8 London, Paris, Rome, Philadelphia, Moscow and Canada;
- 2008 UEFA Championship Austria and Switzerland; and
- 2008 Summer Olympics Beijing.

These annexes provide details of the specific background to each host city and event. They consider individual systems used and assess the impacts of each as reported in various evaluation reports.

In the following section we draw upon those experiences to examine the importance mobility planners have placed upon ITS solutions and compare their perceived effectiveness in different cities. We have observed the evolution of ITS in the last decade and consider its growing application as technology solutions become more powerful and universally accessible through mobile communication devices.

Based on these observations we are confident in predicting the role of ITS in future mobility plans will be a paramount factor in delivering successful events.

6.4. Comparative Assessment of ITS Implementations

Traffic Management and Traffic Operation Centres

Experiences from all events support the fact that maximising the available capacity of the road and public transport networks is essential. Traffic management measures help to fulfil that objective for all modes, including pedestrians and for both public transport and private transport. Coordination of these interventions is achieved with effective with Traffic Operation Centres (TOC) and Traffic Control Centres (TCC).

Traffic Operation Centres (and TCC) manage normal city/regional traffic flows and aim to reduce congestion. They are the core facility that coordinates most of the ITS applications. For very large events (e.g. Olympics or Football Championships) that extend over several weeks and possibly also over large geographic areas with several host cities the organisation teams have found supplementary Command and Control facilities to be useful.

Across all the events studied TCCs and TOCs have demonstrated their value. Enhancements and adaptations to these for an event are common. In case of the 2008 UEFA European Football Championship (Euro 2008) where the event was jointly hosted by Austria and Switzerland additional coordination was required. Existing traffic control centres in the host cities already deployed conventional ITS systems for traffic management. However, in some cased additional ITS application coverage was developed to enhance these facilities. Road traffic management required:

- 50 signs on the motorway and 150 on the cantonal road network to ensure the accessibility of the different parking facilities (cars, coaches, *target groups*);
- 10 variable message signs near the stadium and the *Fan Zone*;
- 300 temporary barriers and 100 moveable signs for diversions and street closures; and
- over 200 people mobilised for each match (Police, Civil Protection, volunteers, etc.).

Other systems used included road sensors, cameras, vehicle counters, occupation rates of parking areas, etc). With the aid of all the information received in real time a global view of the state of the traffic and the occupation rate of the different parking areas was maintained which aided in decision-making.

In Geneva the GIS based application (AGIRE) for real time traffic management was given wider geographic coverage; specifically to meet the needs of the event, but with a lasting benefit for the city. To ensure good traffic management during these events, the Police put in place a complex monitoring system, which included a centralised control unit and several teams in action on the ground. The centralised unit received information from the teams on the ground and especially from sensors installed around the site which supply data in real time (cameras, vehicle counters, occupation rates of parking areas, etc). The AGIRE application, with the aid of all the information received in real time, provides a global view of the state of the traffic and the occupation rate of the different parking areas. It also offers its users a module to aid in decision-making. This involves pre-configuring the application with scenarios which develop in function of the situation observed. For example, when a given car park becomes full, an alert informs the system manager and suggests the implementation of a scenario to redirect traffic to another car park. This traffic redirection is operated by adapting the road signs on the various main roads through an update of the VMS (Variable Message Signs) messages concerned.

AGIRE offers numerous advantages for the management of major events. Its great simplicity of use makes it accessible and understandable to everyone. The contribution of a GIS was decisive in AGIRE's approach. In fact, the possibility of visualising all the data in a cartographic interface where every object (road sections, car parks, VMS, buildings, etc.) is geo-referenced renders their manipulation very intuitive.

The system is relatively complex, as it combines a large number of very different technologies, such as road traffic counters, traffic cameras, VMS, the transmission of secured SMS messages, the web and its spatial data bases. The strength of the system thus lies in its capacity to concentrate all the data received in a single data base (Oracle / ArcSDE), before distributing them to the different people concerned. Thanks to the independence between the hardware and the software, the application is very flexible, and integrates with numerous other information systems. In addition, as the application is used in the context of events controlled by the police, the level of security in data exchanges is very high.

Another example of successful implementation of centralised control can be seen at the Athens 2004 Olympics. There the Olympic Transport Operation Centre (OTOC) provided high level centralised transport command and control to facilitate global intervention for traffic and security functions. The games benefited from use of new technologies (upgrading the signalization system and traffic control centers, machine vision, variable message signs, etc.).

A Traffic Monitoring and Control Centre (TMCC) was created to control some 1,100 signalised intersections, 204 CCTV cameras, 75 VD video detection cameras and 24 variable message signs. The TMCC was linked to 6 other traffic management centres (eg Attiko Metro). The upgraded and extended signalization control system incorporated 150 additional intersections in the central system. Real-time collection of traffic data (vehicles, speeds, etc.) was carried out through the 75 VD cameras and 2,000 detectors located on major arteries.

The focus of ITS for Beijing and the 2008 Olympics was to create a new Internet-based integrated, intelligent traffic-control-and-management system based on real-time traffic data and communication, online GPS or GIS information, and global coordination and optimization strategies. The goal was to develop and implement prototype and deployable ITS modules, platforms, and integration techniques for the Beijing Traffic Command and Dispatching System that could significantly reduce traffic congestion, travel time, and air pollution.

Using a satellite GPS system linked to a network of cameras, the Beijing Traffic Management Bureau could, for example, issue daily traffic forecasts, guide drivers to their destination via electronic traffic signs, answer real-time traffic queries, and provide vehicle location services – all as part of its efforts to ensure a smooth flow of traffic in Beijing during the Olympic Games.

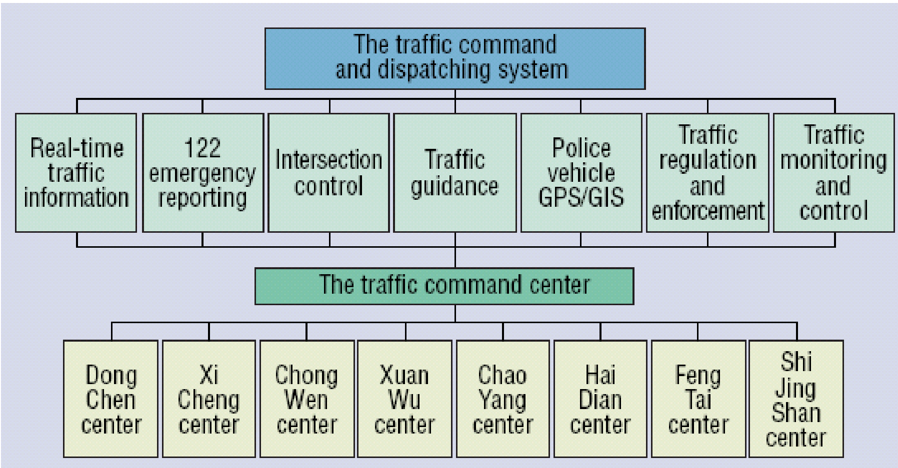


Figure 6.4 Beijing ITS Architecture

Taking into consideration the Beijing road network's specific structure and its existing facilities, development was concentrated on building subsystems for:

- Networked surface-street intersections
- Coordinated surface road and arterial loop interaction and loop ramp metering
- Integrated traffic guidance, monitoring, and dispatching

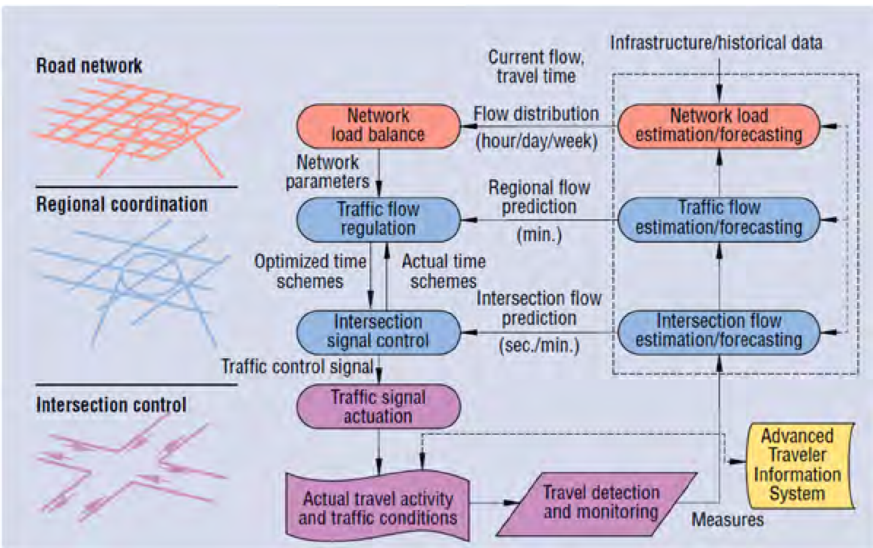


Figure 6.5 Subsystem: Networked Surface-Street Intersections

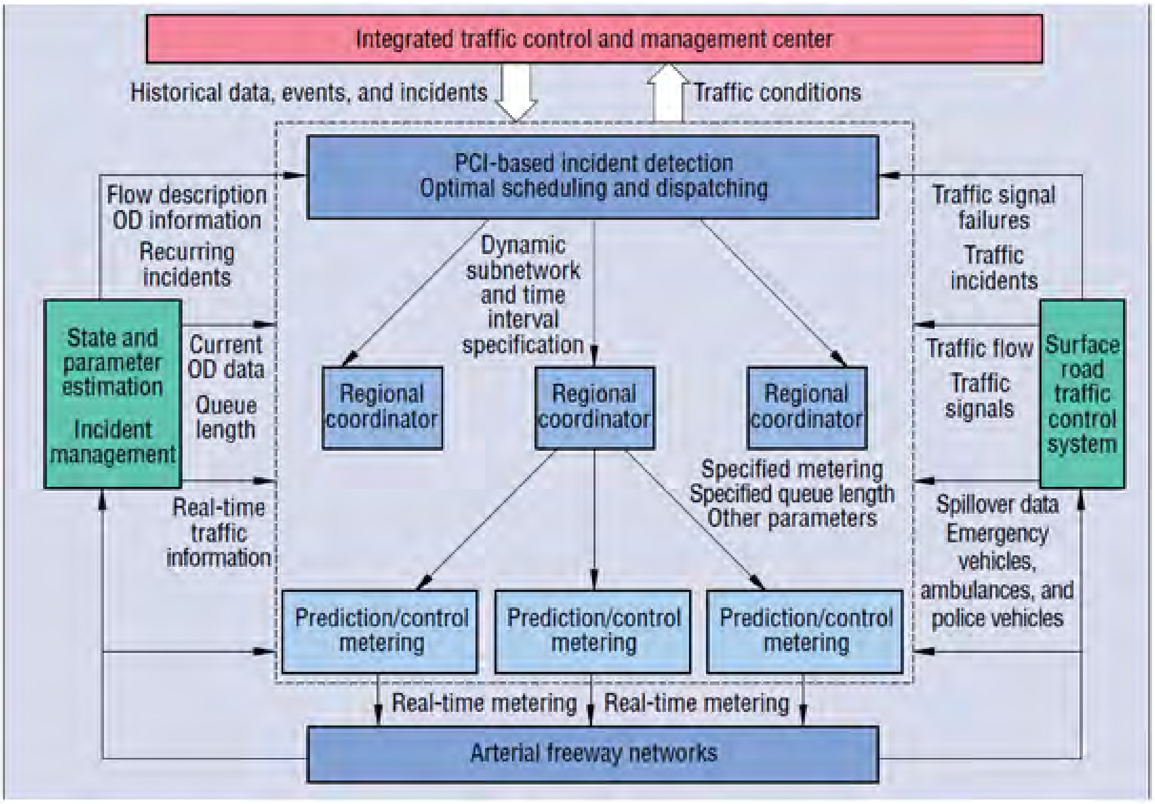


Figure 6.6 Subsystem: Coordinated Road and -Loop Interaction and Metering

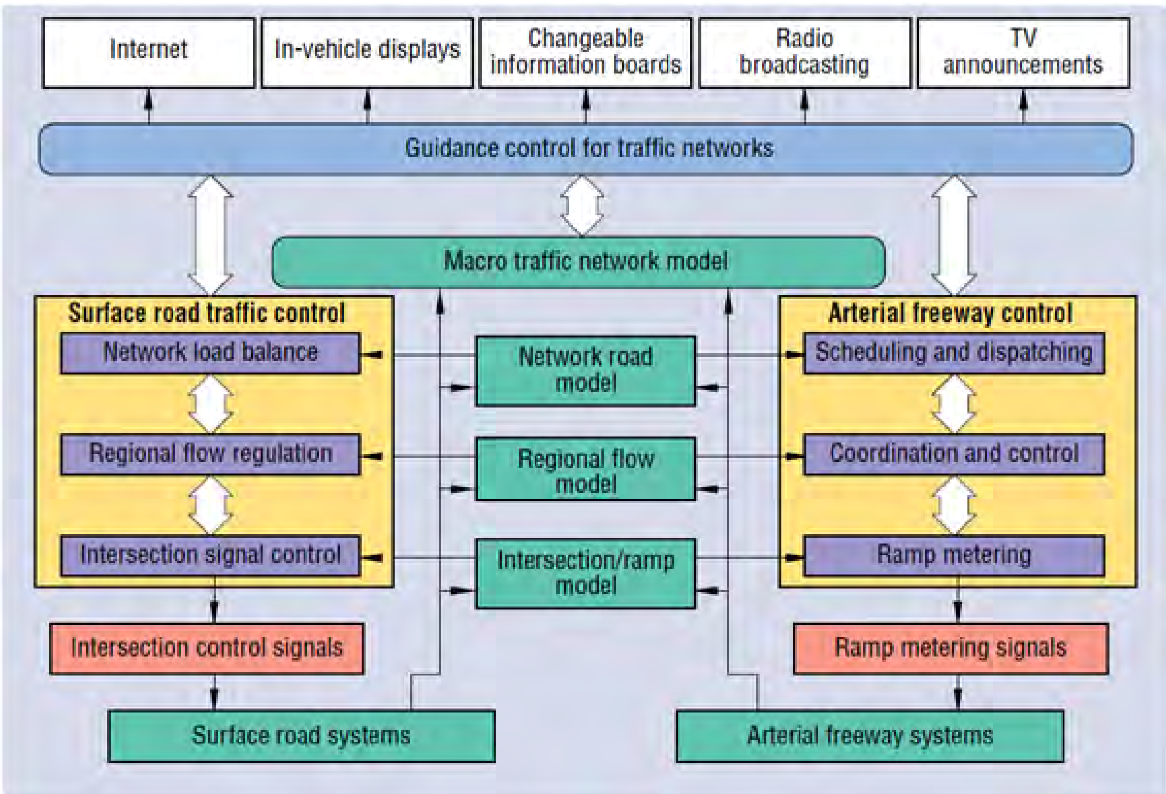


Figure 6.7 SubSystem: Integrated Traffic Guidance, Monitoring, and Dispatching

Besides conventional system analysis and decision-making techniques, major new methods used in developing these subsystems included intelligent control, agent-based control and programming, game theory, data mining, data fusion, fuzzy logic, neural networks, and genetic algorithms. The software platform and integrated development environment were developed for both online and offline operations for network communication, system configuration, data collection, monitoring and inspection, simulation and forecasting, and information analysis and broadcasting, as well as traffic control, guidance, and dispatching.

The Beijing Traffic Management Bureau implemented 10 intelligent traffic management systems to ensure road safety and the smooth flow of traffic during the Olympic Games:

- A modern transportation command system. (A modern Olympic traffic command centre, the Yangshan bridge traffic command centre and a traffic command centre for 38 venues. These centres formed a three-layer Olympic transport command technology system.)
- An automatic traffic incident detection alarm system.
- A comprehensive traffic monitoring system that automatically identifies single- and double-digit car plates.
- A digital high-definition integrated monitoring system in Olympic central area.
- A closed-circuit digital traffic management system.
- An intelligent regional traffic signal system.
- A flexible management of the expressway traffic control system.
- A traffic signal control system in which buses have priority.
- A large-scale road-side intelligence system and information boards.
- A real-time road traffic prediction system.

Figure 6.8 Traffic Management Centre for Beijing Olympics

Beijing also implemented a measure to keep up to half of the vehicles in Beijing off of the streets during the Olympics. Vehicles with license plates that end in an even number were allowed to travel through the core of Beijing on even numbered days, and likewise for vehicles ending in odd numbers. In addition, 300,000 heavy-polluting vehicles were banned from operating within the city, and entry into Beijing by vehicles was strictly limited. These restrictions were enforced using an automated traffic surveillance network. The measure was expected to take 45% of Beijing's cars off the streets to help improve the flow of traffic during the games and helped reduce pollution during the Olympic Games. Post-event evaluation reports show motor traffic flow decreased by 32.57% on the whole with the application of the odd-even day vehicle operation. This contributed towards a 26.9% and 22.8% increase in speed on AM and PM peaks on the traffic network during the Olympic Games.

Public Transport Management Systems

In the same way that applications of ITS in Traffic Management Centres have improved the general operation of the highway network the public transport operations in cities benefit from deployment of intelligent operation centres. The Beijing Olympics offers a good example of how ITS can be deployed to manage and regulate bus operations both during an event and with lasting benefits thereafter.

In the planning stage of the Beijing Olympics improved bus operations was identified as a way of contributing towards the events environmental and mobility objectives to support the local government in managing transportation originated by the Olympic event. An Intelligent Bus Operation and Control System (IBOCS) was therefore developed which built upon the successful ITS-TAP pilot project that had provided a public transportation management system (PTMS). It supports Beijing's intelligent transport system and air pollution monitoring system. The goal was to reduce greenhouse gases and other polluting agents exhausted by motor vehicles. This was achieved by integrating the technologies of air quality monitoring and the intelligent transportation system adopted by public transportation management and public bus transportation system. The programme generated great benefits for the Beijing Environmental Protection Bureau and Beijing Public Transportation Holdings (Group).

IBOCS was designed to improve Beijing Public Transportation Holdings' capability and efficiency to organize and operate public bus transportation, real time monitoring, implement emergency plans, and manage grand scale events under the frame of environmental friendly operation style, as a part of the urban sustainable development plan called 'Blue Sky of Beijing'. The plan focused on providing a better environment for the Olympic event through strengthened management of the city's sustainable transportation and public transportation based on the technology of ITS.

The IBOCS system was an important part of the integrated Operation and Management System (OMS). The major parts of IBOCS project covered:

- Reconstruction and upgrading of the Public Transportation Holdings' dispatching centre;
- IBOCS system installation in the Public Transportation Holdings' dispatching centre;
- Connecting the interfaces of the Public Transportation Holdings' OMS system with the GPS monitoring subsystem and GPS monitoring of the 34 designated Olympic bus lines with 2000 buses;

- Transplanting PTMS System which was a part of the ITS-TAP project into the dispatching centre;
- Updating PTMS system's software and hardware according to the requirements of the Public Transportation Holdings;
- Providing a data interface for the statistic module under the OMS system of the Public Transportation Holdings;
- Providing relevant training programs for the Public Transportation Holdings' management personals to assist them with their ability on the subjects of operation planning, operation management, large scale activity management and emergency event handling.

The reformed public transportation dispatching centre has the ability to deliver vehicle monitoring, video monitoring, voice dispatching, data integrating, large scale activity and emergency events handling. It plays an important role in everyday operation for centralized command, control, and dispatch. It also made a valuable contribution to the success of the Olympic event.

The IBOCS system played an important role for the Olympic event with the capacity to monitor 2200 buses. Among those vehicles, there were 2000 Olympic designated vehicles. Some 40 bus lines were monitored including 34 Olympic designated bus lines. Through monitoring of the vehicles' location, speed and other status information, the system provided supplemental dispatching information and supported emergency command for the Olympic event.

The IBOCS system improved the overall operation and dispatching capability of the Public Transportation Holdings. It provided rich experiences on aspects of integrated application with GPS technology and public transport operation and dispatching and was a beneficial opportunity for the Public Transportation Holdings to adopt a series of advanced ITS technologies to manage public transportation operation.

Evaluation of the system demonstrated implementation of IBOCS improved the change adaptation ability of the public transportation system to meet the needs of the Olympic event. Assisted by the advanced vehicle positioning system and wireless communication system, the public transport system's capacity to control vehicle operation and its reaction to large scale activity (the Olympics) and emergency event has been greatly improved.

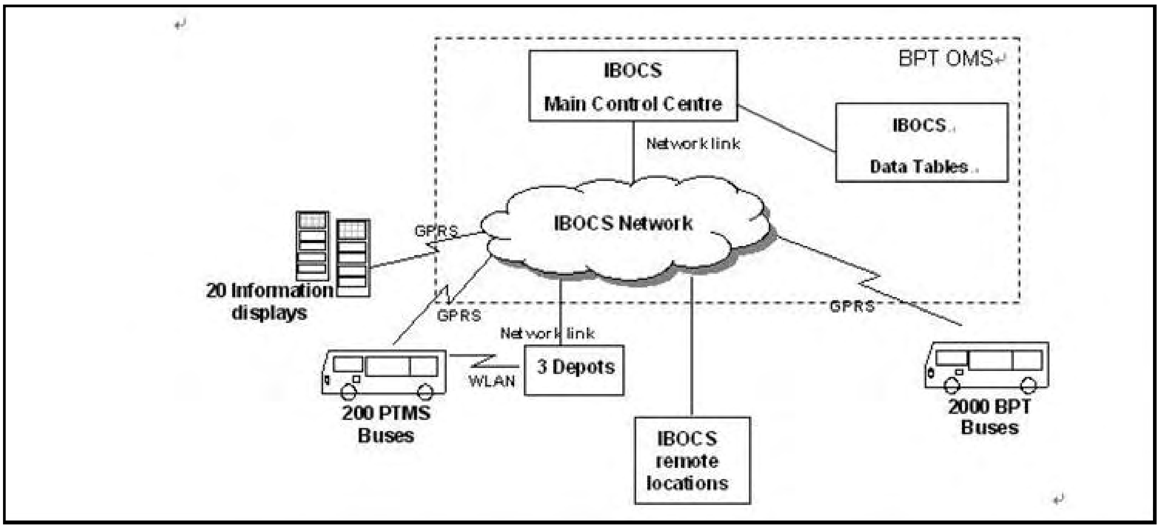


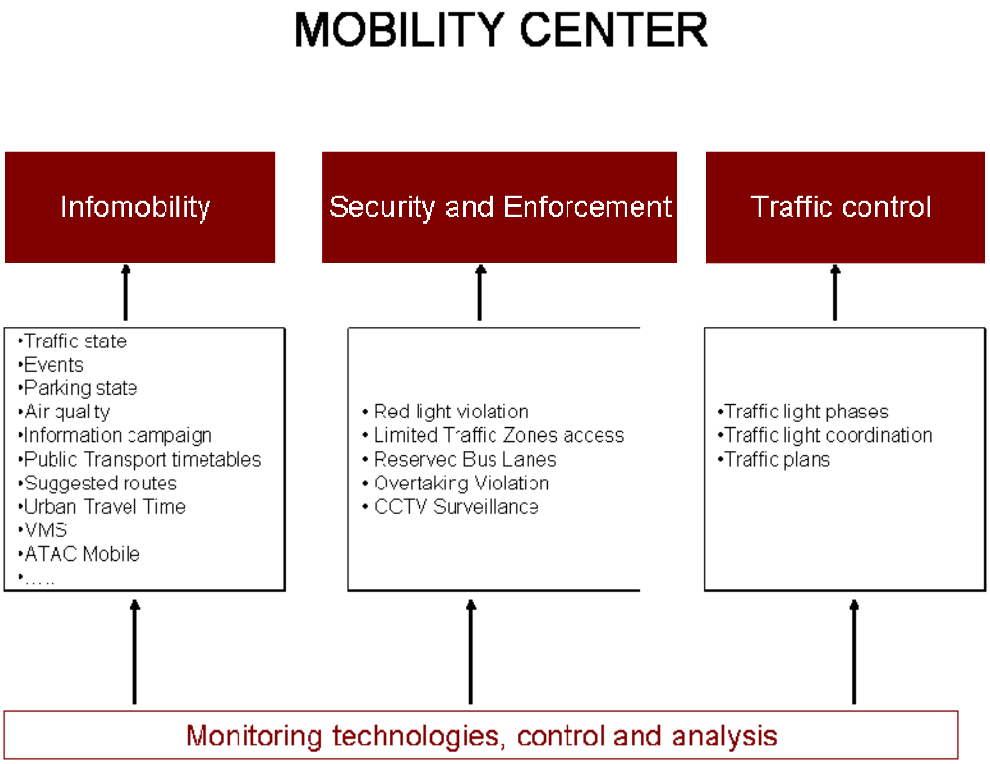
Figure 6.9 IBOCS Structure

A frustration for those working in a host city public transportation operation centre is often the lack of real time data on numbers boarding buses, or waiting for transport. This shortcoming could be avoided with the availability of apparatus to automatically detect the number of passengers boarding the bus fleet. Armed with this information staff can manage dynamically and organically the location of buses on the routes and part of routes most used by passengers.

During the UEFA 2009 Final in Rome the city was able to use an automatic vehicle monitoring system (AVM) connected to a mobility management centre as a fundamental tool for the integrated management of urban mobility. AVM allows automatic detection of the main LPT (Local Public Transport) data and the management of informative flows that are necessary for service modulation. The main services that the system is able to offer are: vehicles monitoring, the collection of service data, distribution of information to passengers, support to planning, organizing, maintaining and operating the service. Each vehicle of the served route transmits data on its position to the Mobility Control Centre that calculates time of arrival of the bus at the bus station and transmits it to the electronic display that shows it in “real time”.

Figure 6.10 Mobility Control Centre in Rome

The Mobility Centre is the core element for Infomobility: it complements the collection of information distributed by ITS systems, processes and makes them available to various users in different ways, as illustrated below.



Similarly, for the Turin Winter Olympics in 2006 a traffic control centre was in place that provided functionality as shown below:

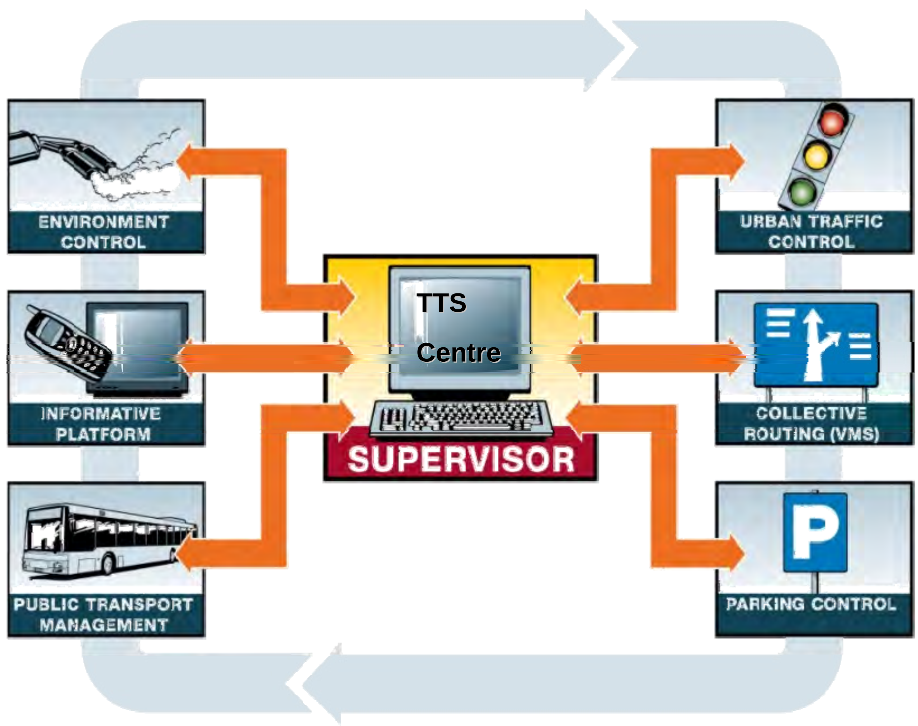


Figure 6.11 Turin Traffic Control Supervisor and Subsystems

The main function of the Mobility Supervisor was to define transport control strategies in real time on the basis of current and forecast traffic flows (public and private), pollution and requests for intervention from the authorities. It generates coordinated management actions to ensure correct actuation of the strategies.

This process requires continuous monitoring of the road network. Inductive loops embedded in the road surface were the principle source of real time traffic data. Additional information on events on the network was provided by the road operators. The strategies are based on a concept which involves maintaining (or recovering) a state of equilibrium for the transport and traffic network by means of coordinated actions implemented through the different subsystems, e.g. traffic signal control, route guidance.

The Supervisor collates all available data to provide a detailed overview of the state of traffic and transport in the network. It uses mathematical models to calculate the equilibrium state (i.e. the optimum distribution of private and PT vehicles in relation to the road network and parking capacity), and the need to avoid excessive pollution.

The modules of the Supervisor are shown in the diagram below.

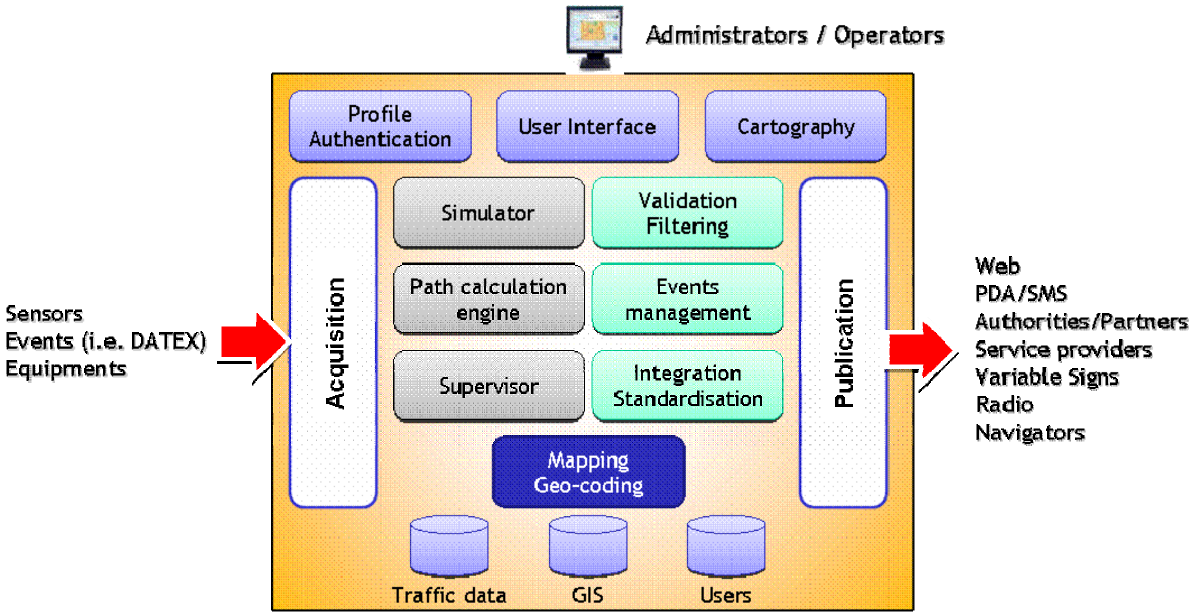


Figure 6.12 Functional Modules of the Mobility Supervisor

The following schematic diagram shows the elements of the public transport management system. This links vehicles with the public transport control room and the 5T integrated control room which then disseminates real-time information to bus stops and mobiles.

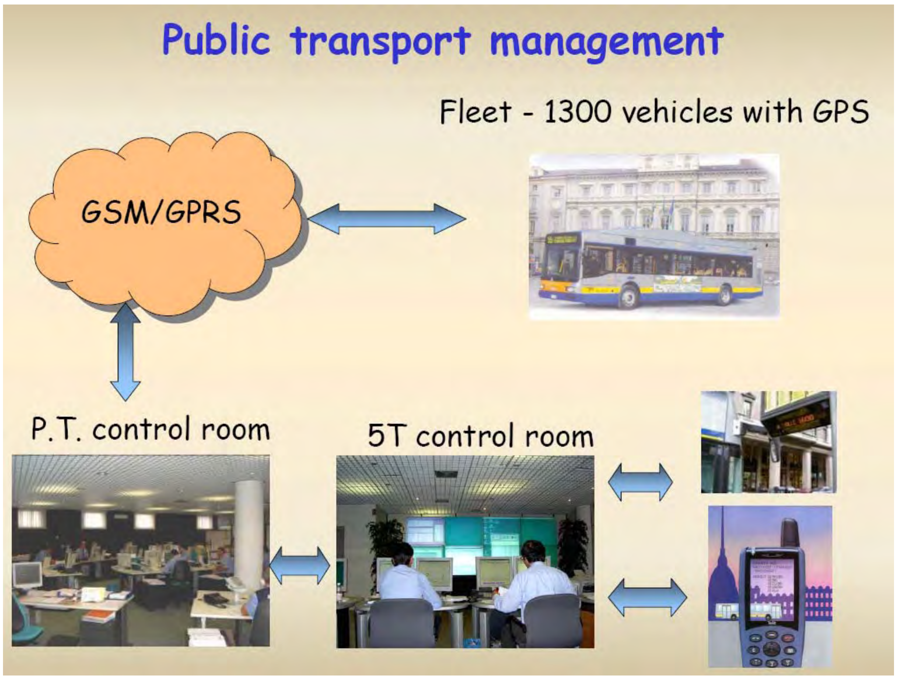


Figure 6.13 Public Transport Management at Turin Games

Coordination

Coordination between host city management teams and transport operators (both within the city and the wider region/internationally) is critical to success. Planning the channels for liaison and providing the guidance on how to reach to given scenarios has been seen to be a key to success. What was true back in 2000 at the UEFA Football Championships hosted jointly in Belgium and The Netherlands still remains valid today. Coordination and information flows need to start at the international borders [with neighbouring TCCs, and airport operators and port operators communicating to the host], be supported along the arterial routes to and between host cities [with information from Highway Agencies and Automobile Clubs], and continue into the city through its transport interchanges [rail & bus stations, etc] and integrate with the city traffic operation centre.

Collecting real time information on movements and transmitting it to all concerned in the chain of command and between modes aids optimisation of mobility. This was a recommendation from the Belgium/Netherlands UEFA Championships 2000 which used simple data reporting from border points, highway agencies and touring clubs in the wider region supplementing city data collection infrastructures.

Park & Ride

In a drive to create “Greener” events, mobility managers have used of Park & Ride facilities in an attempt to increase public transport use and to keep private cars away from the stadiums. For Geneva 2008 UEFA Championship ample provision was planned to work alongside the public transport service based on the existing network, which itself had additional services for the event at the connections between sites and towards the station and the airport. The bus network provided routes serving the stadium and the *Fan Village*, and a special direct Station – *Fan Zone* – *Fan Village* shuttle bus. There are also night buses every day.

A key consideration was the provision of language independent signage for drivers and pedestrians alike; a factor already shown to be important at the UEFA 2000 Championships in Belgium and The Netherlands. The following illustrations demonstrate the utilisation of language independent signage for pedestrians and drivers.

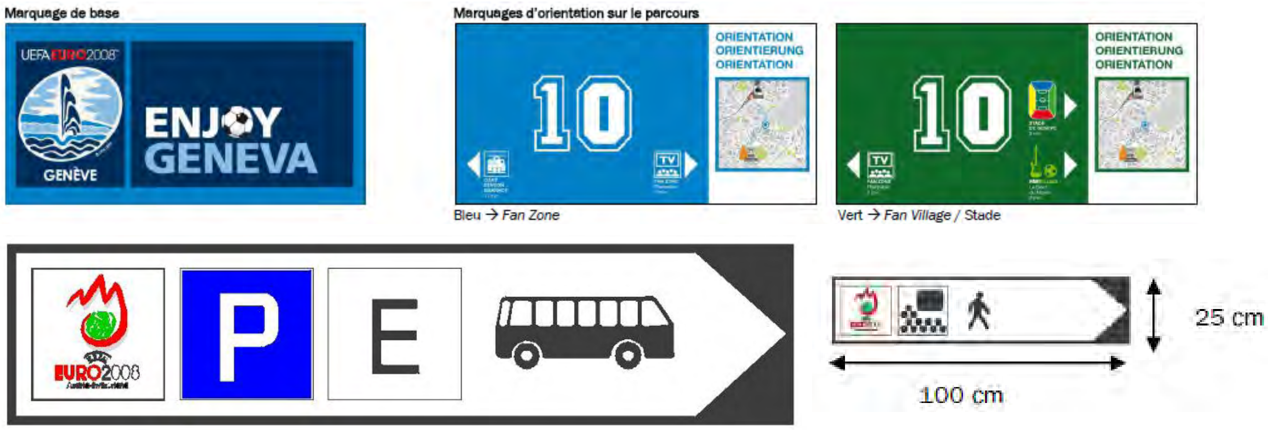


Figure 6.14 Examples of Language Independent Fixed Signage - UEFA 2008

Reported usage for parking facilities during the 2008 Championship reflects a general tendency of all the host cities to have oversized parking provision. On average only 40% of the free temporary parking spaces provided for spectators at the outskirts of the city were filled. This situation was found in all Swiss cities where the modal share of car travel was very low, compensated for by widespread use of public transport. In the city centre, traditional car parks were always available with free spaces.

Use of parking facilities reserved for special categories (UEFA reserved access categories: sponsors, VIP, corporate hospitality, media) set up next to the stadium was also lower (on average 55%) than forecast.

The Melbourne Commonwealth Games in 2006 also made being a “Green Games” a strong point. This meant there was no parking at major Games venues for spectators. To assist Games spectators, ‘park and train’ options were provided at three suburban stations. Other Park & Ride services were provided at various car parks with direct shuttle buses to specific competition venues.

In general Park & Ride facilities have used low technology solutions, as illustrated above, to guide visitors to appropriate facilities. With the increased deployment of VMS and navigation systems ITS can enhance performance. A successful application of ITS at the Turin Winter Olympics in 2006 included a Park & Ride system that filtered traffic. Three parking areas were set up on the approach roads to cater for those travelling to the mountain events by private car. ‘Progressive’ filters were established to avoid congestion on the narrow mountain roads. These regulated car access to the Olympic resorts. When the car parks nearest the sites were full, a filter was activated and private cars directed to the ‘upstream’ parking area.

Awareness and Information Dissemination

Information empowers the traveller. Dissemination of information about alternative mode choices, schedules, ticket prices and journey times should commence before the individual leaves their home with supportive internet sites and broadcast media announcements. For major international events the messages need to be language independent wherever possible. Several cities have found route signage to venues can be colour coded and be linked to parking and spectator seating zones. Today this signage might utilise VMS, but static signs can still have legacy value decades after an event.

Many events create spectator villages (e.g. Geneva for the UEFA Football Championship 2008). These attract high volumes of supporters which require careful management and provide an opportunity to increase the use of sustainable transport modes; in particular walking and cycling between sites. Walking only applies where distances are relatively short, and that was a major asset for Geneva as celebration sites were short distances from each other. The *Fan Zone* was only 1.2 km from Cornavin CFF station. From there, the stadium and *Fan Village* were both 2 km away. These are short distances on the scale of the event. To make the journey more pleasant and encourage people to walk, a pedestrian route showcasing the city was proposed. It was signposted with 180 temporary signs. This route also had security benefits, making it possible to control mass flows and spontaneous gatherings of supporters, since it was defined to avoid sensitive places and remained at a distance from the main traffic axes and public transport intersections. The following figure shows the locations of the sites and the distances between sites with the pedestrian route in place.

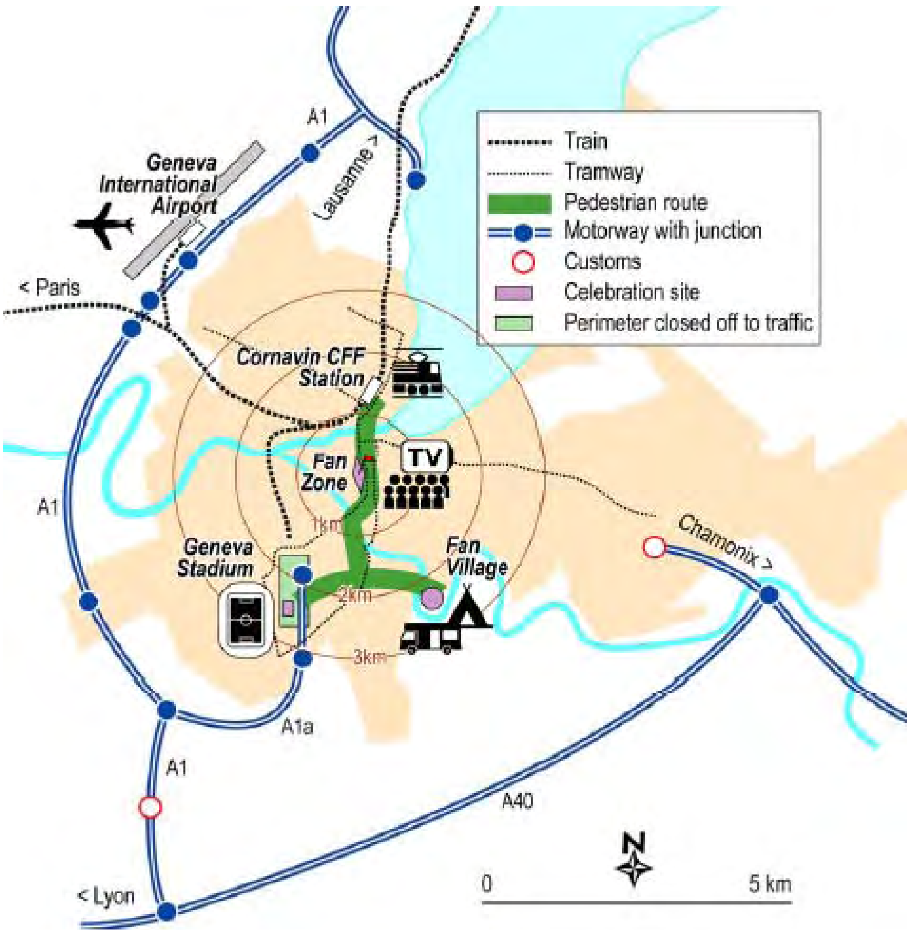


Figure 6.15 Transport Routes and Celebration Sites - UEFA 2008 Geneva

In total Geneva created, 6km of pedestrian routes were put in place in the city, of which 4.5km was along the main Station-Fan Zone-Stadium axis.

A similar, very successful initiative for the World Cup in Germany in 2006 considered the needs of cyclists.

Figure 6.16 Cycle Provision and Signage - Berlin 2006

The initiative saw cycling in the inner city increase by 25 % during the World Cup (compared to April/May 06) with over 70,000 daily trips by bicycle. Car use in the inner city was reduced by 5 % and Public Transport (on match days) saw a 25 % increase.

With the growing development of city cycle hire schemes that utilise ITS technologies to locate hire sites and the manage cycle distribution there is an increasing potential for this mode of transport to play a large role in future events.

Internet based information dissemination has been found to be important both pre-event and during the event to promote Public Transport use and to make visitors aware of mobility options. In Beijing the multi language website was especially useful.

Figure 6.17 Beijing Olympic Website

Beijing 2008

Transport Services

Free transport with an Olympic ticket
Your Olympic ticket provides you with free transport on the day of your event on dedicated Olympic bus lines, the subway and public buses. Note, however, that Olympic tickets do not provide free transport on the shuttle bus between airport and city proper, taxis or the airport express rail.

Olympic Bus Lines
During the Games, there are 34 dedicated bus lines serving all competition venues in Beijing. Other city buses are in service from 6 a.m. to 10 p.m. every day from July 20 to Sept. 20. Bus Lines with a "K", meaning fast lines, are available three hours before and 90 minutes after a competition event. For detailed information on routes and stops, please refer to the Appendix "Guide Map for Spectator Services."

Subway
The subway is the fastest way to get to the Olympic venues. Subway Line 8 runs directly to the Olympic Green. Disembark at the station marked "Olympic Green" and continue through security for a direct entry to the Green.

City Buses
The Olympic venues can all be reached by bus. For details, refer to the section "Getting There" for transport information. During the Games, city bus lines and their schedules may be adjusted. We recommend you make inquiries ahead of time.

Bicycles
All venues have bicycle parking areas. Those who ride to the competition venues must leave their bicycles in the designated areas.

Private Cars
There may be traffic restrictions around the venues during the Games. Vehicles without a specific access permit will not be allowed to approach the venue. Only the Shunyi Olympic Rowing-Canoeing Park and the Triathlon Venue have parking lots for spectators. You are encouraged to use public transport as much as possible.

Spectator Tip

- **Take Note of Traffic Information ahead of Time**
  During the Games, Beijing traffic will vary from its normal conditions. Pay attention to pre-event traffic information to ensure you are not delayed.
- **Allow Ample Time**
  Certain venues are a considerable distance from public transport and taxi drop-off points. You must allow enough time to walk from the drop-off point to the venue itself. We recommend you wear comfortable shoes.
- Refer to the Appendix "Guide Map to Spectator Services" for venue maps and transport information.

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Figure 6.18 Example of Transport Services Website - Beijing Olympics

For short duration high profile events such as Live8 there is little or no new ITS delivered to facilitate mobility management for the event. However, the dissemination of travel information is important and the internet has become the main channel for such awareness information. In the case of Live8 this piggybacked on the existing TfL Journey Planner site (in the case of the London venue) through a special microsite.

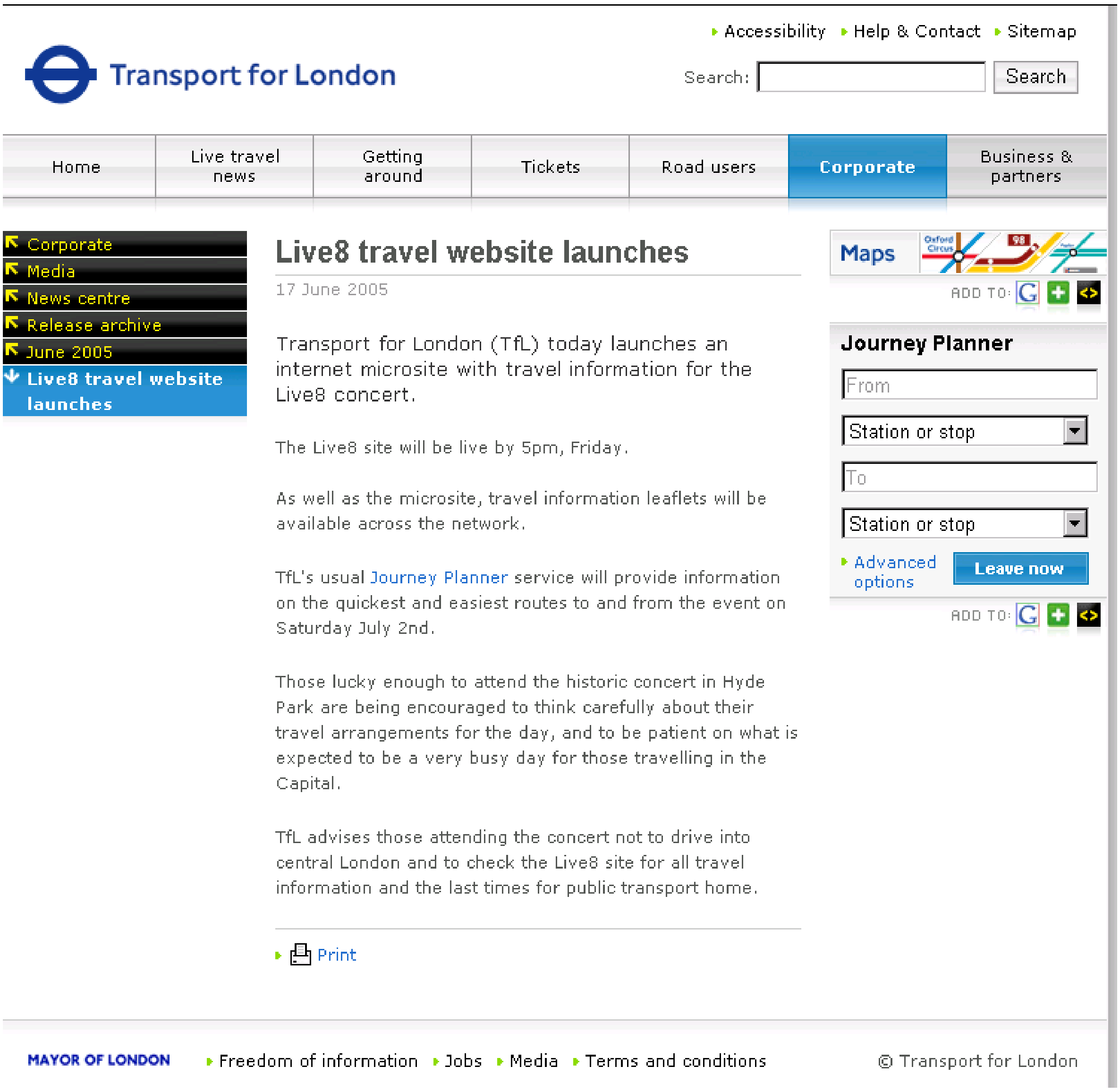

Figure 6.19 Live8 Travel Website

A more comprehensive information service was put in place for the Turin Winter Olympics 2006. The Traveller Information Platform used during the Games provided real-time information on road traffic conditions, public transport, parking status and pollution levels. The information was distributed via the Internet and SMS (text messages).

Recommended travel itineraries were offered from and to any point in the city area based on real time network conditions. The website was an important channel for providing residents and tourists with traffic and transport information for the metropolitan area of Turin. The following services were available:

- Trip planning in the Olympic area for both public and private transport;
- Information on available parking spaces;
- Information on predicted arrival times of public transport at bus stops; and
- Information on traffic conditions with warnings and maps.

Figure 6.20 Real Time Travel Information

Personal digital devices are a rapidly expanding option for host cities to disseminate information to visitors. In particular, the growth in web enabled mobile phones makes it possible to develop a service that can display maps of real-time traffic conditions superimposed on a road map. This was deployed in Beijing. The Beijing Olympic subway line - Line 5 – was also fitted with wireless communication to ensure mobile coverage.

Language will always remain a major barrier given the diversity of nationalities attending major international events and the need to facilitate spectator movement within and between host cities with appropriate route guidance. Managing spectator movement is, therefore, seen as requiring language independent signage to aid car drivers to reach host cities, and then to navigate the last leg to the stadium and its designated parking facilities.

Consideration should be given to creation of event specific signs and awareness material, preferably in multimedia formats to facilitate delivery across a variety of platforms.

Route Guidance and Dedicated Lanes

Host city planners need to consider ways of working with the various highway agencies, touring clubs and broadcasters to both collect and disseminate guidance on the status of the road network to those travelling to an event, or between venues spread over a region.

Route guidance takes many forms and becomes increasingly important as visitors enter the proximity of the event. ITS deliver several solutions to the problem. Utilisation of VMS on major routes is recommended both to reduce congestion and to guide traffic to designated parking sites. For UEFA 2008 in Geneva traffic diversions were put in place, varying according to days and times.

All car parks were signposted from the Geneva motorway bypass with special EURO 2008 signage. Some 500 signposts were put up across the whole road network (motorways, cantonal network and municipal network). This signage was supported by dynamic information displays on variable message signs. The Police, who controlled the signs directly, could set up relief routes ready to absorb the traffic in the event of disruptions.

In order to manage the traffic in the area of the stadium, the Geneva police were able to rely on a GIS, AGIRE application, which was created by the company ARX IT in Geneva (www.arxit.com) and developed with the expertise of CITEC, in collaboration with the Geneva Canton (Transport and Geomatics Department). AGIRE had been specifically developed for the traffic management around the exhibition centre Geneva Palexpo that hosts the Motor show and many other large exhibitions. EURO 2008 gave an opportunity to extend the geographic coverage of the software to the whole Geneva Region and thus include the stadium area.

At the Turin Winter Olympics a Collective Route Guidance subsystem provided warnings and general information to drivers of private vehicles by means of Variable Message Signs (VMS). The aim was to give dynamic guidance through various alternative urban and sub-urban routes for traffic flows, providing specific traffic information on the Olympic locations and occupancy conditions of parking areas.

Within a city event planners may feel the need to devise an event specific road network such as that used for Olympic Games. These temporary road networks typically restrict access to certain classes of vehicle or participants. Guidance on who can use these networks and their extent is imperative. ITS can deliver that guidance.

An example of successful ITS route guidance is that deployed at the Beijing Olympics in 2008. The navigation system allowed vehicle-to-infrastructure communication to ease traffic congestion. The system provided drivers with information on the quickest route to their destination calculated using probe data collected from 13,000 taxis. The input data is routed to the Beijing Transportation Information Centre (BTIC) server to be processed into relevant traffic information. Employing telematics, the data was then delivered to the driver’s navigation monitor in the form of real-time maps indicating current traffic flow conditions. The system helped drivers avoid the most congested roads and contributed towards easing traffic conditions in the city. Results from the application show that the ITS was able to cut down travel times by an average 20%.

At a non-technical level route guidance and pedestrian wayfinding was helped when most of the signs in the streets and public transport networks were replaced by bilingual signs (Chinese, English). For instance 24,000 new road and street signs, as well as 690 public transport station signs were installed. These static fixed signs were the predominant means of information provision.

Figure 6.21 Bilingual Public Wayfinding Signs

During the Beijing Olympics, the traffic guidance by Variable Message Signs (VMS) achieved excellent effects. The road condition dynamic and quantitative information which was released provided travellers with real-time road conditions and travel time of main Olympic lines.

An extensive Olympic route network was implemented with clear signage.

Figure 6.22 Example of Dedicated Lanes and signage on Beijing Olympic Route Network

Similar plans were developed for the Melbourne Commonwealth Games in 2006. The city road network was adapted to include Games lanes for the exclusive use of athletes and officials. Dedicated lanes were introduced on selected roads to ensure vehicles transporting athletes and officials would arrive at their destination on schedule. Exclusive Games Lanes were located on the most suitable and direct routes between the Commonwealth Games Athletes' Village and two major Games venues. They were for use by authorised Games vehicles only although some sections were 'shared zones' to enable access to local commercial and residential properties.

Figure 6.23 Dedicated Lane Network and Signage - Melbourne 2006

Event and Transport Ticketing

In evaluation reports following the UEFA 2000 Championships in Belgium and The Netherlands public transport operators expressed a strong recommendation that travel be included in Stadium tickets at future events. This level of ticket integration has been slow to take off, but is becoming more evident with advances in ticket technology and integration of payment systems.

Paper based ticketing has been the norm for events, though the scope to use e-tickets and smartcard technology is now a practical option. This offers further benefits where the ticket combines both venue entry and travel on public transport.

The great success story of the transport concept put in place the 2008 UEFA European Football Championship (Euro 2008) jointly hosted by Austria and Switzerland was the ticketing system. The success of the events "Kombiticket" made it possible for public transport to have an exceptionally high modal share of spectator travel, exceeding the Confederation's demands. The public transport modal share of long distance travel on match days was 67%

against the target of 60%. The public transport and non-motorised transport modal share was 80% for the last stage of the journey to access the stadium (including car park shuttles), in keeping with forecasts.

Advances in public transport ticketing systems are opening up the long held recommendation of host cities that event and transport tickets should be integrated. An example of the benefits of this technology was observed at the UEFA Champions League Final 2009 in Rome. The public transport ticketing system in Rome is based on magnetic tickets for single journeys and a contactless smart card for subscriptions and season tickets.

In 2009 for the first time in Rome the event ticket was integrated with the public transport ticket (chip-based smart card), providing spectators with a single media to access both the public transport system in Rome and the access to the Stadium: for security purposes related to the entrance at the Stadium, personal data were uploaded in the electronic ticket in advance, allowing smooth operations.

Figure 6.24 Combined PT and Event Ticketing

Combined tickets also offer hosts the flexibility to add other services, for example, in Rome access to the Capitoline Museums was included in the ticket.

The Beijing Olympics strategy to encourage use of public transport envisaged free rides on the Beijing public transport system for those spectators holding a ticket for the Olympic competitions. On the basis of the Games schedule, the free public transport service operated for a total of 51 days, from the opening of the Olympic Village (15 days prior to the Olympic Games Opening Ceremony) till the closure of the Paralympic Village (36 days after the Olympic Games Opening Ceremony).

Beijing offered a Traffic Card which could be used for travel on buses or the subway and a smartcard which also combined Bus & Subway.

The event tickets formed part of a major expansion in the use of RFID technology to prevent counterfeiting and enable automatic ticket checking. Event tickets were effectively paper tickets, but ‘with steroids’, inasmuch as they included an embedded wafer thin chip. Tsinghua Tongfang company RIA provided three types of RFID readers that controlled doors and cameras throughout the facilities. Some were handheld; others connected directly to computers.

The ASK-TongFang wafer-thin chip die and silver-ink printed antenna embedded into the paper tickets are intended to battle counterfeiting, provide speedy check-ins for visitors at venue gates and guard against unauthorized access to specific areas of the Olympics compound.

The 1-kbyte memory chip embedded in the tickets did not carry personal identifiable information, but linked to a database. The chip embedded in the ticket stored a unique serial number to ensure authenticity. It was estimated that ASK-TongFang sponsored the 12-14 million tickets and 1,000 readers at a cost of $7.2 million (50 m RMB). The investment served the Beijing Games as well as September's Paralympics Summer Games.

Having greater control to prevent counterfeiting was a key consideration in adopting the technology, but the 2008 Beijing Olympic Games also relied on RFID to help security personnel monitor Olympic hotels, venues, manufacturers, distribution centres and hospitals.

Earlier at the Turin Winter Olympics (2006) Smartcards and RFID had been used to great effect. Vehicles were for the first time equipped with an on-board unit and an electronic smartcard to pay for special lanes on the tolled motorway approach to the city. The same smart card was used to pay for both parking and public transport systems and gain access to Winter Olympic events. The system was delivered by Q-Free, based in Trondheim, Norway. It was reputedly the world's first system which integrated public and private transport through a single means of payment. The card was delivered by ASK Contactless Smart Card Technology based on RFID.

The unified ticketing system allowed visitors through automatic tolls and to make contactless payments at car parks and also on public transport. The scheme which also included passes for school children, multimodal passes, passes for tourists and passes into museums and galleries was intended to reduce fraud.

The payment instrument is a "two piece tag" consisting of an On Board Unit (OBU), which sits behind the rear view mirror in the car, and a Smart Card that can be inserted into the unit. The OBU can also be used as a stand-alone unit to register payments, even without a Smart Card. The advantage of the system is its flexibility and mobility. The Smart Card goes with the user and can be used not only for road tolling and GTT parking fees, but also to cover GTT public transport usage, fuelling costs, and other forms of transport.

The service was launched in Turin in December 2005. The system is based on a combination of smart cards and microwave dedicated short range communications (DSRC) at 5.8 GHz. The system is compatible with the Telepass national electronic toll collection specifications in Italy. The Telepass specifications are not compatible with the Comite Europeen de Normalisation (CEN) standards for 5.8 GHz DSRC. Before Q-Free, the only Telepass supplier has been Autostrade per L'Italia.

Transport Operator of Turin (GTT) introduced a new access control and ticketing system for Line 1 of Turin's Metro system before the Winter Olympic Games in Turin. This access control and ticketing system consists of access control equipment with tickets and card readers at all sites, intrusion detection systems, and a supervision and control centre. The ticketing system is based upon contactless tickets and cards and magnetic stripe tickets. There is no need to insert the ticket in the validation machine, just pass the ticket over a specific area indicated with short Braille messages placed on the glass barrier that separates the welcome area from the station proper.

The system, operated by a central server based in Collegno, installed in all 15 stations and comprises 183 access control gates, 183 magnetic ticket handling units, 183 contactless card and ticket handling units and 36 automatic ticket vending machines.

GTT also equipped one of the operator's 20 car parks with a ticketing system that was fully integrated with the transport network. Passengers leaving their vehicles at this car park could purchase a magnetic ticket at the car park that covered both the parking and the use of the metro. After delivery of the first car park system in just one month, Thales worked with GTT to implement the same system in the other car parks and expand it to include contactless tickets. Probably the first such system in Europe.

At the Melbourne Games in 2006 the concept of fully integrated ticketing and smart cards was only just emerging. Metcard, the brand name of the integrated ticketing system used to access public transport in Melbourne is a universal ticket which allows users to ride on the city's Metlink network, consisting of suburban trains, trams, and buses, including the NightRider network. The Metcard is a credit card sized ticket made out of cardboard that uses a magnetic strip to store fare data. Metcard is operated by OneLink Transit Systems under a contract to the State Government which is managed by the Transport Ticketing Authority. Metcard was intended to be replaced by the myki contactless smartcard ticketing system, which is progressively being rolled out throughout Victoria.

A ticket to the Commonwealth Games was also a ticket to ride Melbourne’s trains, trams and buses (all services that accept Metcards) on the day of the event. Travellers needed to have their Games ticket with them when travelling and they needed to retain their Games ticket for the journey home. However, there is no indication that the Games ticket was anything other than a paper ticket.

Melbourne is the only event where an example of an e-ticket has been found. It entitled Little Athletics members to free entry into the Sydney Track Classic.

Environmental Monitoring

Although a core consideration of many large events environmental monitoring systems have not been widely reported upon.

The Environmental Monitoring subsystem at the Turin Winter Olympics 2006 acquired meteorological and environmental data from detection stations and processed it, together with traffic-related data and vehicle emission estimates from the UTC subsystem, using a special software suite to calculate forecasts of air pollution for the short and medium terms. The forecasts were sent to the Supervisor system for the calculation of reference strategies.

Security and Surveillance

One of the main security issues at all events relates to the management of flows in the Stadium area; both traffic and pedestrian. The usual procedure is to separate the two supporters groups, in order to avoid any possible contact. Specific areas are designed, with increasing levels of access limitations as spectators get closer to the Stadium.

The following examples from UEFA matches in Rome (2009) and Geneva (2008) illustrate the principle and strategies that are known to work well.

In Rome three zones were defined: a red zone that was completely off-limits and reserved to the participants at the event; a yellow zone accessible just to those bound for the stadium; and a green zone with partial limitations to parking and to through traffic flow. The designated parking areas for vehicles bound for the stadium, the bus stands and the taxi stands, are located predominantly inside the yellow and green zones. The following figure shows the organisation of the stadium area.

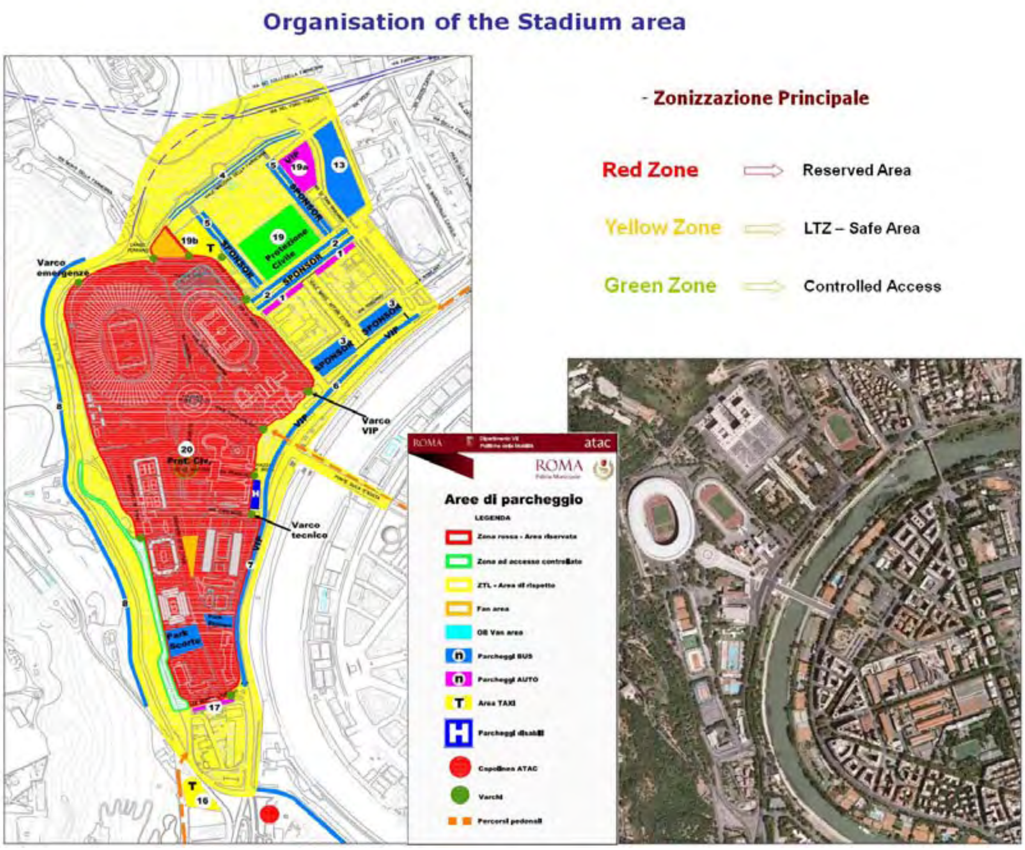

Figure 6.25 Security Zones around Stadium - Rome 2009

Security management was further enhanced by the use of an integrated electronic ticket that contained personal information to smooth access to the ground.

In the case of Geneva within the "traffic control perimeter", traffic restrictions are put in place. Only authorised individuals, VIPs and taxis were allowed in. "Access controls" made it possible to filter vehicles at three entry points of the "traffic control perimeter". Public transport dropped spectators off at the edge of the security perimeter. Then the final leg of the journey was on foot along thoroughfares that had been closed off to traffic, in corridors separated from VIP and authorised traffic.

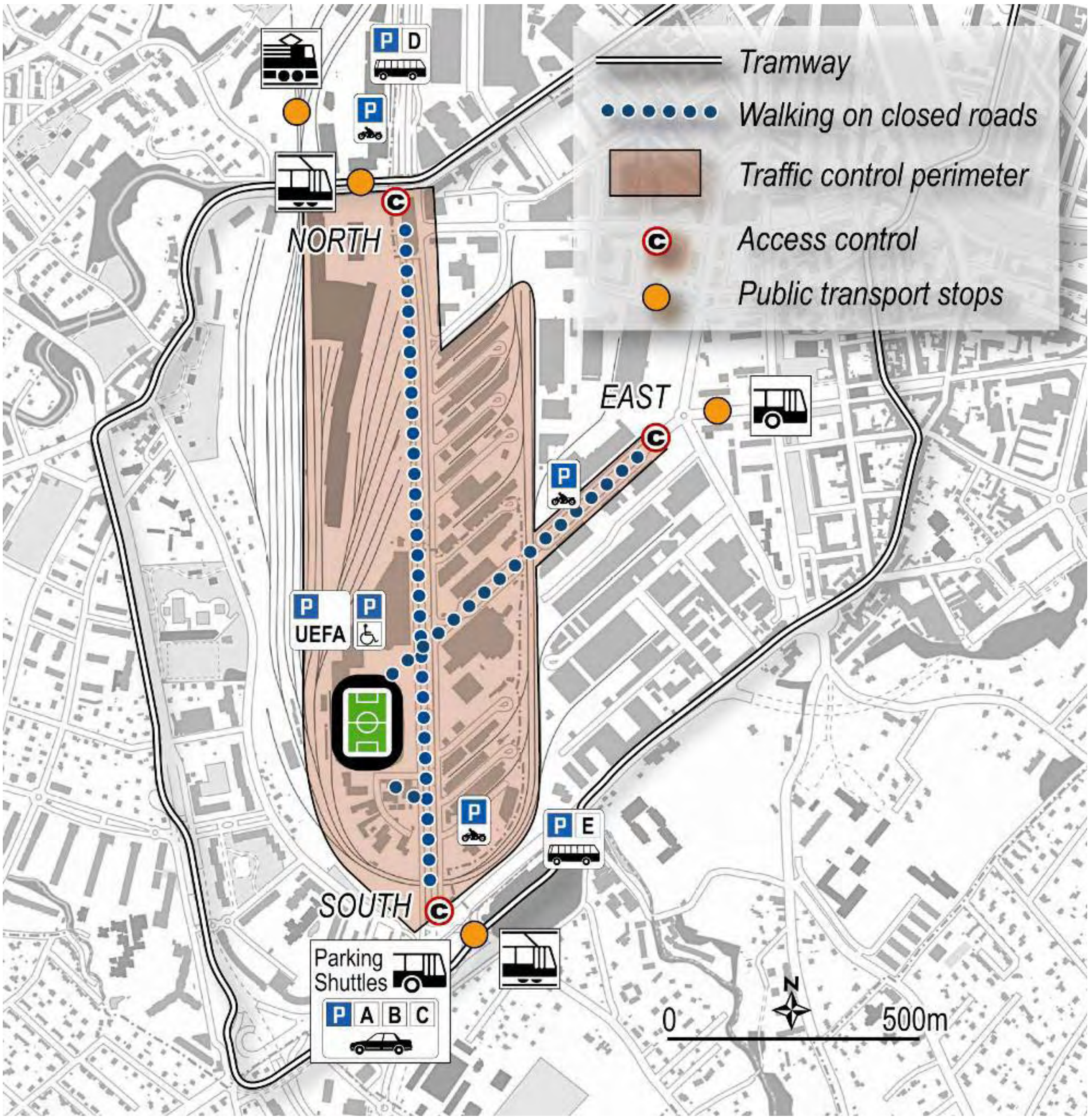

Figure 6.26 Security Perimeters and Access Control around the Stadium - Geneva 2008

It is now conventional to utilise CCTV to support security operations around stadiums and on the transport network with links to control centres and the police. A more recent development is the application of Visual Scene Analysis (VSA) to support decision making and to help identify potentially dangerous situations (e.g. overcrowding on platforms).

7. CONCLUSIONS

7.1. Hosting and Event Management

One of the most significant results of this research has been a distillation of the roles and responsibilities that combine to deliver a successful event. The importance of this should not be underestimated as it clarifies many of the issues encountered by planners and helps to identify the necessary linkages that must be forged between different groups to deliver a successful event.

We identify two distinct communities:

- The Event Community; and
- The Hosting Community.

Our focus is upon the needs of the Hosting Community as they bid to hold large events and subsequently plan the successful delivery of them. To clarify the boundaries of the main thrust of the STADIUM Project, a 'Mobility' community has been identified within the 'Hosting' community.

Liaison with the Event Community cannot be ignored as these "owners" of the event will often set minimum standards for environmental and mobility objectives which a host must fulfil and may dictate some critical targets for mobility management (e.g. journey times between locations, or mode choices to meet a "Green" objective).

Host cities can learn much from the lessons of previous large events and in particular will find guidance in the STADIUM Handbook; distilled from our research an invaluable tool to select potential mobility applications from.

7.2. ITS Systems

By concentrating our research on a core group of large events and assessing the guidance offered by organisations such as the IOC, FIFA and UITP we believe the study has identified examples of all potential ITS solutions used in previous large events that might have merit for future events.

In each event studied the same mobility considerations have emerged and with differing shades of application similar ITS solutions have been implemented. As the years have progressed the sophistication of these applications has increased. They have become part of mainstream traffic control systems and the trend now appears to be that events will be a justification for extension and/or enhancement of those systems.

Our research indicates that while there are some 'off the shelf' applications, much ITS functionality needs to be customised for integration into a host cities existing transport infrastructure. Time is the critical factor in developing or incorporating new applications, so it is likely that only those events which have long bidding periods and delivery times will afford opportunities for significant deployment of new ITS applications.

Attention needs to be maintained on cutting edge ITS solutions as the STADIUM Handbook develops to ensure it keeps pace with advances in ticketing technologies, route guidance and VSA developments.

Transport
For London

STADIUM

Turin Winter Olympics 2006 - Annex

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Version :	0.00.00(10TH)
Version Date :	17/12/2009
Document Reference :	**STAD-DEL-WP2-1112**
Document Category :	Deliverable

Phase: Analysis & Design

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0. PREFACE

0.1 AUTHOR (S)

Name
Angela Spence

0.2 THIS VERSION[1]

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(10TH)	17/12/2009	Tony Haynes	N/A	Accepted all changes. Aligned Configuration Management with QM Proposal

0.3 AUTHORISATION

a) This is a controlled document once issued. All revisions are subject to change control.
b) All revisions of this document must be reviewed by at least one work package subject matter authority.
c) All revisions of this document must be approved by the TfL Stadium Project Manager.
d) All revisions of this document must be accepted by the GCS Programme Manager before being issued.
e) All revisions of this document must be reviewed by at least one consortium authority.
f) All revisions of this document must be approved by the designated consortium authority.

Role	Name	Signature	Date
Reviewed By Work package : Subject Matter Authority			
Approved By Work package: TfL Stadium Project Manager			
Accepted By Work package: GCS Programme Manager			
Reviewed By Consortium :			
Approved By Consortium:			

[1] Version History at Appendix B

0.4 CHANGES FORECAST

None

0.5 VERSION NUMBERING

The review history of all documents follows the pattern:

a)	Author draft(s)	[0.00.00(nAA)]
b)	Workpackage Review	[0.00.01(0)]
c)	Workpackage Approval	[0.00.10(0)]
d)	Consortium Review	[0.00.20(0)]
e)	Consortium Approval	[0.00.30(0)]
f)	Issue	[n.nn.00(0)

1. INTRODUCTION

1.1 PURPOSE

1.1.1 Document Purpose

To deliver an appraisal of the 2006 Turin Winter Olympics Large Event.

1.1.2 Functional Purpose

To understand how Intelligent Transport Systems were used to support the mobility aspects of the 2006 Winter Olympics Large Event in Turin and to elicit information that will contribute to the recommendations in the main 'State Of The Art' Large Event Report.

1.2 SCOPE

The 2006 Turin Winter Olympics Large Event

a) The context and background of the event
b) The challenges of the event
c) The Provision Of Customer Information
d) Ticketing Technologies utilised
e) Security
f) Mobility Management
g) Planning

1.3 DOCUMENT EXCLUSIONS

This document does not repeat information captured in other documentary products. Where such information is relevant those documents will be clearly referenced within the annex.

2. CONTEXT

2.1 OLYMPIC EVENTS

A summary of the generic organisation and objectives of the Olympic Movement will be found in the main report Annex ‘Event Characteristics’ (See Ref. 0)

2.2 BRIEF OUTLINE

The Winter Olympics in 2006 were held from 10-26 February, and were followed by the Paralympics in March. The area concerned consisted of the City of Turin and nine different sites in the Alpine valleys to the west.

FIGURE 1 GEOGRAPHICAL AREA AFFECTED BY THE TORINO 2006 WINTER OLYMPICS

The City of Turin hosted the Olympic Villages, Press centres, the opening/closing and medal ceremonies, and the skating events, while the skiing and other snow-based events were held in the mountains (eight sites were in the Chisone Valley) and one in the more northerly Susa Valley, located at a distance of between 80 and 100 km from the city.

This meant that it was necessary to:

a) ensure that the mobility needs generated by the Olympic events were met without disrupting the normal functioning of the city (in a metropolitan area of around two million inhabitants);
b) provide efficient connections between the city and the mountain venues.

The latter posed particular difficulties. While the Susa Valley is served by a rail link and a motorway, the Chisone valley is served by motorway and rail only as far as Pinerolo. Therefore, using either valley, the final section to reach the major resorts has to be travelled on narrow mountain roads (in the former case for a distance of around 30 km, in the latter at least 60 km).

2.3 SCALE OF THE EVENT

The total number of competition events planned was 177. The estimate made before the Olympics of the number of people requiring transport to and from the event sites was: athletes 3500; technical staff 5500; officials/ VIPs 1000, press corps approx 11500. This totalled well over 20,000 for the 'Olympic Family'. The total number of spectators was more difficult to estimate, but calculated to be at least half a million over the full period.

Whilst this annex covers most of the topics I believe relevant, I propose the following structured headings be used across all event annexes. My intention is consistent and objective review:

City(ies):

Name

Population(s)

Demographic anomalies (such as very young/old/conservative/xenophobic/highly criminalised)

Avialable modes including parking, park and ride, etc

State of each mode's infrastructure

Volumetrics (journeys delivered by modes, typical modal splits for Trip makeup)

Degree of Network integration, co-ordination and operational control

Population densities of locations (propensity for long commutes, typical background commute distances, etc)

THEN

Event size, duration, timing, relative impact (particularly size, scale and timing of travel demands)

Anticipated perturbations, route dedication/denial

CONTEXT

Participant/Spectator/Utility relative volumes

Number of events, venues, geographical location/spacing, capacities, etc

3. CHALLENGES

3.1 GENERAL EVENT CHALLENGES

3.1.1 Olympics Challenges

The Olympic Games have grown in scale to the point that nearly every nation is represented. Such growth has created numerous challenges, including boycotts, doping, bribery of officials, and terrorism.

3.1.2 Environment Challenges

3.1.2.1 Growth

Any city that has a significant growth factor will be experiencing increased demand for transportation services. The balance between this, planned transport development and the demands of a large event will always be a serious challenge. There will also be a potential for increased car ownership adding to the problems of traffic congestion.

3.1.2.2 International Traffic

As a by-product of growth, there are increased demands for international traffic resulting in a need for increased facilities for international transport arrivals and transport departures. This also has an impact on border policing. A Large Event with an international flavour will put extra pressure on both of these aspects of international traffic.

3.1.2.3 Freight Expansion

Similarly, the growth of a city is likely to place extra demands on freight throughput. Such growth will lead to more congestion, slower travel speeds and increased emissions. Therefore the need for integrated transport becomes even more pressing.

3.1.2.4 Road Safety

With the increased transportation demands identified above, the potential for more accidents is an obvious corollary. There is therefore a need to prevent more accidents by whatever means possible. The safety of visitors to the city during a large event is also of paramount importance to the reputation of the city.

3.1.2.5 Pollution

Similarly, with the increased volumes of traffic there is a potential for there to be increased levels of pollution from emissions and noise. A city with high levels of pollution will not be favoured in any bidding process for hosting a large event.

3.2 CITY SPECIFIC CHALLENGES

When all eyes were turning to Turin 2006, the ability of the IT systems to operate without failure was a key criterion in their design. Security and business continuity was paramount.

The risk was that someone could try to hack into the feeds and change the results, such as the name of the winner. The computer systems of the Turin Olympic Games were hacked and accessed by a man who worked as a consultant to the Turin organising committee.

4. PLANNING & DESIGN

Some aspects of planning will not be explored by this report since these aspects do not impinge upon the use of technology. These aspects are:

a) Marketing Planning
b) Sponsorship Planning
c) Site & Venue Planning
d) Finance Planning
e) Programme Planning

4.1 ORGANISATIONAL STRUCTURE

It was necessary to set up an organisational structure to ensure the collaboration the large number of bodies involved, including the Olympic Committee, the police and emergency services as well as the road operators, which included:

a) 6 motorway operators
b) 3 sub-urban road operators
c) 1 urban road operator

The necessary agreements, procedures and role statements between the parties were defined by the Turin Olympic Committee. The plan included a legacy policy whose aim was to keep the system operational after the Games.

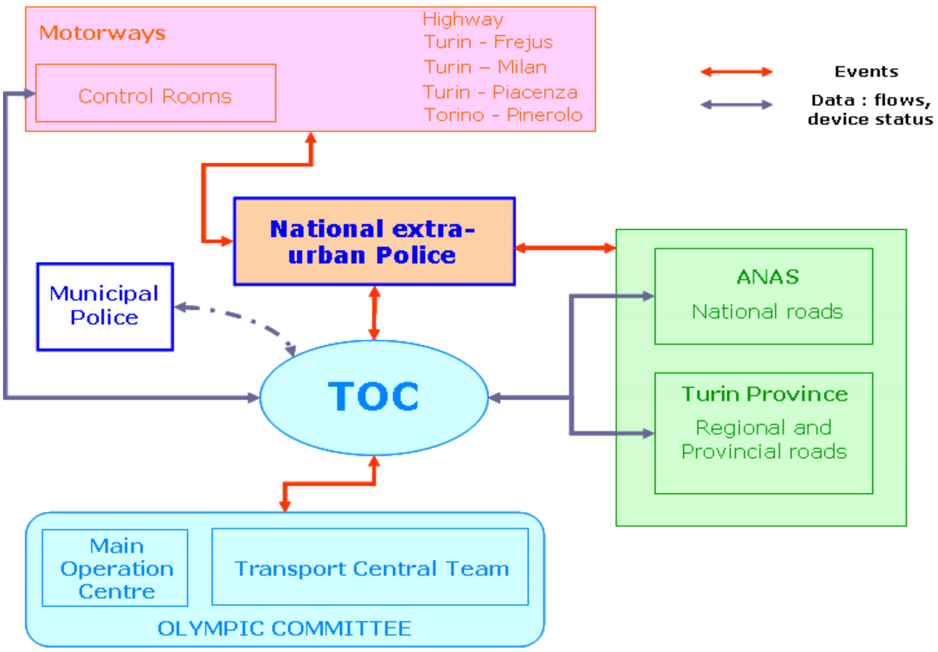


FIGURE 2 ORGANISATIONAL STRUCTURE FOR TRANSPORT MANAGEMENT - TORINO 2006

The Olympic Committee took the overall leadership and responsibility for the Traffic Operation Centre (TOC). Efficient coordination needed to be achieved in the initial planning phase, before any physical connections were made between the sub-systems. The strategy also had to include procedures for the transport

4.2 TIME FRAME

4.3 SIMULTANEITY

4.4 STRATEGIC APPROACH

4.4.1 Mobility

To a very large extent, Turin 2006 used transport best practice of the two previous Summer Games and applied it to specific Winter conditions and the particular situation of a 100km distance separating city ice venues from mountain snow venues.

For the Games, Turin temporarily implemented 80km of directional Olympic lanes, five times the amount of existing bus reserved lanes, which worked very well. Two interesting transport innovations are of particular interest:

a) Mountain rail shuttles. The habit of taking a train to go skiing was long lost in Italy. A Turin Central Rail station to Oulx (about 80km) Olympic shuttle service was introduced for the Games (Figure 4). It proved very successful as 65% of Olympic spectators used it, leaving most mountain pay park and ride facilities half empty.

b) Car-free mountain area transport. All Olympic snow venues were located in two valleys served by narrow two lane low capacity mountain roads. Allowing car traffic would have generated unreliable and chaotic traffic conditions.

Car traffic was therefore prohibited and altogether replaced by an extensive temporary mountain shuttle bus service covering a network of about 80km.

(Ref. 0)

4.4.1.1 Transport Strategy

The transport management strategy was based on some fundamental principles:

a) Attention to environmental and pollution issues:
as far as possible those attending the Olympics events, especially those in the mountains, would be encouraged to use public transport

b) Multimodal transportation:
following from the above, it was necessary to ensure adequate capacity and the efficient organisation of the various transport modes and transfers between them. In particular this involved setting up Park & Ride and Train & Ride arrangements plus the related information services

c) Integrated management centre:
a single Transport Operations Centre (TOC) was to be established in order to centralise the monitoring and management of all transport operations in both the city and the mountain areas

d) Need for a crisis management strategy:
action plans had to be agreed with the Police and other relevant authorities to be able to deal efficiently in the case of unexpected events (e.g. heavy snowfall, accidents, security alerts, etc.

4.4.1.2 <u>City Transport Strategy</u>

The main elements of the city transport strategy were:

a) A Park & Ride system:
a network of large parking areas was set up in the city outskirts. Spectators arriving by private car were encouraged to leave their vehicles there and to continue by public transport or shuttle;

b) Intensification of public transport:
for the transport of spectators, the normal bus and tram services were increased in frequency and the routes extended. A fleet of shuttle buses provided links between car parks, train stations and competition sites. Special shuttle buses were provided for the athletes, technical teams etc.

c) Olympic lanes:
creation of reserved lanes on the main traffic arteries for use by official vehicles and to ensure that the shuttles carrying athletes and technical staff were not delayed in reaching event sites.

d) Reduction of mobility demand:
during the period of the Olympics, schools in the whole area were closed in order to reduce the volume of 'background' traffic.

4.4.1.3 <u>Mountain Transport Strategy</u>

The main elements of the mountain transport strategy were:

a) Train & Ride system:
the existing railway connection between the city and the head of the Susa Valley was intensified. Additional trains were run especially in advance of the major competitions. From the final station, shuttle buses were operated on the last section of road to the mountain villages where the competitions were held;

b) Park & Ride system with road filters:
three large parking areas were set up on the approach roads to cater for those travelling to the mountain events by private car. 'Progressive' filters were established to avoid congestion on the narrow mountain roads. These regulated car access to the Olympic resorts. When the car parks nearest the sites were full, a filter was activated and private cars directed to the 'upstream' parking area.

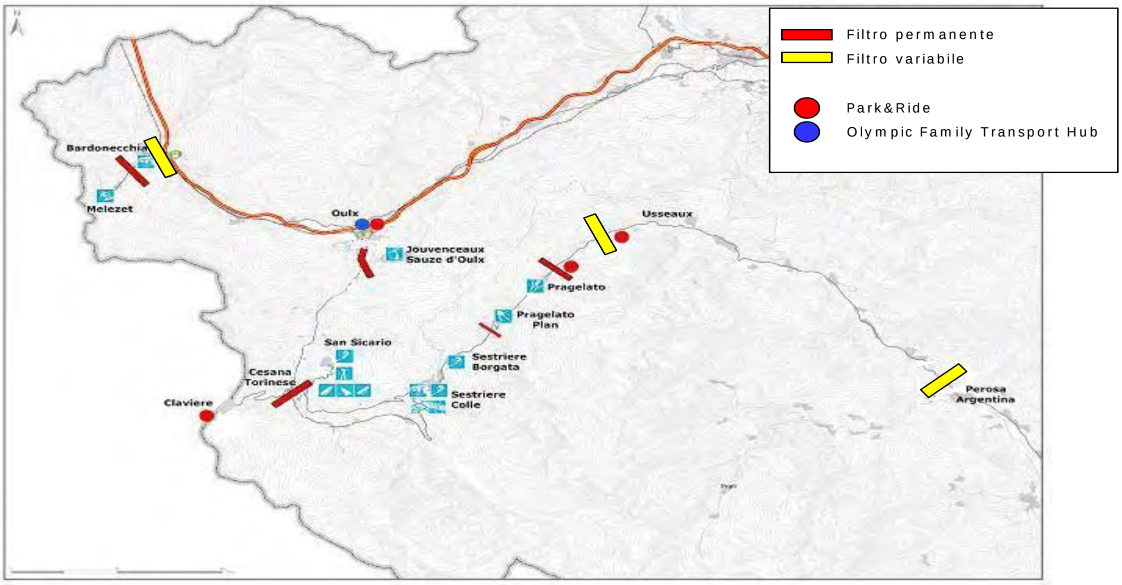


FIGURE 3 THE ROAD TRAFFIC FILTER SYSTEM

All literature and event programmes contained maps and information explaining the transport arrangements giving indications of the bus, tram, train or shuttle services which could be used to reach each competition site and how to obtain real-time information and updates.

4.4.2 Operations

4.4.2.1 Traffic Operation Centre (TOC)

The purpose of this centre was to provide a single strategic traffic control and monitoring instrument, able to cover both the metropolitan and wider areas, and to deal in a coordinated way with all the complex mobility problems.

During the Games, the TOC acquired traffic data from telematic devices (mainly inductive loops) installed along the roads affected and received data in real-time from all the transport Operators and Authorities on traffic events and conditions.

This information was analysed automatically by the 'Supervisor' and provided support for on-line mobility planning. In parallel, the short and medium term traffic flow forecast, compared with the off-line planning, permitted detection of critical situations (queues, congestion, accidents, full parking areas).

The TOC system managed traffic and mobility and applies control strategies by means of a number of traffic management tools:

a) an adaptive traffic light control system
b) public transport priority system (in urban areas)
c) information made available through numerous different channels (variable message signs, SMS, the Internet, radio etc)
d) the management of the park&ride system and filters;
e) the activation of the action plans (limitation of traffic flows, re-routing, etc).

In order to guarantee safe and robust data exchange between the parties involved, standard communications protocols were agreed.

4.4.3 Information

4.4.4 Environmental

See also Post Event Planning

4.4.5 Security

The IT systems ability to operate without failure was a key criterion in their design. Security and business continuity were paramount.

To mitigate the risk was that someone could try to hack into the feeds and change the results, such as the name of the winner the Turin Olympics focussed on the desire for the Olympics to go wireless.

When assessing events that could impact the games, a risk-based approach was taken to security. The result was the development of 50 worst-case scenarios. This allowed business objectives to be tied in with the IT impact. One worst-case scenario developed was the impact of shutting down one venue server for two hours due to a virus.

(Ref. W4)

4.4.6 Health & Safety

4.4.7 Staging

4.4.8 Post Event Planning

In the post-Olympic period, a further process of implementation and integration of the transport services in the entire region was foreseen.

Main targets of this process are:

a) Improvement in the efficiency of public and private transport on a wide scale with better coordination
b) Achievement of more (environmentally) sustainable mobility
c) Improvement in safety in the transport field

In order to achieve these targets, the following actions are necessary:

i) continuous acquisition in real-time of traffic and transport data
ii) feedback on the traffic situation and events, both for private and public transport
iii) analysis of public transport performance (service reporting and certification) to permit the authorities to effectively manage the public transport operations.

This can be facilitated by means of on-line information exchange between the bodies involved and the provision of real-time information for end users of both private and public transport (i.e. car drivers and PT passengers).

Using the 5T architecture which is modular and scalable, all of these features and operations can be performed respecting the autonomy and the responsibility of each operator or authority.

5. MOBILITY

5.1 TRANSPORTATION PROVIDED

Providing adequate mobility for the vast swarms of people that attend a major international event such as the Olympics is a daunting challenge. With its network of light rail transit (LRT) tramways, a new light metro, quality bus services, and regional passenger rail transit, Turin has high-performance transit in abundance. And the city's well-integrated, multi-modal system represents something of a model of the inter-connectivity that such an array of diverse, high-quality public transport can provide.

Turin's public transport network focuses on its LRT system. In 2002, plans for this system were set out. Those plans were to provide Turin with a hierarchy of transport systems. These include:

a) Regional passenger rail (FS) services
b) Automated mini-metro (light metro)
c) "Super tramway" (simi-metro LRT) system
d) "Classic tramlines" (streetcar-type LRT)
e) City buses

5.1.1 Spectator Transport

5.1.2 Participant Transport

5.1.3 Background Transport

5.1.4 Freight Transport

5.2 TRANSPORT MECHANISMS

The GTT (GRUPPO TORINESE TRASPORTI) is the local transport company which employs 5,240 personnel and transports 190 million passengers every year. GTT manages the following public transport networks:

The Turin urban and suburban networks (1 metro, 8 tram lines and 100 bus lines operating 100 km of tramline network and 1,000 km of bus network).

a) The out-of-town bus network
(73 bus lines operating 3,600 km).

b) The rail network
(2 lines in concession covering 82 km and 1 line managed on behalf of the Italian Railway company, Trenitalia, covering 24 km).
The Turin – Caselle Airport – Ceres GTT line links the city with the international airport of Caselle; there are two junction stations in Turin itself, Dora and Madonna di Campagna, connecting with other means of public transport.
The Dora - Caselle Airport route takes 19 minutes.

The local public transport service provides urban and suburban transport services in Turin and in other 25 neighbouring towns. The system is used by 600 passengers daily, with 53.1 million km operated each year by 1,000 buses and 200 trams.

The out-of-town bus service is used by 51,000 passengers daily and includes 310 buses connecting to 220 towns and operating 13.1 million km each year in the provinces of Turin and Alessandria, Asti and Cuneo to the south. The train service (Ferrovie Canavesana and Turin-Ceres) stops in 29 towns in the province of Turin, carries 12,000 passengers/day and operates 48 carriages for a total of 12,000 million km annually.

GTT is currently building line 1 for the Turin underground, which is already operating from Collegno to Porta Nuova.

GTT also operates the “blue line” parking spaces (50,000 parking slots), closed and covered car parks for an overall total of 4,500 parking slots.

In addition, the company manages a number of tourist services including the Sassi-Superga rack tramway, the lift to the Mole Antonelliana and the Turismo Bus Torino line and boat service for tourists along the River Po’.

(Ref. W6)

5.2.1 Road Transport

5.2.2 Rail Transport

FIGURE 4 TURIN – URBAN LIGHT RAIL AND LIGHT METRO SYSTEM

5.2.2.1 Mini Metro

The "mini-metro" is entirely in tunnel. Commercial speed, with layovers, is about 32 kph (20 mph). Under construction since 2000, the first section of the line, 9.6 km (6.0 miles) long with 15 stations, was opened in early February 2006, just in time for the Winter Olympics (see map).

Another light metro alignment, also using the VAL technology, will be extended in a north-south direction, from Porta Nuova to Lingotto. This second segment will have length of 4.5 km (2.8 mi) with 7 stations.

FIGURE 5

5.2.2.2 Light metro

Turin's light metro utilizes the VAL (véhicule automatique léger) Gadgetbahn technology developed by the French company MATRA – and now marketed as a proprietary system by Siemens. Called Metropolitana Automatica di Torino, the system consists of small cars, 13 meters (about 43 feet) long and 2.08 m (about 6.75 feet) wide, running on pneumatic tyres in a special guideway in 4-car trains.

5.2.2.3 Regional rail system

As of 2002 the railway system was already "full-fledged", with new lines and new stations planned, bringing the number of Turin railway stations to seven: Porta Nova, Porta Susa, Lingotto, Stura, Rebaudengo, Dora, Zapata. Wansbeek. This includes an airport rail link, opened in 2001 between Turin's Caselle airport and the Dora railway station. In 2002, it was expected that within a few years, this line will be further extended to reach the main railway station at Porta Nuova.

It was reported, in 2002, that in the near future "an underground four-track main railway line will be built, linking all seven stations, with Porta Susa as the future main station, instead of Porta Nuova." This rail line, he noted, would become the principal airport rail link.

5.2.2.4 Tram Transport

Turin has an extensive legacy LRT tramway system totalling about 180km (112 miles) of standard-gauge double track. The tramway system provides a pervasive, readily accessible, high-quality public transport system radiating through much of the central city.

FIGURE 6

The entire system is being upgraded with new railcars and better facilities, and is being extended by approximately 15km (9 miles).

(Ref. W7, W8)

5.2.3 Water Transport

5.2.4 Air Transport

5.3 TRANSPORT MANAGEMENT & CONTROL

5.3.1 Control and Command Centres

The objective of the **Traffic Operation Centre** was to monitor road traffic in the Olympic area, manage the public transport services and implement a cooperative mobility strategy. It needed to integrate the operations of the existing and new telematics subsystems - Public Transport Management, Urban Traffic Control, Parking Monitoring, Passenger and Spectator Information – within a common architecture.

FIGURE 7 THE TRAFFIC OPERATIONS CENTRE

The effectiveness of the Traffic Operation Centre depended on:

a) transport engineering software,
i.e. a reliable traffic model, able to supervise mobility, to compute control strategies and to foresee "next-day" mobility;

b) technically advanced devices
for measuring traffic flow/speed, car park occupation, pollution monitoring, congestion detection, traffic event management and the provision of information services for drivers and public transport users.

The system needed to be able to physically integrate and coordinate all the many different subsystems or modules.

MOBILITY

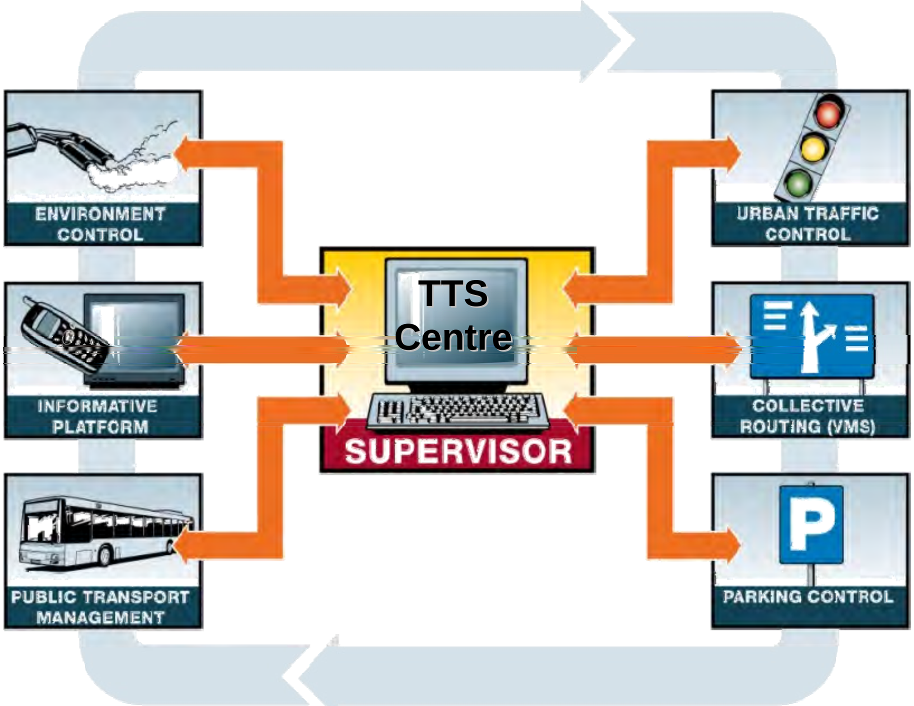


FIGURE 8 THE MOBILITY SUPERVISOR AND MAIN SUBSYSTEMS

The following schematic diagram shows the elements of the public transport management system. This links vehicles with the public transport control room and the 5T integrated control room which then disseminates real-time information to bus stops and mobiles.

(Ref. 0)

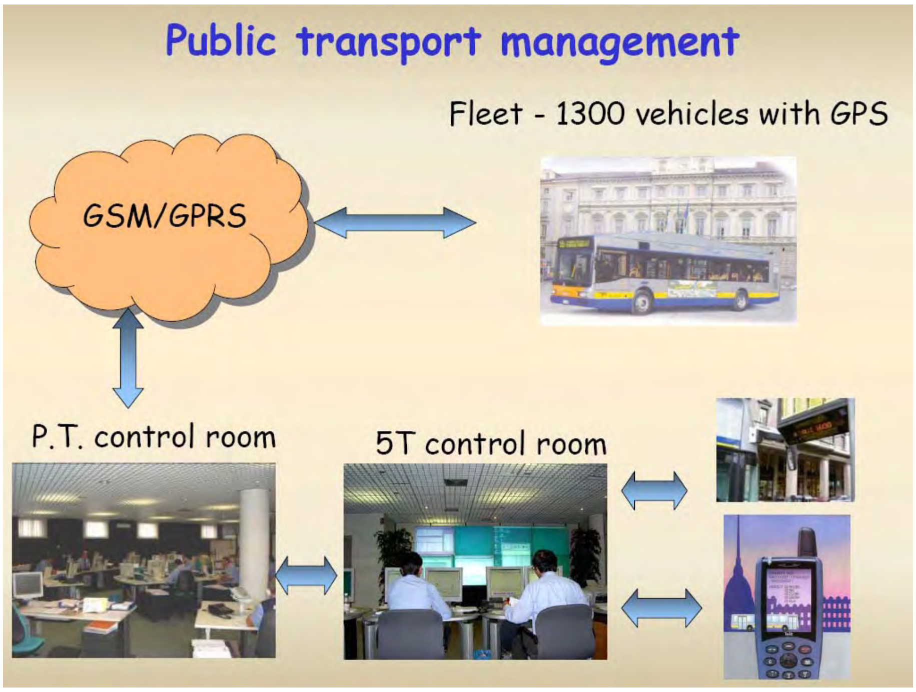


FIGURE 9 PUBLIC TRANSPORT MANAGEMENT

5.3.2 Intelligent Transport Systems

The main ITS modules were the following:

a) Urban Traffic Control (UTC)
b) Public Transport (PT) Management
c) Traveller Information Platform
d) Parking Control
e) Environmental Monitoring
f) Collective Route Guidance
g) Mobility Supervisor

5.3.2.1 Urban Traffic Control (UTC)

The Urban Traffic Control (UTC) subsystem carries out continuous monitoring of traffic conditions and implements a fully adaptive control strategy (powered by the UTOPIA software). The signal plans (cycle length, offset and stages duration) are dynamically optimised to minimise the overall travel time for private traffic and give priority to public transport.

5.3.2.2 Public Transport (PT) Management

The Public Transport (PT) Management subsystem uses FLASHNET software to improve the regularity of bus/tram services. It compares the actual position of PT vehicles with their planned schedule and co-operates with UTOPIA to give priority at intersections to those behind schedule (and special priority vehicles).

Cooperation between the PT system and the Supervisor provides the basis for passenger information services and trip planning operations. It also produces the public transport vehicle travel time data for the monitoring of network conditions. The subsystem is integrated with a passengers information service that provides the information on the predicted arrival time at both the bus stops (about 200 equipped bus stops) or directly on mobile phones via SMS.

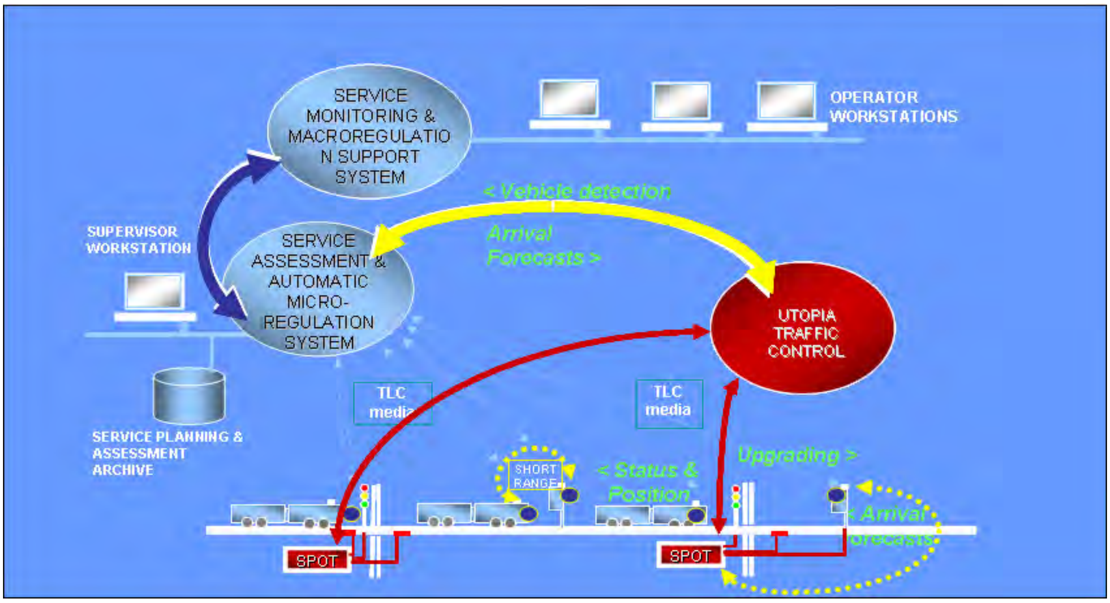


FIGURE 10 COORDINATION OF THE FLEET MANAGEMENT AND UTC SYSTEM

5.3.2.3 Traveller Information Platform

The Traveller Information Platform provided real-time information on road traffic conditions, public transport, parking status and pollution levels. The information was distributed via the Internet and SMS (text messages).

Recommended travel itineraries were offered from and to any point in the city area based on real time network conditions. The 5T website was an important channel for providing residents and tourists with traffic and transport information for the metropolitan area of Turin. The following services were available:

a) Trip planning in the Olympic area for both public and private transport
b) Information on available parking spaces
c) Information on predicted arrival times of public transport at bus stops
d) Information on traffic conditions with warnings and maps.

5.3.2.4 Parking Control

The Parking Control subsystem monitored use of parking areas, calculated occupancy forecasts and through close integration with the information platform provided an advance booking service. Current and forecast occupancies of each parking were sent to the Town Supervisor.

5.3.2.5 Environmental Monitoring

The Environmental Monitoring subsystem acquired meteorological and environmental data from detection stations and processed it, together with traffic-related data and vehicle emission estimates from the UTC subsystem, using a special software suite to calculate forecasts of air pollution for the short and medium terms. The forecasts were sent to the Supervisor for the calculation of reference strategies.

5.3.2.6 Collective Route Guidance

The Collective Route Guidance subsystem provided warnings and general information to drivers of private vehicles by means of Variable Message Signs (VMS). The aim was to give dynamic guidance through various alternative urban and sub-urban routes for traffic flows, providing specific traffic information on the Olympic locations and occupancy conditions of parking areas.

MOBILITY

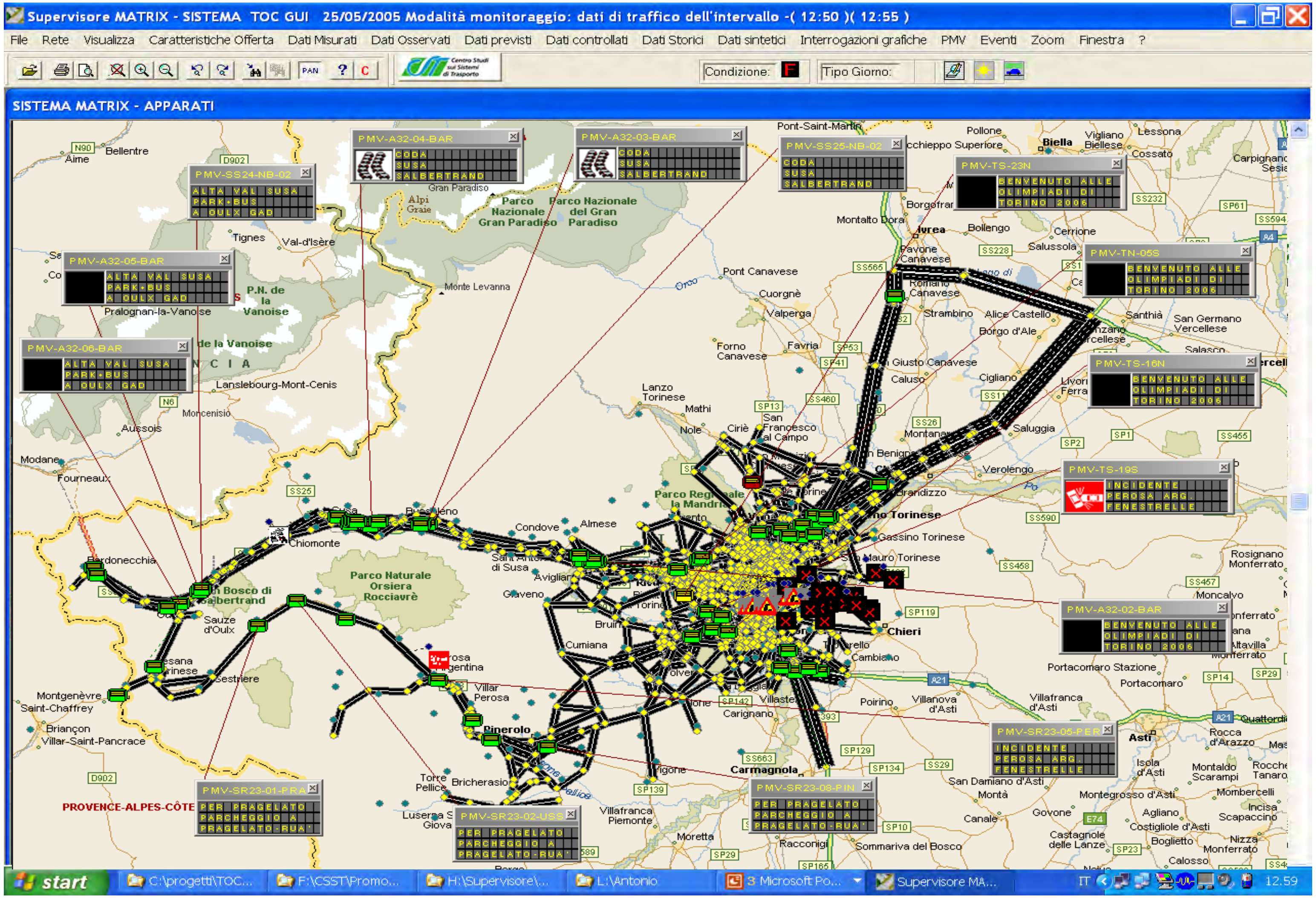

Supervisore MATRIX - SISTEMA TOC GUI 25/05/2005 Modalità monitoraggio: dati di traffico dell'intervallo -(12:50)(12:55)
File Rete Visualizza Caratteristiche Offerta Dati Misurati Dati Osservati Dati previsti Dati controllati Dati Storici Dati sintetici Interrogazioni grafiche PMV Eventi Zoom Finestra ?
Condizione:
Tipo Giorno:
SISTEMA MATRIX - APPARATI
PMV-A32-04-BAR
CODA SUSA SALBERTRAND
PMV-A32-03-BAR
CODA SUSA SALBERTRAND
PMV-SS25-NB-02
CODA SUSA SALBERTRAND
PMV-SS24-NB-02
ALTA VAL SUSA PARK+BUS A OULX GAD
PMV-TS-23N
BENVENUTO ALLE OLIMPIADI DI TORINO 2006
PMV-A32-05-BAR
ALTA VAL SUSA PARK+BUS A OULX GAD
PMV-TN-05S
BENVENUTO ALLE OLIMPIADI DI TORINO 2006
PMV-A32-06-BAR
ALTA VAL SUSA PARK+BUS A OULX GAD
PMV-TS-16N
BENVENUTO ALLE OLIMPIADI DI TORINO 2006
PMV-TS-19S
INCIDENTE PEROSA ARG FENESTRELLE
PMV-A32-02-BAR
BENVENUTO ALLE OLIMPIADI DI TORINO 2006
PMV-SR23-05-PER
INCIDENTE PEROSA ARG FENESTRELLE
PMV-SR23-01-PRA
PER PRAGELATO PARCHEGGIO A PRAGELATO-RUA'
PMV-SR23-02-USS
PER PRAGELATO PARCHEGGIO A PRAGELATO-RUA'
PMV-SR23-08-PIN
PER PRAGELATO PARCHEGGIO A PRAGELATO-RUA'
Parco Nazionale Gran Paradiso
Parco Nazionale del Gran Paradiso
Parco Naturale Orsiera Rocciavrè
PROVENCE-ALPES-CÔTE
Ivrea
Biella
Chieri
Pinerolo
Carmagnola
Asti
start
C:\progetti\TOC...
F:\CSST\Promo...
H:\Supervisore\...
L:\Antonio
3 Microsoft Po...
Supervisore MA...
12.59

FIGURE 11 COORDINATED MANAGEMENT OF THE VARIABLE MESSAGE SIGNS

5.3.2.7 Mobility Supervisor

The main function of the Mobility Supervisor was to define transport control strategies in real time on the basis of current and forecast traffic flows (public and private), pollution and requests for intervention from the authorities. It generates coordinated management actions to ensure correct actuation of the strategies.

This process requires continuous monitoring of the road network. Inductive loops embedded in the road surface were the principle source of real time traffic data. Additional information on events on the network was provided by the road operators. The strategies are based on a concept which involves maintaining (or recovering) of a state of equilibrium for the transport and traffic network by means of coordinated actions implemented through the different subsystems, e.g. traffic signal control, route guidance.

The Supervisor collates all available data to provide a detailed overview of the state of traffic and transport in the network. It uses mathematical models to calculate the equilibrium state (i.e. the optimum distribution of private and PT vehicles in relation to the road network and parking capacity), and the need to avoid excessive pollution.

The modules of the Supervisor are shown in the diagram below.

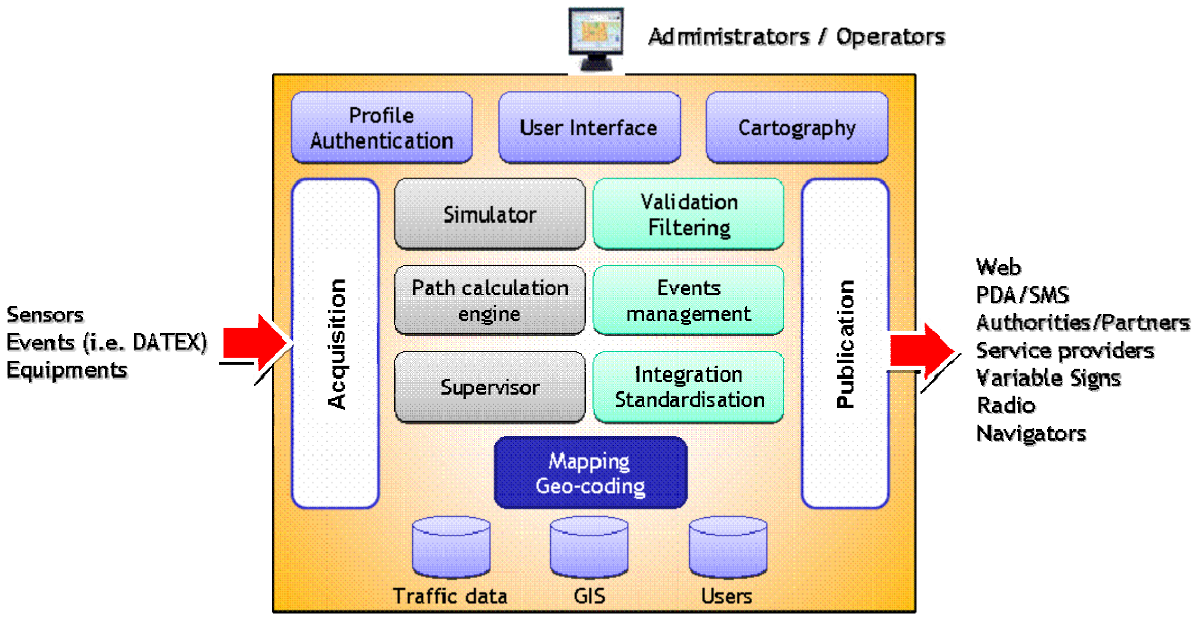


FIGURE 12 FUNCTIONAL MODULES OF THE MOBILITY SUPERVISOR

MOBILITY

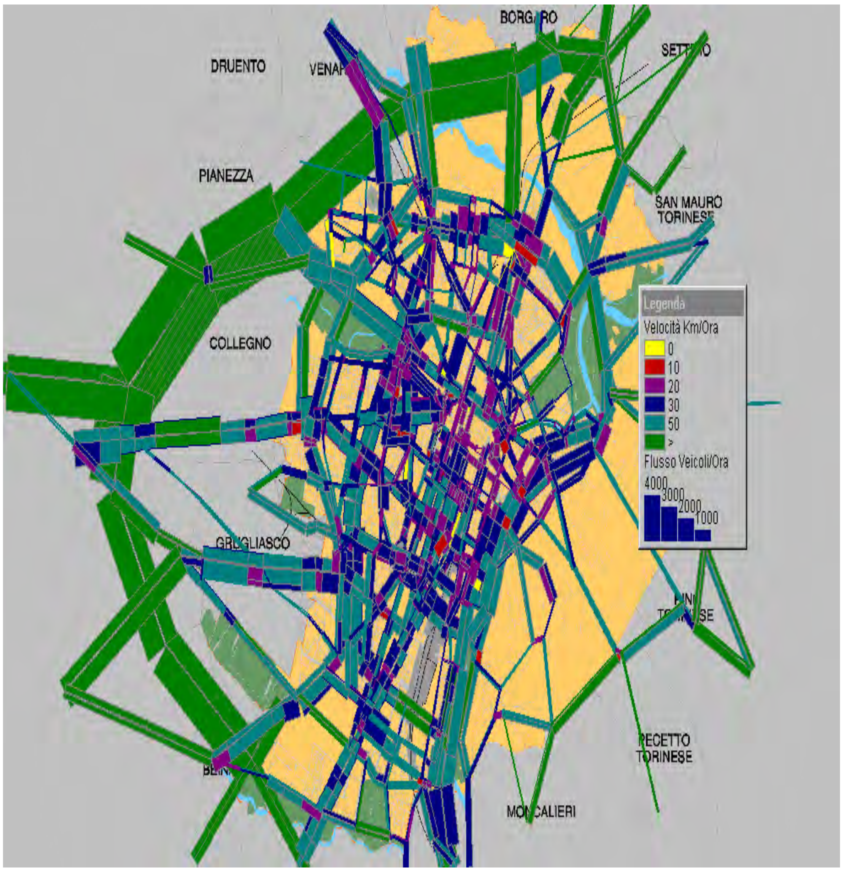
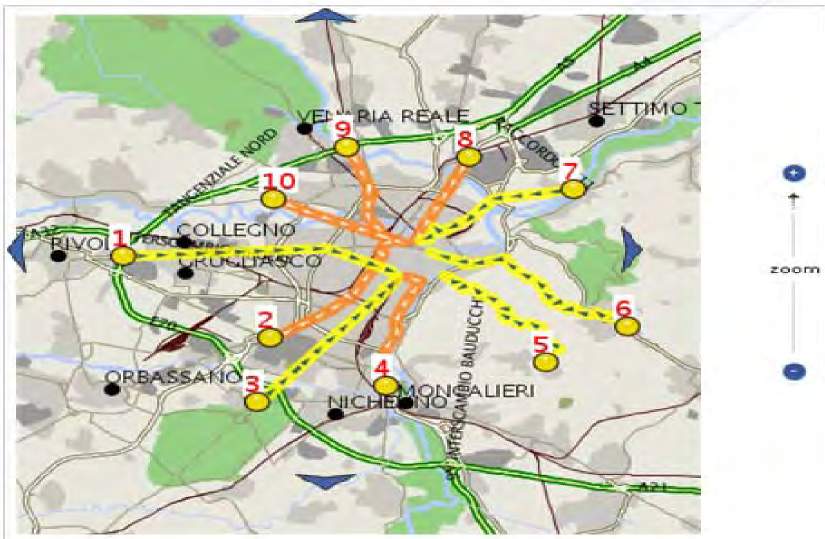


FIGURE 13 MAP OF TRAFFIC DENSITIES IN AND AROUND THE CITY OF TURIN



N.	Percorso	Lunghezza [Km]	Velocità [Km/h]	Tempo [minuti]	Tipologia traffico
1	da Tang.(c. Francia) a P. Nuova per p.za Rivoli	10,74	25	25	intenso

FIGURE 14 REAL-TIME TRAFFIC CONDITIONS ON MAJOR ARTERIES

5.3.3 Other Systems

6. TICKETING

The advance sale of tickets for the Olympic events served as an indication of the volume of traffic which could be expected on the access routes to the various sites. This was especially important for providing forecasts of the number of spectators needing to be transported to the mountain resorts.

6.1 TICKET TYPES PROVIDED

6.1.1 Transport Tickets

6.1.2 Events Tickets

6.1.3 Combined Tickets

6.2 TECHNOLOGIES USED

6.2.1 Paper Tickets

6.2.2 E-tickets

6.2.3 Contactless tickets

Transport Operator of Turin (GTT) introduced a new access control and ticketing system for Line 1 of Turin's Metro system before the XX Winter Olympic Games in Turin. The contract was won by Thales in February 2005. The access control and ticketing system consists of access control equipment with tickets and card readers at all sites, intrusion detection systems, and a supervision and control centre. The ticketing system is based upon contactless tickets and cards and magnetic stripe tickets. There is no need to insert the ticket in the validation machine one will just have to pass the ticket by a specific area indicated with short Braille messages placed on the glass barrier that on the hall level, separates the welcome area from the station proper.

The system, operated by a central server based in Collegno, is to be installed in all 15 stations and comprises 183 access control gates, 183 magnetic ticket handling units, 183 contactless card and ticket handling units and 36 automatic ticket vending machines. As well as implementing the new system, the contract provided training for staff as well as maintenance for a period of twelve months.

As well as the technical considerations, Thales had to take into account specific requirements linked to the Paralympics, which are to take place after the Olympics. Having worked with the Italian association for disabled people to assess the needs of this group when travelling by metro, Thales designed the first ever access gate to accommodate disabled people, especially those who are blind or partially sighted. This included wider gates, a buzzer to warn the passenger and a monitoring device on the floor that reacts to the approaching person; essential in unmanned stations.

6.2.3.1 <u>Parking Tickets</u>

In December 2005, Thales received an additional order from GTT to equip one of the operator's 20 car parks with a ticketing system that was fully integrated with the transport network. Passengers leaving their vehicles at this car park could now purchase a magnetic ticket at the car park that will cover both the parking and the use of the metro. After delivery of the first car park system in just one month, Thales worked with GTT to implement the same system in the other car parks and expand it to include contactless tickets. This is the first time such a system has been installed in Europe.

(Ref. 0, W9)

6.2.4 Smartcard

Vehicles were for the first time equipped with an on-board unit and an electronic smart card to pay for special lanes on the tolled motorway approach to the city. The same smart card was used to pay for both parking and public transport systems and gain access to Winter Olympic events. The system was delivered by Q-Free, based in Trondheim, Norway. It was reputedly the world's first system which integrated public and private transport through a single means of payment. The card was delivered by ASK Contactless Smart Card Technology based on RFID.

The unified ticketing system allows visitors through automatic tolls and to make contactless payments at car parks and also on public transport. The scheme which will also include passes for school children, multimodal passes, passes for tourists and passes into museums and galleries is hoped to reduce fraud.

The payment instrument is a "two piece tag" consisting of an On Board Unit (OBU), which sits behind the rear view mirror in the car, and a Smart Card that can be inserted into the unit. The OBU can also be used as a stand-alone unit to register payments, even without a Smart Card. The advantage of the system is its flexibility and mobility. The Smart Card goes with the user and can be used not only for road tolling and GTT parking fees, but also to cover GTT public transport usage, fuelling costs, and other forms of transport.

The service was launched in Turin in December 2005. The system is based on a combination of smart cards and microwave dedicated short range communications (DSRC) at 5.8 GHz. The system is compatible with the Telepass national electronic toll collection specifications in Italy. The Telepass specifications are not compatible with the Comite Europeen de Normalisation (CEN) standards for 5.8 GHz DSRC. Before Q-Free, the only Telepass supplier has been Autostrade per L'Italia. The contract for Telepass in-vehicle units was worth €1.3m.

(Ref. 0, 0, W10)

6.2.4.1 <u>SI PASS</u>

The new system is called SI.PASS. When the card is used with the OBU it allows drivers to pass through dedicated SI.PASS lanes at Turin's existing toll plazas. A scanner reads the card and OBU and the barrier lifts automatically without the driver having to stop.

FIGURE 15 SI- PASS LANES

6.2.4.2 <u>Two Cards</u>

For the duration of the Winter Olympic Games, road users wishing to travel in and around Turin could buy one of two smart cards. The first smart card was :

a) valid for five days,
b) allowed unlimited use of the A32 motorway toll, the Turin ring road toll,
c) unlimited use of the city's public transport system (both subway and bus), and
d) parking in both the city centre and at Olympic venues in the mountains nearby.

The second smart card, which operated for a similar five-day period, offered all the benefits of the first card but also allowed unlimited use of the Frejus Tunnel.

6.2.5 Personal Digital Devices

7. THE PROVISION OF INFORMATION

7.1 INFORMATION PROVIDED

7.1.1 Travel Information

The module responsible for providing information to the operators and final users (travellers) was fed with real-time information and fully integrated with the other telematic sub-systems.

The dynamic information available included:

a) Path calculation (forecasts)
b) Public transport (bus/tram) arrivals
c) Parking space availability
d) Booked parking spaces
e) Traffic events (accidents, congestion)
f) Dynamic routing recommendations

7.1.2 Event Information

7.2 INFORMATION DELIVERY

7.2.1 Traveller Information Platform

The Traveller Information Platform provided real-time information on road traffic conditions, public transport, parking status and pollution levels. The information was distributed via the Internet and SMS (text messages).

Recommended travel itineraries were offered from and to any point in the city area based on real time network conditions. The 5T website was an important channel for providing residents and tourists with traffic and transport information for the metropolitan area of Turin. The following services were available:

a) Trip planning in the Olympic area for both public and private transport
b) Information on available parking spaces
c) Information on predicted arrival times of public transport at bus stops
d) Information on traffic conditions with warnings and maps.

It was a multi-channel platform able to automatically make available information through multilingual services accessible by means of:

i) A web portal linked to the Olympic Internet site
ii) SMS services (pull and push)
iii) message panels at bus/tram stops (expected arrival times)
iv) IVR – Automatic Voice Recognition (LOQUENDO) via telephone and mobile.

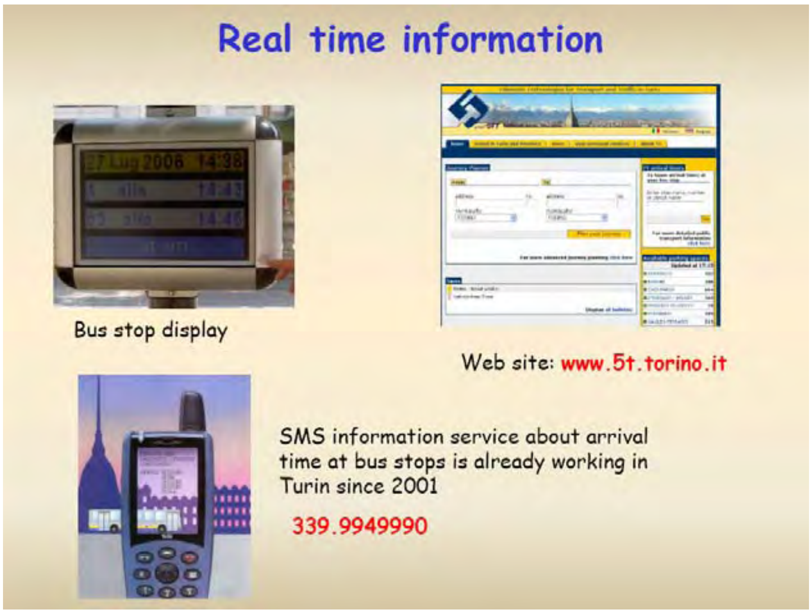


FIGURE 16 REAL TIME INFORMATION

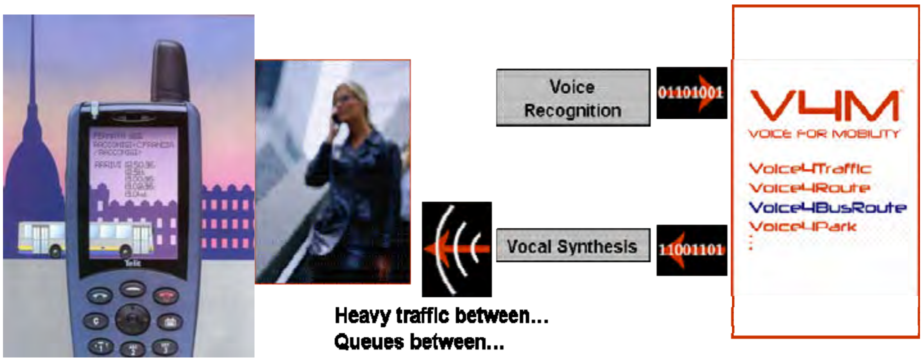


FIGURE 17 TRAVEL INFORMATION SERVICES VIA MOBILE PHONE

7.2.2 Self Service

The number of website accesses during the period of the Games – 16 days in total – was 500,000 with 400,000 web visits and 99,000 requests for route calculations.

7.2.2.1 <u>The City Website</u>

The point of entry for self service transport information for the 2006 Winter Olympic Games is through the City of Turin website. This provides links to public transport information, maps of the city and a journey planner.

(Ref. W5)

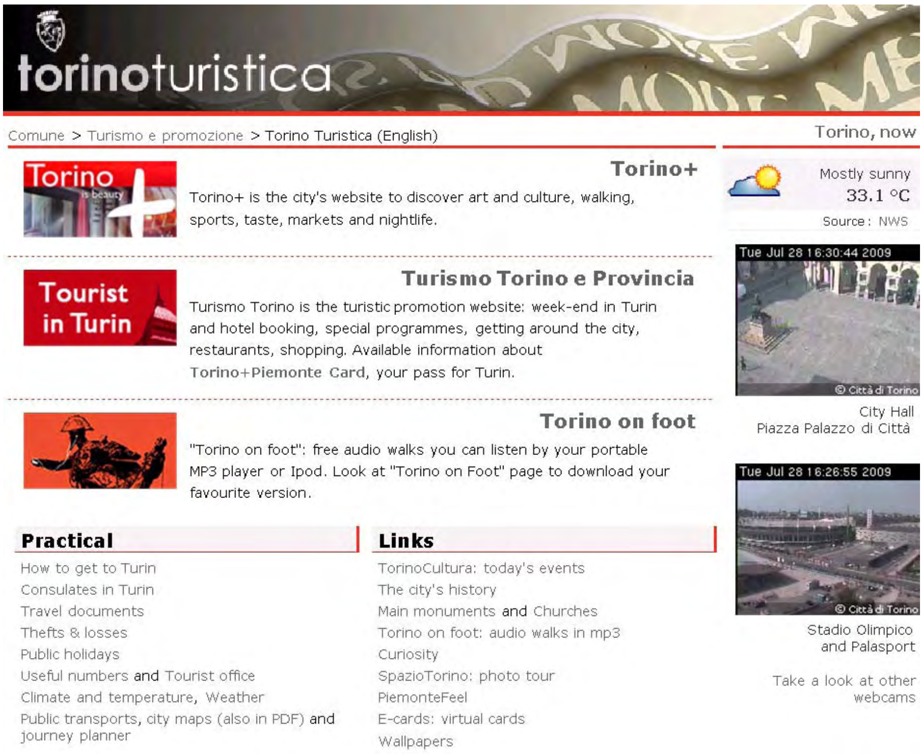


FIGURE 18 CITY OF TURIN WEBSITE

INFORMATION

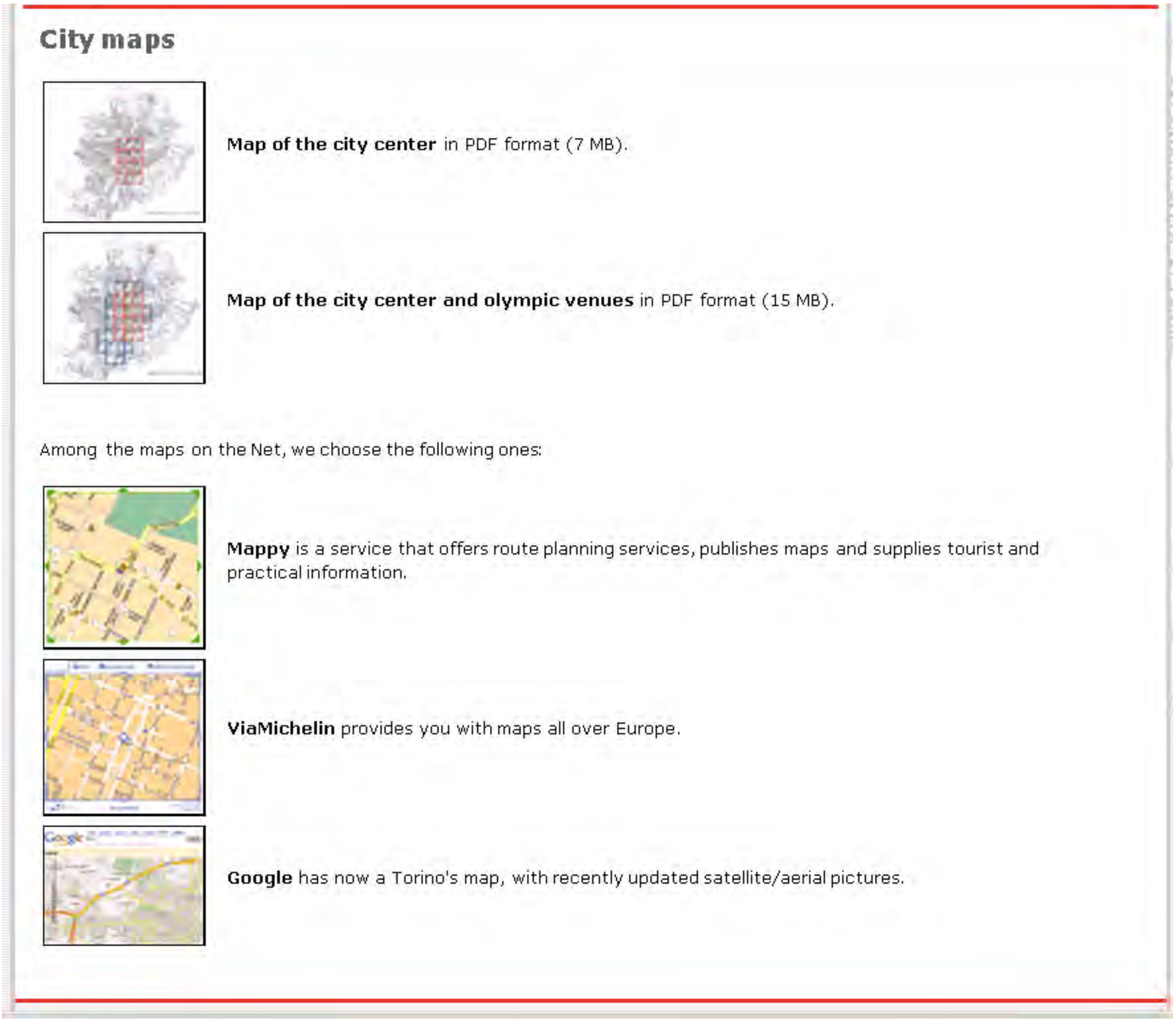


FIGURE 19 CITY MAPS

7.2.2.2 <u>The GTT Website</u>

The City website links to the GTT website for public transport information. The GTT (GRUPPO TORINESE TRASPORTI) is the local transport company which employs 5,240 personnel and transports 190 million passengers every year.

(Ref. W6)

FIGURE 20 GTT WEBSITE

The GTT Journey Planner offers interactive journey planning capability. This provides information about public transport timetables, maps for walk and car routes and traffic conditions on the roads. There are restrictions on the coverage of the system so public transport currently covers Turin and its district, using urban and interurban GTT lines. The Interurban lines are not yet all included. Personal route planning is available for the whole Piemonte region and is based, for the Turin urban area, on real time traffic situation as measured by the 5T system.

It is not clear what was available at the time of the 2006 Olympics but it is unlikely coverage included the mountains venues as well as the sports venues in the city.

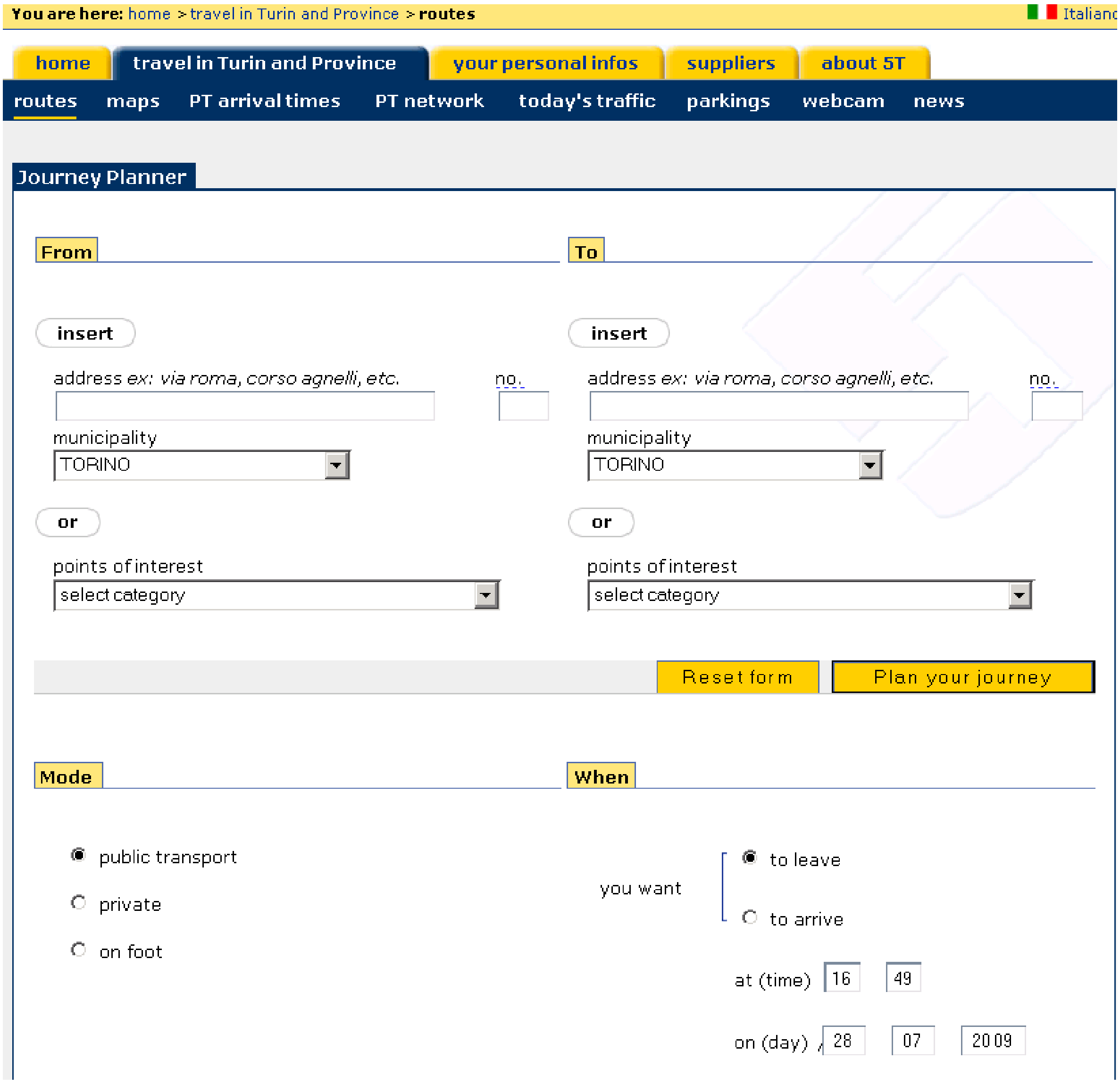


FIGURE 21 GTT JOURNEY PLANNER

(Ref. W11)

7.2.2.3 The 5T Website

The City website also links to the 5T Website. The 5T website provides many useful self service functions and an interface is available which integrates with the Google maps function.

FIGURE 22 PUBLIC TRANSPORT TRIP PLANNING

FIGURE 23 PRIVATE CAR TRIP PLANNING

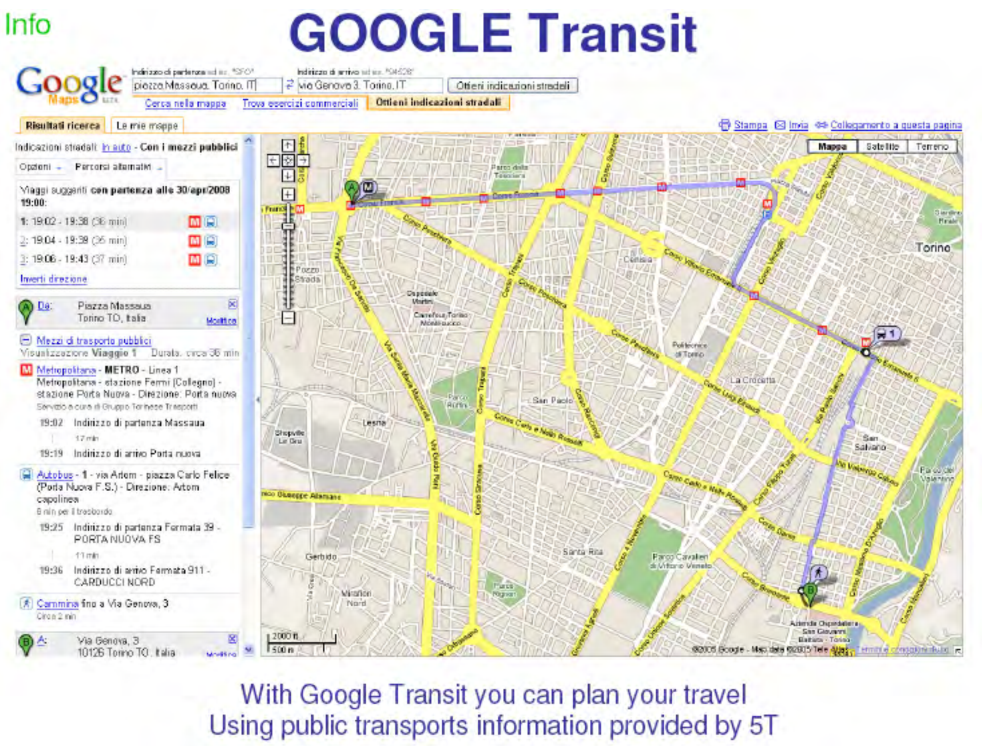


FIGURE 24 GOOGLE MAPS INTERFACE

7.2.3 Customer Service

In 2006, a new automatic bi-lingual phone service was introduced providing trip planning and arrival times at bus stops. There were 6,000 requests for bus arrival information by voice.

7.2.4 Public Signage

Displays showing arrival times are positioned at bus stops.

7.2.5 Personal Digital Devices

Arrival time information was also available by mobile. The SMS service for bus arrival times was receiving 83,000 inquiries a month and the website was being accessed 130,000 times a month with trip planning inquiries. In addition, there were 36,000 requests for bus arrival information by mobile text, .

(Ref. 0, 0)

7.2.6 Communications

GTT metro is the first Italian underground rail system to offer complete wireless coverage. Four wireless operators— Telecom Italia Mobile (TIM), Wind,Vodafone, and 3 (H3G)—contracted Andrew Corporation to install the multi-operator system that enables each of them to provide clear signals to train passengers. The 2006 Winter Olympics was an ideal opportunity to launch this new coverage system due to the massive amount of tourists and locals expected to use the city's railways. By enabling passengers to communicate with friends while waiting for a train, or using the 3G bandwidth to download video clips of the day's Olympic highlights, operators would increase customer satisfaction and revenue.

The operators' system requirements were strict - less than one percent of all calls referred to a person travelling inside a passenger car at 80 kilometres per hour could be dropped - and each operators' different technology standards had to be supported.

Andrew's ION-M fibre distributed antenna system is the backbone of the Turin underground rail coverage system. The ION-M master unit takes signals from the dedicated base stations located in the equipment room and spreads them down fibre cables to remote units installed throughout the tunnels and stations. The remote units feed antennas that communicate with passengers' mobile phones, enabling voice communication or data download even when moving at rapid speeds.

(Ref. 0)

7.3 INFORMATION COLLECTION

8. SECURITY

8.1 SECURITY PROVIDED

8.1.1 Venue Security

Cesare Vaciago, CEO of the 2006 Winter Games in Turin said organisers in Turin used the so-called "mag and bag" (magnetometer and bag search) system for security, which involves special magnetometer metal detectors and bag searches. He said the system cost too much, provided no extra security and caused long lineups at events. "And you can avoid it simply through manual inspection, which is more precise, more attentive and done by experienced guys," he said.

(Ref. W4)

8.1.2 Municipal Security

8.1.3 Transport Security

8.1.4 Border Security

8.1.5 International Security

8.1.6 Other Security

8.1.7 Integration

The level to which security was integrated with transport operations

8.2 TECHNOLOGY USED

8.2.1 Surveillance

8.2.1.1 Enhanced Surveillance Camera Coverage

Neither bright white ski slopes washed with strong sunlight nor the reflections of artificial lighting on exterior venues will be problematic for the video surveillance cameras watching over the 2006 Olympic Winter Games in Turin. Panasonic System

Solutions Company has provided more than 600 Super Dynamic III (SDIII) camera systems to monitor activity at the upcoming Olympic Winter Games.

The ability of these cameras to deliver clear images across a diverse range of lighting conditions assured security personnel that they will be able to clearly view all the action during the course of the Olympic Games. Over 600 SDIII cameras were deployed to help provide an added degree of safety and security for the athletes and spectators.

Panasonic SDIII technology elevates dynamic range to 128x that of conventional cameras to capture exceptional image quality, even in harsh lighting conditions. Such conditions are typically experienced when outside sunlight and indoor light sources overlap–for example, when light filters through open doors, or in building lobbies with windows or glass doors–and outdoors in locations that go from daylight to the dark of night with bright headlights, reflections and street lights.

A double speed Charge Coupled Device (CCD) with advanced Digital Signal Processing (DSP) achieves this by capturing the dark and bright portions of an image separately, and then recombining the two images into a single viewable image frame. The addition of advanced digital contrast correction further optimises the composite image's gray scale for refined definition and balance.

SDIII's powerful intelligent processing also drives numerous DSP features such as Auto Back Focus, which continuously adjusts camera focus when switching from colour to black-and-white operation and back again to colour–automatically. This is achieved through an innovative mechanism that actually moves the position of the CCD within the camera to achieve the most accurate focus attainable in the given lighting–an industry first because the technology resides inside the camera, not in an external device. Additional DSP advancements include :

Auto Image Stabilizer for camera deployment in areas that may be prone to wind and other sources of vibration;

a) Scene Change Detection that sends an alarm when the camera's lens is obstructed or the camera angle changed without authorization;
b) Auto Tracking to follow an individual's movements within the camera's field of view;
c) wider bandwidth for improved resolution to 540 lines (colour);
d) 30x optical zoom (300x electronically), the highest in the industry;
e) Adaptive Digital Noise Reduction to minimize image streaking when viewing moving images; and
f) extreme low light sensitivity in colour (0.5 lux) and BW (0.06 lux).

(Ref. W12)

8.2.2 Communication

8.2.3 Intrusion Detection

Since the IT systems provide real-time information, Atos Origin needed to ensure they could detect viruses immediately. Security is monitored across the Turin network in real-time using an intrusion detection system, and the network is segmented to mitigate the risk of a virus spreading. All information collected through the security monitoring system is aggregated and correlated with the schedule of the games.

It was anticipated that for Turin 2006 there will be 4.7 million security alerts produced by the intrusion detection system, which can be reduced to about 430 high-level "incidents". Of those, 22 would be deemed critical.

Security issues occurring at a competition venue are handled by a local IT manager and helpdesk staff at the site. This means that the security team for Turin comprised just 14 dedicated staff.

Additionally, controls were implemented for laptop users. A security architecture based on policy, procedures and technical controls will be used to restrict access on certain machines. In order to mitigate the risk, the network is not connected to the internet. Access to applications on the system intranet is tightly controlled, and users can only run a limited set of applications and print documents.

For business continuity, each competition site can run independently. There is a primary and secondary datacentre, and the network itself has built-in redundancy. The goal was to be able to failover from the primary to the secondary datacentre within two hours.

Atos Origin ran a week-long technical rehearsal in December, involving a 720-strong team. Testing involved simulating the three busiest days of the games (15, 16, 17 February) and covered the IT systems, communication, sports, security, venue management and press operations to ensure all staff, technology and procedures were in place and in order.

(Ref. W13, W14)

9. HEALTH AND SAFETY

9.1 HEALTH AND SAFETY MEASURES PROVIDED

9.1.1 Venue H&S

9.1.2 Municipal H&S

9.1.3 Transport H&S

9.1.4 National H&S

9.1.5 International H&S

9.2 TECHNOLOGY USED

10. CONCLUSIONS

10.1 OVERALL SUCCESS OF THE EVENT

An analysis of the numbers of people transported during the Olympics was made after the event by CSST (Centro Studi sui Trasporti) (1). The statistics are based principally on data provided by the transport operators and the event organisers (the Olympic Committee). In some cases they have been extrapolated from the available information. The main conclusions are reported below.

The estimated total attendance was **630,000 people** (371,000 for competitions in Turin and 259,000 in the mountains). The total number of tickets sold was 800,000, indicating that on average actual attendance was 70% of ticket sales.

The number of spectators transported by train was 110,000 (89,000 in the Susa Valley line and 22,000 in the Chisone Valley).

The number of cars using the mountain car parks was 15,800 (8,400 in the Susa Valley and 7,400 in the Chisone Valley). Assuming an average occupancy of 2 persons, the total number of spectators arriving by car was 31,600.

The number of trips made by shuttle buses in the mountain area was 2478 (1775 in the Susa Valley and 703 in the Chisone Valley). Based on an estimate of 50 people per bus, and adjusted with information from the operator, it was calculated that a total of 115,418 spectators used the shuttle service.

This information is summarised in Figure 25 and. Figure 26

CONCLUSIONS

Torino 2006: Dati navette																		
Venue	**Disciplina**	**11/2**	**12/2**	**13/2**	**14/2**	**15/2**	**16/2**	**17/2**	**18/2**	**19/2**	**20/2**	**21/2**	**22/2**	**23/2**	**24/2**	**25/2**	**26/2**	**totali**
Pragelato	Ski Jumping	10	33						55		22							**120**
Pragelato/Pragelato Plan	Nordic Combined	10				10						56					146	**222**
Pragelato Plan	Cross Country Skiing		17		8		11	25	130	111			29		30			**361**
Sestriere Colle	Alpine Skiing				48			9			64		37		76	69		**303**
Sestriere Borgata	Alpine Skiing		61						59								13	**133**
Sansicario Fraiteve	Alpine Skiing					24		22	25	36	7							**114**
Cesana Sansicario	Biathlon	40		30	36		29					49		45		55		**284**
Cesana Pariol	Bobsleigh								39	37	20	16				49		**161**
Cesana Pariol	Skeleton						10	25										**35**
Cesana Pariol	Luge	4	22	12	6	12												**56**
Sauze d'Oulx	Freestyle Skiing	39				76				69	73	24	63	79				**423**
Bardonecchia	Snowboard		42	38			44	39					51	52				**266**
dorsale		42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	**672**
potenziamento dorsale				30	30	30	30	30	30	30	30	30	30	30	30	30	30	**420**
totale navette		**103**	**175**	**80**	**98**	**122**	**94**	**120**	**308**	**253**	**186**	**145**	**180**	**176**	**106**	**173**	**159**	**2478**
totale mezzi dorsale		**42**	**42**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**72**	**1092**
stima passeggeri navette		**5150**	**8750**	**4000**	**4900**	**6100**	**4700**	**6000**	**15400**	**12650**	**9300**	**7250**	**9000**	**8800**	**5300**	**8650**	**7950**	**123900**
val chisone navette		**1000**	**2500**	**0**	**400**	**500**	**550**	**1250**	**9250**	**5550**	**1100**	**2800**	**1450**	**0**	**1500**	**0**	**7300**	**35150**
valle susa navette		**4150**	**6250**	**4000**	**4500**	**5600**	**4150**	**4750**	**6150**	**7100**	**8200**	**4450**	**7550**	**8800**	**3800**	**8650**	**650**	**88750**
capacità navette	50																	
coefficiente riempimento medio	1																	

FIGURE 25 DATA ON SHUTTLE BUS TRIPS TO MOUNTAIN RESORTS AND NUMBER OF SPECTATORS TRANSPORTED

CONCLUSIONS

	biglietti venduti	stima spettatori presenti	gare	trasportati su navette (provenienza Torino) (stimati da GTT su tabella corse)	trasportati su navette (rilevazione diretta GTT)	treno (potenziali utenti navette)	in park montani (utenti navette)	P&R da pinerolo (utenti navette)	P&W Pragelato	stima utenti navette (treno+park)
	a	b	c	d	e	f	g	h=d-(f+g)	i	l=f+g+h
Val Chisone (compreso Pinerolo)	138400	96880	47	35150		22098	3560	9492	11115	35150
Val Susa	232094	162466	43	88750	80268	88738	16770			88648
totale montagna	370494	259346	90							
Torino	529739	370817	87							
totali	900233	630163	177	123900	115418	110836	20330	9492	11115	123798
			di cui 30 Curling a Pinerolo							
moltiplicatore biglietti/spettatori				0,7						
moltiplicatore trasportati treno/trasportati navette per la val susa				0,81						

FIGURE 26 ESTIMATE OF NUMBERS OF SPECTATORS TRANSPORTED

CONCLUSIONS

The following conclusions have been drawn in relation to the management of transport for the Winter Olympics in Turin as a whole.

This section is still to be completed

a)
b)
c) The ability to integrate and manage a large ITS applications in a cooperative way, was successfully demonstrated in the Winter Olympics.
d) The modularity of the ITS platform used and the experience acquired in its operation, suggest that such a tool could be easily "exported" for use in other such events. Adaptation and customisation of the functionalities to new customers and requirements can by achieved without major redesign.

10.2 USE OF ITS

Turin had the advantage of already possessing an advanced ITS platform managed by 5T (Telematics Technologies for Traffic and Transport in Turin). This greatly facilitated the implementation of the Olympic transport management strategy as it was possible to exploit the existing framework and systems. The TOC control room was in fact located in the headquarters of the 5T system.

5T was set up in the 1990s by a consortium within the framework of projects funded by the European Commission. Since then it has been improved and extended and in 2006 had become a private company responsible for managing a range of ITS services, including:

a) urban traffic control system
b) public transport management
c) parking availability monitoring
d) environmental (pollution) monitoring
e) a wide range of information services for travellers
f) a VMS routing system

These are coordinated by a high level application referred to as the 'Mobility Supervisor'.

10.2.1 Mobility Supervisor

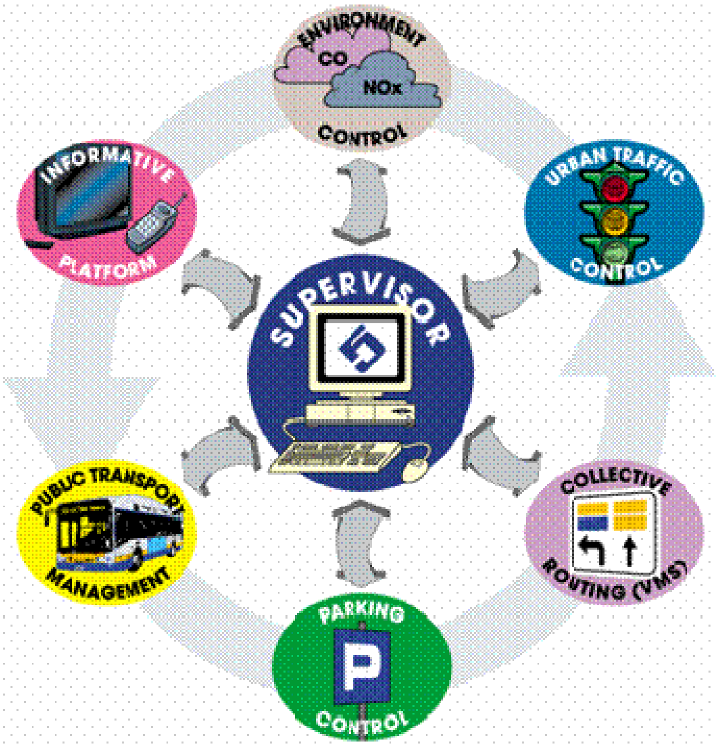


FIGURE 27 THE MOBILITY SUPERVISOR

The Supervisor (using software developed by Mizar Automazione) represented the core of the Olympics system, providing an integrated platform for managing mobility. It was necessary to provide some additional equipment (e.g. extra sensors) and to extend the monitored area by establishing data exchange connections with other control centres (e.g. on the motorway).

Before the Games, 5T monitored, controlled and integrated:

a) 200 centralised junctions in the city (1900 traffic sensors)
b) 50 VMS in the urban area
c) 200 bus stop displays
d) 1,300 equipped Public Transport vehicles (trams and buses)
e) 60 cameras at intersections for video-surveillance
f) pollution monitoring stations
g) 20 city car parks (availability monitoring)
h) video-surveillance systems (on buses and at the bus stops)
i) CCTV controlled access to limited traffic zone in city centre.

For the Winter Olympics, the following were required:

j) Additional equipment:
    i) 107 VMS (on the motorways and other roads)
    ii) 108 traffic detectors (on the motorways and other roads)
    iii) 31 cameras for surveillance (on the motorways)
k) Additional facilities
    i) 10 additional parking areas (in urban and mountain areas)

10.3 ECONOMIC EFFICIENCY OF THE EVENT

10.4 MOBILITY ASSESSMENT

10.4.1 Transport Provision By Sector

10.4.2 Transport Provision By Mode

10.4.3 Management of Transport

10.5 TICKETING ASSESSMENT

10.5.1 Ticket Types

10.5.2 Ticketing Technology

10.6 INFORMATION ASSESSMENT

10.6.1 Content

The author should consider the level of personalisation of the information.

10.6.2 Delivery

The author should consider the accessibility of the delivery to customers with sensory disabilities.

10.7 SECURITY ASSESSMENT

The $175 million budgeted for Olympic security should be enough, said Colin Hansen (Minister of Economic Development, British Columbia) in July 2006 to delegates from future and potential host cities meeting in Vancouver. The Vancouver cabinet minister responsible for the 2010 Winter Olympics predicted there will be no cost overruns for security. Other recent Olympic cities, including Athens and Turin, spent more than that, but Hansen said they used their security budgets to build new police stations and upgrade equipment.

(Ref. W4)

10.7.1 Security Provision

10.7.2 Technologies used

11. APPENDIX A – TABLE OF FIGURES

12. APPENDIX B - DOCUMENT ADMINISTRATION

12.1 VERSION HISTORY

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(a)	14/09/2009	Tony Haynes	N/A	Skeleton For the Annex built from the agreed Annex Template.
0.00.00(1TH)	18/11/2009	Tony Haynes	N/A	Populated Content from draft document from Mirzar.
0.00.00(2TH)	18/11/2009	Tony Haynes	N/A	Repaired Numbering Styles
0.00.00(3TH)	19/11/2009	Tony Haynes	N/A	Added material collected by Marek Banasiac
0.00.00(4TH)	19/11/2009	Tony Haynes	N/A	Added References
0.00.00(5HE)	20/11/2009	Hal Evans	N/A	Sanity check, suggested changes, corrections and typos addressed.
0.00.00(6HE)	23/11/2009	Hal Evans	N/A	Further Edits and proposed changes.
0.00.00(7TH)	24/11/2009	Tony Haynes	N/A	Cleanup of Formatting changes HE comments outstanding
0.00.00(8TH)	30/11/2009	Tony Haynes	N/A	Added reference to Event Characteristics Annex, Updated and accepted typo changes

APPENDIX B

12.2 REFERENCES

12.2.1 Document References

Ref. Document Title	Document Ref.	Version	Location
Solving outstanding mega-event transport challenges	STAD-EXT-REF-0001	6/2006	
2006 Turin Winter Olympic Games - Traffic Operation Centre	STAD-EXT-REF-2001		
ERTICO eNewsletter – No. 5 – 10 June 2005	STAD-EXT-REF-2002		
New ASK Contactless USB Reader	STAD-EXT-REF-2003		
Q-Free Develops Si.Pass Turin Urban Charging System	STAD-EXT-REF-2004		
2006 Winter Olympic GamesTurin Experience	STAD-EXT-REF-2005		
Olympic Heroes Come Home	STAD-EXT-REF-2006		
SOTA Event Characteristics Annex	STAD-DEL-WP2-1912		

12.2.2 Web References

Ref. Document Title	Web Ref.	Location
W1. Olympic Games	STAD-EXT-WEB-0101	http://en.wikipedia.org/wiki/Olympics
W2. World Cup	STAD-EXT-WEB-0301	http://en.wikipedia.org/wiki/FIFA_World_Cup
W3. FIFA	STAD-EXT-WEB-0302	http://en.wikipedia.org/wiki/FIFA
W4. Olympic security budget	STAD-EXT-WEB-2900	http://www.cbc.ca/canada/british-columbia/story/2006/07/11/bc-security.html
W5. Turin City Website	STAD-EXT-WEB-2200	http://www.comune.torino.it/canaleturismo/en/
W6. GTT Website	STAD-EXT-WEB-2201	http://www.comune.torino.it/gtt/en/
W7. Turin (Torino): Quality Public Transport Keeps Winter Olympics City Moving	STAD-EXT-WEB-2901	http://www.lightrailnow.org/news/n_tur_2006-02a.htm
W8. Torino defines new role for tramway system	STAD-EXT-WEB-2902	http://lrta.info/articles/art0204.html
W9. Thales Secures Turin's First Metro Line Network for 2006 Winter Olympics	STAD-EXT-WEB-2903	http://www.railway-technology.com/contractors/signal/thales_telecoms/press2.html
W10. RFID at the Olympics	STAD-EXT-WEB-2904	http://www.informationweek.com/blog/main/archives/2008/09/rfid_at_the_oly.html;jsessionid=3LRNVNTH2BUF3QE1GHPSKHWATMY32JVN

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Ref.	Document Title	Web Ref.	Location
W11.	Turin Journey Planner	STAD-EXT-WEB-2905	http://www.5t.torino.it/5t/en/percorsi
W12.	2006 Olympic Winter Games Employs Panasonic Super Dynamic III Surveillance Cameras	STAD-EXT-WEB-2906	http://www.ifma.org/daily_articles/2006/feb/02_14.cfm
W13.	WiFi could pose threat during Vancouver Olympics	STAD-EXT-WEB-2907	http://www.canada.com/story_print.html?id=207f6d54-68fc-40da-8ae3-dc9f057c2f54&sponsor
W14.	IT security paramount at Winter Olympics	STAD-EXT-WEB-2908	http://www.computerweekly.com/Articles/2006/02/07/214038/it-security-paramount-at-winter-olympics.htm

12.3 ANNEXED DOCUMENT

Ref.	Document Title	Document Ref.	Version	Location

12.4 SUPPLEMENTS

Ref.	Document Title	Document Ref.	Version	Location

APPENDIX B

12.5 DISTRIBUTION

12.5.1 Distribution for Review

Date	Name	Version	Purpose

12.5.2 Distribution for Information

Date	Name	Version	Purpose

12.6 TEMPLATE

Document Ref.	Template Title	Template Version
STAD-TEM-DOT-9002	STAD Generic Annex Template	0.00.00(7TH)

End of Document

EUROPEAN COMMISSION
DG RESEARCH

SEVENTH FRAMEWORK PROGRAMME

Theme 7 - Transport

Collaborative Project – Grant Agreement Number 234127

STADIUM

Smart Transport Applications Designed for large events with Impacts on Urban Mobility

SOTA REPORT ANNEX A2
2008 SUMMER BEIJING OLYMPICS

Project Start Date and Duration	01 May 2009, 48 months
Deliverable no.	D2.1 (Annex)
Dissemination level	0
Planned submission date	30 November 2009
Actual submission date	30 May 2011
Responsible organization	Transport For London

Document Title: SOTA Report Annex A2			WP number: 2	
Document History	Version	Comments	Date	Authorized by
	0.1	Prepared for WQA	28/07/2010	Tony Haynes

Number of pages:	155
Number of annexes:	0

Responsible Organization: Transport For London Contributing Organization(s): - -	Principal Author(s): Tony Haynes Contributing Author(s):

Peer Review	Partner	Date
Version 0.1	**IMPACTS**	**30 March 2011**

Approval for delivery	ISIS	Date
Version	**Coordination**	**23 May 2011**

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LIST OF ABBREVIATIONS

Abbreviation	Explanation
IOC	International Olympics Committee
BOCOG	Beijing Organizing Committee for the Games of the XXIX Olympiad

REFERENCE DOCUMENTS

The present document refers to the following STADIUM documents:

No	Document Title	Report No.	Published By
S1.			
S2.			

ANNEXES

No	Document Title	Document Reference	Published By
A1.			
A2.			
A3.			
A4.			

1. INTRODUCTION

1.1 PURPOSE

1.1.1 Document Purpose

To deliver an appraisal of the Summer Olympics 2008 Beijing Large Event.

1.1.2 Functional Purpose

To understand how Intelligent Transport Systems were used to support the mobility aspects of the 2008 Summer Olympics Large Event in Beijing and to elicit information that will contribute to the recommendations in the main 'State Of The Art' Large Event Report.

1.2 SCOPE

The Summer Olympics 2008 Beijing Large Event Large Event

a) The context and background of the event
b) The challenges of the event
c) Event Community Activities
   i) Event Planning
   ii) Event Mobility Needs
   iii) Event Ticketing
   iv) Event Information
   v) Event & Venue Safety & Security
d) Municipal Community Activities
   i) Hosting Planning
   ii) Hosting Mobility solutions
   iii) Ticketing Technologies
   iv) Hosting Information
   v) Municipal Safety & Security

1.3 DOCUMENT EXCLUSIONS

This document does not repeat information captured in other documentary products. Where such information is relevant those documents will be clearly referenced within this annex.

1.4 APPROACH

Each event has been analysed against a generic process model for Event Management which has been devised from UITP documentation and various academic sources including Ref. B1

The Event Research Annexes do not explore all of the processes defined in the Stadium Process Model since event management *per se* is outside of the terms of reference of the Stadium Project. Nevertheless Event Management processes that impinge upon the hosting community, especially in the context of mobility have been researched wherever possible.

The Event Processes not reported in the annexes are:

a) Initialise Event
b) Event Organisation Planning
c) Event Activity Planning
d) Prepare For Participation
e) Prepare For Sponsorship
f) Participate In Event
g) Cover Event Under Contract
h) Cover Event Not Under Contract
i) Monitor Event Performance
j) Evaluate Event Performance

2. EXECUTIVE SUMMARY

2.1 OVERALL SUCCESS OF THE EVENT

These Games were a tremendous organizational success. In particular the daunting transport task was successfully mastered and managed. For the first time in Olympic transport history, Beijing implemented a massive 60-day odd-even vehicle reduction to significantly ease Beijing metropolitan traffic severe pre-Games congestion and drastically improve air quality.

(Ref. R15)

2.2 ECONOMIC EFFICIENCY OF THE EVENT

2.2.1 Comparison of Pre- and Post-Olympic Traffic

As part of the work reviewing the effectiveness of ITS after the Beijing Games, this paper concluded that with the launch of traffic control measures during the Games, the ratio of passenger cars on expressways declined by 16%, while that of buses increased by 3%. Overall, the vehicle volumes on various types of roads declined by between 19% and 39%.

The paper describes the traffic control arrangements for the Atlanta, Sydney and Athens Summer Games, the Korea-Japan World Cup and Salt Lake City Winter Games. It describes the results of the test runs in Beijing during the China-Africa Cooperation Forum. The paper describes the overall traffic management policy and the measures undertaken to manage demand under 4 key headings:

a) the reduction of the total number of motor vehicles stage by stage,
b) the establishment of Olympic Special Lanes,
c) public transit assurance measures, and
d) the distribution of goods.

(Ref. W32).

2.3 MOBILITY ASSESSMENT

Beijing 2008 key transport scheme and policies incorporated and optimized transport and traffic management innovations tested during the Sydney 2000 and Athens 2004 Games. Beijing Olympic transport results are documented in papers prepared by Chinese Games transport planners/operators and by the author (>biblio/publications).

(Ref. R15)

2.4 TICKETING ASSESSMENT

The official Ticketing Website appears to be only served in Chinese; since this is available on the WWW it would have been advantageous for this to at least have an English Version.

2.5 INFORMATION ASSESSMENT

Whilst customer information was largely provided by static low-tech sources, there were examples of real-time information systems particularly focussed on congestion on the road network, the timing of bus and train services and variable messaging signs to manage traffic flows. In this respect the information was probably more useful to the experienced user in Beijing whilst visitors would largely have availed themselves of advice from one of the many official guides deployed around the city.

2.6 SECURITY ASSESSMENT

Security was approached in a comprehensive manner. Municipal, National & International security were all covered. However, there is little documentary evidence of transport security and/or Transport policing.

2.7 HEALTH & SAFETY ASSESSMENT

Participant & Spectator health were well safeguarded, covering sporting injuries, the Bird Flu epidemic and management of the HIV risk. Health and Safety on transport was exercised through the City H&S Regulations (see Appendix B – Beijing Transport Safety Regulations).

2.8 USE OF ITS

The main thrust of ITS at the Beijing Olympics was focussed towards command an control, with a large programme of work undertaken in co-operation with the OW2 consortium.

The focus of ITS for Beijing and the 2008 Olympics was to create an integrated, intelligent traffic-control-and-management system based on real-time traffic data and communication, online GPS or GIS information, and global coordination and optimization strategies. The goal was to develop and implement prototype and deployable ITS modules, platforms, and integration techniques for the Beijing Traffic Command and Dispatching System that could significantly reduce traffic congestion, travel time, and air pollution.

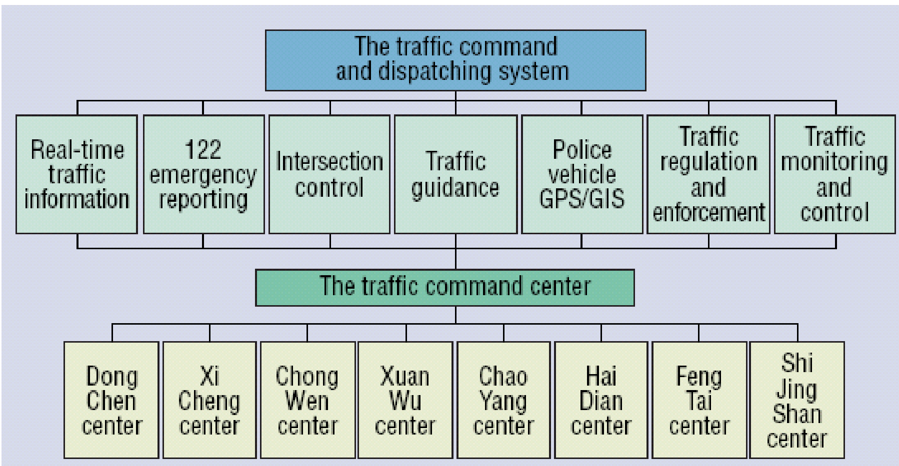


FIGURE 1 ITS ARCHITECTURE

Taking into consideration the Beijing road network's specific structure and its existing facilities, development was concentrated on building subsystems for

a) Networked surface-street intersections
b) Coordinated surface road and arterial loop interaction and loop ramp metering
c) Integrated traffic guidance, monitoring, and dispatching

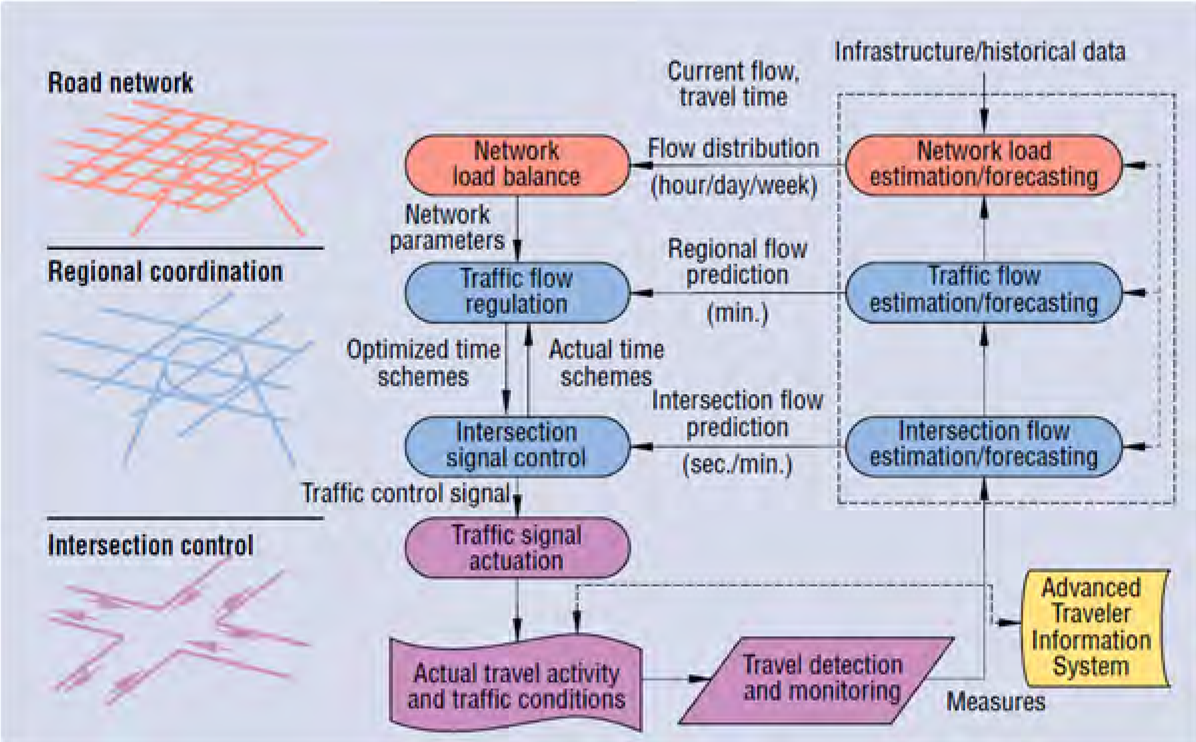


FIGURE 2 SUBSYSTEM: NETWORKED SURFACE-STREET INTERSECTIONS

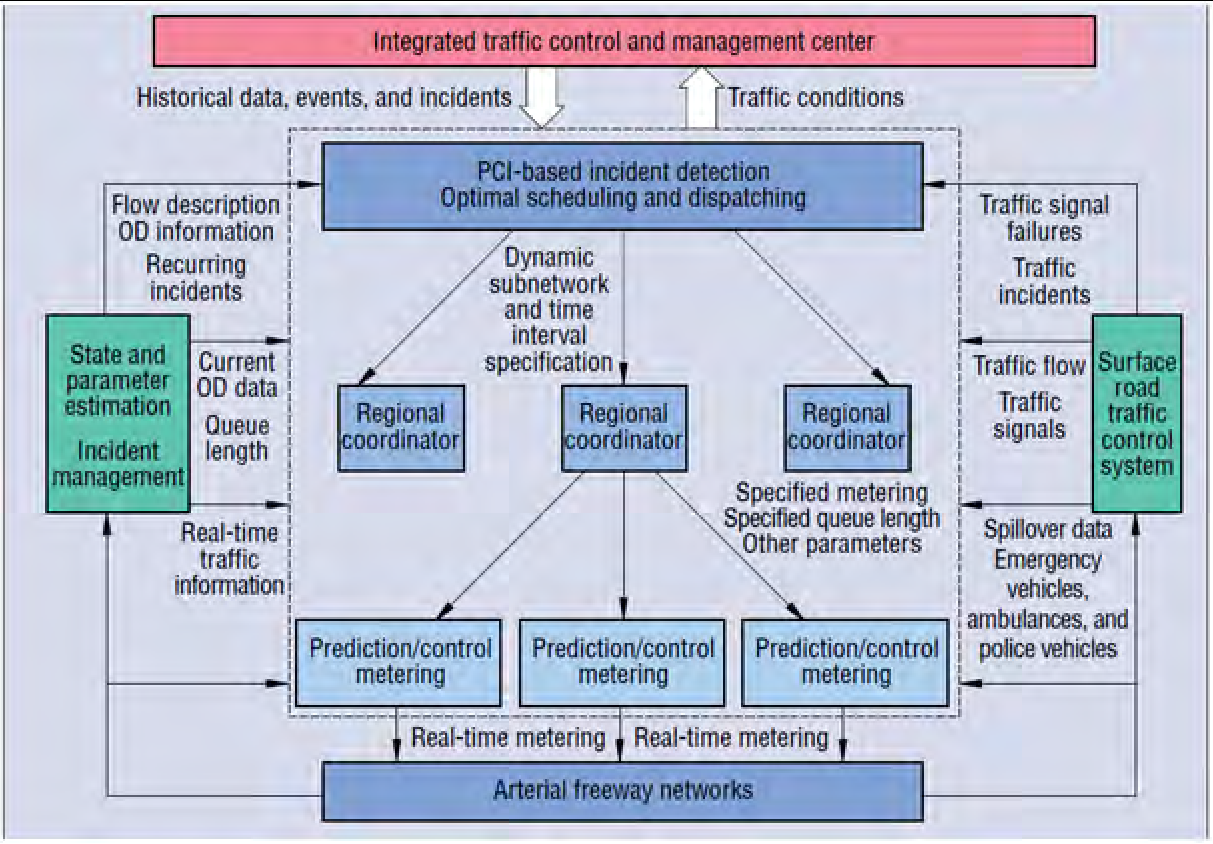


FIGURE 3 SUBSYSTEM: COORDINATED ROAD AND -LOOP INTERACTION AND METERING

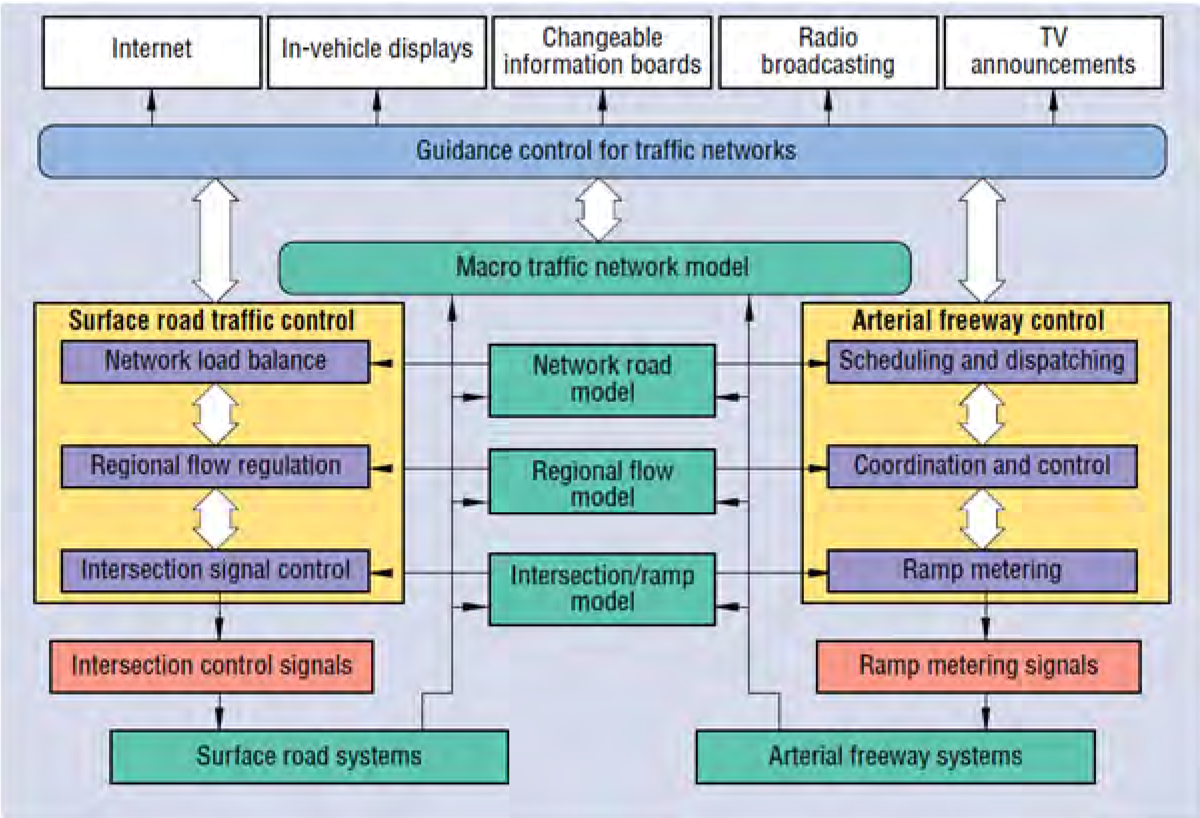


FIGURE 4 SUBSYSTEM: INTEGRATED TRAFFIC GUIDANCE, MONITORING, AND DISPATCHING

Besides conventional system analysis and decision-making techniques, major new methods used in developing these subsystems included intelligent control, agent-based control and programming, game theory, data mining, data fusion, fuzzy logic, neural networks, and genetic algorithms. The software platform and integrated development environment weredeveloped for both online and offline operations for network communication, system configuration, data collection, monitoring and inspection, simulation and forecasting, and information analysis and broadcasting, as well as traffic control, guidance, and dispatching.

(Ref. R21)

2.9 LESSONS LEARNT

2.9.1 Plan

China had a plan that went into high gear from the moment they learned the country won the bid in 2001 to host the 2008 Games. An important aspect was the focus on addressing the approximately 120 sports the country had never achieved any measurable success in such as swimming, track and field and water events.

The country and organizing host city engaged in massive planning efforts to ensure the infrastructure was in good shape. Fabulous venues, subways, airports, highways and railways were built, dirty factories shut down, and automobiles restricted. The IOC suggested China went a bit too far in its planning that went overboard in some aspects of security and media control. The IOC had to publicly tell the hosts not to obstruct reporters.

Plan well and start planning far enough in advance to achieve your goals, however lofty your goals may seem when they first start to take shape.

2.9.2 Slogans for communicating the strategy

“China Project 119” was a simple and clear slogan for communicating the strategy for China’s need to concentrate special resources on the 119 events in which the country was the weakest. “Impossible is nothing” was an Adidas co-sponsor slogan that became one of the main public slogans used for boosting the Games to the general public. Use such slogans if you have a need to communicate ideas to large numbers of people.

2.9.3 Public buy-in

Those who suggest that these Olympic Games were primarily a propaganda gimmick that came from a committee located in Beijing do not understand the Chinese people or the country very well. One would need to go deep into the countryside to find someone who did not have an awareness of or interest in this major national undertaking. Even mountain goats in the Tibet region had Olympic rings painted onto them! If that was purely propaganda, it does not explain how traffic patterns in diverse cities changed in response to events in Beijing with crowds gathered around television sets in the cities and around radios on the trains during various events.

On the other hand, the Hong Kong crowd seemed indifferent in comparison to the mainland Chinese. Olympic flags, T-shirts and paraphernalia are everywhere although it is hard to know how much of it is authentic and from IOC approved suppliers. The Chinese buy-in was huge and you should make sure that you have whatever buy-in you need for your great undertakings.

2.9.4 Resources

There was about $40 billion dollars invested in the Beijing Olympic Games by the Chinese. Some claim about $6 million was additionally spent on each medal-winning athlete. The country has only recently become able to afford this level of spending but did not appear to cut corners on costs. Put up the required resources for your project, plus support and reward your key players well is the message here.

2.9.5 Know yourself and the competitive landscape

The Chinese Olympic leadership set its sights very high – taking aim at the American gold medal count as being the only target worth beating. The sights were high but the leadership understood its own strengths and weaknesses well enough to know that it was an achievable goal. It also knew the strengths and weaknesses of the competition. The American team had its traditional great individual capabilities which Phelps demonstrated to an extreme. The Chinese were able to overcome this through numbers, sifting through a quarter of the world's population to create its talent pool.

2.9.6 Bring in the best

The country brought in about 50 top coaches from a dozen countries to give their team the edge needed to make it over the top. This comes on top of the 2500 coaches China has sent to over 100 countries beginning in the 1960s. Great planners, architects, engineers, administrators and professionals of all types were brought in or consulted on the myriad aspects of the Games. As an example, China had global accounting powerhouse PricewaterhouseCoopers working on medal count spreadsheets.

2.9.7 Great propaganda

Starting several years ahead of time, a 24-hour national television channel was launched featuring Chinese athletes winning events and preparing for the upcoming Games. It is hard to see how this could not inspire athletes and interest the public. This programming was continually available considering that there are relatively few television channels available in China with about half of them still dedicated to old Chinese martial arts based movies and shows. Currently, the other half are dedicated to the Olympics and news. This is only one example of the positive propaganda used to generate and sustain interest in these events. There are many others. The lesson here is to deploy effective propaganda to support your initiatives.

2.9.8 Sufficiently developed infrastructure

Along with new railways, airports and roadways, the whole nation's plumbing system was reworked as part of the preparations for the Games. Entire river systems were altered with water, sewage and industrial wastewater pollution standards substantially upgraded. Ten years ago, finding a relatively clean western-style toilet complete with paper was a treat to find. Now it is the norm. The lesson here is to ensure you have sufficient infrastructure in place that you won't find yourself in an uncomfortable place due to lack of suitable facilities for whatever you are trying to accomplish.

2.9.9 Strong motive

The Chinese have accomplished amazing things in their recent development into a modern society. The Games represent a great opportunity for individual athletes, communities and the country as a whole to show off in a constructive way. This strong motivation is reinforced by the clearly aligned need to continue promoting Chinese interests internally and abroad. Whether your primary motive is showing off or something else, make sure it is a strong one that is clearly aligned with your interests.

2.9.10 Selection, screening and training process

CBS News correspondent Barry Peterson reported that “Nine-year-old Zhang Huiman is on the lonely road to Olympic gold, running 20 miles a day preparing for the games of 2020.” Peterson also reported that the nation is “so obsessed with Olympic gold that it is training 200,000 handpicked kids in state-run sports boarding schools. It’s the same system the Soviets used to train gold medalists like Maria Filatova in their Cold-War sports duel with the United States.” The systems and processes are robust. When Chinese star athlete Liu Xiang failed to clear his first hurdle in Beijing, the massive selection, screening and training process ensured that China’s Olympic aspirations were not dashed. China’s numerous gold-winning weightlifters, divers and gymnasts were more than able to compensate. Have a similarly reliable process for achieving your goals.

(Ref. W55)

3. CONTEXT

3.1 EVENT CHARACTERISTICS

3.1.1 General Olympic Characteristics

The Olympic Games are an international event of summer and winter sports, in which thousands of athletes compete in a wide variety of events. The Games are currently held every two years, with Summer and Winter Olympic Games alternating.

The Olympic Movement currently comprises international sports federations (IFs), National Olympic Committees (NOCs), and organizing committees for each specific Olympic Games. As the decision-making body, the IOC is responsible for choosing the host city for each Olympic Games. The host city is responsible for organizing and funding a celebration of the Games consistent with the Olympic Charter.

The Olympic program, consisting of the sports to be contested at each Olympic Games, is also determined by the IOC. The celebration of the Games encompasses many rituals and symbols, such as the Olympic flag and torch, as well as the opening and closing ceremonies. There are over 13,000 athletes that compete at the Summer and Winter Olympics in 33 different sports and nearly 400 events. The first, second, and third place finishers in each event receive gold, silver or bronze Olympic medals, respectively.

(Ref. W12)

Further general characteristics will be found in Event Characteristics SOTA Report Annex (Ref. R12)

3.1.2 Beijing Specific Characteristics

There were 43 new world records and 132 new Olympic records set. An unprecedented 87 countries won at least one medal during the Games. Chinese athletes won the most gold medals, with 51, and 100 medals altogether. Michael Phelps broke the records for most gold medals in one Olympics and for most career gold medals for an Olympian, and equalled the record for most individual golds at a single Games. Usain Bolt secured the traditional title of "World's Fastest Man" by setting new world records in the 100 metres (330 ft) and 200 metres (660 ft) sprints.

The choice of China as a host country was a subject of criticism by some politicians and non-governmental organizations concerned about China's human rights record. China and others, meanwhile, warned against politicizing the Olympics. At the closing ceremony IOC president Jacques Rogge declared the event a "truly exceptional Games" after earlier asserting that the IOC had "absolutely no regrets" in choosing Beijing to host the 2008 Games. The Games were a source of national pride for China and in the short term may have strengthened public support for the Chinese government. They may have also led to some long-term reforms in environmental policy, a result of efforts to reduce air pollution in the Beijing region. However, the long term economic impact of the Games on Beijing and China as a whole is still unclear.

(Ref. W1)

3.2 EVENT LOCATION(S)

The 2008 Summer Olympics, officially known as the Games of the XXIX Olympiad, were a major international multi-sport event that took place in Beijing, China, from August 8 to August 24, 2008.

A total of 37 venues were used to host the events including 12 constructed for use at the Games.

3.3 LOCATION DEMOGRAPHICS

Beijing is China's second largest city in terms of population, after Shanghai. The population of Beijing has been on the increase ever since the People’s Republic of China was founded in 1949. In 2001, the population is 11.2 million. After 6 years, the total population has grown by 8.0% to 12.1 million in 2007. The above figures do not include the floating population. If floating population were taken into account, the population of Beijing has reached 17.4 million in 2007. One of the factors that resulted in the increase of population is due to the reform of the household registration system that led to a surge in marriages between residents in Beijing and those from other provinces. The average population growth rate is 1.3% from 2001-2007. The trend is expected to continue in the next few years.

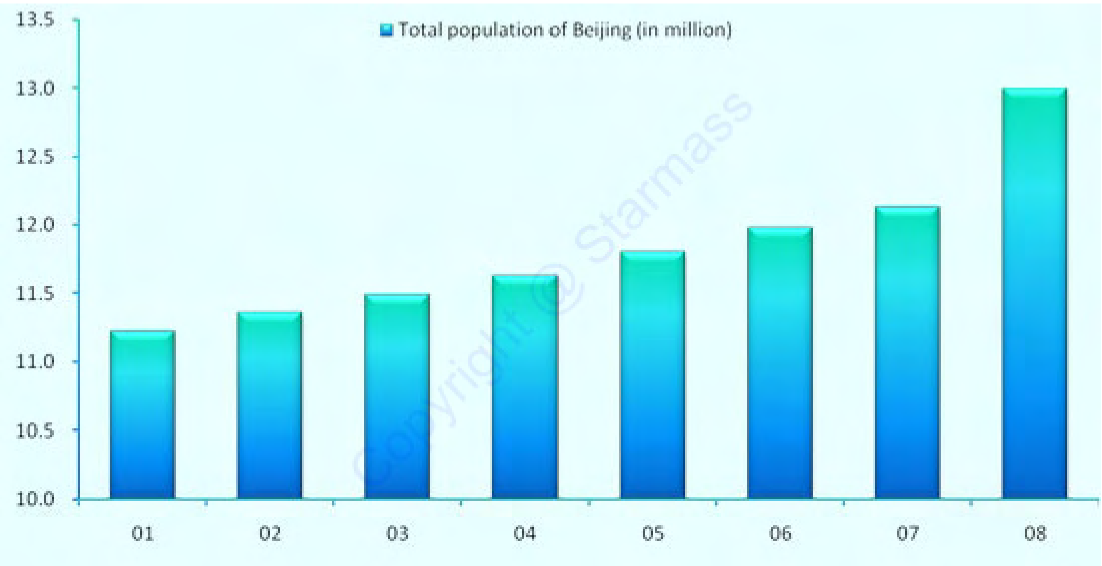


FIGURE 5 BEIJING TOTAL POPULATION AND TRENDS FROM YEAR 2001 - 2008

(Ref. W35)

3.4 SCALE OF THE EVENT

A total of 11,028 athletes from 204 National Olympic Committees (NOCs) competed in 302 events in 28 sports, one event more than was on the schedule of the 2004 Games. Three nations participated in the Olympics for the first time. China became the 22nd nation to host the Olympic Games and the 18th to hold a Summer Olympic Games. It was the third time that the Summer Olympic Games were held in Asia, after Tokyo, Japan in 1964 and Seoul, South Korea in 1988. These Games were the third time that Olympic events have been held in the territories of two different NOCs, as the equestrian events were held in Hong Kong.

Media outlets reported unprecedented audience interest in the Games, and these Olympics had the largest television audience in Olympic history.

(Ref. W1)

4. CITY SPECIFIC CHALLENGES

4.1 TRANSPORT

With over 7.5 million in the city proper and estimates of at least 17 million present in the conurbation, Beijing has been undergoing rapid growth. This includes car registrations that have been increasing by over 15% each year (Ref. W13), contrasting with road space being increased by 3% annually.

With nearly 3.3 million motor vehicles on the road and nearly 4.9 million drivers, traffic in Beijing can be very difficult to navigate. An estimated 500,000 – 850,000 additional people trying to navigate the city during the Olympic Games, meant congestion was expected to be a problem. (Ref. W14).

A key objective of the Beijing Olympic Games focused on controlling the expansion in road traffic in the City to reduce levels of road congestion, improve the environment and ensure travel times for key members of the Olympic family during the Games.

The Olympic Action Plan (Ref. W5) identified the need to establish a world-class, traffic management system as a key objective for the city.

4.2 LANGUAGE BARRIERS

With the necessity to communicate to large numbers of spectators unfamiliar with the layout of the city or its transport services, and who would also not have understood local language, meant that the provision of signage became a significant part of the logistical exercise for communicating with travellers. This was predominantly through fixed signage.

4.3 HEALTH

China presented one of the largest and most difficult challenges for the worldwide HIV/AIDS epidemic. Since China's first indigenous case of HIV was identified in 1989, the epidemic spread numerically and geographically throughout the country. In 2007, HIV-positive people were present in all 31 Chinese provinces, municipalities, and autonomous regions, with about three-quarters of these people living in five Chinese provinces: Yunnan, Henan, Xinjiang, Guangxi, and Guangdong.

The cause of the HIV problem can be traced to several factors:

a) the increase in China's sex trade
b) increasing premarital and extramarital sex
c) greater social tolerance for homosexuality and men having sex with men
d) risky behaviour in the "floating population" of migrant workers

all of which could serve as a bridge to spread the epidemic into the general population and therefore create a great risk for visitors to the 2008 Olympic Games.

(Ref. R17)

5. EVENT COMMUNITY RESEARCH – INITIALISATION & PLANNING

Some aspects of planning will not be explored by this report since these aspects do not impinge upon the use of technology. These aspects include

a) Marketing Planning
b) Sponsorship Planning
c) Site & Venue Planning
d) Finance Planning
e) Competition Programme Planning

As this is an instance of a recurring event, the conceptualisation and feasibility have been well established.

In 1894, Baron Pierre de Coubertin founded the International Olympic Committee (IOC), and two years later, the modern Olympic Games were established in Athens. The IOC has since become the governing body of the Olympic Movement, whose structure and actions are defined by the Olympic Charter.

5.1 EVENT INITIALISATION

Beijing was awarded the Games over four competitors on July 13, 2001, having won an absolute majority of votes from members of the International Olympic Committee (IOC) after two rounds of voting. The Government of the People's Republic of China promoted the Games and invested heavily in new facilities and transportation systems. The official logo of these Olympic Games, titled "Dancing Beijing", featured a stylised calligraphic character jīng referring to the host city.

(Ref. W1)

Refer to the Event Characteristics SOTA Report Annex (Ref. R12) for details of the bidding process.

5.1.1 Strategic Approach

5.1.1.1 Action Plan

Five years before the Olympics, the authorities in Beijing put in place a Beijing Olympic Action Plan. (Ref. W5).

This action plan expressed a desire to explore three principles:

a) Green Olympics
b) High-tech Olympics
c) People's Olympics

A) Green Olympics

The Action Plan states that to achieve this goal, priority will be given to environmental protection (EP) in the planning, designing and construction of Olympic venues and facilities and strict ecological environment standards and systematic supporting systems will be established. EP technologies and means will be extensively used in promoting, on a large scale and in various aspects, environmental treatment, afforestation and beautification of urban and rural areas. We will raise the environmental awareness of the whole society and encourage the public to consciously opt for green consumption and actively join in activities aiming at improving the ecological environment, in an effort to drastically improve the environmental quality of the capital and build it into an ecological city.

B) High-tech Olympics

The Action Plan states that the management will closely follow the latest high-tech developments home and abroad and integrate the high-tech achievements nationwide so as to host a magnificent sports event in high-tech environment. In doing so, Beijing's capacity in high-tech innovation will be improved and the application of high-tech achievements to production and people's life promoted. Beijing Olympic Games will be a window to showcase our high-tech achievements and innovative capacity.

C) People's Olympics

The Action Plan states that the management will promote the traditional Chinese culture, showcase the history and development of Beijing as well as the friendliness and hospitality of its citizens. We will also take the Games as a bridge for cultural exchanges in order to deepen the understanding and enhance the trust and friendship among the people of different countries. We will always give first consideration to the need of people, especially the athletes and provide favourable natural and cultural environment and quality services for them. To promote the Olympic Games and Olympic Movement, we will organize diversified cultural and educational programs to cater to the needs of the people, especially the younger generation, for spiritual and cultural activities. We will also encourage the widest participation of the people in the preparation for Games, as it will greatly push forward the sports and cultural development nationwide and increase the cohesion and pride of the Chinese nation.

5.1.2 Event Organisation & Timing

5.1.2.1 Time Frame

The event took place between August 8 and August 24, 2008

5.1.2.2 Organisation Structure

The main organisation for the event was undertaken by the Beijing Organising Committee for the Olympic Games (BOCOG). They worked closely with Beijing and cities holding events outside of Beijing.

BOCOG was established on December 13, 2001, and was responsible for organising and executing preparations for all operations of the two Games in Beijing. The BOCOG Executive Board had ultimate leadership and decision-making authority. To run "high-level Olympic Games with distinguishing features," the Supervision Commission of the Games of the XXIX Olympiad was set up at the same time as BOCOG was formally established. The commission's role was to exercise independent and overall supervision of preparations for the Beijing Olympic Games as well as over the BOCOG staff, its expenditures and revenues, and procurement of goods and materials for the Games. OCOG had 25 functional departments, all operating effectively to prepare and develop critical plans and programs required for the Games' success.

A) Functional Areas and their Responsibilities

A1) General Office

Responsible for coordination and liaison between BOCOG and various government departments and agencies as well as other co-host cities, the BOCOG internal administration activities and the management of city operations projects for the Beijing Olympic Games.

A2) Project Management Department

Responsible for the compilation, project management and adjustment of overall development plans for the Beijing Olympic Games and the Beijing Paralympics. It is also responsible for providing services for BOCOG's decision-making activity and for organizing and coordinating BOCOG's risk management programmes.

A3) International Relations Department

Responsible for liaison and communications efforts with the International Olympic Committee (IOC), national Olympic committees (NOCs), regional Olympic committees and other Olympic Family members as well as providing other relevant services.

A4) Sports Department

Responsible for the organization of all sports competitions of the Beijing Olympic Games and the Beijing Paralympics.

A5) Media and Communications Department

Responsible for information preparation and news release activities, media relations and general publicity as well as the contents of the BOCOG official website and the Olympic education efforts and programmes.

A6) Construction & Environment Department

Responsible for the coordination and supervision of the Olympic venues and facilities construction and relevant environmental protection issues.

A7) Marketing Department

Responsible for all fund-raising activities associated with the Beijing Olympic Games, the conduct of marketing activities, which include the sponsorship programme, licensing programme and the ticketing programme; and the implementation of the IOC's marketing plan within the jurisdiction of the Chinese Olympic Committee.

A8) Technology Department

Responsible for providing the Beijing Olympic Games and the Beijing Paralympics with necessary technical services and support in effectively maintaining competition records, information, telecommunications and other operations.

A9) Legal Affairs Department

Responsible for the management of the contracts and other legal affairs of BOCOG and the protection of the Olympic Games' intellectual property rights.

A10) Games Services Department

Responsible for accommodations, transportation, accreditation, catering and spectator services as well as the operations of the Olympic Village and other venues for the Beijing Olympic Games and the Beijing Paralympics.

A11) Audit and Supervision Department

An administrative institution of the BOCOG Supervision Commission, the department is responsible for supervising the use of BOCOG's funds and materials as well as the performance of its staff and their honesty and self-discipline.

A12) Human Resources Department

Responsible for the organizational set-up and human resource management of BOCOG, the recruitment, training and management of the BOCOG staff and volunteers.

A13) Finance Department

Responsible for the compilation and management of BOCOG's general budget, annual budget and accounting, and the execution of Beijing Olympic Games' financial risks management, logistics management and procurement.

A14) Cultural Activities Department

Responsible for the organization and implementation of the Olympic youth camp and various ceremonies as well as other Olympic cultural activities, and the design and management of the look and image of the Beijing Olympic Games.

A15) Security Department

Responsible for security affairs and maintenance of public order during the Beijing Olympic Games and the Beijing Paralympics.

A16) Media Operations Department

Responsible for logistical planning and operations of the main press centre, the international broadcast centre and the venue media centres. Also charged with providing equipment and services to accredited news media personnel.

A17) Venue Management Department

The Venue Management Department (VEM) is a functional department in BOCOG which is in charge of coordinating, promoting and fulfilling venue-oriented management and also the game-time venue operations. During the preparation phase, VEM is leading the managing work as well as planning and coordinating all the competition venues and non-competition venues as a whole in order to facilitate the venue-oriented tasks. During the Games time, VEM will be part of the Main Operations Center (MOC) in managing the team operations at every site. Meanwhile, the coordination among various departments during the transition period from Olympics to Paralympics on the venue operations is also VEM's responsibility.

A18) Olympic Logistics Center

Olympic Logistics Center is to provide materials and services for Olympic Games, Paralympic Games and the relative activities. It is mainly responsible for the material planning, and for the procurement, storage, distribution, tracking, management, retrofit and disposal of all the materials for hosting and staging the Olympic and Paralympic Games.

A19) Paralympic Games Department

Responsible for making plans for the preparatory work of the 2008 Paralympic Games; Facilitating the preparatory work and monitoring implementation of plans; Liaising and communicating with the International Paralympic Committee(IPC), International Paralympic Sports Federations(IPSFs), International Organizations of Sports for the

Disabled(IOSDs) and the organizations for the disabled in China; Providing guidance and suggestions on Paralympic-specific work; Assisting in training, promotion and advertisement of the Beijing Paralympic Games.

A20) Transport Department

The Transport is responsible for transport services and traffic management for Olympic Family the Beijing Olympic Games and Paralympic Games.

A21) Olympic Torch Relay Centre

The Olympic Torch Relay Centre is responsible for the planning and implementation of the Beijing 2008 Olympic Torch Relay, including relay cities liaison, route arrangement, torchbearer operations, ceremonies, celebrations, public relations, media communications, image design, marketing, brand management, security, laws and regulations, logistics and transportation.

A22) Accreditation Department

Responsible for the accreditation of Olympic Family Members, Paralympic Family Members and the workforce participating in Beijing 2008 Olympic Games and Paralympic Games.

A23) Opening & Closing Ceremonies Department

Responsible for drawing and implementing the work program as well as the organizational and operational policy for the opeining and closing ceremonies of the Beijing Olympic Games, and forming working teams for the ceremonies to ensure the smooth integration of the processes that include the creation, production, rehersal and the final implementation of the schemes.

A24) Olympic Village Department

Established in Nov. 21, 2006, the Olympic Village Department is responsible for the preparation and operation of the Olympic Village of the Olympic Games and Paralympic Games.

Its main task is to prepare the Olympic Village; to formulate and implement the service standards, operation policies and master plan of the Olympic Village project; to coordinate the preparations and operations carried out by related departments; and to supervise the Olympic Villages in the co-host cities.

A25) Ticketing Center

Responsible for ticketing production, sales, delivery, ticketing operation for the Beijing Olympic Games and the Beijing Paralympic Games.

(Ref. W2)

FIGURE 6 OLYMPIC ORGANISING COMMITTEE WORK BREAKDOWN STRUCTURE

5.1.3 Event Activity

The following Table shows the schedule for the competitions:

Opening/Closing Ceremony | Finals | Competitions | R Reserved Day | G Gymnastics Gala | Number = Number of gold medals available

COMPETITION SCHEDULE

August2008	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	
	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Opening Ceremony																				
Closing Ceremony																				
Aquatics - Diving					1	1	1	1				1		1		1		1		8
Aquatics - Swimming					4	4	4	4	4	4	4	4			1	1				34
Aquatics - Synchronised Swimming															1			1		2
Aquatics - Water Polo																1			1	2
Archery					1	1			1	1										4
Athletics										2	4	6	6	5	3	6	7	7	1	47
Badminton										1	2	2								5
Baseball												R				R		1		1
Basketball																		1	1	2
Boxing																		5	6	11
Canoe/Kayak - Slalom							2		2											4
Canoeing-Sprint																	6	6		12
Cycling – BMX																2	1			3
Cycling – BMX																2	1			3
Cycling - Mountain Bike																	1	1		2

EVENT COMMUNITY RESEARCH – INITIALISATION & PLANNING

August2008	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	
	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Cycling - Road				1	1			2												4
Cycling - Track										1	3	1	2	3						10
Equestrian - Dressage									1					1	R					2
Equestrian - Eventing							2													2
Equestrian - Jumping													1	R		1	R	R	R	2
Fencing				1	1	1	1	2	1	1	1	1								10
Football																1		1		2
Gymnastics - Artistic							1	1	1	1		4	3	3	G					14
Gymnastics - Rhythmic																		1	1	2
Gymnastics - Trampoline													1	1						2
Handball																		1	1	2
Hockey																	1	1		2
Judo				2	2	2	2	2	2	2										14
Modern Pentathlon																1	1			2
Rowing											7	7								14
Sailing											2	1	2	2	2	2	R	R	R	11
Shooting - Pistol				1	1		1	1			1									5
Shooting - Rifle				1		1			1	1		1								5
Shooting - Shotgun					1	1	1		1		1									5
Softball														R		1				1

August2008	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	
	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Table Tennis												1	1				1	1		4
Taekwondo															2	2	2	2		8
Tennis											2	2								4
Triathlon													1	1						2
Volleyball																		1	1	2
Volleyball - Beach																1	1			2
Weightlifting				1	2	2	2	2		2	1	1	1	1						15
Wrestling - Freestyle											2	2		2	2	3				11
Wrestling - Greco-Roman							2	2	3											7
	0	0	0	7	14	13	19	17	17	16	30	34	18	20	11	25	22	31	12	306

(Ref. W38)

A total of 38 coaches from 16 countries trained the Chinese athletes. The American women's volleyball team, athletics team and women's gymnastics team, as well as table tennis, diving and shooting teams of other countries, all had Chinese coaches. This truly reflects that sports can transcend national boundaries and become a celebration of people around the world.

(Ref. W39)

6. EVENT COMMUNITY RESEARCH – MOBILITY & ACCESS

6.1 EVENT MOBILITY

Professor Zhang Wenjie of Beijing Jiaotong University, headed an Olympic logistics research group set up to study the transport needs during the competition. This group advised the Beijing Organising Committee for the Games of the XXIX Olympiad (BOCOG) to set up the Olympic Logistics Centre located in the Beijing Airport Logistics Park, adjacent to the Capital International Airport. The centre covered a total area of 210,000 m2 and was used to store and manage the vast quantity of equipment that was needed at more than 50 venues during the Olympics.

It was expected that 1.2 million pieces of equipment would pass through the centre during August.

Experts estimated that logistics during the Games period would cost US$6.17 billion – $5.95 billion for direct expenses related to moving equipment, $69.83 million for indirect expenses, such as food and tourism, and $15.39 million for disposable products. In response to the hundreds of events, 75,000 tonnes of equipment and materials would need to be transported around the country using more than 2,000 vehicles.

(Ref. W36)

6.1.1 Mobility Strategy

With the goal of delivering an effective, efficient and sustainable service, BOCOG's Transport and Construction and Environment Departments developed a strategy for sustainable mobility during the Games, focused on two pillars:

a) Reinforcing public transportation,
b) Using of low emissions vehicles (cars, vans and buses).

6.1.1.1 Public Transportation

The strategy envisaged free rides on the Beijing public transport system for those spectators holding a ticket for the Olympic competitions. Figure 7 FREE PUBLIC TRANSPORT NETWORK, shows the public ground lines that the spectators were allowed to use for free, in addition to the underground lines.

On the basis of the Games schedule, the free public transport service operated for a total of 51 days, from the opening of the Olympic Village (15 days prior to the Olympic Games Opening Ceremony) till the closure of the Paralympic Village (36 days after the Olympic Games Opening Ceremony)

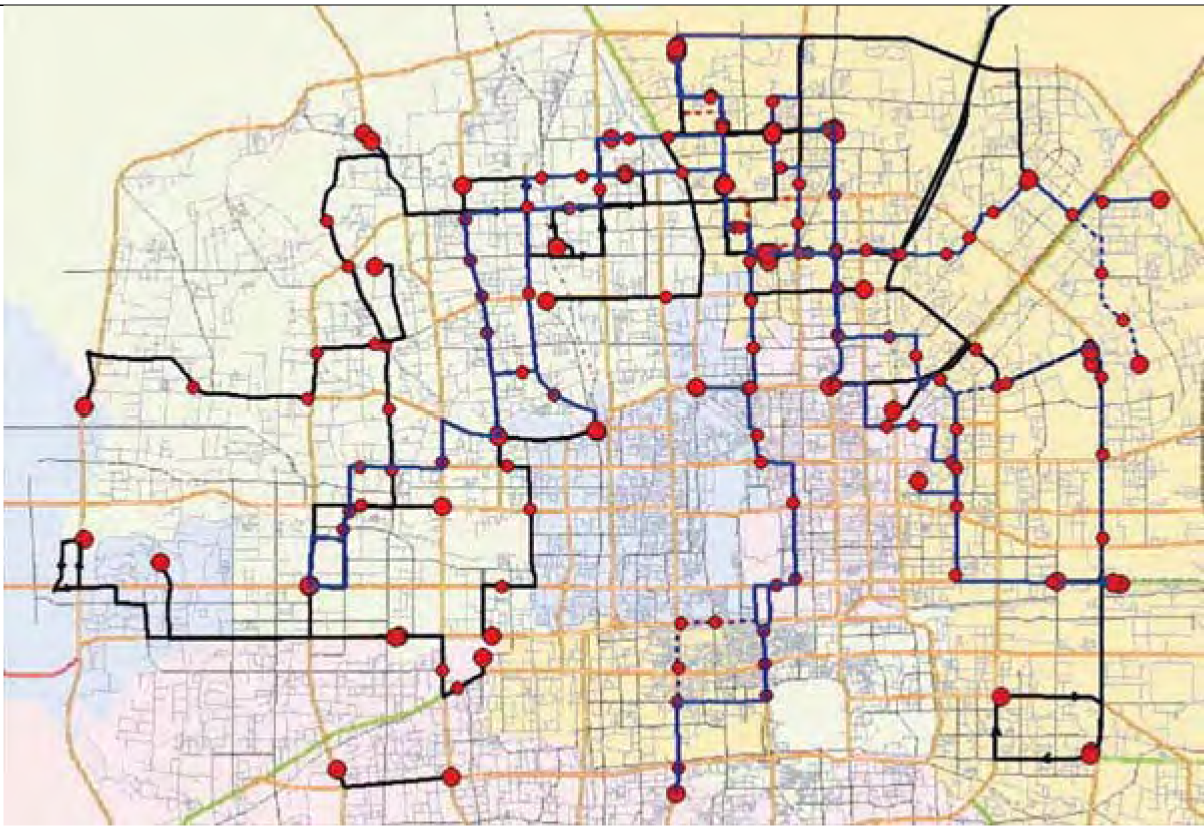


FIGURE 7 FREE PUBLIC TRANSPORT NETWORK
(SOURCE: BEIJING TRANSPORTATION RESEARCH CENTRE)

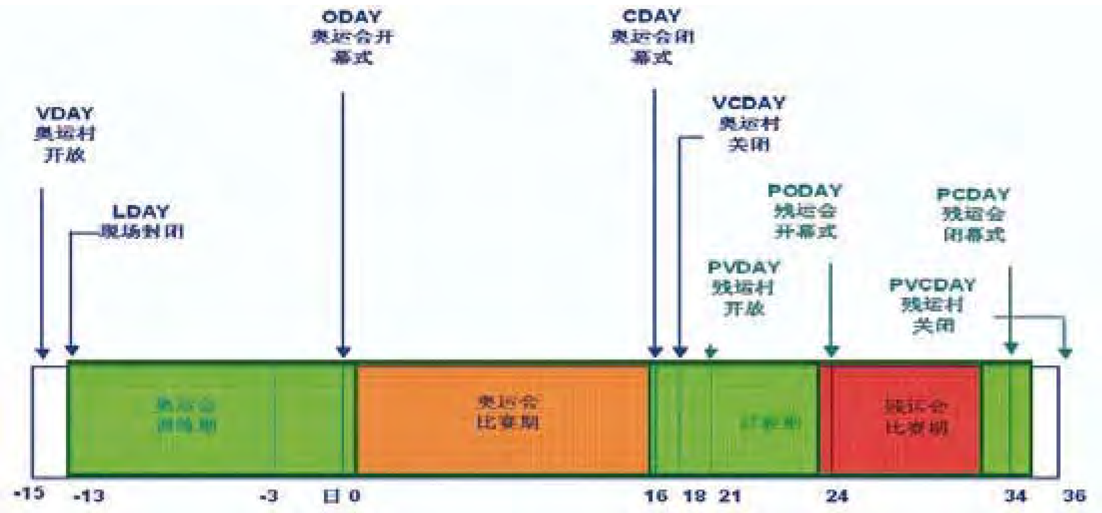


FIGURE 8 FREE PUBLIC TRANSPORT CHART

a) VDAY: Opening of the Olympic Village
b) LDAY: Load in ODAY: Olympic Games Opening Ceremony
c) CDAY: Olympic Games Closing Ceremony
d) VCDAY: Closure of the Olympic Village
e) PVDAY: Opening of the Paralympic Village
f) PODAY: Paralympic Games Opening Ceremony
g) PCDAY: Paralympic Games Closing Ceremony
h) PVCDAY: Closing of the Paralympic Village

6.1.1.2 Low emission vehicles

According to the Beijing Games Organizing Committee, part of the fleet dedicated to transporting the Olympic Family were to be low, zero emission, or electric vehicles. A fleet of 200-300 bicycles were to be available in the Olympic Park and Olympic Village.

The fleet of coaches and buses during Games comprised 2,260 vehicles: 400 were propelled by natural gas and the others by diesel fuel. All of them had less than 100,000 km on the odometer or were vehicles newly registered after 2005.

According to BOCOG, the Olympic fleet of 3,060 cars, minivans and small buses powered by petrol engines met national environmental, technical and safety standards and requirements. BOCOG also prepared the 'Beijing Olympics Transport Services Environmental Protection Guidelines' to detail vehicle emission and maintenance standards to guide BOCOG's Transport Department policies.

Vehicle Type	Number	Engine Capacity	Fuel Type
Audi A6 (5 seats)	692	2.0 L	Gasoline
Magotan (5 seats)	30	1.8 L	Gasoline
Passat (5 seats)	150	1.8 L	Gasoline
Sagitar (5 seats)	698	1.6 L	Gasoline
Octavia (5 seats)	780	1.6 L	Gasoline
Istana (9-15 seats)	178	2.3 L	Gasoline
Turan (7 seats)	532	n.a.	Gasoline

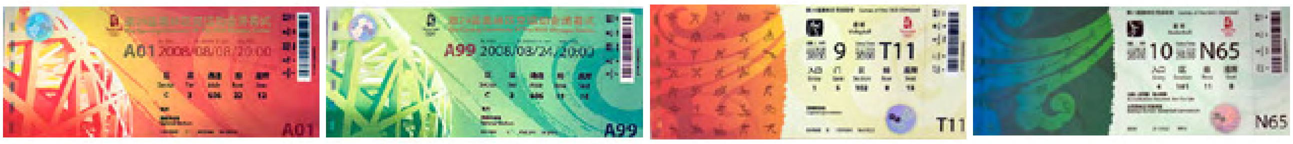
FIGURE 9 SMALL VEHICLES BY TYPE AND CAPACITY

(Ref. **W37**)

6.2 EVENT TICKETING

In April 2007, over seven million tickets for sporting events and ceremonies went on sale. Approximately 75% of tickets went on sale through the Beijing Organizing Committee, which set low ticket prices for domestic tickets, to encourage the Chinese people to attend the Games.

International tickets were available through each nation's NOC. By June 2007, 2.2 million tickets had already been sold. The last round of some 250,000 tickets was on sale in Beijing on 25 July 2008. Long lines were formed the day before at the ticket office including many who slept overnight. (Ref. W7)



Opening ceremony | Closing ceremony | Sports competition | Accredited personnel

FIGURE 10 SAMPLE TICKETS OF 2008 BEIJING OLYMPIC GAMES

Over eight million hits on the booking website were received in the first hour of sales, far more than planners had expected, Bocog said. The frenzy of activity was well beyond the system's capacity of handling one million hits and processing 150,000 ticket sales in an hour. In addition, the number of calls to the ticketing phone line exceeded 3,8-million in the first hour while many other callers were unable to get through, Bocog said. "We underestimated just how enthusiastic the Chinese general public are about the Olympics". (Ref. W40)

Ticket sales for the 2008 Beijing Olympics were based on prices set by the Beijing Olympic Organizing Committee. Ticket prices for games ranged from 30 to 1,000 yuan. Closing ceremony tickets are 150 to 3,000 yuan.

The approximate conversion rate for one Chinese yuan is:

a) $0.1472 US.
b) €0.1192
c) £0.0978

(Ref.W41)

7. EVENT COMMUNITY RESEARCH – INFORMATION

The Beijing Olympic Action Plan (Ref. W5) contains a section entitled Special Programme for Construction of Digital Olympics. This describes the actions to create a 'High-tech Olympic Games'. China was keen to provide a world class information service for 2008 Olympic Games to place it at the forefront of these technological developments. There is some overlap with Hosting Community who provided mobility solution and in the areas of establishing a Comprehensive Information Service for the Public and a Multi-Linguistic Intellectual Information Service. (*Information Planning*)There are also overlaps where the Action Plan talks about the need to strengthen the basic platform for information and communications provision across Beijing.

7.1.1 Travel Information

See Section 18.1.1

7.1.2 Event Information

7.1.2.1 Scheduling Information

Information concerning the scheduling of the competitions was provided in the Official Spectator Guide (Ref. R6).

7.1.2.2 Ticket Information

Information concerning ticketing was provided in the Official Spectator Guide (Ref. R6).

7.1.2.3 City Information

Information about the city was provided in the Official Spectator Guide (Ref. R6).

7.1.2.4 Venue Information

Information about the venues was provided in the Official Spectator Guide (Ref. R6).

7.1.2.5 Regulation Information

Information concerning ticketing terms and conditions and regulation for spectators was provided in the Official Spectator Guide (Ref. R6).

7.1.2.6 Help Line Information

The helpline telephone number was provided in the Official Spectator Guide (Ref. R6). The call centre number and a ticketing support email address were also provided on the website (Ref. W2).

8. EVENT COMMUNITY RESEARCH – SAFETY & SECURITY

8.1 HEALTH AND SAFETY

The BOCOG recruited 200 medical workers from 23 area hospitals to conduct doping control of athletes. The International Olympic Committee announced that up to 4,600 urine and blood tests would be carried out during the 2008 Olympics, which in itself posed quite a logistics challenge.

(Ref. W36)

8.1.1 Sports medicine

Official Health Care Products Partner of the Olympic Committee, Johnson & Johnson (Langhorne, Pa.) were very visible to Olympic athletes. The committee's athlete dental screening program made use of free J&J products that include toothbrushes, mouth rinse, and educational materials. Used to evaluate the athletes' visual skills, the AchieveVision™ program checks skills that are essential to sports performance, such as contrast sensitivity, depth perception, and peripheral awareness. This product was created by The Vision Care Institute™ LLC, a J&J company.

J&J also supported the Olympic Games' Polyclinic by installing diagnostic and sterilization equipment and supplying over-the-counter, prescription, and sports medicines. (The Olympic Village alone had a three-story clinic that included a sports medicine department.) Through J&J's BAND-AID® Brand Olympic Education Campaign, 400 million students in China's schools learnt about the Olympic movement, as well as health and wound care.

(Ref. W57)

8.1.2 Venue H&S

Beijing banned smoking in public places, including parks, on May 1 2008, and China promised this would be a smoking-free Olympics.

(Ref. W57)

8.1.2.1 Air Quality

The new Beijing National Stadium, known as the Bird's Nest, uses a new line of 3M Filtrete Commercial HVAC Filters to clean the air. Installed by The Penn Air Group (Los Angeles, Calif.), a global provider of commercial HVAC system optimization, the filters' nonwoven technology was first used in facial respirators and later migrated into Filtrete filters because of the melt-blown fibers technology's ability to trap minute particles.

Air quality monitoring equipment from TSI Inc. (Shoreview, Minn.) -- indoor air quality monitors and monitors to measure dust and aerosols -- have been used for IAQ measurement, spot testing, and a study of ultrafine particles in Beijing's air that will continue throughout the games. TSI also provided a filter tester used by the Beijing National Center for Disease Control and Prevention to test first responders' respirators and face masks for possible use during a chemical or terrorist attack.

(Ref. W57)

8.1.3 Food safety

Screening efforts ahead of and during the games included use of DuPont Qualicon's BAX polymerase chain reaction detection system in food safety inspections by the Beijing Municipal Center for Food Safety Monitoring. Indeed, the November 2007 adoption of the Beijing Declaration on Food Safety underscored the concern about this area from China and the rest of the world. The adoption took place at a forum co-sponsored by the World Health Organization, China's Ministry of Health, and China's State Administration for Quality and Safety Inspection and Quarantine. The declaration urges all countries to develop comprehensive programs to improve consumer protections and to actively participate in the International Food Safety Authorities Network (INFOSAN).

ARAMARK Corp. (Philadelphia, Pa.), official catering service provider for these games, expects to serve more than 3.5 million meals during the Aug. 8-24 Summer Olympics and the Sept. 6-17 Paralympic Games in Beijing. ARAMARK has about 10,000 employees in more than 15 Chinese cities providing facility management and food service for more than 200 health care operations, manufacturing and commercial office buildings, government organizations, and sporting events.

The DuPont (Wilmington, Del.) BAX System enables fast testing for salmonella, E. coli O157:H7, Listeria, and other pathogens in food samples. The China division of Moody International Inc. (The Woodlands, Texas), also worked with the Beijing municipal government's food safety authorities as technical adviser on a food safety and hygiene management training program for restaurants and caterers. Moody, which said it was the first training service provider accredited by the governmental authority, said the training will extend to more than 50,000 restaurants and 100,000 food safety managers during the next two years, but the first priority was to train the food safety managers for restaurants and 20,000 catering personnel serving the games.

(Ref. W57)

8.2 SECURITY

China Alarm was contracted to provide security services for the 2008 Summer Olympic Games in Beijing, with its city-wide network linking various security systems and the 110 emergency alarm network.

(Ref. W20)

9. EVENT COMMUNITY RESEARCH – ENVIRONMENT & VENUES

9.1 EVENT ENVIRONMENT

The Environmental Management division (see paragraph 5.1.2.2) was responsible for implementing the Environmental Management System of the Committee, for tracking the fulfilment of the bid commitments, for environmental communication, risk management, and cooperation with international organizations (such as UNEP[1] and UNDP[2]) and environmental NGOs[3]. The Environmental Engineering division was in charge of managing the environmental aspects of the design and construction of the venues, one of the most high-impact areas of staging an Olympic Games, and of the venues' waste and cleaning programme.

While BOCOG established guidelines to encourage sustainability in several aspects of the Games, most of its requirements were not mandatory or enforceable. Many of the final decisions on the environmental aspects of, for instance, transport, construction, accommodation and catering, were taken on a voluntary basis by the actors involved in staging the Games. UNEP feels that this reliance on goodwill and trust, while admirable, leaves too much leeway for taking shortcuts at the expense of environmental sustainability in the case of potential conflicts related to deadlines and budget overrun.

While BOCOG devoted considerable effort into fulfilling the letter and spirit of its promise to deliver a 'Green Olympics', for future such events, UNEP feels that the IOC might consider making strict environmental standards mandatory for all areas of Olympic planning, including procurement and relations with service providers and sponsors.

Nevertheless, the Beijing Organizing Committee for the Games of the XXIX Olympiad (BOCOG) successfully passed the on-site examination of its environmental management system (EMS) for 2006. After an extensive check from 12 to 14 September, China's Environmental Certification Centre arrived at the conclusion that BOCOG had achieved evident progress in comparison with 2005 in environmental management, and its EMS conforms to ISO14001:2004 requirements, according to BOCOG Environmental Activity Department.

BOCOG's EMS covered many areas such as catering service, Olympic procurement, organization of large-scale activities, Games-time transport service, selection of

[1] United Nations Environment Programme
[2] United Nations Development Programme
[3] Non-Governmental Organisations

Olympic torch relay routes, BOCOG Green Office, event route planning, venue planning, selection of partners, selection of contracted hotels, communication and environmental management.

The examination group not only checked the work of relevant BOCOG departments, but also met with personnel from the Beijing 2008 Project Construction Headquarters Office, Olympic venue owners and constructors, contracted hotels to seek their opinions on BOCOG's EMS work.

(Ref. **W2**)

9.2 EVENT VENUES

9.2.1 Location and Usage

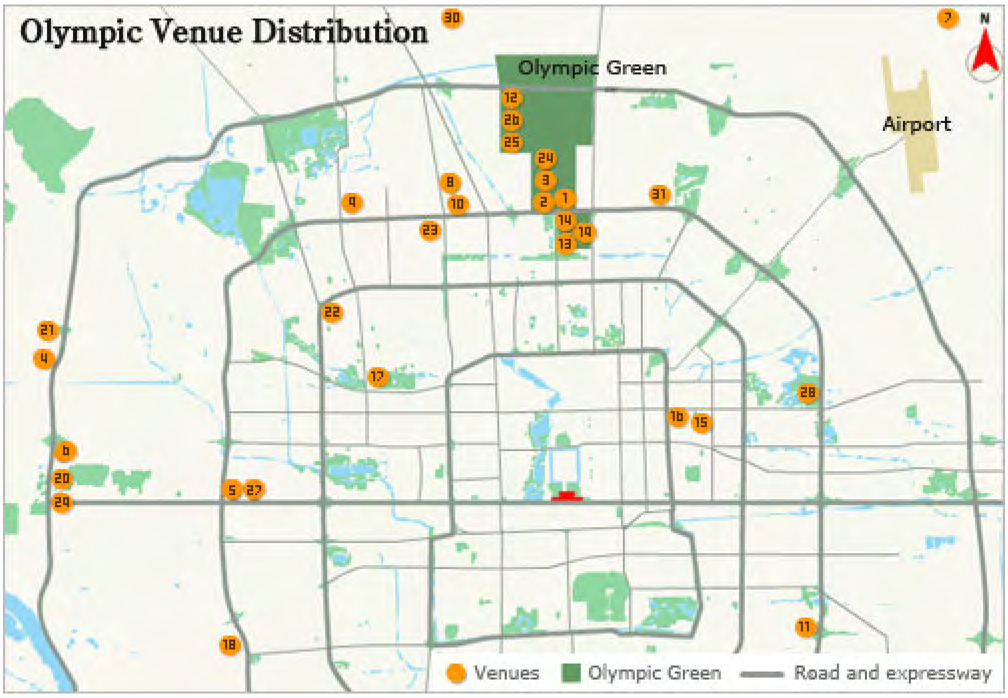


FIGURE 11

9.2.1.1 <u>New Venues in Beijing</u>

a) 1. National Stadium
   i) Athletics
   ii) Football

b) 2. National Aquatics Center
   i) Swimming
   ii) Diving
   iii) Synchronized Swimming

c) 3. National Indoor Stadium
   i) Artistic Gymnastics
   ii) Trampoline
   iii) Handball
d) 4. Beijing Shooting Range Hall
   i) Shooting
e) 5. Beijing Olympic Basketball Gymnasium
   i) Basketball
f) 6. Laoshan Velodrome
   i) Cycling
g) 7. Shunyi Olympic Rowing-Canoeing Park
   i) Rowing
   ii) Canoe/Kayak -- Flat-water
   iii) Canoe/Kayak -- Slalom
h) 8. China Agricultural University Gymnasium
   i) Wrestling
i) 9. Peking University Gymnasium
   i) Table Tennis
j) 10. Beijing Science and Technology University Gymnasium
   i) Judo
   ii) Taekwondo
k) 11. Beijing University of Technology Gymnasium
   i) Badminton
   ii) Rhythmic Gymnastics

9.2.1.2 Existing Venues in Beijing

a) 13. Olympic Sports Center Stadium
   i) Modern Pentathlon (running and equestrian)
b) 14. Olympic Sports Center Gymnasium
   i) Handball
c) 15. Beijing Workers' Stadium
   i) Football
d) 16. Beijing Workers' Gymnasium
   i) Boxing
e) 17. Capital Indoor Stadium
   i) Volleyball
f) 18. Fengtai Sports Center Softball Field
   i) Softball
g) 19. Yingdong Natatorium of National Olympic Sports Center
   i) Water Polo
   ii) Modern Pentathlon (Swimming)
h) 20. Laoshan Mountain Bike Course
   i) Mountain Bike
i) 21. Beijing Shooting Range CTF
   i) Shooting

j) 22. Beijing Institute of Technology Gymnasium
   i) Volleyball
k) 23. Beijing University of Aeronautics & Astronautics Gymnasium
   i) Weightlifting

9.2.1.3 Temporary Venues in Beijing

a) 24. Fencing Hall of National Convention Center
   i) Fencing
   ii) Modern Pentathlon (fencing and shooting)
b) 25. Beijing Olympic Green Hockey Stadium
   i) Hockey
c) 26. Beijing Olympic Green Archery Field
   i) Archery
d) 12. Beijing Olympic Green Tennis Court
   i) Tennis
e) 27. Beijing Wukesong Sports Center Baseball Field
   i) Baseball
f) 28. Chaoyang Park Beach Volleyball Ground
   i) Beach Volleyball
g) 29. Laoshan Bicycle Moto Cross (BMX) Venue
   i) Cycling (BMX)
h) 30. Triathlon Venue
   i) Triathlon
i) 31. Road Cycling Course
   i) Cycling (road race)

(Ref. W2)

9.2.2 Innovation

Liu Qi, president of the Beijing Organizing Committee for the Games of the XXIX Olympiad (BOCOG) on called for innovative spirit in the construction of Olympic venues in Beijing. When he knew that Chinese researchers and technicians had independently developed their own technologies and resolved very difficult problems, Liu urged the builders to make the mega projects contemporary fine works of independent innovation. “We need to better apply and protect the technologies possessing intellectual property rights, and let them play their role in other Olympic projects," he said. It is reported that technologies such as thick steel-plate welding at the National Stadium were innovated by the Chinese technical forces, who are also capable of dealing with the ETFE (Ethylene tetrafluoroethylene) membrane structures at the National Aquatics Centre. Of the 31 competition venues planned for Beijing, 20 were built from scratch.

(Ref. W2)

9.2.2.1 National Swimming Centre--exquisite and exciting "Water Cube"

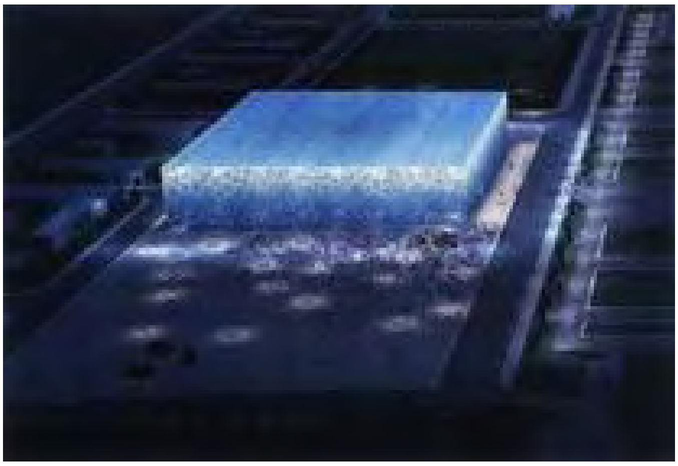


FIGURE 12 THE NATIONAL SWIMMING CENTRE

A semi-transparent "cube", with "bubbles" spread out all over its surface, is a shape very similar to the structure of "H2O", the outlook for the National Swimming Centre at the 2008 Olympic Games. After the games, it will become a recreational water park open to the public. In Chinese culture, water is an important natural element. It creates a calming atmosphere and inspires happiness. Taking full consideration of the functions of water in recreation and bodybuilding, designers have explored many ways for people of different age groups to appreciate its function. The design is called "Water Cube". Many creative designs have been employed in the creation of the swimming pools at the swimming centre. Other high-tech facilities including optical devices used to define positions of athletes, and multiple-angle, three-dimensional screening systems are provided to help spectators enjoy competitions. The National Swimming Centre, one of the three landmark buildings for the 2008 Beijing Olympic Games, is located inside the Beijing Olympic Park. Covering a total floor space of 50,000 square meters, it has 17,000 seats. The project costs about US$100 million. The centre was a venue for swimming, diving, synchronized swimming and water-polo games during the period of the Olympic Games. After the games, the centre has become a large water recreational centre open to the public. In January 2003, Beijing started to solicit design schemes for the National Swimming Centre. The international competition settled on "Water Cube" as the winning scheme. It was designed by the design consortium consisting of the China State Construction Engineering Corporation, China State Construction International (Shenzhen) Design Co Ltd, PTW Architects (Australia) and Ove Arup (Australia). The National Swimming Centre was the only landmark Olympic venue that was constructed by donations from compatriots from Hong Kong and Macao.

9.2.2.2 National Stadium--natural "Bird's Nest"

FIGURE 13 THE NATIONAL STADIUM

"Bird's Nest" was jointly designed by Herzog and De Meuron Architekten AG, Switzerland, and China Architecture Design Institute. It gained high praise and also aroused most controversy Some people thought the design was too avant-garde and trendy, and not in keeping with acceptable traditional ideas. However, insiders thought "Bird's Nest" properly expressed a new architectural vernacular. Such schemes could not work out without an understanding of Chinese philosophy and the Chinese idea of good timing, geographical convenience and harmonious human relations. According to designer De Meauron, first, it is a contemporary Chinese building; second, it has close links with Chinese culture; third, it is reliable in its use of techniques. The architecture of the 20th century emphasized technology. In the new century it would reflect the contemporary culture of the Olympic Games. The stadium was designed for its people; the "gentle" environment shows respect to its athletes. The stadium is a bowl shape with a red stand. It looks like a nest structure. It is made of gray mining steel covered with a transparent membrane. "Bird's Nest" is an original creation, with a fresh and unique appeal, an exciting example of global architecture. As the main stadium for the 2008 Olympic Games, the National Stadium is located in the Olympic Park, northeast of the city axis line, covering an area of 204,100 square meters and forming a construction area of 258,000 square meters. During the 2008 Olympics, the National Stadium was designated to host the opening and closing ceremony, the track and field competition and the soccer games. The National Stadium accommodates 100,000 spectators of which 20,000 are with temporary seating. Since the 2008 Olympics, the National Stadium has been converted to an 80,000-seater stadium suitable for large-scale sport competitions and other non-competitive events. The National Stadium has become a large-scale venue for sports, recreation and entertainment for the people of Beijing.

9.2.2.3 New CCTV site--unconventional "Z crisscross"

FIGURE 14 THE NEW CCTV SITE

While elaborating on his design concept, Ram Koolhass, designer of "Z crisscross" said: "It's the architecture that China needs -- I bring it to you now!" Wu Yaodong, vice general architect of Tsinghua Architecture Design Institute, pointed out "The open attitude shown in selecting design schemes of this high caliber has surpassed the architecture itself." A member of the review committee said, "the designer of the new CCTV (China Central Television) site changed from a domestic master to an international master. The pressure it brought was not whether the scheme was backward, but rather the futurist design may not be accepted by the general public." The design of the new CCTV site started from invitation biddings from 10 architecture design organizations, of different styles, from around the world, to the final selected scheme. Hong Kong architect Rocco Yim, a member of the review committee, said, "The design scheme selection of the CCTV competition was very professional," compared with other appraisals he has taken part in. Koolhass's scheme (Metropolitan Architecture of the Netherlands) became the final selection. With a 230-meter high major building, the new CCTV site is a landmark in the heart of the Central Business District (CBD) in eastern Beijing. The project, which cost around US$600 million, has 550,000 square meters of floor space. The space is divided into several construction areas in accordance with the operational requirements and functions of various departments.

9.2.2.4 National Grand Theatre--Paul Andrew's "Eggshell"

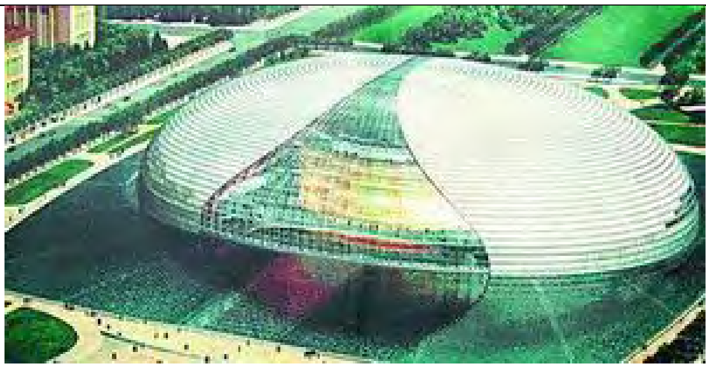


FIGURE 15 NATIONAL GRAND THEATRE

According to French architect Paul Andrew, the Grand Theatre would look like a huge green park with an oval and silver grand theatre encircled by green water. The shell, made of titanium metal and glass together with day and night lights would add radiance and beauty to each other, and have fast-changing colours. The surroundings of the Grand Theatre are semi-transparent, golden netted glass walls. People can see the sky inside the building through its dome. Some people describe the complete Grand Theatre as "a crystal drop of water", other people call it a "big egg shell" or "boiled egg". The Grand Theatre project was approved by the State Council in April, 1998 and formerly put into construction on December 13, 2001. It was planned to be China's top arts performance centre and a first class art palace. Covering a total area of 118,900 square meters, the Grand Theatre has a total floor space of 149,500 square meters. It is equipped with accessory facilities including halls for opera, music, drama, art exhibitions, as well as an art exchange centre, and audio and video store. Opera, dancing and ballet are presented in the opera hall, which can accommodate an audience of 2,416. The Music Hall, which can accommodate 2,017, presents large orchestral work and folk music. Drama and local opera including Peking opera are staged in the drama hall. At the northern side of the Grand Theatre there is an underground parking lot, which can hold almost 1,000 motor vehicles and 1,400 more bicycles. It can be used as an accessory facility for the Grand Theatre and as a public facility in the Tian'anmen Square area. Beijing joins world architecture trend Wang Mingxian, deputy chief of the Environment Art Committee of the China Construction Culture and Art Association, said: "In recent years, Beijing has taken big steps in introducing modern architecture at a high level."

"People hold different opinions about whether the large-scale introduction of variously styled architecture from global competitors will make Beijing an experimental area of foreign architecture. In regard to the underdeveloped modern architecture of Beijing, we first have a welcome attitude. However the needs of city planning as well as historical protection require combining old with new."

(Ref. W42)

9.3 EVENT STAGING

Led by Chief Director Zhang Yimou, a long list of talents including Zhang Jigang, Chen Weiya, Yu Jianping, Chen Qigang, Cai Guoqiang, and other artists gave the world spectacular shows at the opening and closing ceremonies of the Beijing 2008 Olympic Games.

9.3.1 Zhang Yimou: Commander-in-Chief

Zhang Yimou, an internationally renowned director with strong artistic ability, was the obvious choice for BOCOG. Zhang had a deep understanding of the concepts of the Beijing Olympic Games and the soul of the Olympics. He as was involved in the Beijing Olympic Games from the start – from promotional videos for the bid process to promoting the Beijing Olympic emblem. Additionally, he produced eight minutes of the closing ceremony at the Athens 2004 Olympic Games.

9.3.2 Zhang Jigang: choreography master

Internationally acclaimed choreographer Zhang Jigang assisted Zhang Yimou in the development and direction of the opening and closing ceremonies. As head of the Song and Dance Troupe of the Chinese People's Liberation Army General Political Department, Zhang Jigang choreographed the award-winning dance "Thousand-Hand Guanyin" performed by 21 artists with a hearing disability.

9.3.3 Chen Weiya: opening ceremony specialist

Chen Weiya has accumulated extensive experience from directing the opening ceremony for many major events, including the opening ceremony for the Beijing 2001 World University Games. Additionally, Chen has worked with Chief Director Zhang Yimou on numerous occasions, which will prove advantageous in their cooperation for the Beijing Olympic Games.

9.3.4 Cai Guoqiang: fireworks professional

Cai Guoqiang was the chief special effects designer on Zhang Yimou's creative team. A graduate of the Shanghai Theatre Academy, Cai began using gunpowder in his creative works in the 1980s. The special effects for the four ceremonies included a show of fireworks.

9.3.5 Chen Qigang: music composer extraordinaire

Chen Qigang, a 1983 graduate of the Central Conservatory of Music, was the music director for the opening and closing ceremonies.

9.3.6 Yu Jianping: technical director

Yu Jianping was the behind-the-scenes hero of the Beijing 2008 Olympic Games opening and closing ceremonies. He led the technical team for the ceremonies. Yu, president of the Beijing Special Engineering Design Institute, played a role in the launching of the Shenzhou V and Shenzhou VI spacecrafts. He had expressed that not one aspect of the high-tech requirements of the opening and closing ceremonies would be overlooked by his team.

9.3.7 The Task Force

Chief Director Zhang Yimou, along with assistant directors Zhang Jigang and Chen Weiya, led the taskforces for the Beijing Olympic opening and closing ceremonies.

Nearly 1000 people made up the taskforce, which had three divisions: a creative team, a technical team, and a management team.

(Ref. W2)

10. EVENT COMMUNITY RESEARCH – POST EVENT PLANNING

Unlike Olympics of the past, plagued by overspending and waste, Beijing did its best to ensure that this would be one Olympics earning a gold in civic planning.

This was the plan for the facility from the outset, according to Ross Milne, director of the Hong Kong office of international architecture firm RMJM Hillier. “From the start, the focus of the developer was the site after the Olympics,” says Milne, who explained that the design was for a multi-faceted convention centre, with supporting hotels and retail. “Think of it as being really an exhibition centre; the Olympics just happened to be the first tenant.”

Milne described a dual-train design process, which created a bit of extra work. “There was the constant juggling with two different layouts, the post-Olympics design and the Olympics drawings,” he says. There was also extensive scrutiny from both the owner and the Olympics committee, each with different goals in mind. “It was an intense process,” he conceded.

Weeks in the staging, but nearly a decade in the planning, the legacy of these Olympic Games has been far more long lasting than the TV images. China not only excelled on the tracks and in the stadiums, but showed with the right attention to detail behind the scenes, a grand Olympics can also be green and pay dividends for the host community for years to come.

(Ref. W53)

11. EVENT COMMUNITY RESEARCH –OPERATIONS AND MONITORING

ATOS Origin (AO) provided the IT Infrastructure to support the running of the Beijing Olympics. AO holds a contract with the IOC to provide such services and, including Beijing, has provided IT infrastructure for 4 Olympics.

The IT supports the transmitting of real-time results, as well as timing and scoring technology, such as pressure pads at the end of swimming lanes. For the Biejing Olympics the infrastructure consisted of around 1000 servers and 10000 PCs, which were centrally managed from a Technical Operation Centre.

During the Beijing Olympics the Operation Centre published an average of 500 stories a day, half of which were translated into French or Chinese. Compared with previous Olympics this event added more than 40 percent more sports disciplines (8 in total), supported 30 percent more hits on the internet (averaging around 1.2 million hits per day).

The Operation Centre also managed accreditation, arrivals, protocol and staffing. This included support for the issue of passport-grade badges to all 200,000 accredited employees.

From a security perspective, the systems collected and filtered more than 12 million IT Security events each day to detect any potential security risk for the Olympic Games IT Systems. From these, less than 100 were identified as real issues. All were resolved, so there was no impact at all on the Olympic Games.

(Ref. W54)

12. EVENT COMMUNITY RESEARCH – EVENT COVERAGE

The 2008 Games were the first to be produced and broadcast entirely in high definition (HD) by the host broadcaster. In comparison, American broadcaster NBC broadcasted only half of the Turin Winter Games in HD.

According to Nielsen Media Research, 4.7 billion viewers worldwide tuned in to some of the television coverage, one-fifth larger than the 3.9 billion who watched the 2004 Olympic Games in Athens. American broadcaster NBC produced only 2 hours of online streaming video for the 2006 Winter Games but produced approximately 2,200 hours of coverage for the 2008 Summer Games. For the first time "live online video rights in some markets for the Olympics have been separately negotiated, not part of the overall 'broadcast rights,'"; this new media of the digital economy was growing "nine times faster than the rest of the advertising market".

12.1.1 Cover Event Under Contract

Globally, the 2008 Olympics was subject to extensive copyright restriction, which amounted to territorial restrictions whilst still being covered extensively online within various exclusive copyright autarkies. Thus despite the international nature of the event and the global reach of the internet, the coverage world wide of assorted nation-states and television networks was not readily accessible. There was no global or supranational media coverage. The international European Broadcasting Union (EBU), for example, provided live coverage and highlights of all arenas only for certain territories on their website, Eurovisionsports.tv. Many national broadcasters likewise restrict online events to their domestic audiences. The General National Copyright Administration of China announced that "individual (*sic*) and websites will face fines as high as 100,000 yuan for uploading recordings of Olympic Games video to the internet," part of an extensive campaign to protect the pertinent intellectual property rights.

The host broadcaster was BOB (Beijing Olympic Broadcasting).

12.1.2 Cover Event Not Under Contract

In their bid for the Olympic Games in 2001, Beijing stated to the Olympic Evaluation Commission "that there will be no restrictions on media reporting and movement of journalists up to and including the Olympic Games". although some media outlets claimed that organizers ultimately failed to live up to this commitment.

12.1.3 Official International Broadcasters

Nation	Broadcaster
Argentina	Canal 7 (All events), TyC Sports (all events)
Australia	Television broadcast: Seven Network (Many events) SBS (Limited events only) Radio broadcast: 2GB SEN 5AA 6IX 2CC KOFM ABC Local Radio GTV Radio
Austria	ORF
Belarus	Belteleradiocompany: TV-First and LAD
Belgium	VRT, RTBF
Bolivia	Unitel, RedUno, TyC Sports
Bosnia and Herzegovina	BHRT
Brazil	Free-to-air television broadcast: Rede Globo Rede Bandeirantes Cable and Satellite television broadcast: Sportv (Sportv 2 | Sportv 3 | Sportv 4 | Sportv +) Band Sports ESPN ESPN Brasil Internet and Cellphone broadcast: Terra Networks Radio broadcast: Rádio Gaúcha Rádio CBN Rádio Globo Rádio Jovem Pan Rádio Eldorado
Bulgaria	BNT
Canada	CBC, Radio-Canada, bold, TSN, RDS
Chile	TVN, Canal 13; webcast on Terra Networks
China	CCTV; webcast on Sohu.com
Colombia	Free-to-air: Señal Colombia, Caracol, RCN Webcast: Terra Networks
Croatia	HRT

Nation	Broadcaster
Czech Republic	ČT (ČT2, ČT4 Sport)
Denmark	DR, TV 2
Dominican Republic	Telecentro
European Union	Eurosport
Finland	TV broadcast: YLE TV1, YLE TV2, YLE FST5 & Urheilukanava Radio broadcast: YLE Radio Suomi & YLE Radio X3M
France	France Télévisions
Germany	ARD, ZDF, DWTV
Greece	ERT
Hong Kong	ATV, TVB
Hungary	MTV
Iceland	RUV
India	Doordarshan, Zee TV
Indonesia	Free-to-air television stations and networks ; TVRI, RCTI, SCTV, TPI, antv, Indosiar, Metro TV, Trans TV, Global TV, Trans 7, TVOne and All Localwide Television Channel These are the channels that can be received by subscribers of ; First Media, Indovision, (inclunding such as Indovision and Top TV these a channel such as MNC News Channel (MNC News), MNC The Indonesian Channel, MNC Music Channel, MNC Entertainment Channel (MNC Entertainment, SUN TV Network, ANTARA TV, Vision 1, Vision2 and Vision 3 Baby), Astro Nusantara, Aora TV, TelkomVision and IndosatM2.
Iran	IRIB 3
Ireland	RTÉ
Israel	TV broadcast: Channel 1 Sport 5 (Including Sport 5+, Sport5+ Live and Sport5+ Gold) Webcast: sport5.co.il Cellphone broadcast: Pelephone, Orange and Cellcom
Italy	RAI (Rai Due)
Japan	NHK, Nippon TV Tokyo, Fuji TV, TV Asahi, TV Tokyo, TBS Tokyo
Latvia	LTV7, LTV1 (opening and closing ceremonies)
Malaysia	Astro, Media Prima Berhad: TV3, ntv7, 8TV, TV9, Radio Televisyen Malaysia (RTM)

Nation	Broadcaster
Mexico	Televisa TV Azteca TVC Deportes
Moldova	TRM
Mongolia	MNB, UBS, Channel 25, TV5, TV9, NTV
Montenegro	RTCG
Netherlands	NPO/NOS
New Zealand	TV ONE, TVNZ Sport Extra, both of which were also streamed online along with two online only channels, tvnz.co.nz three and tvnz.co.nz four which carried feeds directly from BOB (i.e. No TVNZ branding)
Norway	TV: NRK1 and NRK2 Radio: NRK P1 and NRK Sport Internet: NRK Nett-TV
Pakistan	Geo Super
Philippines	Updates ABS-CBN, GMA, TV5 Television Cable: Solar Sports Basketball TV Jack TV SOLAR All Access 1 and 2(PPV) Free-to-air: C/S ETC 2nd Avenue
Poland	TVP1, TVP2, TVP Sport
Portugal	TV: RTP (RTP1, RTP2, RTPN) and SportTV (SportTV 1) Radio: RDP Antena 1
Puerto Rico	Telemundo de Puerto Rico
Qatar	Al Jazeera Sports 1, Al Jazeera Sports 2, Al Jazeera Sports +3
Romania	TVR 1, TVR 2, Telesport
Russia	VGTRK: Russia and Sport and news info on Vesti, Channel One, NTV Plus
Serbia	RTS
Singapore	StarHub TV, MediaCorp Radio, SPH UnionWorks and MediaCorp TV : MediaCorp TV Channel 5, MediaCorp TV Channel 8, MediaCorp TV Channel U, MediaCorp TV TVMobile and Channel News Asia
Slovakia	STV

Nation	Broadcaster
Slovenia	RTV Slovenija
South Africa	SABC, SuperSport: SSX, SSX2, SS5, SS6 (Gold), SS7
South Korea	KBS, MBC, SBS (the Korean Pool, 2002~2008)
Spain	TVE1, TVE2, Teledeporte. Also broadcast on the web through TVE a la Carta and to cellphones by Adsmedia.
Sri Lanka	Rupavahini
Sweden	SVT1, SVT24, Peking+, SRP4 and SR's webcasts. Also broadcast on the web through SVT Play and to cellphones by Tele2.
Switzerland	SF TSR TSI
Taiwan	CTV News Channel, CTV, CTS, ETTV News, FTV, GTV, PTS, SET, STAR TV, TTV
Thailand	TVPOOL and NBT
Turkey	TRT 3
Ukraine	First National
United Arab Emirates	Dubai Sports Channel, Abu Dhabi Sports Channel
United Kingdom	BBC
United States	NBC, CNBC, MSNBC, Oxygen, USA Network, Telemundo; Westwood One (radio)
Venezuela	Venevision, Meridiano TV, TVES
Vietnam	HTV2, VTV1, VTV3 and VTC (together with many local transmitters)

13. EVENT COMMUNITY RESEARCH – EVENT EVALUATION

Cities who host the Olympic Games must commit to significant investments in sports venues and other infrastructure. It is commonly assumed that the scale of such an event and the scale of the preparation for it will create large and lasting economic benefits to the host city. Economic impact studies confirm these expectations by forecasting economic benefits in the billions of dollars. Unfortunately these studies are filled with misapplications of economic theory that virtually guarantee their projections will be large. Ex-post studies have consistently found no evidence of positive economic impacts from mega-sporting events even remotely approaching the estimates in economic impact studies. For the 2008 Summer Olympic Games in Beijing, it appears China will take these massive investments in venues and infrastructure to a new level. If organizers of the Beijing Games base their expectations on economic impact studies from previous Olympics, they are sure to be disappointed. The potential for long term economic benefits from the Beijing Games will depend critically on how well Olympics related investments in venues and infrastructure can be incorporated into the overall economy in the years following the Games.

(Ref. W56)

14. HOST COMMUNITY RESEARCH – PLANNING & ORGANISATION

About US$ 26 billion was invested in 142 projects improving city infrastructure. Excluding new stadiums and venues, most projects covered transportation both within and around Beijing. According to the Beijing Olympic Action Plan, the BOCOG hoped to have a total 202 kilometres of railway track, 718 kilometres of expressway and 14,700 kilometres of motorway in place in Beijing before the Games began. China's inter-city rail network was also improved, particularly to connect Beijing to the other Olympic Cities. Well over 6,000 kilometres of track now allow operational speeds of up to 200 km/h.

(Ref. W36)

14.1 MUNICIPAL ORGANISATION

The "2008"Project Construction Headquarters of the Beijing Municipal Government (AKA Beijing 2008 Project Headquarters) was a provisional mechanism. Under the leadership of the Beijing municipal government, it took unified command and comprehensive coordination of the construction of the Olympic competition venues and their affiliated facilities. The Beijing 2008 Project Construction Headquarters Office was an administrative body in charge of day-to-day operations of the Headquarters.

Main responsibilities

14.1.1 Headquarters

The Headquarters was responsible for

a) Overall planning of the construction schedule for the Olympic competition venues in Beijing, their affiliated facilities and related urban infrastructure. It is also responsible for instructing the governments of concerned districts and counties and owners of the competition venues to work out comprehensive plans of construction schedule and detailed network plans, examining and finalizing the plans and submitting reports to the Communist Party of China (CPC) municipal committee and the municipal government of Beijing on the execution of .the plans.

b) Initiation of preliminary steps for the construction of the venues and related affiliated facilities in Beijing, coordination and overseeing of feasibility study, layout and design, land requisition and residents relocation, first-stage land development, groundbreaking, and other works. The Headquarters also coordinates the task of different departments of the municipal government in assembling the projects for examination and approval in order to ensure their commencement on schedule.

c) Deployment of the task for the construction of the venues and affiliated facilities in Beijing,resolution of any problems which may arise in the course of construction, with an aim at carrying out the construction in a unified and harmonious manner to meet all the requirements in the areas of safety, quality, construction time limit, function and cost.

d) Coordination of the task for environmental improvement in places adjacent to the venues and affiliated facilities in Beijing.

e) Collection, clear-up, statistical compilation and management of the information related to the construction of the venues and affiliated facilities, proper management of archives by relevant departments.
f) Overseeing the enforcement of contracts signed by the venue owners and government authorities, redressing any violations.
g) Supervising the implementation of compulsory criteria set up by the state in the areas of safety, quality, firefighting and environmental protection during the construction of the venues, overseeing and guaranteeing the implementation of the technical criteria and quality requirements set up by the International Olympic Committee (IOC) and international sports federations.
h) Managing a portion of the Olympic Special Fund for the municipal government, overseeing its use.
i) Superintending tender and bid activities of project entities and concerned departments of the Beijing municipal government to ensure transparency in every stage of construction.
j) Engaging in publicity of the Olympic venues in Beijing, strengthening links with the Beijing Organizing Committee for the Games of the XXIX Olympiad (BOCOG) and with concerned departments of the state government.
k) Attending to other matters assigned by the municipal Party committee, the municipal government of Beijing and BOCOG.

The Beijing 2008 Project Headquarters Office had a provisional administrative capacity of 57 staff.

14.1.2 Branch Offices

The 2008 Project Construction Headquarters Office established ten functional departments in compliance with the above responsibilities.

1. General Office
2. Project Planning and Key Project Construction Department
3. Competition Venue Construction Department
4. Training Venue Construction Department
5. Urban Facility Construction Department
6. Quality Control Department
7. Technology Department
8. Finance and Budget Department
9. Audit Department (audit room)
10. Communications Department

(Ref. W2)

15. HOST COMMUNITY RESEARCH – MOBILITY

15.1.1 Mobility Planning

The Beijing Olympic Action Plan set out a 'Transport Construction and Traffic Management Plan'. In the main, this plan describes the transport infrastructure that is to be built to enable the Olympic Games such as new road and rail lines. This is described in sections entitled 'Urban Transport and City' and 'Interurban Transport'. Two sections, namely 'Traffic Management' and 'Traffic Support System', are more specifically focussed on ITS provisions for the Games.

This part of the plan expresses the transport outcomes which the Beijing Games sought to achieve.

15.1.1.1 Roads

Average auto speeds on urban expressways in rush hour will reach 35-50km/h, and the average speed on main roads in urban areas will reach 20km/h.

a) The average time for commuter trips within the 5th ring road will not exceed 50 minutes.
b) During Olympic Games, it will take no more than 30 minutes for athletes, coaches and Olympic officials from residential places to venues.
c) Vehicle stop times will be reduced by over 50%. Queuing at intersections will be decreased by 50%. Traffic accidents will be reduced by 20%.

15.1.1.2 Railways

In 2004, the China Academy of Railway Sciences identified that Beijing scored very low (4.7%) in terms of the percentage of urban journeys being made by rapid transit, well below the levels of Hong Kong, Moscow (both 55%) or Paris (66%). Even in Tokyo where car ownership is high compared to Beijing, the quality and coverage of public transport in the Japanese capital meant that urban rail systems enjoyed high patronage by commuters.

The problems of pollution from industry and traffic were well documented prior to the Olympics, prompting extreme official measures to reduce risk levels. The apparent success of these measures plus the Games-related increase in public transport capacity appears to have strengthened the case for maintaining the commitment to rail expansion, even if was not been well received by the growing car-owning classes.

Beijing city authorities also supported rail expansion to cut the currently long travel-to-work times and as a stimulus for businesses to disperse from the centre to new sites in the suburbs. Funding for system expansion is reported to have been 40% from municipal authority budgets, approximating to $1.5bn annually, with the remainder coming from commercial loans.

(Ref. W13).

Two new subway lines and a new rail line built especially for the games to keep about half of Beijing's 3.3 million motor vehicles off the roads opened just in time: Opening ceremonies were held July 19, BOCOG said. Official operations began Aug. 1 on the Beijing-Tianjin line, cutting the 75-mile journey from 90 to 30 minutes thanks to the line's CRH (China Railway High-speed) bullet trains, which reach a top speed of 220 mph in normal operations but exceeded that speed in test runs.

The Beijing South station is equipped with solar panels on its roof and 24 platforms to cope with what officials foresee as massive future demand for travel. The new, Chinese-built trains, which include soundproof and bulletproof glass, are much wider than equivalent European express trains, said Zhang Shuguang, head of the Railway Ministry's Transport Bureau.

General Electric (Fairfield, Conn.), a Worldwide Partner for these games, was one of the companies that worked with China's Ministry of Railways to introduce the new rail technology.

(Ref. W57)

15.2 PRE-EVENT SERVICES

15.2.1 Pre Event Traffic Flow Composition

Traffic flow composition is defined as the proportion taken by different travel modes in the total traffic volume on a given point or road section per unit time.

In the end of the year 2007, the total mileage of urban roads in Beijing reached 4460 km (expressway 236 km, arterial road 960 km, secondary road 694 km, as well as branch road and street 2570 km), which rose by 80.50% compared with the year 2000. Meanwhile, there were 3.128 billion registered motor-vehicles by the end of 2007, which was an increase of 107.15% over the year 2000. Compared with the year 2000, the number of registered private cars ran to 2.121 million and grew by 148.07% in the year 2007. These data make it clear that the increase of road length cannot meet the demand of ever-increasing registered vehicles. Therefore, frequent traffic jams are created by the contradiction between the vehicles' large travel demand and the limited urban roads.

Vehicle types	Traffic Flow Composition
Passenger vehicle Large-sized coach	1.09%
Medium-sized coach	7.28%
Car	60.16%
Taxi	19.46%
Truck	0.41%
Bus	4.91%
Non-motorized vehicle	6.68%
Total	100%

FIGURE 16 PRE OLYMPICS TRAFFIC FLOW COMPOSITION

(Ref. R13)

15.3 EVENT SERVICES

15.3.1 During and Post Event Traffic Flow Composition

Vehicle types	Traffic Flow Composition
Passenger vehicle Large-sized coach	1.46%
Medium-sized coach	3.96%
Car	50.85%
Taxi	23.60%
Truck	0.42%
Bus	6.08%
Non-motorized vehicle	13.63%
Total	100%

FIGURE 17 OLYMPICS TRAFFIC FLOW COMPOSITION

During the Olympics, the odd-even day vehicle operation in Beijing cut down on nearly 1.95 million vehicles on the road and directly changed the traffic flow composition. It can be observed from Figure 17 that owing to the implementation of some traffic control measures, cars shared considerably less proportion in the road traffic flow. The proportion of cars reduced from 60.16% to 50.85% (decreased 9.31%). Meanwhile, large-sized coaches had an increase from 1.09% to 1.46%. The roots can be traced from two aspects. On one hand, cars take an absolute leading position in motor-vehicles, which compose 92.5% of the total vehicles in urban district and 78.8% vehicles in the whole city of Beijing. Therefore, the odd-even day vehicle operation directly induced a decrease of cars in traffic flow composition. On the other hand, there are a huge number of large-sized coaches to meet the travel demand of Olympic volunteers, athletes, and officials. These large-sized coaches, including 2.2 thousand prepared by the Organizing Committee and the remainder coming from cities all around China, were not affected by the odd-even day vehicle operation. It is worth pointing out that the percentage of buses increased by 1.17% during the Olympics, as bus departure frequency was highly raised (the number of departures amounted to 167 thousand from 152 thousand per day) and there were 34 newly-added special bus lines connected to stadiums. Additionally, there were other policies that were carried out. For example, ticketed spectators were free to take the bus, subway, and special bus lines for stadiums on that day. Convenient public transit absorbed more car users, which led to the reduction of cars' sharing rate. At the same time, another part of car users turned to non-motor vehicles on the evidence that the proportion of non-motors grew from 6.68% to 13.63%.

(Ref. R13)

15.3.2 Transport Sectors

The International Olympic Committee (IOC) divided all the participating delegations into five levels, that is, T1–T5. At levels T1–T3 were the presidents, vice-presidents, general secretaries, and officials of IOC, presidents, vice-presidents, general secretaries of all the member states, heads of delegations, group leaders of delegates, top state officials, top officials from auspices agencies, officials with the Beijing Organizing Committee of Olympic Games (BOCOG), the organizing committees of the last and next session of the Games, and officials from the bidding cities. Level T4 included athletes and officials coming with their delegations, technical officials, BOB relay agencies, entitled relay agencies, accredited literal media, and auspices agencies. T5 refers to spectators, Olympic staff, volunteers, and visitors.

(Ref. R20)

The ‘tiers’ equate to the SOTA Report categories as follows:

T1 – Management Transport

T2 – Management Transport

T3 – Management Transport

T4 – Participant Transport

T5 – Spectator Transport

15.3.3 Spectator Transport

Transport for spectators was provided in the following modes:

a) Airport Bus
b) Bus
c) Subway
d) City Rail
e) Taxis

The buses were designated as:

T5—buses free of charge

15.3.4 Participant Transport

Transport for participants was provided through:

a) Athlete Coaches

Designated as:

T4—buses for exclusive use

Assisted by the provision of:

I) Olympic Lanes

15.3.5 Management Transport

Different cars were designated to different clients' use:

T1—exclusive car and designated driver for a single person

T2—exclusive car and designated driver for two

T3—booked vehicle for joint use

15.3.6 Background Transport

The reader can deduce some impact on background traffic from the statistics in section 15.3.1.

15.3.6.1 Freight Transport

The transport, storage and tracking of food products was monitored by GPS and linked to a unified quality supervision system. The chairman of one food supplier for the Games, Beijing No 2 Commerce Group, expected the company to deliver over 1,000 varieties of food, mostly of famous brands, during the Games.

The amount of medical supplies was also enormous. The Chinese company Pharmaceutical Co Ltd has increased its fleet by 20 vehicles and tripled its storage facilities to satisfy the needs of about 200 clinics and temporary medical stations in August.

(Ref. W36)

By the end of 2007, five important freight terminals were constructed, including Majuqiao first-grade freight terminal, Yancun first-grade freight terminal, Tianzhu first-grade freight terminal, Shibali Dian second-grade freight terminal and Laiguangying second-grade freight terminal.

The restructuring of highway freight industry was accelerated to optimize the vehicle composition and payload structure, and improve freight yards and logistics infrastructure. Priority was given to the development of urban logistics distribution, container transportation and multi-mode combined transportation, upgrading Beijing's freight transport industry to the standards of a modern international metropolis with advanced facilities, professional management, well regulated markets and smooth flow of freight. The highway transport information platform took shape for the intelligent and IT application in the dispatch of passenger and freight transport. The highway freight industry achieved modernization in vehicle equipment, transport organization, yard facilities, information exchange and social service, and met the freight transport and logistics service demands during the Olympic Games.

(Ref. W43)

15.3.6.2 Parking

In view of the possible increase of civilian motor vehicles, the civilian parking lots (primarily those for night parking) in urban area were estimated to reach 1.5 million, upgrading the ownership of fixed parking lots for motor vehicles from 66% to 100%. The number of public parking lots were therefore increased to 225,000, raising the rate between public parking sets and motor vehicle ownership from 12% to 15%.

The public parking facilities were constructed in conformity with the capability of road network according to the city plan and downtown area traffic demand management plan. The supply of public parking space was measurably controlled in the downtown areas. Flexible charging was introduced in order to regulate the in-come flow of cars in the downtown areas for a better balance of dynamic and static traffic.

The construction of public parking facilities outside the downtown areas was encouraged. Car parking and bicycle parks were constructed as auxiliary facilities at railway terminals and bus centres. Park-and-ride was encouraged. In the peripheral areas, parking facilities were constructed along main radial highways for the temporary parking and cleaning of freight trucks from other provinces and cities.

(Ref. W43)

15.3.7 Mechanisms

15.3.7.1 Road Transport

A) Taxi

The most common taxi cars in Beijing are Hyundai ELANTRA, Volkswagen Jetta and Citroen FUKANG or Elysee. ELANTRA cars are new and usually green, red, blue and purple on yellow background. Each taxi in Beijing has a sign upon the roof reading TAXI and a red sign can be seen behind the front window when it is ready to serve you.

All taxis have price labels on both side windows near the back seats. The charge starts from RMB 10 yuan for the first 3 kilometres and RMB 2 yuan for each kilometre after that. If you ride between 23:00 and 5:00, the meter automatically charges you extra 20%. Furthermore, toll fee and parking fee go to the passenger, and charge for return ride occurs in case of a ride over 15 kilometres.

You are entitled to make the taxi driver use the meter, and never forget to ask for an invoice with the plate number and the company of the car as well as its telephone number for complaint, through which you may find the car in case that you have lost your valuables in it or been soaked, or complain to administrative authorities. (Ref. W22).

B) Airport Bus

There are 7 routes for airport Buses.

FIGURE 18 AIRPORT SHUTTLE BUS ROUTE MAP

C) Bus

There are 4 types of Beijing City Bus:

a) Single and Double-digit numbered Buses are those circulating downtown Beijing (City Center).
b) The 300 number-series Buses are those moving about the outlying suburban areas.
c) The 200 number-series, which are night-time Buses with different operating hours.
d) The 100 number series are the Trolley Buses.

Beijing has 13 Bus Stations

(Ref. W34)

The website at BJBUS.COM provides Bus transportation and transfer information, but this is rendered only in Chinese and is therefore not much help to international travellers.

FIGURE 19 BEIJING BUS MAP

D) Dedicated Lanes

To ensure safe, on time, reliable and convenient traffic for the games and activities of 2008 Beijing Olympics and Beijing Paralympics, with approval of Beijing municipal Government, it was decided to launch exclusive traffic lanes in accordance with normal practice of Olympic Games and the Beijing Olympic Bid pledges.

a) The Olympic lanes were exclusively provided for authorized Olympic vehicles only between Olympic Games and Training Venues, Olympic participant residence, hotels for media, airport, Beijing Olympic Main Press Center, radio and TV centers and other related facilities for Olympic and Paralympic Games.
b) Olympic lanes, consisted of lane signs, pavement markings and traffic signs, were designated to the leftmost lane of traffic moving direction.
    i) Olympic lane signs were marked with yellow and white alternate dashed lines. The left line of the designated lane remained the original dividing line, while the right line marks with yellow and white alternate dashed line separating from other lanes.
    ii) The pavement markings consisted of the Olympic Five-Ring logo and white background.
    iii) The traffic signs consisted of white dashed lines and white arrow lines in blue background, and the Five-Ring logo with white background.
    iv) Some Olympic lanes were specified with a period of time of restriction.
c) During the effective time of the Olympic lanes, the following came into force:
    i) If the signs of a specific Olympic lane did not indicate a period of time restriction, it was cordoned off all the time for Olympic use only. Non-Olympic vehicles and pedestrians were prohibited from entering the lane.
    ii) If the signs of a specific Olympic lane indicated a period of time restriction, it could be used by authorized Olympic vehicles only within the restricted hours. Non-Olympic vehicles and pedestrians were prohibited from entering the lane.
    iii) If the road with an Olympic lane also had a public bus lane, non-Olympic vehicles were permitted to use the public bus lane temporarily during the restriction period.
d) During the period of July 20, 2008 to Sept. 20, 2008, the restrictions of Olympic lanes were applied in different streets in different times based on the needs of the Olympic Games, such as the arrival and departure of participants or transiting athletes for training and competitions. During the restriction time of Olympic lanes the following vehicles only were authorized to use the lanes. Other vehicles and pedestrians were prohibited from entering the lanes.
    i) Following vehicles with the authorized Olympic vehicle permit issued by BOCOG (not include the yellow face temporary Olympics and Paralympics parking permit or parking permit for outlying venues):
        1 Passenger vehicles with authorized Olympic vehicle permit
        2 Vehicles of transporting luggage and equipment for Olympic participants.
        3 Vehicles to ensure the normal operation of telecommunication and electric power of venues, doping control, medical emergency rescue and breakdown assistance.

4 Satellite broadcasting vehicles that are in charge of games broadcasting.

5 Cargo vehicles for transporting material resources, catering and waste with rated capacity weight below 4 tons (including 4 tons) (but not allowed to enter the Olympic lanes in Chang An street, the 2nd, 4th and 5th Ring roads)

ii) On duty police wagons, fire engines, ambulances, breakdown assistance vehicles

iii) Vehicles with a pass to the opening or closing ceremony or a pass to the rehearsal of the opening or closing ceremony at the National Stadium of the Olympics and Paralympics, but only on the day when the ceremony is held.

e) Roads without Olympic lanes that led to Olympic participant residence, training and competition venues, non competition venues and Olympic related facilities were subject to temporarily enforced traffic control per the needs of Olympic transportation by Traffic Control Department of Public Security Bureau. Vehicles and pedestrians had to follow the direction of police and avoid or give way to Olympic vehicles.

f) Anyone who violated these rules was punished as per the state and city law of road traffic safety by Traffic Control Department of Public Security Bureau.

(Ref. W44)

FIGURE 20 EXCLUSIVE OLYMPIC LANES

15.3.7.2 Rail Transport

A) Subway

Currently, there are eight lines of subway including Line 1, Line 2, Line 5, Line 13, Batong Line, Line 10, Airport Express and Olympic Branch Line. Ticket Price: RMB 2 yuan. The transfer between each two lines is free of charge.

It is also planned that by 2008 the Olympic Games, Line 10 Part I and Airport line will be built; by the end of 2012 Line 10 Part II, Line 4, 6, 8, 9, Yizhuang Line, Daxing Line and Shunyi Line, a total distance of 407 km, shall be finished; by the end of 2015, another 5 lines including Line 7, 14, Datai Line, Changping Line, and Fangshan Line, a total distance of 561km, shall be finished too.(Ref. W22)

FIGURE 21 BEIJING SUBWAY PLAN 2008

Lines 5, 8, 10 Part I and the Airport Express were all built for the 2008 Olympic Games. The 3 urban lines, 5, 8, and 10 cost $3.2bn.

15.3.7.3 Water Transport

There are three waterways available for tourism in Beijing, and the boats are in service from April to October every year. This offers another way of sightseeing in Beijing. Tourists to the Yuyuantan Park can take a boat in the port of Bayi Lake and enter the south gate of the Summer Palace by waterway; tourists to the Beijing Zoo, Beijing Exhibition Centre and Beijing Aquarium can reach the summer Palace by taking a boat in the port of Back Lake.

(Ref. W45)

However, there is no indication that any use was made of this mode of transport in connection with the Olympics.

15.3.7.4 Air Transport

There were also great improvements to China's airport capacity. Beijing Capital International Airport was expanded with a new terminal, new runways, and parking and traffic control facilities. Today, the airport is one of the largest in the world regarding land area, and facilitates both passenger and cargo movement. It can now accommodate 60 million passengers and handle 1.8 million tonnes of cargo each year, and had the capacity for up to 1900 flights per day during the Olympics; the average during this period was around 1600 flights per day. SAS Cargo played its part in these operations. Outside of Beijing, several other Chinese airports were also expanded, including Tianjin Airport and Qingdao Liuting International Airport.

Special regulations exempted the customs deposit for materials that were imported for use at the Games and then re-exported within the specified time period. The BOCOG issued a Letter of Guarantee in lieu of the customs deposit once the correct applications had been made.

(Ref. W36)

16. HOST COMMUNITY RESEARCH - TICKETING

16.1 TICKET TYPES PROVIDED

16.1.1 Transport Tickets

Whilst travel could be paid for on each mode separately, Beijing also offered a Traffic Card which could be used for travel on buses or the subway and a smartcard which also combined Bus & Subway.

There are three types of short-term Traffic Cards:

a) 3-Day Card valued RMB 10 which can be used 18 times within 3 days;
b) 7-Day Card valued RMB 20 which can be used 42 times within 7 days and;
c) 15-Day Card valued RMB 40 which can be used 90 times within 15 days.

There are three types of short-term traffic cards: 3-Day Card valued RMB 10 which can be used for 18 times within 3 days; 7-Day Card valued RMB 20 which can be used for 42 times within 7 days and; 15-Day Card valued RMB 40 which can be used for 90 times within 15 days. Applicant should pay a RMB 20 deposit while buying a traffic card. When returning a card, only deposit is refunded, neither the left times nor cash is returnable. A short-term traffic card has no photograph and is not limited to the applicant. A short-term traffic card is only valid for ordinary buses. Duration of the card starts from the moment of buying, and the first day ends at 23:59 of the same day.

16.1.1.1 <u>Subway Lines</u>

At the time of the Olympics, there were eight subway lines. The ticket price was RMB 2. The transfer between any two lines was free of charge.

16.1.1.2 <u>Buses</u>

A fixed price at RMB 1 was charged for a public bus numbered in the 200's, Traffic Cards were also accepted. Buses numbered between 300 and 599 charge by distance, i.e. RMB 1 for a ride within 12 (including 12) kilometres, and RMB 0.5 is accumulated for every additional 5 kilometres. Traffic Cards were not accepted on these buses. (Ref. W5, W13)

16.1.2 Events Tickets

For details of event Tickets see section 6.2

16.1.3 Parking Permits

Venue Access and Parking Permits (VAPPs) for the accredited printed press were available for booking on BOCOG's Rate Card website (https://ratecard.beijing2008.cn). There were two types of Rate Card VAPP available:

a) All Competition Venue VAPPs
b) Independent Venue (precinct) VAPPs.

Vehicles with All-Competition Venue VAPPs could access the designated areas, load/unload zone and park at designated parking areas in all competition venues and Main Press Centre, Media Villages in Beijing.

Vehicles with independent (precinct) VAPPs could access the designated areas, load/unload zone and park at designated parking areas at specific venues in Beijing and Co-host cities except Hong Kong.

The VAPPs were not applicable for Opening & Closing Ceremonies.

The parking at venues was limited and BOCOG didn't guarantee that all requests would be met. BOCOG reserved the right to allocate parking requests if the demand exceeded the number of parking spaces available. BOCOG reserved the right to adjust the Rate Card VAPPs plan in case of changes in venue construction.

(Ref. W46)

16.1.4 Combined Tickets

Entrance tickets for Olympic events provided free travel on Olympic dedicated routes, the subway, city rail and public buses. However, Olympic tickets did not provide free transport on shuttle bus between airport and city proper, taxis and the fast airport rail line.

(Ref. W2)

16.2 TECHNOLOGIES USED

16.2.1 Paper Tickets

Event tickets were effectively paper tickets, but 'with steroids', inasmuch as they included an embedded wafer thin chip.

16.2.1.1 Purchase

Entrance tickets for Olympics events were sold in phases. Each phase being a release of a tranche of event tickets. Demand was such that the release of phase II caused a crash of the underlying systems and the resignation of the Chinese officials responsible. (Ref. W16). These problems had been addressed by the issue of phase III of the tickets when 1.38 million tickets were made available and were sold out in 30 minutes. Tickets were sold through Bank of China outlets and through the Olympic website. (Ref. W17, W18, W19).

16.2.1.2 Usage

Tsinghua Tongfang company RIA provided three types of RFID readers that controlled doors and cameras throughout the facilities. Some were handheld; others connected directly to computers.

16.2.1.3 Technology

The event tickets formed part of a major expansion in the use of RFID technology to prevent counterfeiting and enable automatic ticket checking. China's Ministry of Industry and Information Technology (MIIT) prepared for the use of RFID technology at the 2008 Beijing Olympic Games by running several test programs, most notably in the six major Olympic co-host cities of Shanghai, Tianjin, Shenzhen, Dalian, Chengdu and Nanjing. The selected cities deployed RFID applications focused on agriculture to ensure food safety, event ticketing, public security, manufacturing and supply chain management.

France-Sino ASK AG and Tsinghua Tongfang Ltd. formed a joint venture, ASK-TongFang, in September 2005 to provide RFID-embedded tickets for the Beijing Games. The ASK-TongFang wafer-thin chip die and silver-ink printed antenna embedded into the paper tickets are intended to battle counterfeiting, provide speedy check-ins for visitors at venue gates and guard against unauthorized access to specific areas of the Olympics compound.

The 1-kbyte memory chip embedded in the tickets did not carry personal identifiable information, but linked to a database. The tickets, manufactured in Miyun, near Beijing, were delivered to the Bank of China in March 2008. The chip embedded in the ticket stored a unique serial number to ensure authenticity. It was estimated that ASK-TongFang sponsored the 12-14 million tickets and 1,000 readers at a cost of $7.2 million (50 m RMB). The investment served the Beijing Games as well as September's Paralympics Summer Games.

Having greater control to prevent counterfeiting was a key consideration in adopting the technology, but the 2008 Beijing Olympic Games also relied on RFID to help security personnel monitor Olympic hotels, venues, manufacturers, distribution centres and hospitals. The technology also supported a food safety tracking system. (Ref. W9, W10, W11).

16.2.2 E-tickets

There is no reference to E Tickets.

16.2.3 Smartcard

Using the term loosely there were two types of 'travel card':

a) Traffic Card
b) AFC Smartcard

16.2.3.1 Traffic Card

A) Purchase

The Traffic Card could be purchased from the website. (Ref. W2)

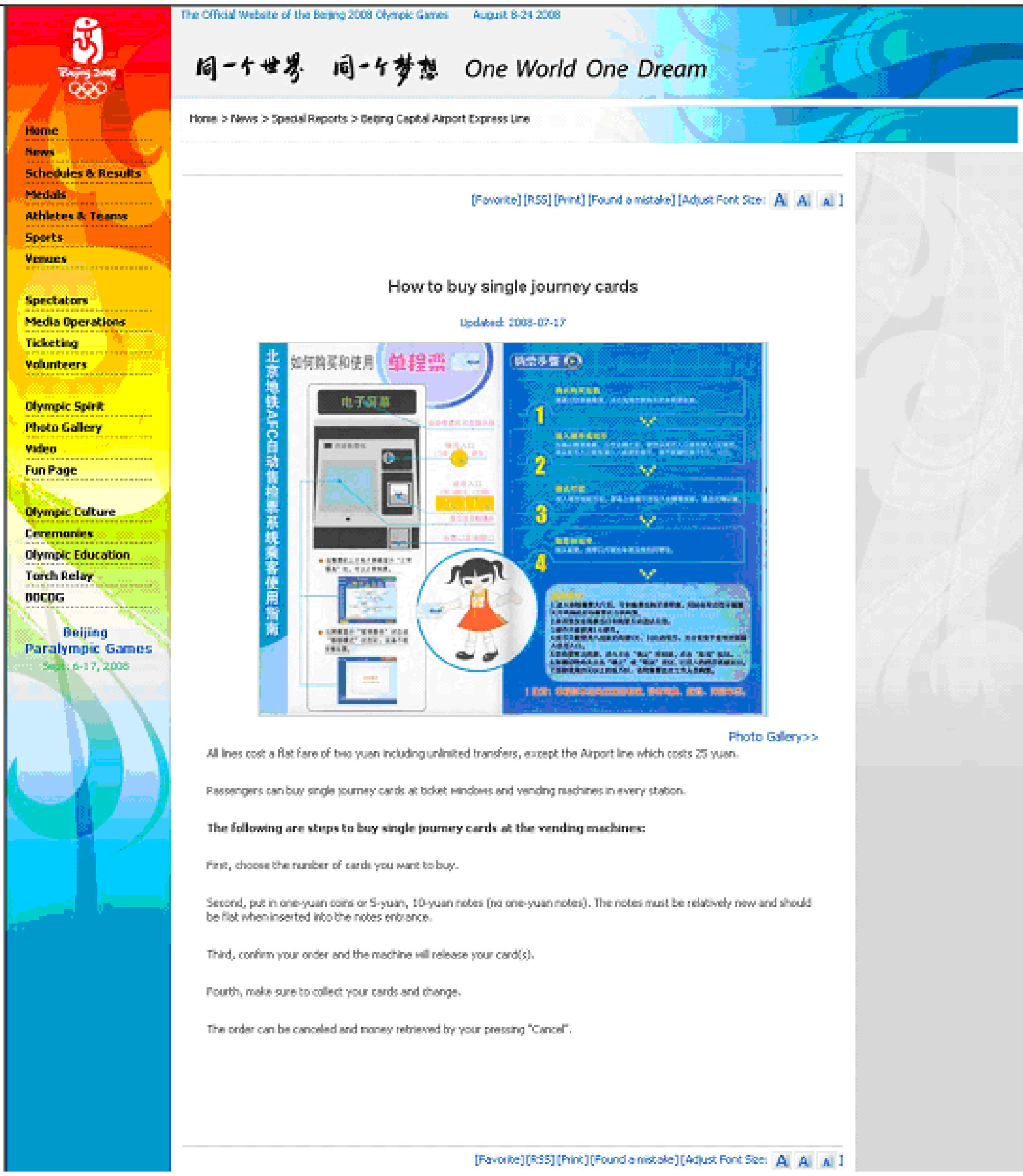


FIGURE 22 PURCHASING A TRAFFIC CARD

16.2.3.2 Automatic Fare Collection (AFC) Smartcard

A new Automatic Fare Collection (AFC) system was introduced just before the Olympics based around a ticket called a Smartcard. This supplemented the existing paper ticketing system. Smartcard's integrated bus and subway ticketing.

A) Implementation

In 2006, Thales teamed up with local companies Beikong and LG to win the contract from Beijing Mass Transit Railway Operation Corporation Ltd. to supply a new ticketing system for the subway's three oldest lines. The systems were scheduled to be introduced for the Beijing Olympics. All seven lines of the city's metro system will ultimately be refurbished. (Ref. W8)

Gunnebo were the providers to Thales of the bi-parting telescopic flap gates for the cabinets used on the ticketing system. The orders comprised of 643 gates for Line 10 and 1246 gates for lines 1 and 2 and the Batong Line. Gunnebo delivered the mechanism along with the technology for detecting passengers, while Samsung and Thales delivered the cabinets. In line with the Chinese government's requirements for local content, the components were assembled locally. (Ref. R7).

The new subway ticketing system was previewed with the opening of Line 5 in October 2007. It came into service on the 9 June 2008. Besides removing the human factor from ticket sales and collection, a feat accomplished already with debit-based ticketing cards that have been in place for quite a while, the system puts Beijing in league with advanced systems that can use rider data to adjust service. As the new system requires passengers to check in and out electronically, it records precisely their entry and departing stations. This enabled Beijing to accurately record passenger flow on each line and station.

A user would pay a RMB 20 deposit when buying a Traffic Card. When returning a card, only the deposit is refunded. Any unused cash is not returnable. A short-term Traffic Card has no photograph and is not limited to the ticket holder. Short-term Traffic Cards are only valid for ordinary buses. Duration of the card starts from the moment of buying, and the first day ends at 23:59 of the same day.

B) Technology

FIGURE 23 TELESCOPIC FLAP GATES

C) Purchase

The card can be purchased at any subway station, train station, large bus station (not bus stop) and various stores and street stalls.

D) Usage

The AFC Card allows users to gain access to the Platform of correct line at the Subway Station or in the case of Bus Travel, to get in at the correct door. (Ref. W15).

FIGURE 24 AFC SMARTCARD

The paper-based tickets which continued to be used were checked on the system by the incorporation of magnetic strips. (Ref. W15).

16.2.4 Personal Digital Devices

There is no reference to storing 'ticket' access on personal digital devices.

17. HOST COMMUNITY RESEARCH – COMMAND & CONTROL

Beijing is a crowded city. It has a population of 15 million people and more than 3 million cars on the road, increasing by 1,000 per day. During the Olympic Games, the city had to deal with one million people on the go. To help cope with this, a new Internet-based Intelligent Transportation System (ITS) were designed to provide the technology platform for the capital's transportation system.

Using this satellite GPS system linked to a network of cameras, the Beijing Traffic Management Bureau could, for example, issue daily traffic forecasts, guide drivers to their destination via electronic traffic signs, answer real-time traffic queries, and provide vehicle location services – all as part of its efforts to ensure a smooth flow of traffic in Beijing during the Olympic Games.

(Ref. W36)

17.1 TRAFFIC MANAGEMENT

The Beijing Olympic Action Plan, published 5 years before the Olympic Games, sets out objectives to establish world class management systems and intelligent road traffic management. The police controlled area was planned to be increased by 10-15%. When looking at the more detailed plans for urban transport, the plan seeks to meet the demand for high quality communications and information search during the Olympic Games and normal daily bus and trolley bus users. In relation to parking in urban areas the plan talks of an objective to 'regulate the incoming flow of cars to downtown areas for a better balance of dynamic and static traffic.'

In relation to traffic management, the plan identifies that by 2008, an intelligent traffic management system, reflecting advanced management and technology, will be instituted to satisfy both Beijing's economic and social development and the transport requirements of the Games. Moreover, Beijing clearly signposted it's intention to 'join the most advanced traffic management cities in the world'.

The Action Plan describes the objectives of the Intelligent Traffic Management System. The system was intended to 'comprehensively upgrade the collection, analysis and integration of dynamic and static information of road traffic and administration.' Another objective identified the system was to 'improve the ability in handling traffic accidents and the ability in emergency response.'

The plan identifies two systems to be introduced by 2008,

a) Intelligent Traffic Control System,
b) Advanced Traffic Management Information System.

Eight projects were itemised, as follows:

i) the expansion and improvement of the urban road traffic real-time-dynamic information system,
ii) the renovation of intelligent traffic signal control system,
iii) the establishment of integrated comprehensive intelligent transportation management system,
iv) the establishment of the wireless communication system of traffic management,
v) the establishment of the intelligent communication network security system,

vi) the construction of the broadband communication integrated services network,
vii) the construction and improvement of integrated traffic management information application system, and
viii) the improvement of the traffic management information distribution system.

A year later, the same strategic imperatives remained or were reinforced.

The Action Plan, identified traffic management and control as one of the major areas of ITS development for the Games. Alongside the major infrastructure improvements occurring in and around Beijing, the city focussed on developing these systems.

Major components of these systems as mentioned by a number of commentators include the following:

1 an extensive system to collate and analyse traffic information,
2 a hi-tech Transportation Supervision and Coordination Centre for controlling the city’s traffic,
3 a bus fleet management using GPS for automatic vehicle location,
4 an advanced ITS to improve transport safety services,
5 a vehicle guidance system,
6 fleet dispatching management,
7 transit priority, and
8 parking guidance.

(Ref. R3, R5, R10).

17.1.1 Bus Operations

Additionally a Bus Operation System was planned. This is loosely connected with the reduction of pollution (see Section 21.1.1) but delivers most benefit to the operational management of Bus Services.

This project is called IBOCS – Intelligent Bus Operation were initiated as pilot projects.

The project named IBOCS (Intelligent Bus Operation and Control System) is a joint venture between Thetis and ATAC, the Rome Mobility Agency.

The IBOCS project will enable the planning and real-time GPS monitoring of the 34 special bus lines, managed from a brand new main control room at the Beijing Public Transport corporation headquarters involving over 2,000 vehicles dedicated to spectator transport, on top of the 200 buses used for the pilot project previously mentioned.

A two-component system is proposed for the IBOCS project. The first involves planning the bus timetables and shifts with sophisticated computerised programs based upon operational research methods, optimizing resource management in public transport. The second deals with the real-time service monitoring, based upon the GPS system for the buses.

The IBOCS contract stems from a long-term agreement signed in November 2007 by BPT, Thetis and ATAC, under which the Chinese holding and the two Italian companies will draw on the ex

17.1.2 Rail Operations

17.1.2.1 Olympic Family Transport

SmartTrans Limited collaborated with China Alarm to offer its Intelligent Transport Systems and services to the Beijing Organising Committee for the Olympic and Paralympic Games in 2008. SmartTrans was originally developed for the smooth running transport arrangements for officials, VIPs and the Olympic family including members of the IOC attending the Sydney Olympics.

As the system required passengers to check in and out electronically, it records precisely their entry and departing stations. This enabled Beijing to accurately record passenger flow on each line and station.

The train companies can adjust train schedules to ease traffic. This was especially important during the Olympic Games. (Ref. W21).

17.2 CONTROL AND COMMAND CENTRES

17.2.1.1 Underground Road Infrastructure

The underground system is a circular 5.5 km roadway connecting surface roads and vast underground parking facilities with the Beijing Olympic Park where the major Olympic sporting venues are located.

The challenges of transporting 3 million Beijing Olympic athletes, media and spectators efficiently to more than 300 sporting events and 1,000 cultural activities were eased by a technologically sophisticated underground traffic system. Traffic control, monitoring and management of that system were controlled by applications running on servers from Stratus Technologies. Stratus servers hosted the traffic control, monitoring and management software for the underground transportation system linking Beijing's Olympic venues.

A computerised, tunnel, intelligence management system located in the mission-control monitoring centre provides real-time information that enables an accurate, reliable and rapid response to ever-changing conditions in the loop, keeping traffic flowing efficiently and travellers safe. System integrator and application provider, Shanghai Hi-Tech Control Systems (Hite) of Nanjing and Shanghai, partnered with the regional Singapore office of U.S.-based Stratus Technologies to provide a complete traffic control and management solution.

The constant collection of information from video monitoring and data collection devices throughout the tunnel system to the server made possible immediate analysis of input, evaluation of conditions, multi-point communications, and proactive traffic management. Large video screens in the control centre also display this data and video information to workers and supervisors on duty in real-time. All information is stored to a unified database and used for data mining, activity reporting and operations management. Each ftServer system contains the equivalent of two tightly coupled industry-standard x86 servers that run simultaneously in lockstep, with each processing the same data at the same time. To the operating system and application, the two physical server halves appear as one single logical server. Should one half suffer an issue that causes it to take itself out of service, the other half continues to run the operating system and application software without interruption, thereby eliminating unplanned application downtime, failover and data loss. The server uptime availability was field-proven to be better than 99.999 percent, the server industry's highest uptime reliability for Windows and Linux applications. (Ref. R9).

17.2.1.2 Control and Command Centres

In 2008, the Beijing Traffic Management Bureau announced 10 intelligent traffic management systems that will ensure road safety and the smooth flow of traffic during the Olympic Games:

a) A modern transportation command system. (In time for the Games, Beijing established a modern Olympic traffic command centre, the Yangshan bridge traffic command centre and a traffic command centre for 38 venues. These centres formed a three-layer Olympic transport command technology system.)
b) An automatic traffic incident detection alarm system.
c) A comprehensive traffic monitoring system that automatically identifies single- and double-digit car plates.
d) A digital high-definition integrated monitoring system in Olympic central area.
e) A closed-circuit digital traffic management system.
f) An intelligent regional traffic signal system.
g) A flexible management of the expressway traffic control system.
h) A traffic signal control system in which buses have priority.
i) A large-scale road-side intelligence system and information boards.
j) A real-time road traffic prediction system.

(Ref. W23).

The traffic command centre has integrated 22 technical systems that help to monitor traffic, control the flow of traffic, information, and dispatching of traffic command resources to address issues anywhere in the system. This 24-hour a day, real-time system automatically detects traffic accidents, detects congestion and re-routes vehicles in the system, and give the exact location of police officers in the system.

The command centre has 98 big screen monitors and helps officials keep track of all traffic developments in the system.

"Police units can arrive at the scene of an accident within five minutes anywhere in the system," says Shi Yan, deputy director of the Beijing Traffic Police Command Centre. The system "provides macro-control over traffic within the whole city.". (Ref. W14)

FIGURE 25 TRAFFIC MANAGEMENT CENTRE FOR THE OLYMPICS

17.2.1.3 Road Traffic

The city of Beijing implemented a measure to keep up to half of the vehicles in Beijing off of the streets during the Olympics. Vehicles with license plates that end in an even number were allowed to travel through the core of Beijing on even numbered days, and likewise for vehicles ending in odd numbers. In addition, 300,000 heavy-polluting vehicles were banned from operating within the city, and entry into Beijing by vehicles was strictly limited. These restrictions were enforced from July 20 to September 20. The automated traffic surveillance network was used for enforcement. Authorities decided to compensate car owners for the inconvenience, by exempting them from payment of vehicle taxes for three months. This measure was expected to take 45% of Beijing's cars off the streets.

While this measure helped reduce pollution during the Olympic Games, it was a very important measure to help improve the flow of traffic during the games. During the Olympics, special Olympic lanes — similar to car pool lanes — were utilized by official Olympic vehicles to help get athletes and officials to and from the Olympic Venues.

However, before the Olympics, these lanes were used by all vehicles on the roadway, so taking the lanes away was expected to create even more traffic congestion unless vehicle restriction measures were put in place.

A pilot test was conducted in August 2007 for four days, restricting driving for a third of Beijing's fleet, some 1.3 million vehicles. A 40% daily reduction of vehicle emissions was reported. A previous test carried out in November 2006 during the Sino-African Summit show reductions of 40% in NOx auto emissions. (Ref. W14, W1, W27).

Environmental objectives were also addressed through new vehicle purchasing: 2,810 environmentally friendly buses at least 80% of which met Euro IV standards, 300 more buses which are powered by compressed natural gas and 160 more electric-powered trolley buses. (Ref. R4).

17.3 INTELLIGENT TRANSPORT SYSTEMS

17.3.1 2003 - Command & Dispatching System

A paper in the IEEE intelligent systems journal describes the set up of Beijing’s Traffic Command and Dispatching system in 2003 and the focus of research and development efforts pointing towards improvements required for the Olympic Games.

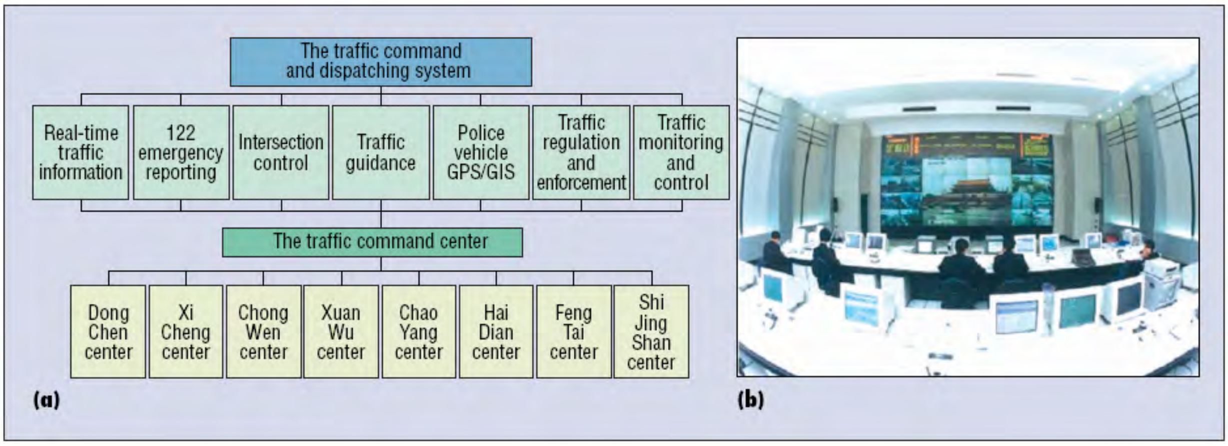


FIGURE 26 BEIJING’S TRAFFIC COMMAND AND DISPATCHING SYSTEM

(Ref. W29).

17.3.2 2004 - ITS Projects

In 2004, by using advanced information technology, Beijing initiated an intelligent transport systems project in the hope of relieving traffic congestion before the Olympics.

The deputy director of the Control Centre of the Beijing Traffic Administration Bureau, said that although the present control system in Beijing was the most advanced in China, there was still room for improvement. For instance, traffic signals at intersections were to be replaced by a control system that works according to actual circumstances on the road.

In 2004, Beijing was mobilizing think-tanks around the country to give a final evaluation of the Beijing Intelligent Transport Systems (ITS) Project, which they hoped would relieve the traffic snarls that blighted the capital for years.

The project - approved as a key scientific research item in the country's 10th Five-Year Plan (2001-05) - combined the efforts of leading scientists nationwide. International specialists who were honed during previous Games in Sydney and Atlanta were also involved, according to the ministry.

In 2004, the central government allocated 560 million RMB ($68 million) for national ITS research, and Beijing served as a pilot city in the project.

Analysing intelligent traffic control systems, parking systems, public transport systems and information service networks for passengers, the project is expected to significantly improve the capital's traffic management. (Ref. W30).

A US report in 2004 stated that Beijing plans to invest $3.6 billion in Intelligent Transportation Systems technology to increase the average speed and fleet efficiency while reducing operating costs. Computerised real-time traffic monitoring, passenger information, incident monitoring, and area-wide Global Positioning Satellite-based, fleet tracking systems are all part of this effort, along with contactless farecards. (Ref. W31).

17.3.3 2005 - Planning For ITS Systems

In 2005, a presentation to the 24th Annual Southern African Transport Conference, the plans for ITS at the Beijing Games were further set out. This comprehensive presentation described the challenges facing Beijing at the time and the policies governing transport development. (Ref. R11).

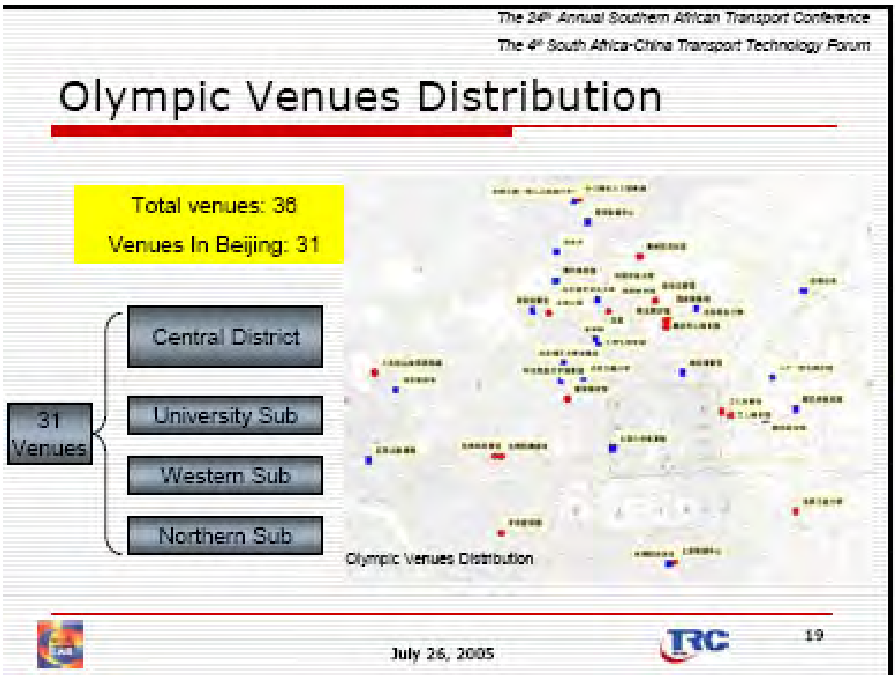
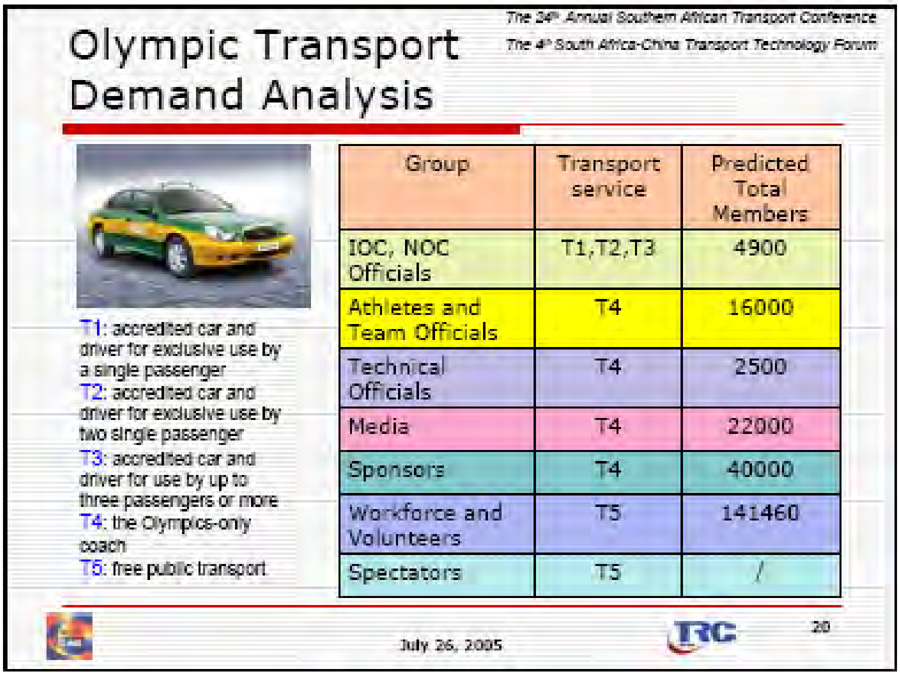


FIGURE 27 OLYMPIC BENUES DISTRIBUTION



Group	Transport service	Predicted Total Members
IOC, NOC Officials	T1,T2,T3	4900
Athletes and Team Officials	T4	16000
Technical Officials	T4	2500
Media	T4	22000
Sponsors	T4	40000
Workforce and Volunteers	T5	141460
Spectators	T5	/

FIGURE 28 OLYMPIC TRANSPORT DEMAND ANALYSIS

The presentation describes the objectives behind the transport transformation required for the Games. The presentation concludes with a slide which describes the plans to strengthen ITS by expanding the demonstration systems existing in 2005 towards building new systems before 2008.(Ref. R11).

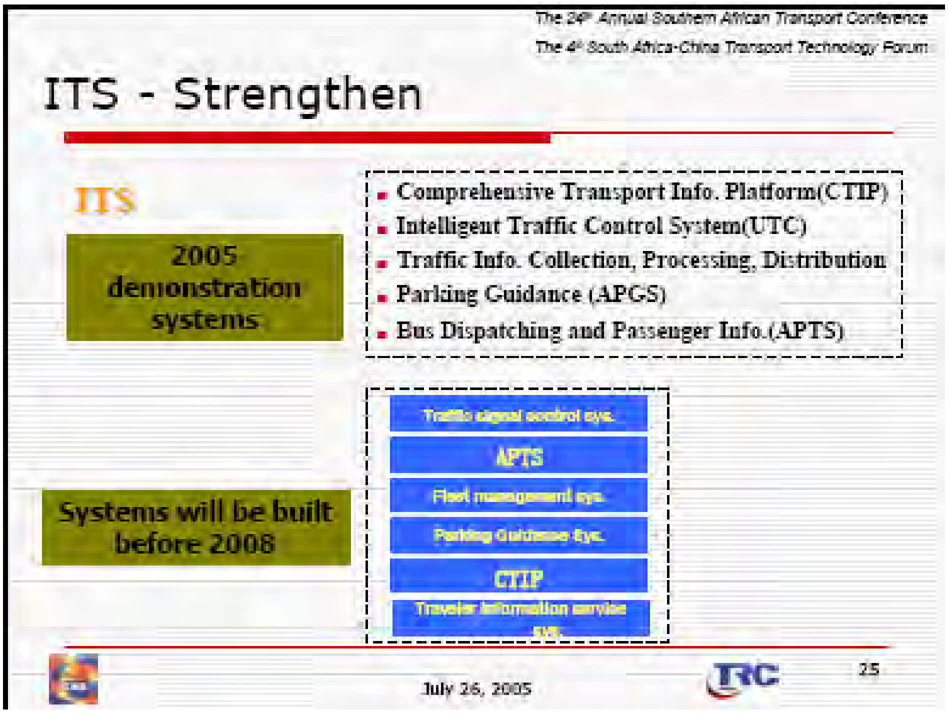


FIGURE 29 ITS SYSTEM PLANNING

17.3.4 2006 - The Approach of Developing ITS Architecture

In 2006, a report was produced of a study to explore and develop an approach of identifying the ITS architecture that can be utilized by Beijing Olympic Transportation Committee as a tool to deal with traffic-related issues. This architecture is developed based on the Turbo Architecture, which is software developed in USA. (Ref. W33).

17.3.5 2007 - Prototype Navigation System

Nissan Motor Co., Ltd. and Beijing Transportation Information Centre (BTIC) jointly announced that they have co-developed "STAR WINGS," an innovative prototype navigation system based on the concept of an Intelligent Transportation System (ITS). The system allows vehicle-to-infrastructure communication to ease traffic congestion.

The system provides drivers with information on the quickest route to their destination calculated using probe data collected from taxis. The input data is routed to the BTIC server to be processed into relevant traffic information. Employing telematics, the data is then delivered to the driver's navigation monitor in the form of real-time maps indicating current traffic flow conditions. The system helps drivers in Beijing to avoid the most congested roads and contributes towards easing traffic conditions in the city.

Nissan and BTIC begun conducting tests on the ITS in Beijing from January 2007. Results from the tests show that the ITS was able to cut down commute times by an average 20%. (Ref. W26).

18. HOST COMMUNITY RESEARCH – INFORMATION

18.1 INFORMATION PROVIDED

18.1.1 Travel Information

18.1.1.1 Transport Services

An overview of the Beijing transport services was provided on the website. (Ref. W2)

Beijing 2008

Transport Services

Free transport with an Olympic ticket
Your Olympic ticket provides you with free transport on the day of your event on dedicated Olympic bus lines, the subway and public buses. Note, however, that Olympic tickets do not provide free transport on the shuttle bus between airport and city proper, taxis or the airport express rail.

Olympic Bus Lines
During the Games, there are 34 dedicated bus lines serving all competition venues in Beijing. Other city buses are in service from 6 a.m. to 10 p.m. every day from July 20 to Sept. 20. Bus Lines with a "K", meaning fast lines, are available three hours before and 90 minutes after a competition event. For detailed information on routes and stops, please refer to the Appendix "Guide Map for Spectator Services."

Subway
The subway is the fastest way to get to the Olympic venues. Subway Line 8 runs directly to the Olympic Green. Disembark at the station marked "Olympic Green" and continue through security for a direct entry to the Green.

City Buses
The Olympic venues can all be reached by bus. For details, refer to the section "Getting There" for transport information. During the Games, city bus lines and their schedules may be adjusted. We recommend you make inquiries ahead of time.

Bicycles
All venues have bicycle parking areas. Those who ride to the competition venues must leave their bicycles in the designated areas.

Private Cars
There may be traffic restrictions around the venues during the Games. Vehicles without a specific access permit will not be allowed to approach the venue. Only the Shunyi Olympic Rowing-Canoeing Park and the Triathlon Venue have parking lots for spectators. You are encouraged to use public transport as much as possible.

Spectator Tip

- **Take Note of Traffic Information ahead of Time**
During the Games, Beijing traffic will vary from its normal conditions. Pay attention to pre-event traffic information to ensure you are not delayed.
- **Allow Ample Time**
Certain venues are a considerable distance from public transport and taxi drop-off points. You must allow enough time to walk from the drop-off point to the venue itself. We recommend you wear comfortable shoes.
- Refer to the Appendix "Guide Map to Spectator Services" for venue maps and transport information.

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FIGURE 30 TRANSPORT SERVICE INFORMATION

18.1.1.2 Guide to Using the Subway

The following guidance was provided on the website:

a) Find the subway station
Beijing subway station is marked with a blue sign above the entrance, usually with the name of the station at the entrance. Get in the station from the entrance like this.

b) Buy a ticket
When you get in the station, follow the sign to buy a ticket at the ticket window, and then check in.

c) Wait for the train
Usually, there are two ways of trains heading for the opposite directions, so you must follow the sign and choose the right side to wait for your train. In some stations, you can get the waiting time information from the screens there.

d) Take the train
While taking the subway, you can enjoy some TV programs on the screen, and get the arriving station reminder from it too.

e) Make a transfer
The signs of transfer in Beijing Subway are very clear. If you need a transfer, just follow the signs.

f) Get out of the station
After you get out of the train, you shall take a look at the sign on exit information. Usually, there are four exits in one station, each leads to a different direction. Find the direction of your destination, and choose the right exit to get out of the station.

(Ref. W22)

18.1.1.3 Route Planning Information

During the Olympic period, the complex transport measures and constraints confused not only millions of visitors but also local residents since they could not follow their routine journeys or rely on their local knowledge. Therefore, traveller information services became popular. Websites, telephone services, SMS & kiosks were well used by the public to plan their journeys in advance. (Ref. R1).

Route finding as provided on the Olympic website was not reliant on ITS as much as good static information contained on guides, signs and websites and assistance from officials.

18.1.1.4 Way Finding Information

A) Maps

A map of the main transport services is contained with the Online Guide. It shows the major public transport routes (subway routes and stations, and both

An interactive map of the transport system in Beijing was also provided, highlighting the major transport lines available as they are selected. It did not offer automatic route selection between specific origins and destinations and did not provide information on the likely travel times.

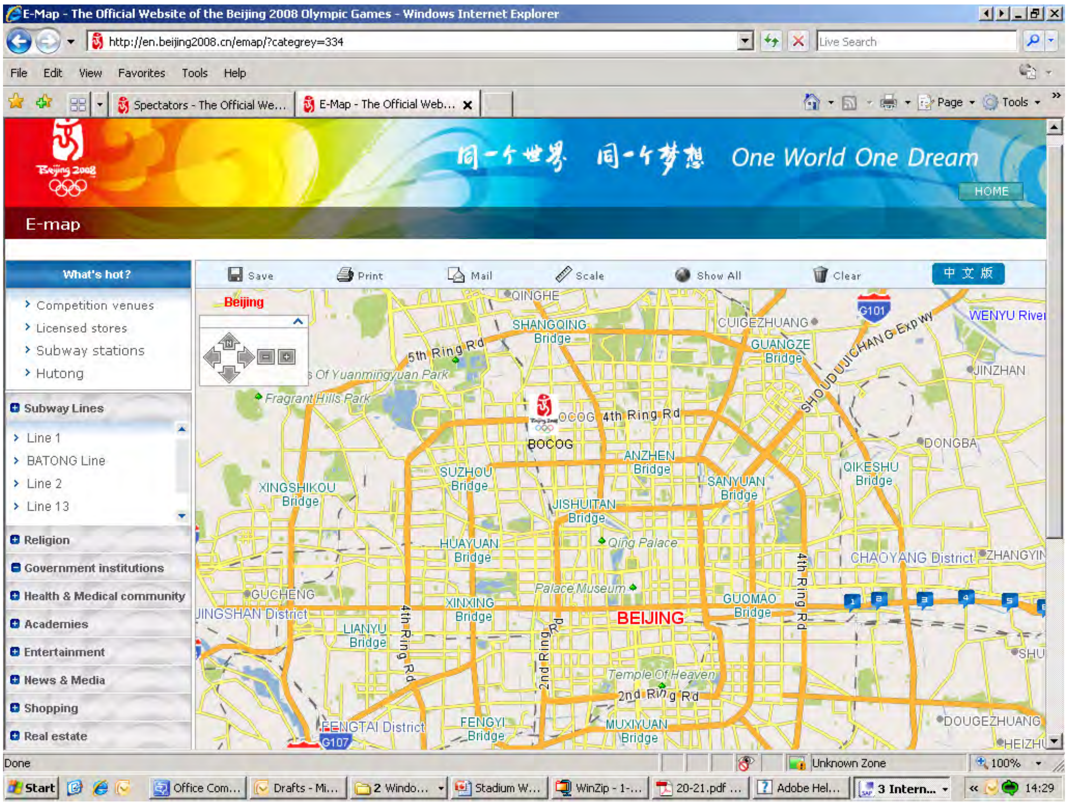


FIGURE 31 INTERACTIVE MAP OF THE TRANSPORT SYSTEM IN BEIJING

B) Distance Information

Within the Guide, there is a tabulation of the distances between various key sites to aid travel planning.

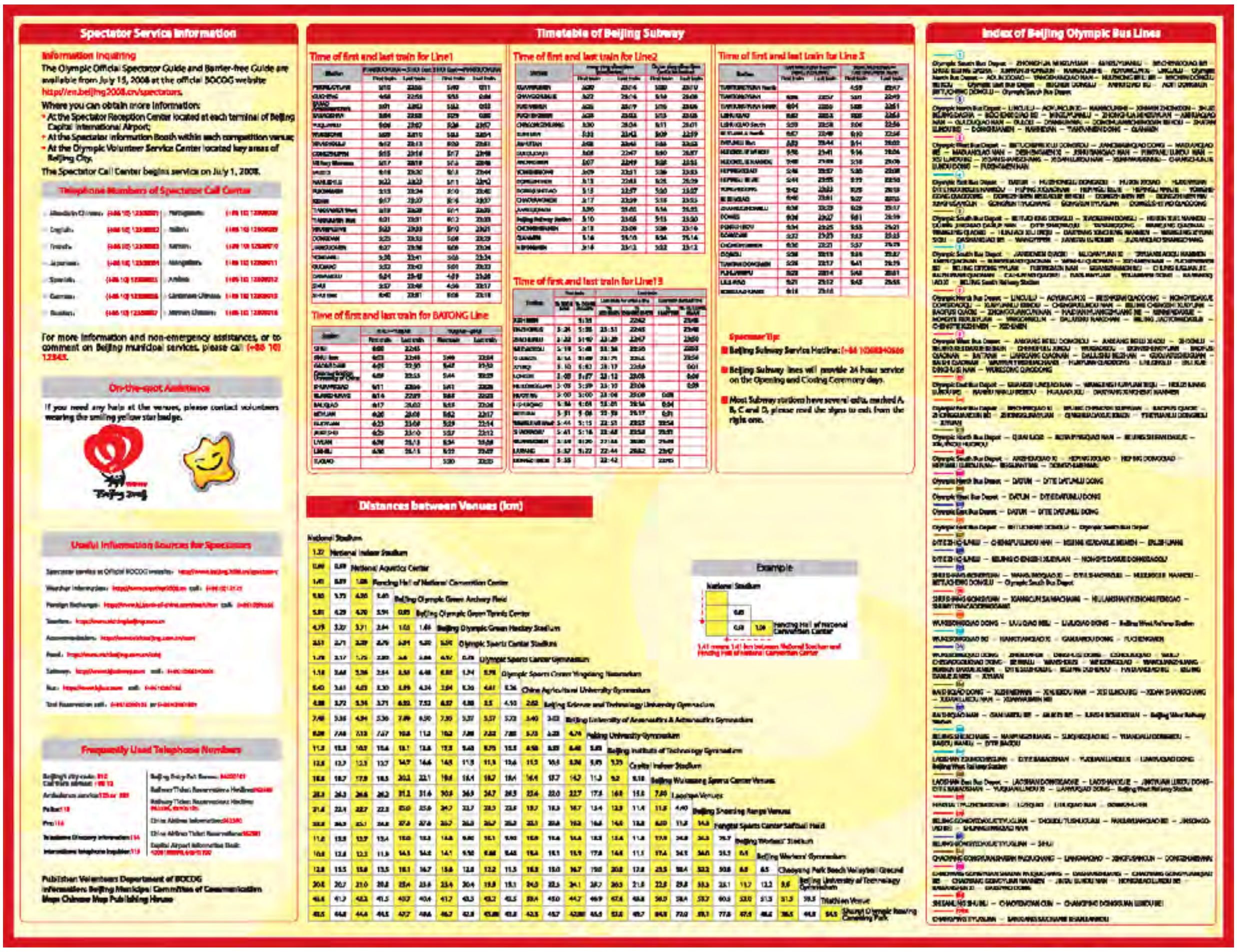


FIGURE 32 TRAVEL DISTANCES

The website itself is not particularly interactive but does refer people to real-time traffic information to ensure they are not delayed. (Ref.R3).

18.1.1.5 Real Time Travel Information

Real-time information was key for Beijing's residents to understand the changes that had been introduced to the city's transport systems and for spectators to be advised of disruptions to the planned services as described in the guides.

Provision included:

a) Real-time traffic conditions
b) Daily Travel Tips

18.1.2 Event Information

See Section 7.1.2

18.2 INFORMATION DELIVERY

18.2.1 Self Service

18.2.1.1 Official Website

When users of the Beijing transport system during the Summer Olympics were investigating which route to take to get to specific sporting events, or to understand how to buy tickets, or the location of their point of departure or arrival, they would probably first have turned to the Olympic website for the Beijing Games(Ref. W2). Other web-links generally referred a traveller to independent travel sites which provided information which is based on the Olympic website. Moreover, Beijing transport or city organisations do not seem to have their own portals to provide advice or customer information.

FIGURE 33 THE BEIJING OLYMPIC WEBSITE

18.2.1.2 Maps

The Olympic website provides various links to transport-related information including the 130-page Olympic Spectator Guide (Ref. R6), and provides maps of Beijing.

18.2.1.3 Daily Travel Tips

Daily Travel Tips on each competition day and information about Olympic transport services were compiled and published on government websites to help spectators making travel choices on competition days'. (Ref. R2)

18.2.2 Customer Service

18.2.2.1 Face to Face

VISA sponsored 55 counters in the Chinese Olympics host city, at Beijing Capital International Airport, various Olympic venues and key tourist and shopping locations.

FIGURE 34 A VISA SPONSORED KIOSK

Visitors were able to obtain multilingual information related to Olympic events and venues, public transportation facilities in Beijing during the Games as well as tourist attractions, and even medical assistance. Visa cardholders could also receive on-site services in the event of loss of credit card.

Richard Chang, Visa's executive vice president and general manager of Greater China and the Philippines, said: "This may be the first visit to China for many of the visitors arriving for the Games, and we recognize that with so many events happening in the 17-day Games period, the public will need accurate information quickly and in a language they know and understand."

Chang told ZDNet Asia in an e-mail that the set-up would be staffed by volunteers from Visa and the Beijing Organizing Committee for the Games of the XXIX Olympiad (BOCOG), which the company worked with to design the kiosks. Each kiosk was equipped with laptops, phones and wireless connectivity.

(Ref. W47)

18.2.2.2 Call Centres

China Netcom, the partner for the 2008 Beijing Olympics, launched the Olympic Call Centre so that visitors could obtain one-stop information services.

Before the event, it provided information about volunteers, torch relay and ticket sales. During the event, it provided information about the games, stadiums, security inspection, licensed commodities, cultural activities, other host cities in China and non-emergency aid services (including the information about traveling, restaurants, transportation, and hotels). The non-emergency aid services continued after the event. As a long-term strategic partner of China Netcom, Huawei Technologies Co., Ltd. (hereinafter referred to as Huawei) worked with China Netcom since early 2006 to plan and establish the Olympic Call Centre.

A) Managing and Providing Mass Multimedia Information

The knowledge base of the Olympic Call Centre played a key part in obtaining information with a single call. It recorded the information directly related to the event, including the information about transportation, stadiums, games, notices regarding entering stadiums and inspecting security, utilities and services in the stadiums, spectator regulations, cultural activities and provided answers to personalized questions. It also recorded common information, such as the information about traveling, transportation and hotels in Beijing. The multimedia knowledge management technology provided with Huawei's Call Centre solution could efficiently store, query and manage multimedia data. These operations were performed on Web pages, which facilitated the service deployment.

B) Providing Multilingual Services and Language-Specific Access

As people who attended the Olympics were from all over the world, language was the key to communication. For the first time in China, the Olympic Call Centre provided services in 21 languages, including English, Spanish, Japanese, French, German, Mongolian, Arabian, Cantonese and Hokkien. Huawei's Call Centre solution supports two methods for developing interactive voice response (IVR) services: graphical service creation environment (SCE) and standard voice extensible markup language (VXML). By using the two methods, operators could quickly develop and deploy various automatic services. This made it possible for developing multilingual services for the Olympics within a short period of time. To help both domestic and overseas visitors to directly obtain information in the languages they wanted, several 8-digit hotline service numbers corresponding to different languages were provided besides the short service number 12308.

C) Providing Multiple Access Modes for High Service Satisfaction

To provide convenient services to the public attending the Olympics, the Olympic Call Centre also supported other access modes, including short message, VoIP phone, email, fax and Web page. Access requests could be queued and routed following the same queuing rule and routing rule. Different media could work together to provide information. For example, after an visitor obtained information by calling the Olympic Call Centre, a short message containing the information was sent to the visitors mobile phone.

D) Providing the Virtual Call Centre that Supports Service Outsourcing

A virtual call centre is a logical call centre, whose creation is based upon the existing operators call centre. Resources are allocated specifically for the virtual call centre. Therefore, users can not only have their own agents and service processes but also share agents. By simply renting virtual call centres, users could enjoy all the services of the call centre without establishing it. With the virtual call centre technology, the Olympic Call Centre was able to provide services for spectators, ticket sales and licensed commodity sales independently, although it had only one call centre platform. After the event, the Olympic Call Centre may be used to quickly provide other outsourced call centre services.

E) Providing the Two-Centre Disaster Recovery Function

By using the network call centre technology, multiple call centres could be connected to form a network call centre. In this case, all the distributed nodes of the network call centre provided services for the party that was accessing the call centre. The network call centre is a large-scale system in which resources are shared, load is balanced and the disaster recovery function is implemented among the nodes. To ensure that 24x7 hour call centre service could be provided and all calls efficiently handled at peak hours, the network call centre consisted of two platforms located in Dongsi and Zaojunmiao. The agents were allocated in two agent rooms and half of the agents in each agent room were connected to various access platforms. This dual-call-centre solution improved the security of the Olympic Call Centre.

F) Providing Fine Service Management to Ensure the Successful Operation

Most staff of the Olympic Call Centre were volunteers and had no experience in using call centre systems before. Therefore, they were required to attend the common training, specific services training and an on-the-job training to get familiar with the Olympics information, service policies, hardware & software operations and the operation interfaces of the knowledge base and workflow. In the Olympic Call Centre, the knowledge base helped to collect, learn and query knowledge; the bulletin and memo functions facilitated internal communication and management; and the Web-based monitoring console implemented the real-time monitoring of service provisioning data. The real-time monitoring of service provisioning data helped to handle emergencies. The Beijing Olympic Committee publicised the Olympic Call Centre through Web sites, newspapers, TV stations and broadcasting stations. As a result, people better understood the facility of the Olympic Call Centre and the prompt and convenient services it offered.

(Ref. R14)

18.2.2.3 Hard Copy

Information on access to the 31 Olympic venues by public transport was made available through the guide and the folder on “Public Transportation to Competition Venues for Beijing Olympics and Paralympics”, available in Chinese and English, with 25.000 volumes of the guide and 3.3 million copies (of 63 types) of the folder. (Ref. R2).

The distribution points for copies this information - the 25 volunteer service counters, the head stations of the special Olympic bus lines and at the 13 metro transfer stations. – demonstrated the importance of well informed officials and volunteers. (Ref. R2).

18.2.2.4 Olympic Spectator Guide

The 130-page Olympic Spectator Guide, (Ref. R6) refers to a number of maps intended to help the spectator make decisions about how to get to venues and how to use the transport system.

Contents

FIGURE 35 OLYMPIC SPECTATOR GUIDE

18.2.3 Public Signage

18.2.3.1 Fixed/Static Signage

Special road signage for the Games was installed, so as to provide accurate and convenient guidance for OF members and spectators. The signage fell into three types,

a) Urban road way-finding traffic signs outside the venues,
b) Traffic signs inside the venues
c) Public information signs inside the venues.

(Ref. W2)

A presentation by Jifu Guo, from the UITP study tour, (Ref. R5) indicates that considerable numbers of road signs were employed: ‘Traffic Signs – New Road signs 24,000; Venue Traffic signs 2,000; Transport Station Signs 690.’

FIGURE 36 BI-LINGUAL PUBLIC WAYFINDING

Most of the signs in the streets and public transport networks were replaced by bilingual signs (Chinese, English). For instance 24,000 new road and street signs, as well as 690 public transport station signs were installed. (Ref. R2)

This confirms the predominance of static fixed signs as the means of information provision.

18.2.3.2 <u>Variable Message Signs</u>

During the Beijing Olympics, the traffic guidance by Variable Message Signs (VMS) achieved excellent effects. The road condition dynamic and quantitative information which was released during the Olympics provided travellers with real-time road conditions and travel time of main Olympic lines. The paper focuses on the exploration of the VMS release of the Olympic traffic guidance system which was based on the real-time detection of traffic flow. In the referenced paper there are pictures of the interface to the software operating the signs and examples of the signs containing the traffic information. The paper describes the structure of the system showing information flows and then explains the underlying algorithms modelling traffic behaviour. (Ref. W28).

The extent of assets deployed to manage Beijing's traffic was set out in the referenced presentation. It describes how Beijing's road network of 4,010 km has 365 surveillance cameras, 700 red light cameras, 79 incident detectors, 50 Variable Message Signs, and 1250 signal control devices. (Ref. R3).

The picture below depicts a large variable message board on the station concourse at the southern entrance to Beijing South Railway Station. This new station was part of the significant infrastructure improvement programme which occurred in advance of the Olympics (Ref. W6).

FIGURE 37 A LARGE VARIABLE MESSAGE BOARD

On public transport, there was a need for real-time information about delays and disruptions. Within the reports from the Games, there are references to Variable Messaging Signs and monitors. A World Bank report shows a picture of a VMS provided in a station (Ref. R3). The UITP Study Tour presented views of monitors and signs provided on platforms (Ref. R5).

FIGURE 38 VARIABLE MESSAGE SIGNS

18.2.3.3 <u>Countdown</u>

The UITP study tour made reference to 'Passenger information system controlled by GPS to broadcast station & other information in speech & text' in relation to the Bus Rapid Transit system (Ref. R5).

The illustration depicting the system suggests that the location of bus vehicles will have been gathered as the basis for any real-time information provided by this system.

18.2.3.4 <u>Digital TV</u>

The main form of real-time guidance was through regular traffic announcements on televisions. Televisions were located in many public spaces including buses, subway trains, station platforms, taxis and cars. At the end of May 2007, work began on fitting a digital television system in two of Beijing's subway lines putting 6 screens in each carriage. The system, run by Beijing Mobile TV, had live broadcasts of the Games. The TVs featured news reports including traffic updates. It was also planned to fit 17,000 buses and 30,000 taxis. (Ref. R1, R4).

18.2.4 Personal Digital Devices

18.2.4.1 Navigation Systems

Beside traveller information services, navigation systems, particularly those with Traffic Message Channel (TMC) enlarged their market share in Beijing. Since the road situation and traffic conditions changed so fast during the Games, drivers, even experienced drivers, found that they really needed guidance. (Ref. R1)

A total of six channels of communication were available: web portal, mobile phone, Variable Message Signs, media/press, call centre, and car navigation terminal. (Ref. R2)

18.2.4.2 Mobile Phones

Maps of real-time traffic conditions superimposed on a road map of Beijing were also available through mobile phones. The Olympic subway line - Line 5 – was fitted with wireless communication to ensure mobile coverage (Ref.R3, W3, R4). This form of information required a high degree of knowledge of Beijing's transport system to work into decisions about which mode or route to take or to estimate timings. The level of road congestion during the Olympics was significantly reduced by measures:

a) to control the use of private cars,
b) to encourage the use of the public transport, and
c) to enforce the Olympic Route Networks,

The key impact would have been on achieving the 30 minute accommodation to venue times set out as an objective for the Olympic family. These transport users will have been largely accompanied by informed officials. (Ref. W4, W5)

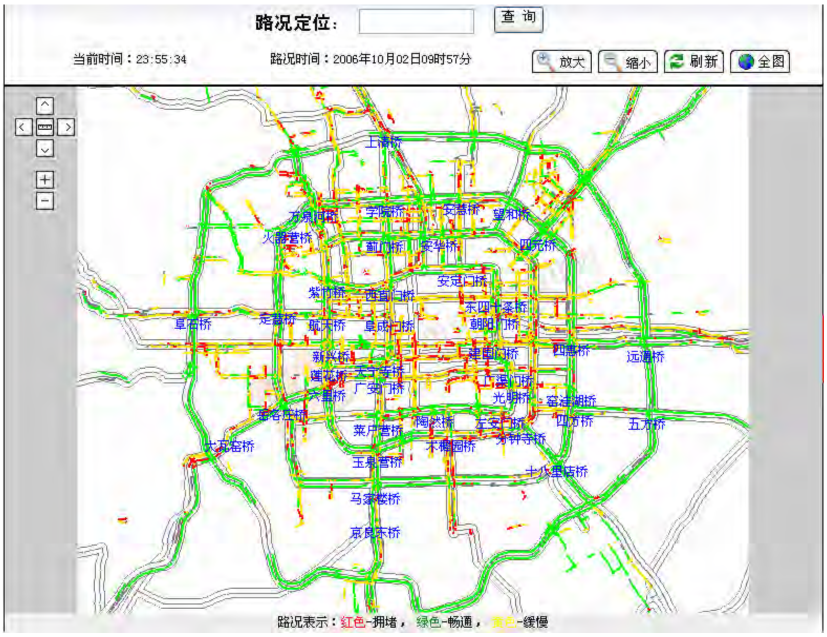


FIGURE 39 REAL TIME MOBILE PHONE MAP

18.3 INFORMATION COLLECTION

18.3.1 Real Time Information

As part of China's preparations to host the 2008 Olympics, an Intelligent Transportation System (ITS) was developed to cope with traffic during the event. The project - Beijing Real-Time Traffic Information Collection, Processing, Analysis and Distribution System - Phase I – was focussed on being able to collect, process, analyze, display, and store real-time traffic status information from various independent systems in and around the city. The information will be used to control and streamline traffic.

CS&S Delineate implemented the first phase of the project. The company also deployed IONA real-time traffic management system to implement the system. The Ministry of Transportation, Science & Technology, Communication, Central Government of China, the Beijing Traffic Management Bureau (BTMB) and Beijing Olympics Organizing Committee are the joint sponsors of the project. The government has allocated RMB3 billion and the private sector RMB8 billion for the ITS project.

Phase I of the project accumulated traffic data from around the city. The system collects, processes, analyzes, displays and stores real-time traffic status information from a variety of independent systems. This is sent to a number of different end-users within the BTMB.

Another function of the first phase of the project was to create a basic framework upon which additional systems can be integrated as the BTMB continues to build its full ITS for the Summer Olympics.

The framework was intended to be expanded in several phases up to 2008. After Phase 1, the next phase brought together all real-time and near real-time systems online, which integrated data from several static data sources. Finally, the traffic control systems were integrated, which gave the BTMB real-time tools to manage traffic in Beijing on permanent basis.

As Orbix became operational, controlling the information flow, the BTMB was able to reorganize traffic control, modify police deployments and direct traffic police more accurately. The first phase also enabled the establishment of a robust, common integration platform and traffic control strategy. (Ref. W24).

A significant manifestation of the results of this work is visible on the BTMB website which presents a map of the city’s road network including real-time information about the levels of congestion.

HOST COMMUNITY RESEARCH – INFORMATION

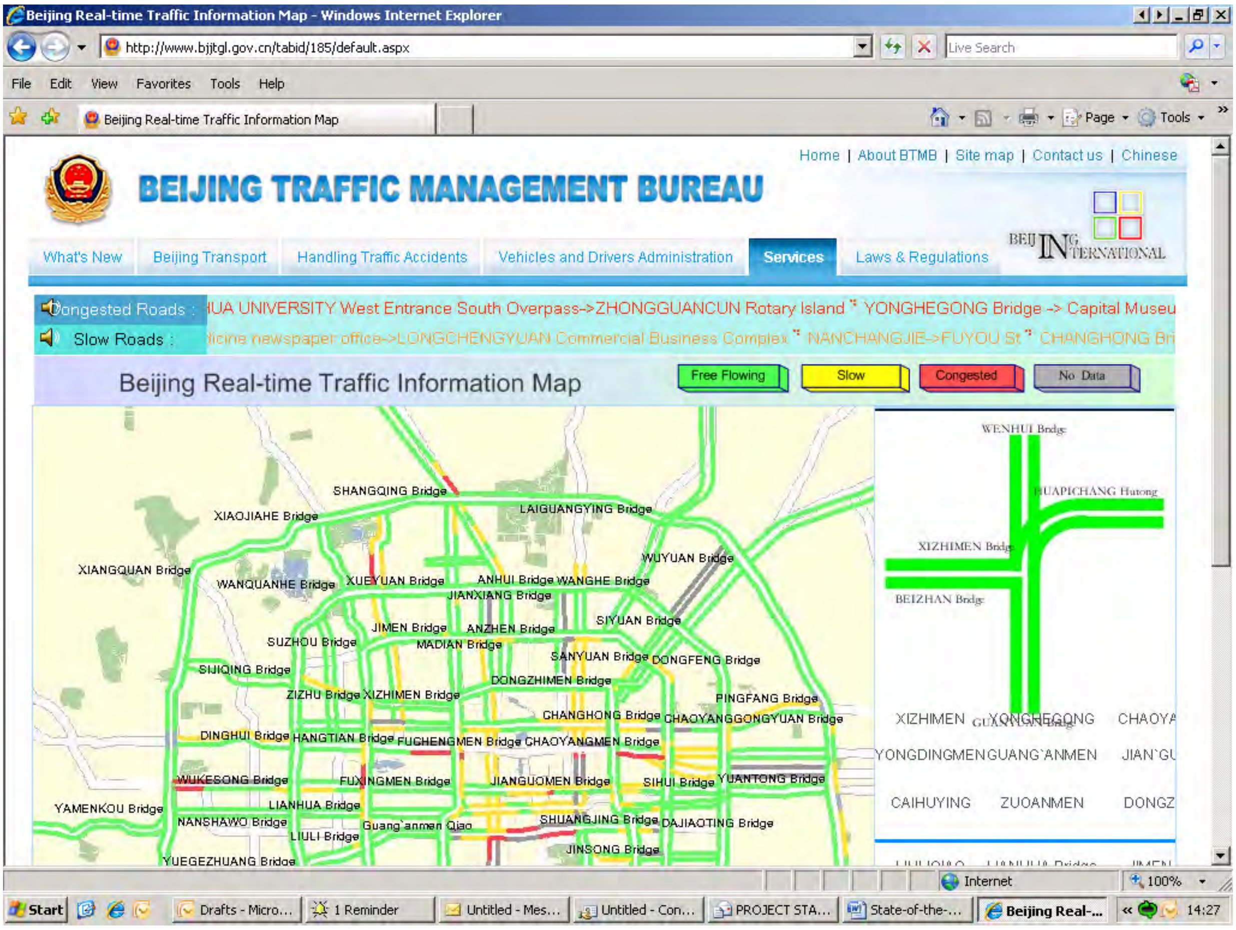


FIGURE 40 BEIJING REAL TIME TRAFFIC INFORMATION MAP

18.3.1.1 <u>Real-time Traffic Information ‘Based on 13,000 Floating Cars’</u>

Real-time traffic information was collected from 13,000 cars on the network which were fitted with GPS. They automatically report on their speed on the road. As a result traffic information of entire road network in Beijing was published and updated every 5 minutes (Ref. W25, W3). This information was also used in various research and reporting purposes e.g. to conclude, in 2008, that the urban traffic was “smooth” during the Olympic Games and the Paralympics Games compared with the “moderately-congested” status before the Olympic Games. (Ref. W25).

FIGURE 41 REAL TIME ROAD NETWORK SPEEDS

The system provided an information platform for supporting provision of real-time information into in-car navigation systems as reported in descriptions of the following project.

19. HOST COMMUNITY RESEARCH - SECURITY

19.1 SECURITY PROVIDED

19.1.1 Venue Security

China bolstered its Olympic security effort by deploying a battery of surface-to-air missile launchers a kilometer south of the showpiece venues for the Beijing Games. At least two camouflaged Hongqi 7 missile launchers were visible from a public road close to the stadium built for the 1990 Asian Games, which is just across the city's fourth ring road from the Bird's Nest arena and Water Cube aquatics centre.

Radar dishes and other military vehicles along with uniformed air force personnel were also visible through a fence on which was posted a notice reading "Military Administrative District, No Admittance". Aircraft were almost never seen in the skies above central Beijing, which is restricted airspace. Olympic broadcasters, however, were allowed to use helicopters to cover the August 8-24 Games.

China regarded terrorism as the biggest threat and claimed to have foiled bomb plots and plans to kidnap athletes by militants from the far-Western region of Xinjiang. A special 100,000-strong security force, including the elite Snow Wolf Commando Unit, was on alert for terrorists.

However,Rights groups accused China of using the potential terrorist threat as an excuse to suppress internal dissent.

(Ref. W48)

19.1.2 Municipal Security

The Olympic security scheme involved the participation of almost all the security organizations around the city. This included public security, national security and the armed police. Safety departments at various work units and even drivers of subway trains, buses and taxis were involved.

Qiang Wei, Beijing's deputy Party secretary, said Beijing would also work with the security organs of other countries - such as the United States, Germany, Britain, France and Russia - to enhance its defence against riots or terrorist attacks. Qiang, also head of the co-ordination team organizing Olympic security, made the remarks at a rally, which marked the implementation of the city's Olympic security masterplan. But he did not reveal the budget for running the security scheme, which contains all-round protection in the air, on land and at sea for the Games. Ma Zhenchuan, director of the Beijing Municipal Public Security Bureau, said apart from safety protection, providing a good service to participants was another priority task. Ma said his bureau would carry out a seven-year language training programme, which started in 2001 when Beijing was picked to host the 2008 Summer Olympics. He said Beijing police will encounter thousands of people who do not speak any Chinese during the 2008 Olympics. "We have published a textbook of 'Olympic Security English' which mainly focuses on the handling of every possible problem that may happen during our security work for the Games," said Ma, who is a deputy head of the co-ordination team organizing Olympic security. Ma said his team would set up two branches - the Olympic security command centre and the intelligence centre .

(Ref. W49)

19.1.2.1 Security Website

In addition to the Command Centre Beijing security also provided a security website.

The website (www.bjayab.cn) was committed to giving timely and efficient news coverage of the Games security area, making the general public further aware of the preparatory work for the 29th Olympiad. The website was expected to popularize security know-how, answer questions on security matters, take suggestions on the issue, and provide liaison channels with an aim to serve as a window of Olympic Games security work and a bridge of international cooperation.

(Ref. W49)

19.1.2.2 Explosives detection

American Science and Engineering Inc. (Billerica, Mass.) supplied its Gemini Parcel Inspection Systems to screen for explosives and contraband in parcels at key checkpoints for the games. The system has two imaging systems in one machine: dual-energy transmission for metallic detection plus proprietary Z® Backscatter™ technology for enhanced organic detection

Automated explosives detection systems were also provided by L-3 Communications (Woburn, Mass.) to the Beijing Airport. L-3's Security and Detection Systems subsidiary supplied 22 MVT-HR multi-view tomography explosives detection systems and 81 operator workstations for the hold-baggage screening system at Terminal 3, the world's largest airport terminal, which opened in 2008.

(Ref. W57)

19.1.3 Transport Security

The author has been unable to find any specific mention of Transport security or Transport Policing.

19.1.4 Border Security

The following is a statement of intent by China Customs concerning border security.

a) Pushing for Customs e-governance to facilitate on-line adminstrative examination and approval
With the E-Port system, Olympic materials can go through the examination and approval formalities on line, which will be simplified to raise clearance efficiency. We will roll-out "on-line payment" to simplify the operational process for paying duties, taxes and related fees. Our portal website will also help us go public with our work and do our jobs on line.

b) Allocating dedicated facilities, windows or desks, and passages

i) a. Dedicated Customs facilities
Every customshouse will allocate facilities for the purpose of Olympic materials only, and send teams there or to relevant competition venues to go about Customs procedures.

ii) Dedicated windows or desks
Related operational-level Customs facilities will set up dedicated windows or desks to take care of the processing of declaration documents, tax exemptions and reductions and cargo supervison formalities in relation to Olympic materials. Priority will be given to the clearance of Olympic

materials, and whenever they arrive at ports, there will be officers for them to go through the Customs procedures.

iii) Dedicated passages

At the 5 airports (Beijing Capital International Airport, Qingdao Liuting International Airport, Shanghai Pudong International Airport, Shenyang Taoxian International Airport and Guangzhou Baiyun Airport), the 3 land passes (Beijing, Shenzhen, Guangzhou) and the 4 seaports (Shanghai ,Tianjin, Dalian and Qingdao), Olympic passages will be set up at the operational-level passenger-processing Customs facilities to facilitate the clearance of IOC officials, foreign athletes, other members of the Olympic family and their personal belongings.

c) Providing omni-directional services to accelerate the examination and release of Olympic materials

i) 24-hour services

To ensure that import Olympic materials are cleared straightway, especially those for competition venues and key projects, we will provide 24-hour non-stop services for the clearance of emergency Olympic materials. Dedicated officers will be assigned to process Olympic materials which must go through import formalities immediately, prioritizing them over other cargo, so that they can be cleared in time.

ii) Pre-declaration and release upon arrival

The consigners, consignees or Customs brokers of imports for the Olympics may declare to Customs in advance with the information they have got from the bills of lading, waybills, cargo inventories or manifests examined and accepted by Customs. Thus, the goods will be released upon arrival if everything matches.

iii) Appointment clearance services

The consigners, consignees or Customs brokers of imports for the Olympics may make appointments with Customs during our office hours, asking Customs to process their goods during non-office hours, including holidays and weekends.

iv) Pre-classification and Pre-valuation

Before declaring imports for the Olympics to Customs, declarers may apply to Customs to determine in advance the classification, dutiable price or place of origin of the imports. Customs will provide maximum clearance facilitation for enterprises and parties relevant to the Olympics.

d) Courteous treatment for relevant personages

i) Olympic and government officials holding diplomatic or courteous visas will be cleared through the “Diplomatic and Courteous Passage” and exempt from Customs examinations.

ii) For visiting heads of state, heads of government and heads of party, exemption from Customs examinations will be granted, with the notification from the Ministry of Foreign Affairs of China, to the personal belongings of their delegations and retinues, to the planes and vehicles their delegations take, including chartered civil aviation planes, and to the articles used on the planes and vehicles.

e) Extending the time allowed for temporary admission and simplifying the examination and approval procedures thereof

Olympic materials temporarily admitted may, with the approval of regional Customs, be re-exported within one year after the first entry. Under extraordinary circumstances, the time allowed for temporary admission may, with the consent of Customs, be extended again, but the materials must be re-exported before March 2009

f) Bonded release of materials enjoying tax exemption and reduction
For import materials to enjoy tax exemption and reduction under the umbrella of preferential tax policies for the Olympics that arrive at ports before the issuance of related tax exemption and reduction lists and other specific implementation measures, with the letter of proof by the Logistics Department of Beijing Organizing Committee for the Games of the XXIX Olympiad (hereinafter referred to as BOCOG) and a bond equivalent to the sum of the tax payable by the importer or a letter of bond issued by banks, China Customs will release them first and go about the procedures of tax collection and exemption later according to relevant regulations

g) Granting BOCOG the qualification as import entity
Beijing Customs allows BOCOG to register as "temporary declarer" and gives it a fixed long-term temporary registration code so that BOCOG can go about the import procedures for Olympic materials while Customs supervision is exercised

h) Enhancing Customs protection of Olympic intellectual property rights
We will take multi-faceted measures to intensify Olympic IPR protection in import and export in strict accordance with Regulations on the Protection of Olympic Symbols. For example, we will conduct extensive education and publicity concerning Customs laws, regulations and policies on IPR border protection to raise enterprises' awareness. In respect of combating the entry and exit of infringing goods, we will constantly step up our efforts to fight such infringements emerging from goods, passengers' luggage as well as postal articles. Measures will be taken to stengthen the monitoring over the clearance node so as to ensure that IPRs are effectively protected at ports and the legitimate rights and interests of rightholders are well safeguarded.

i) Disposing of smuggling and violation cases appropriately according to law to purify the clearance environment
To ensure the economic security and social stability of the capital, China Customs resolutely fights smuggling crimes or violations committed under the name of the Olympics. Based on the principle of "legal and efficient", we will simplify relevant penalty procedures to raise the efficiency of investigation and disposal of cases at the operational level, thus securing smooth clearance of Olympic materials and people.

j) Establishing emergency mechanism to ensure that the Olympics Games go smoothly
  i) Organizational guarantee
  We will set up a steering board on Olympic Customs clearance as well as a cross-department group to coordinate matters of approval, Customs supervision, examination and release related to the entry and exit of Olympic materials and people.
  ii) Fast reaction mechanism
  Different departments of Customs will set up the mechanism of hotline contact so that when emergency comes in the processing of inward and

outward passengers, mails, express consignments and cargo, special teams will pop up immediately to implement our emergency plans to ensure port safety by efficient disposal.

iii) Enhancing security
We will make more strenuous efforts to fight such contrabands as weapons, ammunitions and biological and chemical hazardous materials. Vigilance will be enhanced against behaviour constituting a threat to the national political and economic security to prevent terrorists from smuggling contrabands sneakingly through our passenger, cargo, mail and express consignment checks

(Ref. W50)

19.1.5 International Security

Interpol developed a security Database for the Beijing Olympics. The following text is a report from the Security Technology News.

"Speaking to the Chinese Xinhua news agency, a spokesman from the International Criminal Police Organization, 'Interpol', confirmed that the firm would be assisting China with the security aspects of next year's Olympic Games. As detailed by Interpol's Secretary General, Ronald K. Noble, a support team will be sent to Beijing armed with in-depth data regarding internationally-known suspected criminals, including their names, images, fingerprints and relevant DNA information.

Mr Noble's comments were made during the International Conference on Security Cooperation, currently being held in Beijing in the build up to the 2008 Summer Olympics.

He highlighted how the international police organisation had created its most elaborate screening system in respect of both via and passport applications, in order to pick up on travel documents that have been stolen, forged or lost. Additionally, the process will identify known criminals and suspected terrorists.

"Terrorists...", said Noble, "...will not use their real names, so they will use documents that were stolen or lost in order to conceal their identities". He continued: "Our system will permit automated screening of thousands of individuals against Interpol's global most-wanted databases at the time of their visa application, which will provide China with the most advanced early detection system of fraudulent travel documents and criminals currently available."

Mr Noble further detailed how Interpol's 24-hour Command and Coordination Center would place maximum priority on data that could be linked to the Olympic Games' security, as it travels through its Interpol National Central Bureau network.

Additionally, he confirmed, Interpol has created an online service with China in mind. The basis for this, he said, was the nation's 15.7m-strong database of stolen, fabricated and lost travel documentation."

(Ref. W51)

19.1.6 Other Security

19.1.6.1 Food Security

Olympic organizers closely monitored food deliveries to the estimated 10,700 athletes and 31 competition venues in Beijing and in six venues outside the city.

Food to be delivered to athletes was closely monitored with an RFID system throughout the process of production, processing and transport. AeroInfo were the constructer of the food safety tracking system.

Safety and quality control issues in China's food supply chain before the Games generated negative attention ahead of the Games. Indeed, the U.S. Olympic Committee announced that the team from the United States would bring its own food to Beijing because of food- safety concerns. (Ref. W10, W11)

19.2 TECHNOLOGY USED

19.2.1 Surveillance

The 2008 Olympics used the IBM Smart Surveillance System (S3) to prevent terrorism from grabbing the spotlight during the games. The S3 system, developed by IBM's T.J. Watson Research Centre, combines existing network and video surveillance infrastructure with state-of-the-art Information Technology. "Physical security and IT security are starting to come together," said Julie Donahue, vice president of security and privacy services with IBM. "A lot of the guys I'm meeting on the IT side are just starting to get involved on the physical side."

The S3 system scanned video images of city streets looking for everything from troublemakers to terrorists. The S3 uses analytic tools to index digital video recordings and then issue real-time alerts when certain patterns are detected. It can be used to warn security guards when someone has entered a restricted area

The ability of S3 to weave into an existing network and video surveillance infrastructure is an important selling point for the product, Donahue said. "It's expensive to get that video infrastructure in place just for even basic analogue cameras," she said. "So what we do is, we can hook in your analogue cameras and reuse that infrastructure, put in IP-based cameras, and then architect it so that we can do the right level of analytics

(Ref. W52)

19.2.2 Communication

19.2.2.1 <u>Radio Communications.</u>

The Beijing Games attracted some 10,700 athletes and involved around eight times as many personnel dealing with the coaches and support staff from 204 countries, 5,600 accredited press and photographers and staff from 12,000 broadcasters. Quality voice and data communications services were essential in order to manage the situation successfully. The answer was provided by the Beijing Government Shared Radio Network which was supplied by EADS and operated by Beijing JustTop Network Communications.

Established network users included the police, fire, health, water conservancy and various Government organisations in and around Beijing. During the Games the network was also used by 10,000 staff from the official event organising committee known as BOCOG. It required the utmost efficiency and reliability form the chosen TETRA digital radio network.

EADS and JustTop also set up a Mobile Operation Centre (MOC), which was held in readiness at all times to provide temporary extra coverage outside the network or in case of an emergency. The organising committee and public security staff were each assigned to their own dedicated base stations at the Bird’s Nest stadium, so that any peaks in the organiser’s traffic would not affect the base stations serving the authorities and vice versa. A total of four base stations covered both indoor and outdoor areas and served more than 20,000 on the day of the opening ceremony.

One of the big challenges was coordinating the many different organisations involved. Both intra- and inter-agency talk groups needed to be flexible to cope with changing demands, while each user organisation also needed to maintain the privacy and security of its internal communications. The EADS TETRA system enables talk groups to be set up flexibility. For example, they can be set up to cover particular geographical areas, so they could target personnel working in and around a particular venue.

Each user organisation on the shared network could also keep their internal communications confidential thanks to Virtual Private Network technology, which enables each agency to manage and control its radio users, talk groups and call rights independently. Secure access rights and radio authentication also ensured that information exchanged over the TETRA network could only be accessed by authorised personnel.

A rough timeline of procurement and roll-out is as follows:

a) 2003
Beijing JustTop Network Communications Ltd, purchased the TETRA system from EADS and began trials in several areas of the city

b) 2004
The first government agencies began to join the network with police organisations joining later that year

c) 2005
By September there were already more than 30,000 users in the network

d) 2006
April marked the decision to use the network for the games in 2008 and games organisers began staging test events in August.

(Ref. R8).

20. HOST COMMUNITY RESEARCH – HEALTH & SAFETY

20.1 HEALTH AND SAFETY MEASURES PROVIDED

Free medical services for athletes and officials will be offered by 300 doctors and over 1,000 medical workers at three designated hospitals.

(Ref. W2)

20.1.1 Venue H&S

See Section 8.1.2

20.1.2 Municipal H&S

Beijing banned smoking in public places, including parks, on May 1 2008, and China promised this would be a smoking-free Olympics. Not only did the Beijing fire brigade put several new fire stations in service for these games, but the department also developed and implemented a digital fire response system with help from Tsinghua University and other agencies. The system helps to pinpoint a fire's location, chooses the best route for responders, and dispatches firefighters. All 93 Olympics venues were equipped with this technology by the end of 2007. MSA China (part of Pittsburgh, Pa.-based MSA) provided SCBAs, thermal imaging cameras, and gas masks to the brigade and supplied fire helmets for use at the games' water sports venue.

A spokesman for the 3M Occupational Health and Environmental Safety Division (St. Paul, Minn.) said the division was among "a number of 3M businesses providing a wide variety of products" to support the games. PPE provided by the unit to various Chinese health and Olympics agencies for use in preparation for the games included respiratory, hearing, eye protection, and reflective products. The company did not reveal how much of this equipment it provided.

(Ref. W57)

20.1.2.1 <u>Toxic gas and radiation monitoring.</u>

RAE Systems' radiation detection and wireless toxic gas monitoring equipment was permanently deployed at the Beijing Capital International Airport. The company's devices also were used at the Barcelona (1992, summer), Salt Lake City (2002, winter), Athens (2004, summer), and Torino (2006, winter) games and the Munich World Cup (2006), spokesman Bob Durstenfeld said. "I think it's become a very unfortunate reality that you have to do atmospheric monitoring at these events," he said. With at least 10 heads of state and more than 100 corporate chieftains expected to attend the Beijing games, "security is paramount," he added. Universal Detection Technology (Los Angeles, Calif.) has provided radiation detection equipment for use at entrances to sports stadiums and the Olympic Village.

(Ref. W57)

20.1.2.2 Environmental Protection

Air pollution and the potential impact of Beijing's smoggy air on athletes' health and performance seem to have been BOCOG's top concern during the run-up to the games.

(Ref. W57)

20.1.2.3 Water quality.

General Electric (GE) installed a full-scale water treatment plant in Dongguang City and supplied a mobile water treatment plant that purifies water for neighboring villages. GE donated both; the company said this is the first time an advanced mobile water treatment system has been used in China to bring clean water to areas outside the nation's centralized municipal water infrastructure. China has set a goal of providing safe, reliable water supplies by 2015 to more than 300 million people living in rural areas, and GE hopes to provide equipment to achieve that goal, said Jeff Garwood, president and CEO of GE Water & Process Technologies.

Beijing Praxair Inc., an affiliate of Shanghai-based Praxair China, and thus of Praxair Inc. (Danbury, Conn.), signed a contract in March with Beijing Drainage Group Co. Ltd. to be the exclusive supplier of oxygen to three wastewater treatment plants in Beijing that were built for the games to improve water quality in Beijing and save water resources. In the plants, wastewater is treated via membrane filtration, activated carbon adsorption, and an ozone de-color process.

(Ref. W57)

20.1.2.4 Health

GE units provided medical imaging technology, 308 advanced electrocardiogram devices, five advanced ultrasound machines, and two magnetic resonance imaging machines to the Olympic Village General Hospital for use at venues during the games. Twenty-four official Olympic Games hospitals were designated throughout Beijing for these games, and BOCOG said 3,223 qualified medical workers from 84 hospitals were selected and grouped into 37 teams to handle health issues during the games.

(Ref. W57)

20.1.3 Transport H&S

See Appendix B – Beijing Transport Safety Regulations

20.1.4 National H&S

20.1.4.1 Diseases

China's constructive response to a growing and unchecked HIV/AIDS epidemic, which began in 2003, reflects the influence of external actors, including the Joint United Nations Program on HIV/AIDS, the World Health Organization, and the Geneva-based Global Fund to Fight AIDS, Tuberculosis, and Malaria.

(Ref. R16)

A number of new initiatives were introduced.

a) A high-level interagency body
b) A national treatment program

c) Chinese government policy
d) HIV/AIDS regulations

A) Interagency Body

The State Council Working Group on HIV/AIDS was established in 2003 to better coordinate the national response. The central government took a highly visible interest in HIV/AIDS and mobilized the bureaucracy to mount a more effective response.

B) National Treatment Program

China CARES (China Comprehensive AIDS Response) was initiated in 2003. China CARES has been supported by central government funding and a grant from the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund).

C) "Four Frees and One Care." Policy

Introduced in late 2003, this national policy calls for:

a) Free antiretroviral drugs for rural AIDS patients and for urban AIDS patients facing financial difficulties;
b) Free voluntary counseling and testing services in high-prevalence areas;
c) Free education for children orphaned by AIDS;
d) Free voluntary counselling and testing as well as services to prevent mother-to-child transmission of HIV for pregnant women;
e) Care of AIDS patients and their families facing financial difficulties.

D) HIV/AIDS regulations

These regulations, which came into effect on March 1, 2006, bring greater national attention to the plight of those who have contracted HIV, while also codifying antistigma and antidiscrimination rules. The regulations stipulate the role of different government agencies at national and local levels and spell out the rights and obligations of HIV-positive persons and their families.

E) Overall Effect

Beijing has developed good policies in response to the epidemic. Yet, persistent and serious gaps remain in the Chinese government's response. A debilitated public health system, particularly in rural areas where HIV is hitting hardest, undermines an effective response to HIV/AIDS. Overall, resources and capacity are lacking at many levels. Medical professionals lack the expertise and necessary incentives to treat HIV/AIDS patients as well as the necessary equipment and technologies to properly diagnose, counsel, treat, monitor, and care for them. The central government has placed increasing responsibility for financing health care on local authorities. HIV/AIDS, however, is most prevalent in some of the poorest and most remote parts of China, where there is the least financial capacity to address HIV/AIDS prevention and control.

(Ref. R17)

20.1.4.2 Food Safety

China sought to mitigate the risk from unsafe food, maintain the focus on food and product safety, and raise the expectation that the benefits of enhanced oversight would extend beyond the Olympics. Although a high-tech tracking and tracing system was a positive step toward ensuring the safety of food supplies for Olympic athletes, risks remained. Poor animal husbandry practices, a dilapidated healthcare system, and widely varied hygiene and manufacturing practices increased the risk that a public health, food safety, or consumer product crisis could emerge at an inopportune moment, with little guarantee that local or central government officials would respond appropriately.

(Ref. R16)

20.1.5 International H&S

Beijing set aside thousands of hospital beds for emergency use during the 2008 Olympic Games in case of outbreaks of infectious diseases. By the time the Games began in August 2008, the city had 6,350 beds and 144 hospitals equipped to diagnose and treat infectious diseases like bird flu and SARS.

"In the past, the outbreak of an infectious disease might not be reported in Beijing for up to a week. Now ... the delay has been reduced to less than 10 hours," Xinhua said, citing the Beijing Disease Prevention and Control Centre.

China was widely criticised for its initial cover-up of the SARS virus, which originated in southern Guangdong province in 2002 and rapidly spread around the world, infecting about 8,000 people and killing 800. An outbreak in Beijing panicked residents and caused many to stay indoors for weeks on end in 2003 for fear of infection. China was also seen as crucial in the fight to control bird flu. In April 2007, China launched a campaign to vaccinate billions of domestic poultry to guard against outbreaks occurring.

(Ref. R18)

21. HOST COMMUNITY RESEARCH – ENVIRONMENT

21.1.1 Environmental Planning

A project was conceived to help improve air quality, through selective traffic constraint in Beijing. This was triggered by the Olympics but with a long-term view to provide permanent benefits to the population. This project is called ITS-TAP – Intelligent Transport Systems for Traffic Air Pollution.

This project is a joint venture coordinated by Thetis and involving Fata DTS, ATAC and Ecotema, and undertaken between 2004 and 2008, and was carried out to develop an “intelligent” Limited Traffic Area within the second ring road. The innovative idea behind this pilot project lies in the fact that it allows limited access to the more polluting vehicles during pollution peaks.

These peaks are forecast by a mathematical model based on the continuous monitoring of traffic pollutants and the number of vehicles circulating in the ring road area.

21.1.2 Post Event Planning

Beijing Mayor Liu Qi, who was also chairman of the Beijing 2008 Olympic Bid Committee, pointed out that the IOC, by awarding Beijing the right to host the 2008 Olympic Games, would indeed "leave China and the world with a unique precious legacy," as was stated in the Evaluation Report of the IOC.

This can be interpreted primarily in four aspects. Firstly, for the first time the Olympics would be held in a country with a population of 1.3 billion, which means the Olympic spirit would be disseminated to the most people. Secondly, the Olympics being held in a developing country like China would greatly boost its national economy. Thirdly, with sports, culture and environmental protection being the three themes of the current Olympics, Beijing would greatly promote the integration of sports and culture, raise the consciousness of environmental protection and improve the environment through hosting the Olympic Games. Finally, with Beijing hosting the Olympic Games, China would open wider to the rest of the world and better integrate with world economy.

Mayor Liu also noted that over the past few years, Beijing had maintained a relatively high rate growth in its urban development and economic construction. Having won its Olympic bid, the process would undoubtedly be accelerated. Liu said that, as the economy continuously grows, the financial revenue of the municipal government increases at an annual rate of 20 percent, which provides sufficient financial capacity for hosting the Olympic Games. In return, through preparing and hosting the Games, Beijing would open wider to the outside world and attract more foreign investment and Sino-foreign economic cooperative projects.

Tang Long, news spokesperson of the Beijing municipal government, said Beijing mapped out the new development strategies at the beginning of the century. It had been decided to put a record 180 billion yuan in the construction of urban infrastructure in the following five years. Specifically, the money would be used in the construction of 142 projects in an attempt to narrow the gap between Beijing and other international metropolises. Of it, 90 billion yuan would be used to build subways, light rails, expressways and airports to form an efficient transportation network; 45 billion yuan would be used to improve the environment; 30 billion will be used in IT construction to lay a foundation for "digital Beijing" and initially realize e-administration, e-commerce, IT community and remote education. The remaining 15 billion yuan would be used for the construction and upgrading of facilities, including the supply of water, power, gas and heating.

By 2008, Beijing had completed the 93-km Fifth Ring Road, the 35-km high-speed interconnection road and the 105-km trunk roads. Rail lines increased to seven, with the total mileage reaching 190 km. The public transit system had 650 operating lines, with the annual passenger handling volume reaching 4.5 billion people. In addition, 222 long-distance bus lines led to the city's outskirts. A public transit network, centering on the city proper and radiating to its fringe as well as various residential districts, was formed. Traffic Management would make full use of the global satellite positioning system to control and regulate traffic volume in a scientific and accurate manner, thus significantly reducing the occurrence of traffic jams.

Beijing's Capital International Airport now has two runways, two terminal buildings and 75 aircraft waiting bays. Before 2008, the air- port underwent large-scale expansion, adding one runway, an additional terminal building and 55 standard aircraft waiting bays, so its annual passenger handling capacity reached 48 million people. The frequent arrival and departure of travelers also benefitted Nanyuan Airport in suburban Beijing and Binhai Airport in Tianjin.

Beijing also accelerated its construction of a digital cable TV network and broadband transmission system. New submarine fibre opticwas laid and a satellite ground station is under construction. A transportable satellite system will also be adopted, while a digital broadcasting system covering the entire country will be completed.

Liu reiterated that in the following few years, Beijing would try its best to build a high-standard ecological system, a high-efficiency green industrial system and a high-level forest and green land resource system. In doing so, Beijing would become a modern international metropolis boasting of fresh air, a beautiful environment and sound ecology to attain the goal of "green Olympics."

Great efforts made to improve the environment were by no means just a move of decoration during the procedure of the Olympic bid. Rather, it was a development plan that Beijing Municipality made much earlier. According to the plan, Beijing would have completed 20 major projects involving environmental improvement by 2007. When the 29th Olympic Games are held in Beijing, the city's environmental quality would be up to all the standards required of the Olympic Games. Beijing will be matched with major cities in developed countries.

Spokesperson Tang Long pointed out that by 2008, Beijing would lead the country in realizing modernization, with the framework of a world-class international metropolis taking shape. He noted that Beijing was faced with quite a number of problems, including air pollution, water shortage, congested traffic and the need to renovate dilapidated houses. However, the historical mission of modernization and the solemn commitments to the Olympic Games would motivate people in Beijing to use their wisdom, courage and spirit of working in earnest to create a "New Beijing, Great Olympics." (Ref. W39)

22. HOST COMMUNITY RESEARCH - FINANCE

China invested over $45 billion on the event. According to some estimates it could be $70 billion, making Beijing Olympics the costliest so far. In the Olympics in Athens in 2004, Greece invested $15 billion.

(Ref. W59)

22.1 THE RESOURCES OF THE BOCOG

The Beijing Organizing Committee for the Games of the XXIX Olympiad (BOCOG) develops the budget of US$ 1625 millions. The TV rights (International Olympic Committee, 2001) are the main revenue (43.6 %). Another 20.3 % derives from sponsors and licenses, 11.1 % should be from lotteries, and 8.6 % from tickets. (See the Table 1.)

The current operations of the BOCOG suppose 88.3% of the expenditures. Investments financed by BOCOG represents 11.7% of the total budget, from them 6.3% applied to sports facilities.

A REVENUES	US$ m	%	B EXPENDITURE	US$ m	%
1 Television rights[1]	709.00	43.63	B1 Capital investments	190.00	11.69
			13-Sports facilities	102.00	6.28
			-Olympic Village	40.00	2.46
2 TOP sponsorship[2]	130.00	8.00	-MPC and IBC	45.00	2.77
3 Local sponsorship	130.00	8.00	-MV	3.00	0.18
4 Licensing	50.00	3.08			
5 Official suppliers	20.00	1.23			
			B2 Operations	1419.00	88.31
6 Olympic Coins Program	8.00	0.49	14-Sports events	275.00	16.92
Philately	12.00	0.74	-Olympic Village	65.00	4.00
7 Lotteries	180.00	11.08	-MPC and IBC	360.00	22.15
			-MV	10.00	0.62
			15 Ceremonies and Programs	100.00	6.15
8 Ticket sales	140.00	8.62	16 Medical Services	30.00	1.85
9 Donations	20.00	1.23	17 Catering	51.00	3.14
10 Disposal of assets	80.00	4.92	18 Transport	70.00	4.31
11 Subsidies	100.00	6.15	19 Security	50.00	3.08
-National Government	50.00	3.08	20 Paralympic Games	82.00	5.05
-Municipal Government	50.00	3.08	21 Advertising and promotion	60.00	3.69
12 Others	46.00	2.83	22 Administration	125.00	7.69
			23 Pre-Olympic events and coordination	40.00	2.46
			24 Other	101.00	6.22
25 Shortfall			25 Surplus	16.00	0.98
Total	1625.00	100.00	Total	1625.00	100.00

-US dollar/ RMB *yuan* exchange rate used in preparing the budget: 1:8.27
-Date of finalisation of the budget: 14 December 2000

FIGURE 42 TABLE 1:BUDGET OF BOCOG 2008: REVENUES AND EXPENDITURES. (SOURCE: BOCOG (2007))

22.2 THE INVESTMENTS RELATED TO BEIJING OLYMPIC GAMES

The investments related to the Beijing OG can be estimated in US$ 14,256.6 millions. Three are the main items: environment protection (60.5%), transports (25.8%), and sports facilities (10.0%).

C Capital Investments	Construction Cost (US$ m)								Total
	2001	2002	2003	2004	2005	2006	2007	2008	
Planned Non Olympic Specific Expenditure									
Environmental protection	1000	1000	1500	1500	1500	1300	827	0	8627
Roads & railways	547	592	636	636	636	313	313	0	3673
Airport	12	30	31	12	0	0	0	0	85
Olympic Related Expenditure									
Sports venues			212.57	425.13	495.99	283.42	12.01	0	1429.12
Olympic Village					110.62	158.87	134.74	38.25	442.48
Total	1559	1622	2379.57	2573.13	2742.61	2055.29	1286.75	38.25	14256.60

FIGURE 43 TABLE 2: INVESTMENTS RELATED TO BEIJING 2008 (SOURCE: BOCOG (2007))

22.3 RELATIVE SCALE OF INVESTMENT

In comparing the previewed investments for Beijing 2008 with other Olympic case investments (Brunet 1994 and 2003, and Poynter 2006) we can realize the big scale of the works related to these OG. These figures are not definitive and thus the total investment favoured by the OG 2008 should be larger as well as the private contribution. (Yaxiong Zhang and Kun Zhao, 2007.)

Olympic City	Infrastructure Investment – actual sums (Billions - US Dollars)	Sources of Investment: Public Sector (percentage of total investment)	Sources of Investment: Private Sector (percentage of total investment)
Barcelona 1992	8.012	61.5	38.5
Sydney 2000	3.03	64.4	36.6
Beijing 2008*	14.257	85.0	15.0
London 2012*	13.7	64.2	35.8

FIGURE 44 TABLE 3: INVESTMENTS RELATED TO THE OLYMPIC GAMES (SOURCE: POYNTER (2006: 15))

(REF. R19)

23. HOST COMMUNITY RESEARCH – EVENT SPECIFIC DEVELOPMENT

Beijing Olympics Games Construction Project Management Information Platform

23.1 PROJECT OVERVIEW

The "Beijing Olympics Games Construction Project Management Information Platform" is a unified construction information management platform set up by Litsoft for the Beijing Organizing Committee for the Olympic Games (BOCOG).

To successfully hold the "2008 Beijing Olympic Games", the construction of the arenas and stadiums is a crucial task for the BOCOG and Beijing Municipal Construction Commission. There are more than one hundred sports sites and facilities need to be built in China. Because they are scattered in different places of the country and they have different construction cycles and different project management software. In 2003, the construction of Beijing Olympics Games arenas and stadiums entered the stage of full-scale implementation. To guarantee the smooth completion of all sports sites, the BOCOG need to effectively supervise about one hundred construction projects distributed in the country. It should make timely and effective monitoring and control of the funding situation, construction progress, engineering quality and existing risks of each project to make effective decisions and secure their successful completion.

The "Beijing Olympics Games Construction Project Management Information Platform" is thus designed and developed against this background, and is used to manage every construction project in the country in an all-round way. Various parameters of construction projects will be gathered in time to be uploaded to the Beijing Olympics Games Construction Project Department, and project managerial personnel make timely analysis of these data to conduct effective regulation and control of projects under construction.

23.2 SYSTEM ARCHITECTURE

Since the Beijing Olympics Games construction projects are characterized by numerous items, diversified investment, wide distribution area, great technical difficulties, strict quality requirement, many matters related to the communication and cooperation among projects and rigid progress control, the total scheme used 3-level platform as the overall arrangement. The level 1 platform is oriented to high-level decision-makers by providing service support. The level 2 platform is geared to regional administrators by providing services. The level 3 platform is designed for project owners, designing units, supervisory units and construction units. The data exchange is realized among all levels of platforms through the platform data exchange system to meet the requirements of all personnel for Beijing Olympics Games project construction management.

iNOVO Integration Server, iNOVO BPM Server, iNOVO Adapter, iNOVO MOM and iNOVO CM Server among EAI product lines of iNOVO are mainly used to realize the project management, e-government, coordinated office and information issue platform of the BOCOG, and provide the real-time heterogeneous system integration and data exchange of construction management systems like P3 and Menglong. The total system has fully shown the ideas of distributed data collection and concentrated data management for information platform, and offered complete business schemes and implementation reference for the Beijing Olympics Games construction projects, and even the domestic building industry.

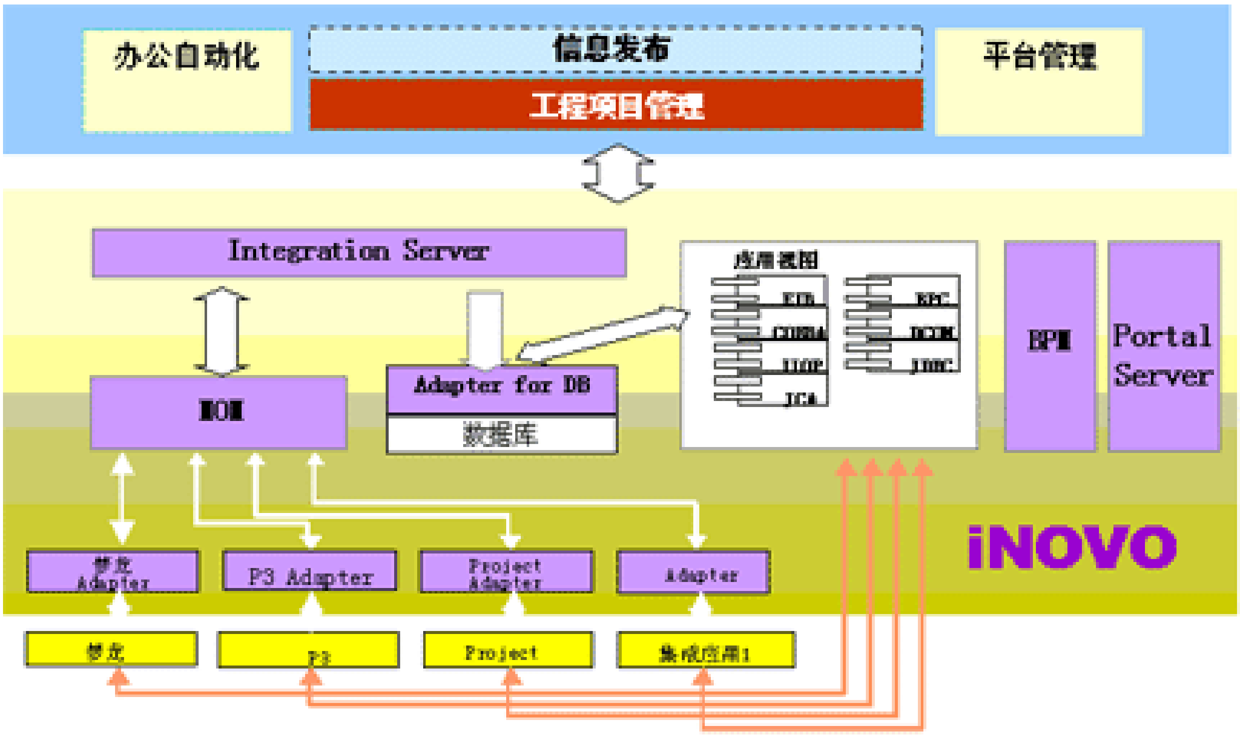


FIGURE 45 SYSTEM ARCHITECTURE

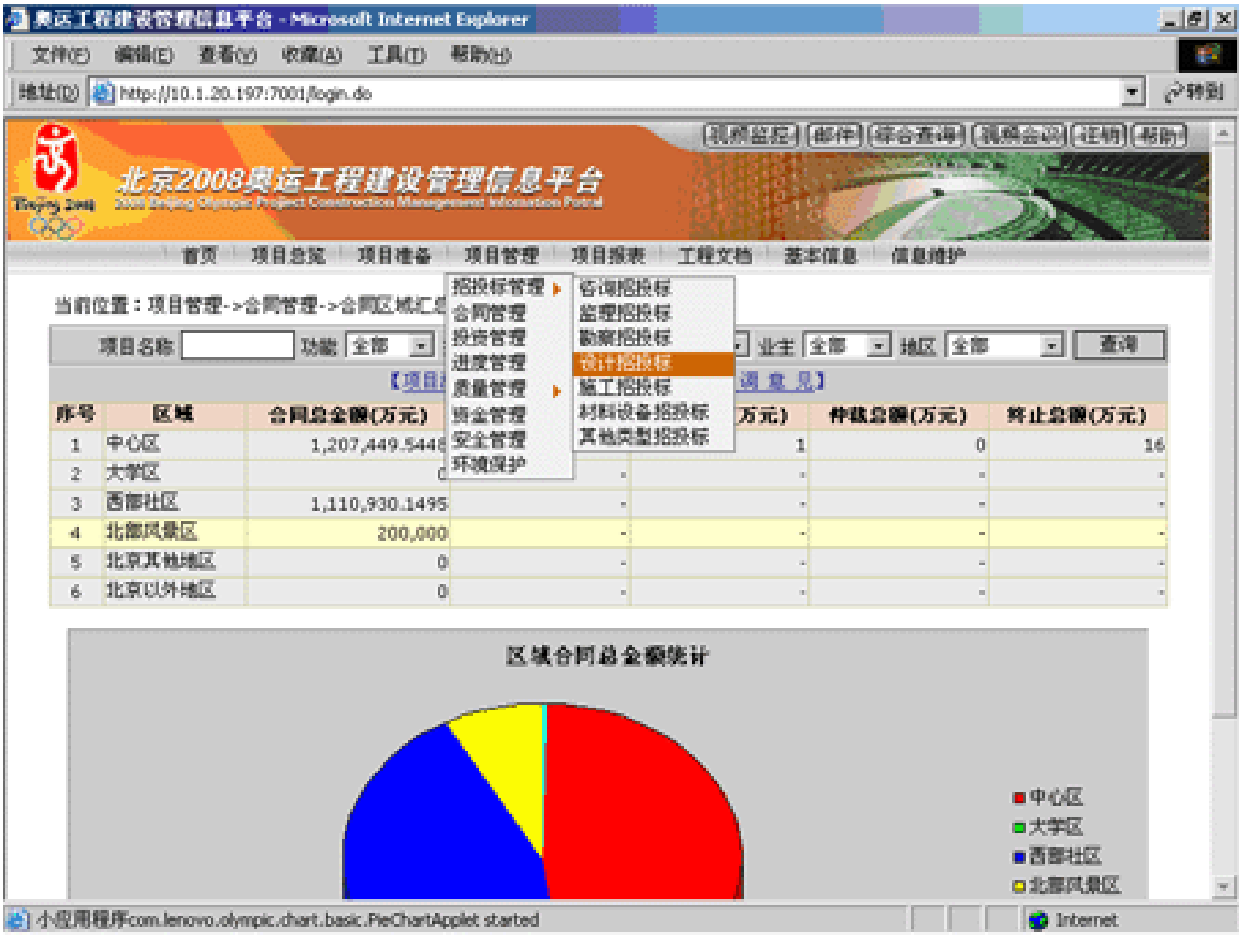


FIGURE 46 SCREEN SHOT 1

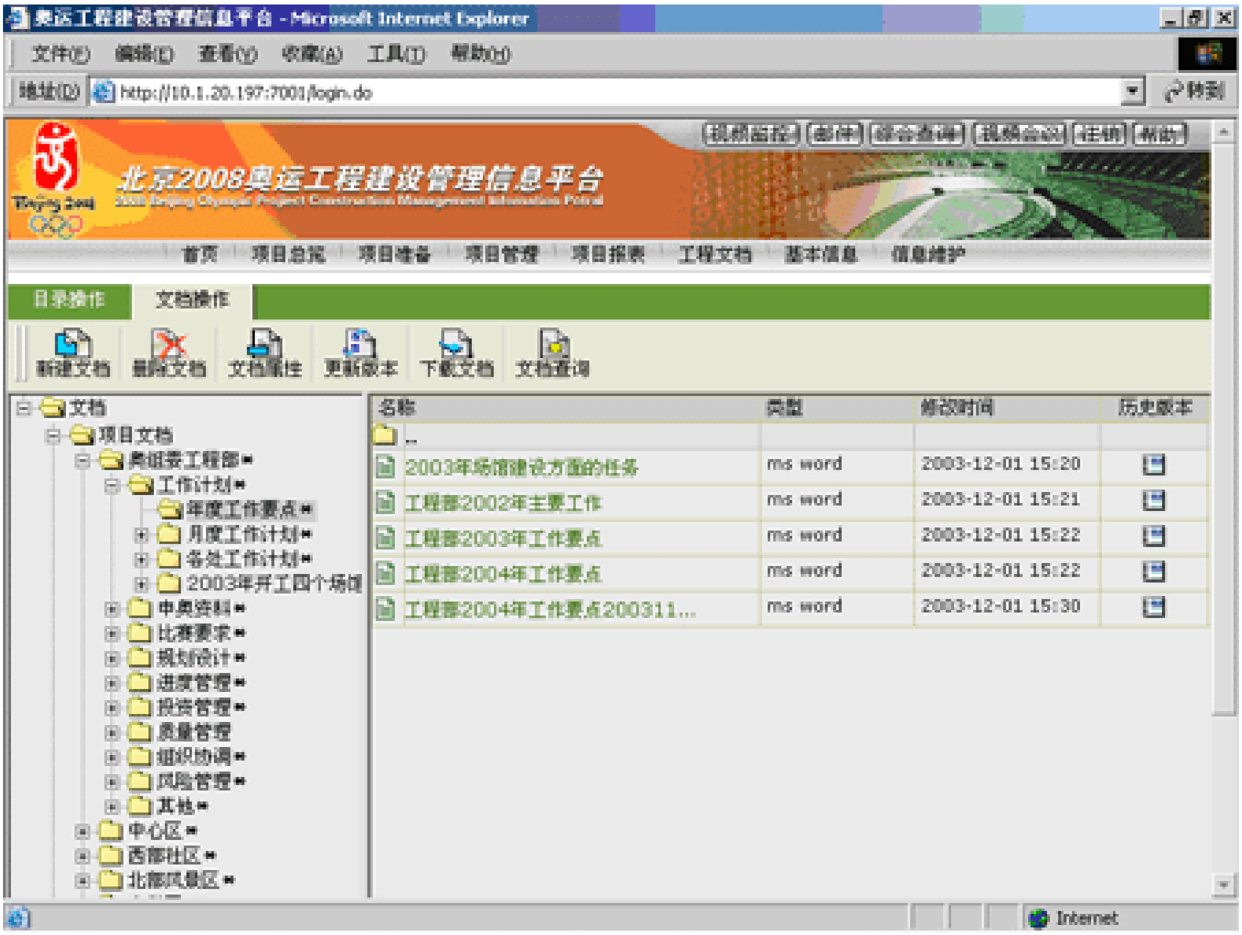


FIGURE 47 SCREEN SHOT 2

23.3 TECHNOLOGIES USED

Application Server: BEA Weblogic 7.0

Development Environment: Jbuilder 7.0

Project Management Enviorment:ProjectServer2002 PVCS

Operating System: Solaris 9, MS Windows 2000

Hardware Platform: Sun v880, Sun v480, Lenovo WanQuan R630

Database Server: Oracle 9i

24. HOST COMMUNITY RESEARCH - OPERATIONS

24.1 COMMAND SYSTEM FOR PUBLIC TRANSPORT DURING THE GAMES

The public transit operation centre was established during the Games in order to facilitate an overall supervision and coordination in operation of the city transport, which would ensure the harmonious operation of the Olympic transport and city transport as a priority, with the principle of safety, punctuality, reliability, and convenience. Public transit operation centre set up five branches, namely, the centre office, the events transport service centre, the security arrangements centre for transport organization, the transport facilities arrangements centre, and the city transport service centre, which would coordinate with other departments, such as, the transport office of the Olympic organizing committee, the public security transport administration bureau, and the transport bureau, in order to confirm the organization and security of the Olympic and social transport (Figure 48). The centre would also provide transport services for five groups (T1–T5).

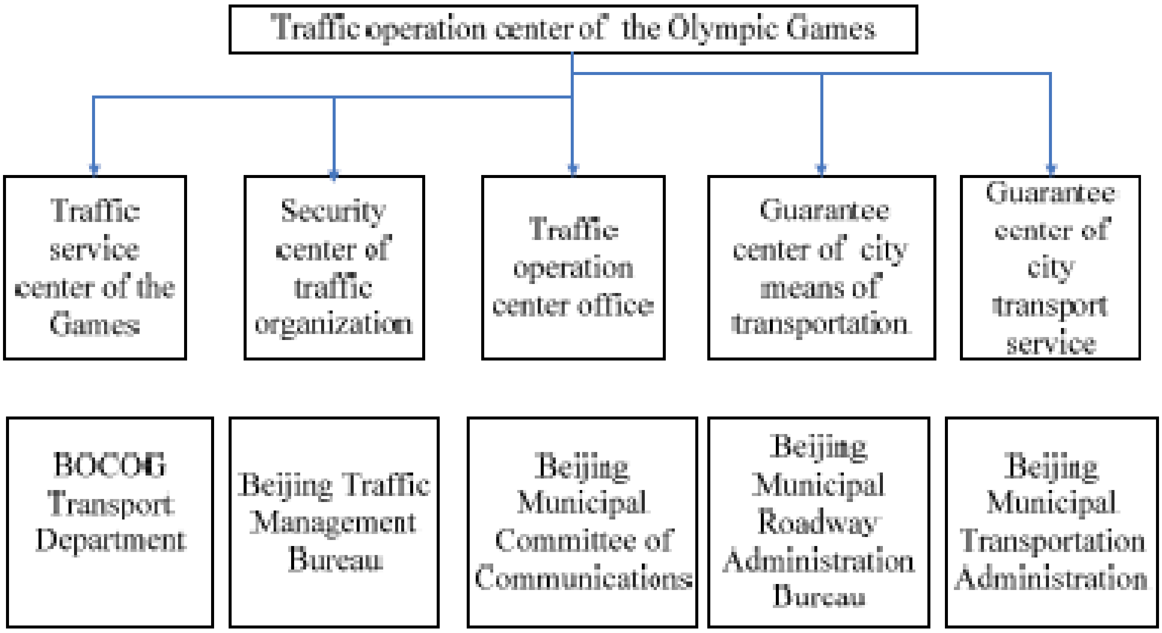


FIGURE 48 FRAMEWORK OF BEIJING OLYMPIC TRANSPORT COMMAND SYSTEM

24.2 TRANSPORT OPERATION TO VENUES

To keep an effective regional control of venues and surroundings, three sections were segmented, namely, the leading section, the control section, and the restricted section. Personnel and possessions were fully controlled in the leading section. Having access to these areas, vehicles were duly advised to backtrack or detour. Personnel and vehicles with valid certificates were entitled to gain entrance to the control section. The restricted section was exclusively accessible for personnel and vehicles with valid certificates via security check, Figure 49, indicates the details. The transport organization of the Olympic Games venues was programmed in coordination with security check and transport schemes to ensure the smooth operation. Its basic principles were safety and order, convenience, special routes for client groups and regional control. In order to meet the needs of various client groups, special routes were provided for spectators, mass media, honoured guests, staff, athletes, and technology officials.

FIGURE 49 THREE TRAFFIC CONTROL AREAS FOR OG

24.3 TRANSPORT ORGANIZATION OF OPENING AND CLOSING CEREMONY

Detailed plans were worked out to achieve an effective transport. Twenty-eight special bus lines, subways, and routine bus networks were served for spectators and volunteers. Remote rendezvous, regional parking, and time-sharing arrival through different routes were managed for various groups of clients. Remote rendezvous, security check, and time-sharing arrival were organized for honoured guests, athletes, and technology officials. In case of evacuation, 100 routes were arranged to link up with special bus lines. In addition, a 24-hour subway operation was undertaken. An effective coordination system jointly involving jointly the national stadium, the Olympic Green and transport service teams for clients was established. Accordingly, when the opening ceremony concluded, political celebrities and athletes could return to their lodging with 27 min and 50 min, respectively. Spectators at centre area needed 75 min to evacuate, which reduced 15 min compared to 90 min in the original plan. In the closing ceremony of the Olympics and opening ceremony and closing ceremony of the Paralympics Games, the evacuation from the stadium was completed within 70 min. Figure 50 indicates performers' routes in OG. Other works included design on security arrangements and traffic operation. The former was concerned with setup of security guard areas and security check sites around venues according to traffic requirements. These security check sites were intended for vehicles, passengers with certificates, and spectators with tickets. Meanwhile, the security check system was established according to circulation. The latter referred to the design on organizational routes for traffic groups on the basis of traffic facilities and security guard designs, which included vehicles, routes and ring design, venue of vehicles route, organizations, establishment of stops for personnel with certificates, operation organization of traffic stations, and routes for spectators on foot.

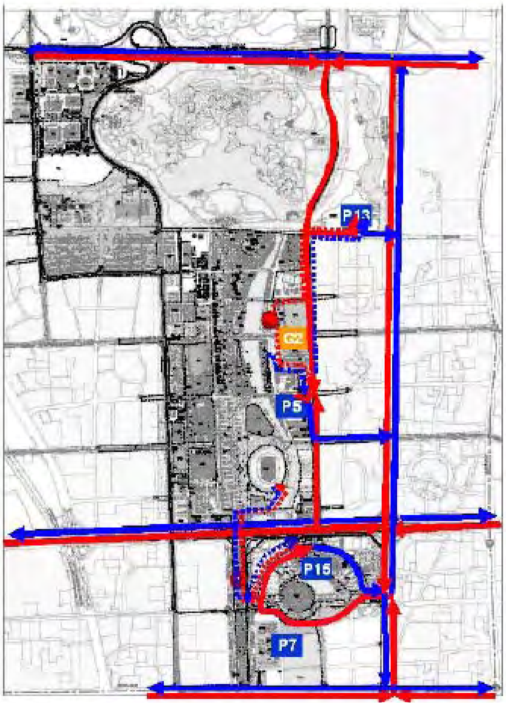


FIGURE 50 TRAFFIC ROUTES FOR PERFORMERS IN OG FOR OPENING CEREMONY

24.4 ROAD TRANSPORT OPERATION

24.4.1 Decrease of Motor Traffic Flow

Motor traffic flow decreased by 32.57% on the whole with the application of the odd-even day vehicle operation. During the Olympics, the odd-even day vehicle operation had affected the traffic flow, and the changes of different vehicles are shown inFigure 51. The total traffic flow of motor vehicles dramatically decreased during the two periods of restriction. The decrease in the period before the Olympic Games was more obvious with a decreased ratio of 32.5%. Because of the formal operation of Olympic service vehicles, the traffic flow during the Olympic Games period slightly increased. However, there was still a 22.55% decrease compared to the normal investigation result.

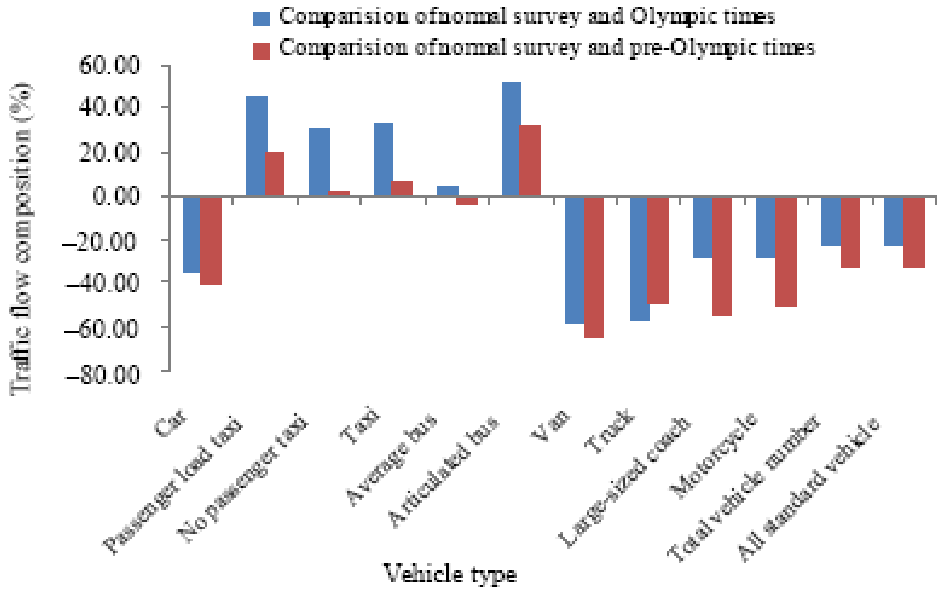


FIGURE 51 CHANGE OF VEHICLE QUANTITY PERCENTAGE BEFORE AND DURING OLYMPIC TIME

24.4.2 Traffic Network Speed Increase

During the Olympic Games, the speed on AM and PM peaks on the traffic network increased by 26.9% and 22.8%, respectively. With regard to the speed, the traffic during Olympics and Paralympics was very smooth. Compared with the conditions before the restriction regulations, the speed on AM and PM peaks on the traffic network, increased by 26.9% and 22.8%, respectively during the Olympics. The increase rates were 16.9% and 19.6% during the Paralympics (Figure 52).

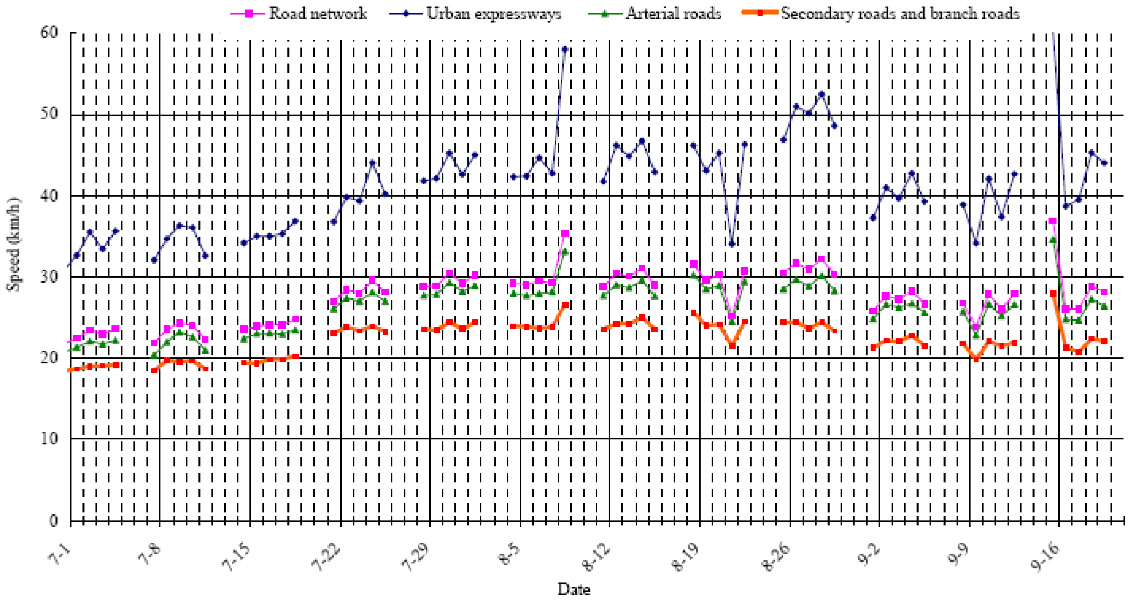


FIGURE 52 SPEED IN AM PEAK PERIOD BY DIFFERENT ROAD TYPE (WORKDAYS)

24.4.3 Rush Hour Migration

The appearance of rush hour in the morning delayed about half an hour during the Olympic and Paralympics Games. By comparison, the appearance of rush hour was delayed about half an hour during the Olympic and Paralympics Games. As a result, speed differences between rush hour and average time decreased markedly, which led to a balance of road network (Figure 53).

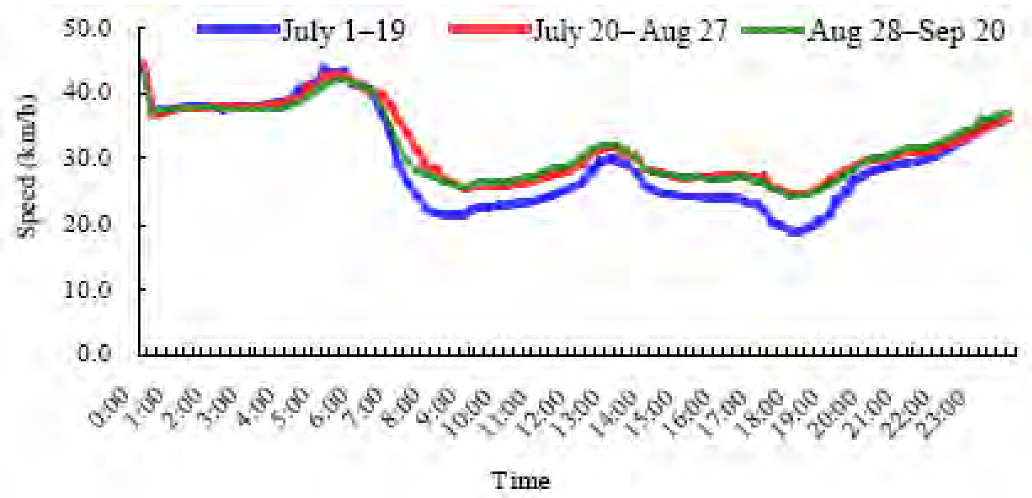


FIGURE 53 SPEED OF ROAD NETWORK IN FIFTH RING ROAD

24.4.4 Avoidance of Traffic Jams

On the whole, traffic jams were avoided in the road network during the Olympic and Paralympics Games. According to the time distribution calculated by floating cars, on the whole, traffic congestion was avoided in the road network during the Olympic and Paralympics Games. With the application of the odd-even day vehicle operation, the waiting time produced a null effect, which was generally five hours and three quarter hours, due to traffic jams (Figure 54).

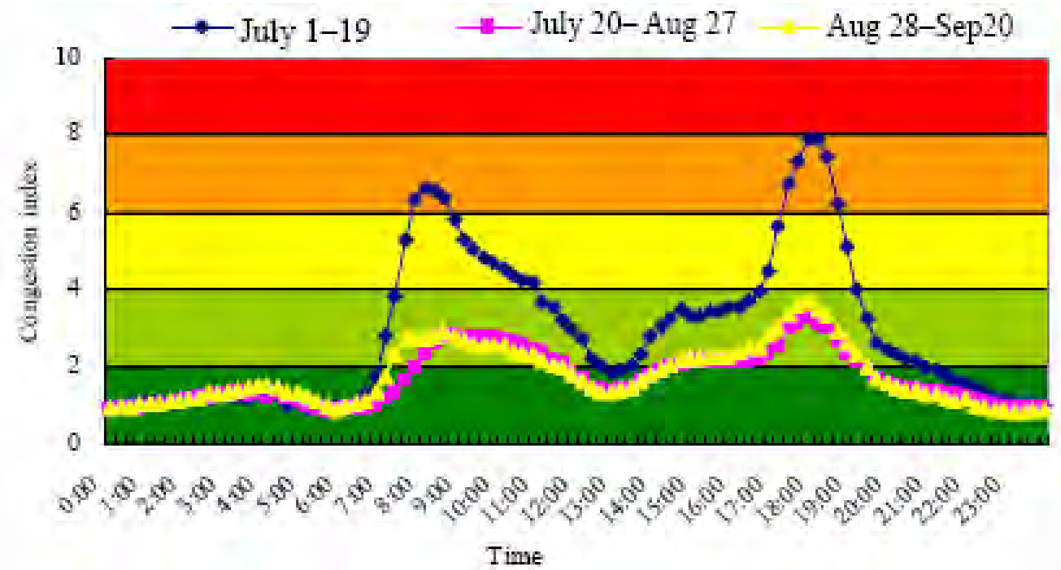


FIGURE 54 CONGESTION INDEX BEFORE AND DURING OLYMPIC TIME ON WORKDAYS

24.5 PUBLIC TRANSIT SERVICES

Workload of buses and trolleys had been increased by taking measures such as improving efficiency, increasing vehicles, and developing potentials during the Olympic Games. More than 17 thousand buses and trolleys were prepared daily, which operated 172 thousand times on average and carried 2.8 million passengers per day. As implied in related surveys, public transport services were improved during the Olympic and Paralympics Games. 74% surveyors agreed a huge increase on speed. 50% surveyors accepted that the buses are less crowed. 50% surveyors found the decreased waiting time and higher service level (Figure 55).

Table Results of a survey on transport service quality

Service index	Prior to the Games			During the Games		
	Operation speed	Crowd	Time spent on waiting for buses	Operation speed	Crowd	Time spent on waiting for buses
Growing crowd	4%	27%	11%	1%	16%	6%
Much the same	28%	44%	51%	25%	37%	44%
Less crowd	53%	29%	38%	53%	47%	50%
Faster	15%	–	–	21%	–	–

FIGURE 55 RESULTS SERVICE QUALITY SURVEY

(Ref. R20)

25. HOST COMMUNITY RESEARCH – MONITORING

25.1 THE NEED FOR AN INTEGRATED MONITORING SYSTEM

The legacy transportation information system was designed and used solely for the needs of the transportation department. At the time, interconnection with other systems was not a priority and data exchange was difficult to achieve. The difficulties were many, including: lack of information sharing mechanisms and methods, inconsistent data formats and statistics. This resulted in poor managerial coordination and the inability to cope with unforeseen events. However, the Internet ITS Centre of Beijing was dedicated to provide the technology platform for the overall transportation system of the capital city. The objective was to build a world-class innovative transportation management system for the citizens of Beijing and the Olympic Games in 2008. The authorities aimed at promoting Beijing as a modern and international metropolis with a transportation system which is altogether smooth and efficient, safe and comfortable, economical and modern.

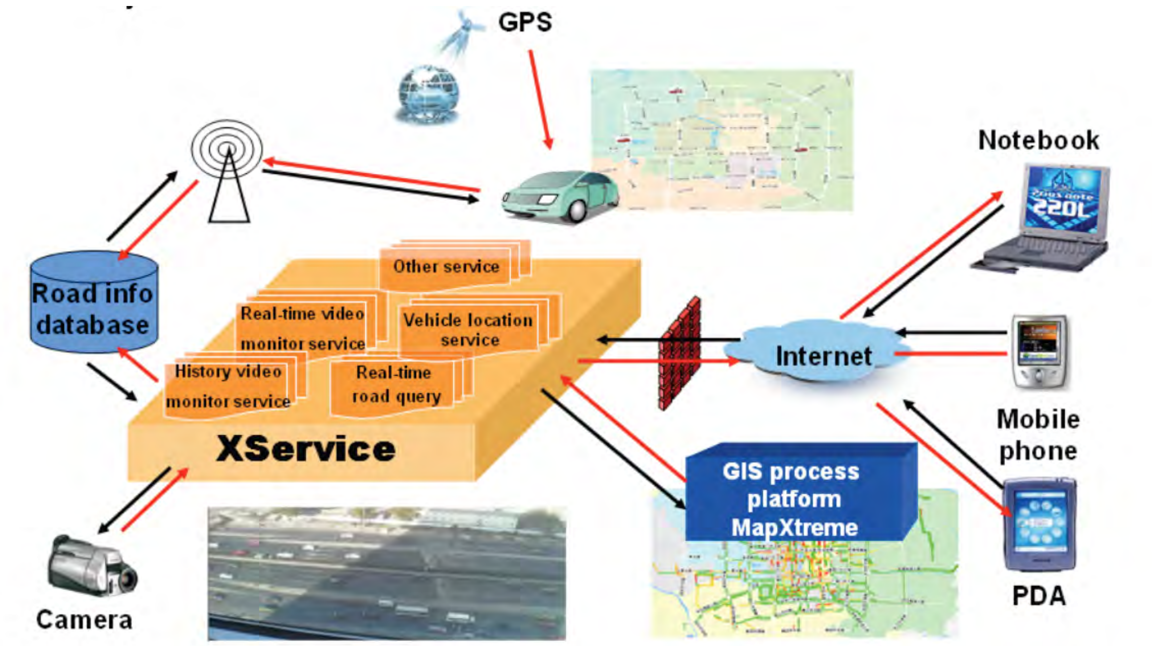
25.2 THE SOLUTION

Web Service solution is called Xservice. Xservice is a complete environment to support Web Services-based applications from the OW2 Consortium. Xservice provides an efficient way to share data and software resource over the Internet. It supports Java Web Service by default; it can also transform many kinds of components such as EJB, CORBA, and CCM into Web Services by a series of adapters. As detailed in the illustration, in the ITS platform, Xservice provides the interconnection mechanism between:

a) Real-time road query services
b) Vehicle location services
c) Real-time video monitor service
d) History video monitor service.

The ITS technical architecture includes four key functional areas:

i) Information collection and manipulation: this is based on embedded technology implemented by the automobiles manufacturers
ii) Road monitoring and measurement: this is based on the next generation Internet technology
iii) Publication of traffic information: this is based on advanced the Web Service technology
iv) Terminal of the intelligent vehicle: development carried by specialist companies.



(Ref. R22)

25.3 BEIJING REAL-TIME TRAFFIC INFORMATION COLLECTION, PROCESSING, ANALYSIS AND DISTRIBUTION PROJECT

Phase I of the Beijing Real-Time Traffic Information Collection, Processing, Analysis and Distribution project is to accumulate traffic data from around the city. The system collects, processes, analyzes, displays and stores real-time traffic status information from a variety of independent systems. This is sent to a number of different end-users within the Beijing Traffic Management Bureau (BTMB).

Another function of the first phase of the project was to create a basic framework upon which additional systems could be integrated as the BTMB continues to build its full ITS in advance of the 2008 Beijing Summer Olympics.

The ITS was built using IONA's Orbix 2000. IONA is part of the OW2 onsortium.. The IONA platform provides the CORBA-compliant functionality required for transparent, system-wide data transport and integration between the various sub-systems within the BTMB.

The framework was expanded in several phases up to 2008. The next phase was to bring all real-time and near real-time systems online, which integrated data from several static data sources. Finally, the traffic control systems were integrated to give the BTMB real-time tools to manage traffic in Beijing on permanent basis.

(Ref. W61)

25.4 AIR QUALITY

Beijing has 27 air-quality monitoring stations, but some observers have questioned whether the stations, many of which are in rural and mountainous areas in the city's suburbs, accurately reflect the quality of air in the crowded urban centre of the city where most people live — and where most Olympic events will take place. In recent days, one reporter at the news conference remarked, the hazy air has seemed polluted, though the environmental agency's daily figures say the pollution level has been low.

(Ref. W60)

26. HOST COMMUNITY RESEARCH – EVALUATION

In 1999, the Chinese Academy of Sciences established the ITS Laboratory for developing, testing, and evaluating traffic control and management systems. Figure 56 The Chinese Academy Of Sciences Its Laboratory.shows some facilities at the ITS Lab, which is located at the CAS Institute of Automation's Intelligent Control and Systems Engineering Center in Beijing.Figure 57 shows the hardware architecture and an earlier version of the intersection traffic controller developed in the ITS Lab. The version in the figure is based on the Type 2070 Advanced Traffic Controller specification (a US standard) and an embedded application-specific operating system (ASOS). An expanded, comprehensive testing laboratory will be established soon in the National Field Testing Facility for ITS in Tong County, Beijing. Since 2002, systems have been deployed for traffic control in cities outside Beijing, and the CAS is conducting several site evaluations. The control and management of Beijing's traffic system offers a golden opportunity to validate and deploy ITS concepts and techniques for both China and the world. Although tremendous progress has occurred over the last three years, the road to a fully functional and integrated intelligent- traffic-operation system in Beijing will still be long and difficult. With only five years left, we hope that the efforts of this project and many others will make the 2008 Olympics not only a grand festival of world athletes but also an exciting demonstration of effective ITS technology.

FIGURE 56 THE CHINESE ACADEMY OF SCIENCES ITS LABORATORY.

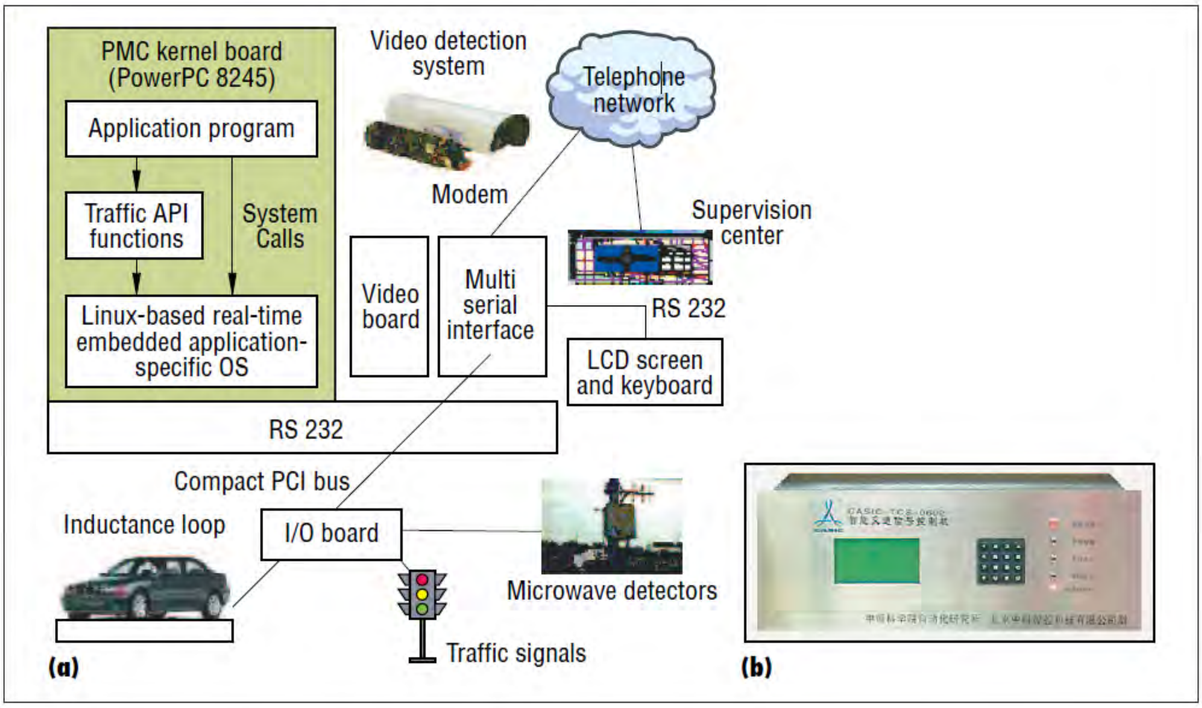


FIGURE 57 THE CASIC INTERSECTION TRAFFIC SIGNAL CONTROLLER

() Hardware Architecture and (b) Prototype.

(Ref. R21)

There appears to be no evidence of MAESTRO Style evaluation of the ITS Measures.

27. APPENDIX A - TABLE OF FIGURES

28. APPENDIX B – BEIJING TRANSPORT SAFETY REGULATIONS

Decree of Beijing People's Government (No.147)

"Management Measures for the Safe Operation of Beijing's Urban Track Transportation ", adopted on April 20th at the 23rd meeting of the Standing Committee of Beijing People's Government, is now promulgated and shall go into force on June 1, 2004. Mayor Wang Qi'shan April 28, 2004

Measure of Management for Safe Operation of Beijing Urban Railroad Transportation

28.1 CHAPTER 1 - GENERAL PRINCIPLES

28.1.1 Article 1

This Measure is formulated with a view to strengthening the management of the safety of the urban track transportation, ensuring the safe operation and protecting the lawful right and interest of the passengers and in light of the reality of this city.

28.1.2 Article2

All the activities conducted in the administrative scope this city and in relation with the safe operation of urban track transportation shall follow this Measure.

The urban track transportation mentioned in this Measure refers to the urban track public passenger transportation system including subway and light railway.

28.1.3 Article3

The management for the safe operation of the urban track transportation shall follow the principle of "safety first and prevention prioritized".

28.1.4 Article4

The city's administrative and management department for supervision over the safe production shall be responsible for the comprehensive supervision and management of the safe operation of the urban track transportation.

The city's administrative and management department of transportation is responsible for the supervision and management of the safe operation of the urban track transportation service, the work of guiding the operational units of the urban track transportation(hereinafter referred to as operational unit)to fully implement the measures of safe operation and eliminate hidden hazard of accident, correcting the operational units' activities violating the this Measure and requiring the administrative management department concerned to deal with the violations in accordance with law.

The administrative management department of planning, construction, public security, firefighting, public health, environment protection and municipal management shall effect supervision and management over the safety of the urban track transportation as required by their respective responsibilities.

The people's government of the district and counties along the track shall be responsible for the publicity, education, assistance in the reaction to emergencies and aid requirement.

28.1.5 Article 5

The department concerned of the people's government of the city and the operational unit shall take multiple forms to publicize the laws, rules and safety know-how about the safe operation of the urban track transportation among the public so as to enhance their awareness of safety.

28.2 CHAPTER 2 - LINK BETWEEN CONSTRUCTION AND OPERATION

28.2.1 Article 6

In the feasibility study and initial design of the construction project of the urban track transportation, there should be the contents of fixing the operation of trains, the dispatch and order issuing, the auxiliary system of operation, the repair and maintenance system and the organization of working staff and such contents should be the result of safety study and the functions system should meet the requirement of safe operation.

28.2.2 Article7

The equipment and the design, installation and construction of facilities of the urban track transportation should be in line with the designing standard and technological specifications of the city and the state.

28.2.3 Article8

When the construction of the urban track transportation system is completed, the designing unit should provide the operational unit with technological file and relevant information and organize a trial operation with the operational unit so as to test the equipment and facilities and make safety testing. The period of trial operation should be not shorter than 3 months and the train shall not take passengers during this period.

28.2.4 Article9

If the trial operation meet the relevant requirement, the construction unit should make final test to complete the construction. If the result of the test reaches the goal expected, the construction should be reported to the construction administrative department for file keeping. Then, it can be transferred to the operational unit so that the system can be put into trial operation.

During the period of trial operation, the operational unit shall conduct safety monitoring and comprehensive testing over the equipment, the operation of equipment and the operation reality according to the designing standard and technological specifications. The period of trial operation shall be not shorter than 1 year. If the equipment and facilities keep a normal operation when the trail period expires and can be put into formal operation, the operational unit should report to the transportation administrative department for file keeping thirty days before the formal operation of these equipment and facilities.

28.3 CHAPTER 3 - SAFE OPERATIONAL MANAGEMENT

28.3.1 Article 10

It is prohibited to setting horizontal cross and zebra passage on the tack on the surface of ground. It is prohibited to building any kind of buildings or constructions that will affect the view scope of the driver at the inside area at the curve of the track lines on the ground surface. It is also prohibited to planting trees that will affect the view scope of the drivers of operational trains.

28.3.2 Article 11

To strictly control the operation that may affect the safe operation of subways. If the following operation that my affect the safe operation of subways is really needed, the construction unit should produce effective plan for effective protection. When the operational unit agrees to this plan, the construction unit can make application to the administrative department of planning and construction for administrative license.

(1)To build, rebuild or expand the old buildings or constructions;

(2)To dismantle buildings and constructions;

(3)Other operations that increase or decrease load in large areas.

The administrative management department should make their decisions of administrative permission according to the safety protection plan that has passed the feasibility study. For the operation that have been give permission, the constructing unit should fully implement the plan of safety protection. The construction unit and operational unit should make dynamic monitoring over the operation according to relevant technological specifications. Should there occur things that may endanger the safe operation, the construction unit should stop the construction immediately and take remedial measures. The construction unit should also report to the administrative management department, the city's transportation administrative and management department and operational department.

28.3.3 Article 12

The city's transportation administrative and management department should formulate the standard for the safe operation of the urban track transportation and the operational unit should transport passengers according to such standard.

28.3.4 Article 13

The operational unit should shoulder the following responsibilities for safe operation:

(1)To establish a complete responsibility system for safe operation

(2)To organize the work to formulate rules for safe operation and procedures of operation

(3)To ensure the effective returns of the input made by itself on the safe operation

(4)To guarantee the check of the safe operation by itself and eliminate the hidden hazard of accident

(5)To organize the work to formulate and implement the plan for dealing with emergency at its early stage and the plan for operation under special circumstance

(6)To report accident in time and in truth.

28.3.5 Article 14

The major person in charge and the clerk managing and supervising safe production must have the knowledge of safety and capability of management for operation.

28.3.6 Article 15

The operational unit should provide education and training in safety for the working staff in the line so that the staff have necessary knowledge of safe operation, are familiar with relevant rules of safe operation and procedures of safe operation and grasp the techniques for the safe operation at their posts.

The working staff of the operational unit should perform the following duties for safe management:

(1)To maintain the order in the station, guide the passengers to take the train in good order and guide the passengers to evacuate from the station when dangers occur;

(2)To stop activities that may cause dangerous result or dissuade people from doing such things in time; if the effort to stop or dissuade is useless, the person doing such things will be transferred to police station;

(3)To report in time the hidden hazard of accident.

28.3.7 Article 16

The working staff for special operations of the operational unit must have taken the special training for safe operation, as required in the relevant rules of the state. After they get the license for special operation can they work for such special operation.

The driver of the train should follow the rules of safe operation and the procedure for safe operation and should refrain from any activities not related with driving.

28.3.8 Article 17

When the train for the urban track transportation runs on ground surface in the meteorological conditions of sand, hail storm, rain, snow, fog or ice, the plan and rule of operation should be followed to secure safe operation.

28.3.9 Article 18

The operational unit should make regular repair, maintenance, upgrading and reform on the safety guaranteeing systems like the power supply system, telecommunication system, signal system, ventilation system, water supply and drainage system, disaster-prevention monitoring system and environment and equipment monitoring system according to the safety standard and technological specifications of the city and state for the equipment and facilities of the urban track transportation so that the train can run normally.

28.3.10 Article 19

No vendor's stand is allowed to enter the platform, hall and evacuation passage of the urban track transportation system.

The exit/entrance of the station and the stations of the urban track transportation should be kept unobstructed. No behavior affecting passing and aid and evacuation is allowed there.

28.3.11 Article 20

The station, train carrier, track and tunnel should be equipped with equipment of warning, lighting for emergency conditions, protection, rescue and fire distinguisher and all equipment should be kept in good conditions.

28.3.12 Article 21

The operational unit should install luminous safety marks for the purpose of direction showing, evacuation, reminding, warning, restriction and prohibition at the obvious positions at the operation places like the railroad line, tunnel, platform, station hall, evacuation passage, exit/entrance, ventilation plant and train carriage and make regular check, repair and maintenance on these marks so that they can function well.

28.3.13 Article 22

The relevant organs of power supply, telecommunication and water supply should secure to satisfy the need of the urban track transportation for power, telecommunication and water.

28.3.14 Article 23

The operational unit should provide the passengers with safe and fast passenger transportation service so as to protect their lawful rights and interests.

When the operation of the train of the urban track transportation is affected as a result of problems, the operational unit should solve the problems in time to resume the operation. When the operation cannot be resumed, the operational unit should evacuate the passengers and help them to change the train.

28.3.15 Article 24

When the passenger volume rises due to the factors of weather, holiday, festival or large-scale public activities, the operational unit should expand its transportation capability in time to scatter passengers.

28.3.16 Article 25

The passengers entering the stations of the urban track transportation system should follow the following rules:

(1)to receive the security check-up by the public security officers and the working staff at the station and coordinate them in such check-up;

(2)to follow the marks of safety and follow the instructions of the working staff;

(3)to stand behind the safety line when waiting for a train and follow the rule of "out first, in second"when getting in the train and refrain from touching the door of the train after it is closed.

28.3.17 Article 26

The following behavior that may jeopardize the operation of the urban track transportation system shall be prohibited:

(1)to intercept train;

(2)to enter the forbidden area like the railway line and tunnel without permission;

(3)to get in and out of the train by force;

(4)to throw objects to the train, engine, repair vehicles and other equipment;

(5)to damage the train, tunnel or rail;

(6)to damage or disturb the electro mechanic equipment, over-lying electro cable and telecommunication signals;

(7)to cross and damage separating walls, barristers, protection network and switch gate;

(8)to use facilities for emergency use and safety equipment under non-emergency conditions;

(9)to damage and move safety marks without permission;

(10)other behaviors damaging the safe operation of the urban track transportation system.

(Ref. W58)

29. APPENDIX C – DOCUMENT ADMINISTRATION

29.1 REFERENCES

29.1.1 Document References

Ref.	Document Title	Document Ref.	Version	Location
R1.	Clear Skies Thinking Highways Vol 4 No 2	STAD-EXT-REF-1001		
R2.	Large Events and Public Transport: A Winning team	STAD-EXT-DOC-1002		
R3.	The World Bank Observations on ITS and Urban Mobility in China	STAD-EXT-REF-1003		http://www.ibec-its.org/Presentations/Sunday%20Sessions/Urban%20Mobility/Observations%20on%20ITS%20and%20Urban%20Mobility%20in%20China%203.pdf
R4.	World Highways/Routes du Monde, Vol. 16 No. 8	STAD-EXT-REF-1002		
R5.	UITP Asia-Pacific Study Tour	STAD-EXT-DOC-1003		
R6.	The Olympic Spectator Guide	STAD-EXT-REF-1004		
R7.	Gunnebo Sets Gold Standard in Beijing	STAD-EXT-REF-1005		
R8.	EADS Tetra networks goes for gold in Beijing	STAD-EXT-REF-1006		
R9.	Beijing Olympics Keeps Traffic Moving with Stratus ftServer Systems	STAD-EXT-REF-1007		
R10.	Hong Kong Information Technology Federation ITS Policy Paper	STAD-EXT-REF-1008		
R11.	Beijing Urban Transportation Development and the Olympics Transportation Strategy	STAD-EXT-REF-1009		
R12.	Event Characteristics SOTA Report Annex	STAD-DEL-WP2-1912		
R13.	Pre & Post Olympics Transport Comparison	STAD-EXT-REF-1111		http://www.scribd.com/doc/13387544/Comparison-of-Pre-PostOlympic-Traffic-a-Case-Study-of-Several-Roads-in-Beijing
R14.	An Information-Supported Olympics Showcases China's Passion	STAD-EXT-REF-1113	2008 Issue 04	http://www.huawei.com/publications/view.do?id=3254&cid=5666&pid=2043
R15.	BEIJING OLYMPIC GAMES—Beijing - August 2008	STAD-EXT-REF1005	2010	http://www.mobility-bovy.ch/page1/assets/_UPDATE-NEWS-2010.pdf
R16.	More at Stake than Gold Medals	STAD-EXT-REF-1114		http://media.ft.com/cms/9c817252-dee2-11dc-91d4-0000779fd2ac.pdf
R17.	China's Response To HIV/AIDS	STAD-EXT-REF-1115		http://csis.org/files/media/csis/pubs/071002-lu-gill-chinaresponsehiv4web.pdf
R18.	Beijing to boost disease control for Olympics	STAD-EXT-REF-1116		http://www.alertnet.org/thenews/newsdesk/PEK255645.htm
R19.	The economy of the Beijing Olympic Games	STAD-EXT-REF-1117		http://ddd.uab.cat/pub/worpap/2009/hdl_2072_13789/WP116_eng.pdf

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Ref.	Document Title	Document Ref.	Version	Location
R20.	Traffic Operation during Beijing Olympic Games	STAD-EXT-REF-1118		http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B8H0W-4VDRVV0-1&_user=9483614&_coverDate=12%2F31%2F2008&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1406031871&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=9483614&md5=7e04cd4bf1d8eb1b57ff2e1217db329c
R21.	Toward Intelligent Transportation Systems for the 2008 Olympics	STAD-EXT-REF-1119		http://www.csse.monash.edu.au/courseware/cse5610/2006/Students-only/Readings/its-olympics.pdf
R22.	Intelligent Transportation System of Beijing, China, and Xservices	STAD-EXT-REF-1120		http://www.ow2.org/xwiki/bin/download/NewsEvents/SuccessStories/OW2-CS-Xservices-Beijing.pdf

29.1.2 Book References

Ref.	Document Title	Document Ref.	Author	Publisher
B1.	Events Management	STAD-EXT-BOK-1001	Glenn Bowdin	Elsevier Butterworth Heineman

29.1.3 Web References

Ref.	Document Title	Web Ref.	Location
W1.	2008 Summer Olympics	STAD-EXT-WEB-1100	http://en.wikipedia.org/wiki/Beijing_Olympics
W2.	Official Beijing Olympics Website (OBOW)	STAD-EXT-WEB-1200	http://en.beijing2008.cn/news
W3.	Beijing Transportation Website	STAD-EXT-WEB-1300	http://www.bjjtw.gov.cn/english_index.html
W4.	OBOW - Transport Construction and Traffic Management Plan[4]	STAD-EXT-WEB-1201	http://en.beijing2008.cn/90/92/article211929290.shtml
W5.	OBOW - Beijing Olympic Action Plan	STAD-EXT-WEB-1202	http://en.beijing2008.cn/59/80/column211718059.shtml
W6.	Beijing South Railway Station	STAD-EXT-WEB-1101	http://en.wikipedia.org/wiki/Beijing_South_Railway_Station
W7.	2008 Summer Olympics marketing	STAD-EXT-WEB-1102	http://en.wikipedia.org/wiki/2008_Summer_Olympics_marketing
W8.	Thales to supply transit ticketing systems in Beijing	STAD-EXT-WEB-15011	http://www.contactlessnews.com/2006/07/20/thales-to-supply-transit-ticketing-systems-in-beijing-dubai-and-madrid?tag=Transit
W9.	RFID Chips Adopted For Door Ticket Of Beijing Olympic Games	STAD-EXT-WEB-1421	http://www.chinatechnews.com/2008/05/15/6744-rfid-chips-adopted-for-door-ticket-of-beijing-olympic-games/
W10.	Beijing Olympic Games Prompts RFID Development in China	STAD-EXT-WEB-15021	http://www.networkworld.com/community/node/18988
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[4] Replaced By W43

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W12.	Olympic Games	STAD-EXT-WEB-0101	http://en.wikipedia.org/wiki/Olympics
W13.	Beijing Subway Development	STAD-EXT-WEB-1431	http://www.railway-technology.com/projects/beijing_subway/
W14.	Moving People Around Beijing	STAD-EXT-WEB-15041	http://news.ncmonline.com/news/view_article.html?article_id=0ee82c05127f9768accb019b74252c67
W15.	China Report - AFC Card	STAD-EXT-WEB-1440	http://www.drben.net/ChinaReport/Beijing/Beijing-City_Public_Transportation_System/Transport-in-Beijing-Menu.html
W16.	Public Notice on Olympic Ticketing Systems Upgrade	STAD-EXT-WEB-1203	http://en.beijing2008.cn/news/official/bulletin/official/n214169046.shtml
W17.	Beijing Olympics Online Ticketing System Survives Latest Round of Purchases	STAD-EXT-WEB-15051	http://www.cio.com/article/351513/Beijing_Olympics_Online_Ticketing_System_Survives_Latest_Round_of_Purchases?page=2
W18.	Beijing Olympic ticketing system collapses	STAD-EXT-WEB-15061	http://www.abc.net.au/news/stories/2007/10/30/2076451.htm
W19.	Beijing Olympic ticket system crashes under massive demand	STAD-EXT-WEB-15071	http://afp.google.com/article/ALeqM5hoXTWSYL9z-XedN7kMHTH7ApAJNw
W20.	SmartTrans signs MOU with China Alarm for Beijing Olympics	STAD-EXT-WEB-15081	http://www.ferret.com.au/c/SmartTrans/SmartTrans-signs-MOU-with-China-Alarm-for-Beijing-Olympics-n670542
W21.	Beijing subway upgrade ends paper tickets	STAD-EXT-WEB-15091	http://news.cnet.com/8301-13908_3-9964497-59.html
W22.	Transportation	STAD-EXT-WEB-1204	http://en.beijing2008.cn/spectators/beijing/n214277146_1.shtml
W23.	Beijing Olympics to ensure safe and smooth traffic flow	STAD-EXT-WEB-15101	http://english.peopledaily.com.cn/90001/90776/90882/6450460.html
W24.	Beijing Real-Time Traffic Information System, China	STAD-EXT-WEB-15111	http://www.roadtraffic-technology.com/projects/real-time/
W25.	Operational Analysis on Beijing Road Network during the Olympic Games	STAD-EXT-WEB-15121	http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B8H0W-4VDRVV0-3&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&_docanchor=&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=50b92f72e063bb7e6041cbf96d7a9b37
W26.	Nissan Launches New ITS Systems for Beijing Olympics	STAD-EXT-WEB-15131	http://www.ivsource.net/modules.php?name=IV_Archives&file=article&sid=429
W27.	Road Space Rationing	STAD-EXT-WEB-1104	http://en.wikipedia.org/wiki/Road_space_rationing
W28.	VMS Release of Traffic Guide Information in Beijing Olympics	STAD-EXT-WEB-15122	http://www.sciencedirect.com/science?_ob=PublicationURL&_cdi=42505&_pubType=J&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=0418ef51e88879604c61670724c8aa85&jchunk=8#8
W29.	Intelligent Systems, IEEE: Toward Intelligent Transportation Systems For The 2008 Olympics	STAD-EXT-WEB-15141	http://ntlsearch.bts.gov/tris/record/tris/00975255.html
W30.	Beijing Games' high-tech to benefit all	STAD-EXT-WEB-1451	http://www.chinadaily.com.cn/english/doc/2004-11/15/content_391595.htm
W31.	Transit Investments Spur China Market Ahead of 2008 Beijing Olympics	STAD-EXT-WEB-15151	http://www.apta.com/passengertransport/Documents/archive_803.htm
W32.	Comparison of Pre- & Post-Olympic Traffic	STAD-EXT-WEB-15123	http://www.sciencedirect.com/science?_ob=PublicationURL&_cdi=42505&_pubType=J&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=0418ef51e88879604c61670724c8aa85&jchunk=8#8

APPENDIX C – DOCUMENT ADMINISTRATION

Ref.	Document Title	Web Ref.	Location
W33.	The Approach of Developing ITS Architecture for Beijing 2008 Olympics Based on Turbo Architecture	STAD-EXT-WEB-15171	http://www.itsradarinternational.info/News-Events/Latest-News/The-Approach-of-Developing-ITS-Architecture-for-Beijing-2008-Olympics-Based-on-Turbo-Architecture.htm
W34.	China Report - Beijing Buses	STAD-EXT-WEB-1441	http://www.drben.net/ChinaReport/Beijing/Beijing-City_Public_Transportation_System/Beijing-Bus1.html
W35.	Beijing Demographics	STAD-EXT-WEB-15172	http://www.starmass.com/china_review/city_overview/beijing.htm
W36.	The Logistics Olympics in Beijing	STAD-EXT-WEB-15173	http://www.sascargo.com/CargoNewsCenter/Previous-CNC/Issue-4/Olympics-in-Beijing.aspx
W37.	The Olympic Venues: Transport	STAD-EXT-WEB-15174	http://www.unep.org/publications/ebooks/beijing-report/Default.aspx?bid=ID0EGYAG#ID0EZZAG2
W38.	Team GB Beijing 2008	STAD-EXT-WEB-15175	http://www.olympics.org.uk/beijing2008/Schedule.aspx
W39.	2008 Beijing Olympics and Paralympics	STAD-EXT-WEB-15176	http://www.bjreview.com.cn/nation/txt/2009-05/26/content_197566.htm
W40.	Beijing apologises for Olympics ticket fiasco	STAD-EXT-WEB-15177	http://gaia1.mg.co.za/article/2007-10-31-beijing-apologises-for-olympics-ticket-fiasco
W41.	Beijing 2008 Olympic Ticket Prices	STAD-EXT-WEB-15178	http://www.krolltravel.com/TravelNews/tn2007030255.html
W42.	Four Great Buildings to Shape Olympic Beijing	STAD-EXT-WEB-1452	http://www.china.org.cn/english/2004/Jan/84895.htm
W43.	Transport Construction and Traffic Management Plan[5]	STAD-EXT-WEB-1453	http://www.ebeijing.gov.cn/Government/Mayor_office/Mayor_bulletin/t929887.htm
W44.	Exclusive Olympic Lanes During 2008 Beijing Olympic and Paralympic Games	STAD-EXT-WEB-1454	http://210.75.211.252/publish/portal1/tab167/info3712.htm
W45.	Beijing Waterways	STAD-EXT-WEB-1455	http://www.beijingtrip.com/transport/waterway.htm
W46.	Olympic Venue Access and Parking Permits	STAD-EXT-WEB-1456	http://www.sportatlas.com/?mod=library&p=41&id=28711
W47.	Olympic visitors get info kiosks	STAD-EXT-WEB-15179	http://www.zdnetasia.com/olympic-visitors-get-info-kiosks-62044182.htm
W48.	Olympic venue security bolstered by missile launchers	STAD-EXT-WEB-15180	http://www.reuters.com/article/idUSPEK25645520080624
W49.	Beijing unveils security plan for Olympics	STAD-EXT-WEB-1457	http://www.chinadaily.com.cn/english/doc/2005-03/23/content_427550.htm
W50.	Facilitating Legitimate Entry and Exit in Support of Beijing Olympics	STAD-EXT-WEB-1458	http://english.customs.gov.cn/publish/portal191/tab28300/module60424/info121216.htm
W51.	Interpol develops Security Database for Beijing Olympics	STAD-EXT-WEB-15181	http://www.security-technologynews.com/news/interpol-develops-security-database-for-beijing-olympics.html
W52.	Beijing Olympics Will Use IBM High-Tech Surveillance System	STAD-EXT-WEB-15182	http://www.allheadlinenews.com/articles/7009416793
W53.	After the Olympics	STAD-EXT-WEB-15183	http://www.gluckman.com/Beijing%20Olympics%20Legacy.html
W54.	Beijing Olympics And Information Technology	STAD-EXT-WEB-15185	http://www.authorstream.com/Presentation/nandinimadhu-278214-beijing-olympics-information-technol-technology-entertainment-ppt-powerpoint/

[5] Replaces W4

APPENDIX C – DOCUMENT ADMINISTRATION

Ref.	Document Title	Web Ref.	Location
W55.	Ten Lessons from China's Olympics Preparations	STAD-EXT-WEB-15186	http://www.lifehack.org/articles/management/ten-lessons-from-chinas-olympic-preparations.html
W56.	Estimating the Cost and Benefit of Hosting Olympic Games	STAD-EXT-WEB-15187	http://findarticles.com/p/articles/mi_qa4127/is_200510/ai_n15705690/pg_13/?tag=content;col1
W57.	Supplying the Beijing Olympics	STAD-EXT-WEB-15188	http://ohsonline.com/articles/2008/08/supplying-the-beijing-olympics.aspx
W58.	Relevant rules and regulations	STAD-EXT-WEB-1205	http://en.beijing2008.cn/news/special/airportline/n214457988.shtml
W59.	Beijing Olympics have been most expensive so far	STAD-EXT-WEB-15189	http://www.financialexpress.com/news/beijing-olympics-have-been-most-expensive-so-far/348024/
W60.	Beijing Announces Traffic Plan for Olympics	STAD-EXT-WEB-15189	http://www.nytimes.com/2008/06/21/world/asia/21china.html
W61.	Beijing Real-Time Traffic Information System	STAD-EXT-WEB-15190	http://www.roadtraffic-technology.com/projects/real-time/

29.2 DISTRIBUTION

29.2.1 Distribution for Review

Date	Name	Version	Purpose

29.2.2 Distribution for Information

Date	Name	Version	Purpose
26/06/2010	Hal Evans	0.00.00(16TH)	Update on Status
20/07/2010	Hal Evans	0.00.00(17TH)	Update on Status
21/07/2010	Hal Evans	0.00.00(19TH)	Update on Status
22/07/2010	Hal Evans	0.00.00(22TH)	Update on Status

30. APPENDIX D – TFL ADMINISTRATION

30.1 VERSION NUMBERING

The review history of all documents follows the pattern:

a)	Author draft(s)	[0.00.00(nAA)]
b)	Prepared For Work-Package Review	[0.00.10(0)]
c)	Prepared For Work-Package Approval	[0.00.20(0)]
d)	Prepared For Work-Package Acceptance	[0.00.30(0)]
e)	Prepared For Consortium Review	[0.00.40(0)]
f)	Prepared For Consortium Approval	[0.00.50(0)]
g)	Prepared For EU Acceptance	[0.00.60(0)]

30.2 THIS VERSION

Version	Date	Author	CC Ref.	Changes Since Previous Version
0.00.10(0)	28/07/2010	Tony Haynes	N/A	Prepared for WQA

30.3 FULL VERSION HISTORY

Version	Date	Author	CC Ref.	Changes Since Previous Version
0.00.00(0)	11/09/2009	Marek Banasiak	N/A	Annex abstracted from First Draft Report
0.00.00(a)	11/09/2009	Tony Haynes	N/A	Skeleton For the Annex built from the agreed Annex Template.
0.00.00(0)	14/09/2009	Tony Haynes	N/A	Skeleton Populated from MB Research Work. Styles updated to match Stadium TfL Template.
0.00.00(1TH)	14/09/2009	Tony Haynes	N/A	Action Plan Moved to separate Annex
0.00.00(2HE)	17/09/2009	Hal Evans	N/A	First pass typo corrections
0.00.00(3TH)	18/09/2009	Tony Haynes	N/A	Restructured the information section providing a template for the other annexes Updated References where appropriate
0.00.00(4TH)	18/09/2009	Tony Haynes	N/A	Recovered From Word Crash
0.00.00(5TH)	21/09/2009	Tony Haynes	N/A	Restructured Chapters 4 & 5
0.00.00(6TH)	23/09/2009	Tony Haynes	N/A	Corrected Hyperlink Style
0.00.00(7HE)	16/10/2009	Hal Evans	N/A	Minor typo corrections
0.00.00(7TH)	12/11/2009	Tony Haynes	N/A	Aligned with generic template
0.00.00(8TH)	17/11/2009	Tony Haynes	N/A	Restructured and re-grouped to align with documentation changes since the Rome Consortium meeting.
0.00.00(9TH)	17/11/2009	Tony Haynes	N/A	Incremental safety save

APPENDIX D – TFL ADMINISTRATION

Version	Date	Author	CC Ref.	Changes Since Previous Version
0.00.00(10TH)	18/11/2009	Tony Haynes	N/A	Aligned with Turin Olympics Annex
0.00.00(11HE)	25/11/2009	Hal Evans	N/A	Corrected Typos
0.00.00(12TH)	09/06/2010	Tony Haynes	N/A	Accepted Changes
0.00.00(13TH)	14/06/2010	Tony Haynes	N/A	Aligned with final Report
0.00.00(14TH)	14/06/2010	Tony Haynes	N/A	Incremental Save
0.00.00(15TH)	16/06/2010	Tony Haynes	N/A	Transferred to Consortium Template
0.00.00(16TH)	16/06/2010	Tony Haynes	N/A	Started to fill gaps
0.00.00(17TH)	19/07/2010	Tony Haynes	N/A	Continued to fill gaps
0.00.00(18TH)	20/07/2010	Tony Haynes	N/A	Incremental Save
0.00.00(19TH)	21/07/2010	Tony Haynes	N/A	Completed Research
0.00.00(20TH)	22/07/2010	Tony Haynes	N/A	Reviewed & Tidied
0.00.00(21TH)	22/07/2010	Tony Haynes	N/A	Recovered From Word Crash
0.00.00(22TH)	22/07/2010	Tony Haynes	N/A	Accepted All Changes and corrected numbering errors created by WORD

30.4 TEMPLATE

Template Ref.	Template Name	Template Version
STAD-TEM-DOT-0011	Consortium Generic Word Template	0.00.00(9TH)

30.5 CHANGES FORECAST

None

30.6 TFL AUTHORISATION

a) This is a controlled document once issued. All revisions are subject to change control.
b) All revisions of this document must be reviewed by at least one work package subject matter authority.
c) All revisions of this document must be approved by the TfL Project Board.
e) All revisions of this document must be reviewed by at least one consortium authority.
f) All revisions of this document must be approved by the Designated Consortium Authority.

Role	Name	Signature	Date
Reviewed By Work package : Subject Matter Authority			
Approved By Work package: TfL Project Board			
Reviewed By Consortium :			
Approved By Consortium: Designated Consortium Authority			

STADIUM

Event Characteristics Annex

Author: **Tony Haynes**

Version : 0.00.00(5TH)
Version Date : 09/02/2010

Document Reference : **STAD-DEL-WP2-1912**
Document Category : Annex

S1. Phase: Analysis & Design

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0. PREFACE

0.1 AUTHOR (S)

Name
Tony Haynes

0.2 THIS VERSION[1]

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(5TH)	09/02/2010	Document Controller	N/A	Updated Authorisation Updated References.

0.3 AUTHORISATION

a) This is a controlled document once issued. All revisions are subject to change control.
b) All revisions of this document must be reviewed by at least one work package subject matter authority.
c) All revisions of this document must be approved by the GCS Programme Manager.
d) All revisions of this document must be accepted by the Stadium Project Board before being issued.
e) All revisions of this document must be reviewed by at least one consortium authority.
f) All revisions of this document must be approved by the designated consortium authority.

Role	Name	Signature	Date
Reviewed By Work package : Subject Matter Authority			
Approved By Work package: GCS Programme Manager			
Accepted By Work package: Stadium Project Board			
Reviewed By Consortium :			
Approved By Consortium:			

[1] Version History at Appendix B

PREFACE

0.4 CHANGES FORECAST

None

0.5 VERSION NUMBERING

The review history of all documents follows the pattern:

a)	Author draft(s)	[0.00.00(nAA)]
b)	Workpackage Review	[0.00.01(0)]
c)	Workpackage Approval	[0.00.10(0)]
d)	Project Review	[0.00.20(0)]
e)	Project Approval	[0.00.30(0)]
f)	Issue	[n.nn.00(0)

1. INTRODUCTION

1.1 PURPOSE

1.1.1 Document Purpose

To provide single source reference for the overall context of all events types referenced in the State Of the Art Report.

1.1.2 Functional Purpose

To assist in evaluating the effectiveness of the management of individual events within their categories.

1.2 SCOPE

a) Sport
   i) Olympics
   ii) Commonwealth Games
   iii) Football
b) Culture
   i) Music
   ii) Film
   iii) Dance
   iv) Seasonal
c) Politics

1.3 DOCUMENT EXCLUSIONS

This document does not repeat information captured in other documentary products. Where such information is relevant those documents will be clearly referenced within the annex

2. SPORTING EVENTS (OLYMPICS)

2.1 BACKGROUND

The Olympic Games are an international event of summer and winter sports, in which thousands of athletes compete in a wide variety of events. The Games are currently held every two years, with Summer and Winter Olympic Games alternating. Originally, the ancient Olympic Games were held in Olympia, Greece, from the 8th century BC to the 5th century AD. In the late 19th century, Baron Pierre de Coubertin was inspired by Olympic festivals to revive the Games. For this purpose, he founded the International Olympic Committee (IOC) in 1894, and two years later, the modern Olympic Games were established in Athens. The IOC has since become the governing body of the Olympic Movement, whose structure and actions are defined by the Olympic Charter.

The evolution of the Olympic Movement during the 20th century forced the IOC to adapt the Games to the world's changing social circumstances. Some of these adjustments included the creation of the Winter Games for ice and snow sports, the Paralympic Games for athletes with physical disabilities, and the Youth Olympic Games for teenage athletes. The IOC also had to accommodate the Games to the varying economical, political, and technological realities of the 20th century. As a result, the Olympics shifted away from pure amateurism, as envisioned by Coubertin, to allow participation of professional athletes. The growing importance of the mass media created the issue of corporate sponsorship and commercialization of the Games.

The Olympic Movement currently comprises international sports federations (IFs), National Olympic Committees (NOCs), and organizing committees for each specific Olympic Games. As the decision-making body, the IOC is responsible for choosing the host city for each Olympic Games. The host city is responsible for organizing and funding a celebration of the Games consistent with the Olympic Charter. The Olympic program, consisting of the sports to be contested at each Olympic Games, is also determined by the IOC. The celebration of the Games encompasses many rituals and symbols, such as the Olympic flag and torch, as well as the opening and closing ceremonies. There are over 13,000 athletes that compete at the Summer and Winter Olympics in 33 different sports and nearly 400 events. The first, second, and third place finishers in each event receive gold, silver or bronze Olympic medals, respectively.

Every two years, the Olympics and its media exposure provide unknown athletes with the chance to attain national, and in particular cases, international fame. The Games also constitute a major opportunity for the host city and country to promote and showcase themselves to the world.

(Ref. Wikipedia - W1)

2.2 OLYMPIC BIDDING PROCESS

The Olympic bidding process begins with the submission of a city's application to the International Olympic Committee (IOC) by its National Olympic Committee (NOC) and ends with the election of the host city by the members of the IOC during an ordinary session. The process is governed by the Olympic Charter, as stated in Chapter 5, Rule 34.

Since 1999, the process has consisted of two phases. During the first phase, which begins immediately after the bid submission deadline, the "applicant cities" are required to answer a questionnaire covering themes of importance to a successful Games organisation. This information allows the IOC to analyse the cities' hosting capacities and the strengths and weaknesses of their plans. Following a detailed study of the submitted questionnaires and ensuing reports, the IOC Executive Board selects the cities that are qualified to proceed to the next phase. The second phase is the true candidature stage: the accepted applicant cities (from now on referred to as "candidate cities") are required to submit a second questionnaire in the form of an extended, more detailed, candidature file. These files are carefully studied by the IOC Evaluation Commission, a group composed of IOC members, representatives of international sport federations, NOCs, athletes, the International Paralympic Committee, and international experts in various fields. The members of the Evaluation Commission then make four-day inspection visits to each of the candidate cities, where they check the proposed venues and are briefed about details of the themes covered in the candidature file. The Evaluation Commission communicates the results of its inspections in a report sent to the IOC members up to one month before the electing IOC Session.

The IOC Session in which a host city is elected takes place in a country that did not submit an application to stage the Olympics. The election is made by the assembled active IOC members (excluding honorary and honour members), each possessing one vote. Members from countries that have a city taking part in the election cannot vote while the city is in the running. The voting is conducted in a succession of rounds until one bid achieves an absolute majority of votes; if this does not happen in the first round, the bid with the fewest votes is eliminated and another voting round begins. In the case of a tie for the lowest number of votes, a special runoff vote is carried out, with the winner proceeding to the next round. After each round, the eliminated bid is announced. Following the announcement of the host city, the successful bid delegation signs the "Host City Contract" with the IOC, which delegates the responsibilities of the Games organisation to the city and respective NOC.

(Ref. W6).

2.3 HOSTING

Using London (as An Example of Hosting Organisation)

2.3.1 Olympic Delivery Authority

The Olympic Delivery Authority (ODA) is the statutory corporation responsible for ensuring delivery of venues, infrastructure and legacy for the 2012 Summer Olympic and Paralympic Games in London. Along with the London Organising Committee for the Olympic Games (LOCOG), the ODA is one of the two main agencies organising the London Olympic Games.

The ODA was established by the London Olympic Games and Paralympic Games Act 2006 and is the responsibility of the Department for Culture Media and Sport.

In advance of the formal establishment of the ODA, the London Development Agency (LDA) and Transport for London (TfL) were asked to undertake the development work necessary for the Olympic Park and the transport infrastructure which will service the Games, and to build up an interim team.

The ODA is based alongside LOCOG at One Churchill Place in Canary Wharf.

2.3.1.1 Board members

a) Deputy Chairman: Sir Roy McNulty, chairman of the Civil Aviation Authority
b) Lorraine Baldry, chair of the London Thames Gateway Development Corporation
c) Tony Ball, former chief executive and managing director of British Sky Broadcasting
d) Sir Howard Bernstein, chief executive of Manchester City Council
e) Barry Camfield, assistant general secretary of the Transport and General Workers Union
f) Neale Coleman, policy director to the Mayor of London
g) Stephen Duckworth, doctor, academic and entrepreneur
h) Christopher Garnett, former chairman and chief executive of Great North Eastern Railway
i) Baroness Morgan, former Cabinet Office minister
j) Kumar Muthalagappan, managing director of the Pearl Hotels and Restaurants group
k) Sir Nicholas Serota, director of Tate
l) David Taylor, chairman of Silvertown Quays Limited

2.3.1.2 Responsibilities

The ODA is building the theatre, while LOCOG is putting on the show.

The ODA has responsibility for:

a) All Olympic Park infrastructure and site preparation
b) Delivery of permanent competition venues

c) Building the Olympic Village and the International Broadcast Centre and Main Press Centre
d) The building of relocatable arenas
e) Olympic transport projects
f) Permanent works to existing sports venues
g) Olympic Park venue legacy conversion

The LDA will continue to lead on the acquisition of land in the Olympic Park site, and TfL will continue to deliver many of the major transport projects on which London 2012 will depend.

2.3.1.3 Finance

The ODA's original budget was £2.375 billion, provided by a public sector funding package agreed between Government and the Mayor of London in 2003. However, in October 2006, Culture Secretary Tessa Jowell announced that this could rise to over £4 billion. In March 2007 she announced a new funding package for the ODA, increasing its budget to £5.3 billion.

The government had expected to take advantage of the UK's increasing property prices, and developers, including Lend Lease and Igloo, were expected to fund construction of parts of the Olympic village and media centre. However, as a result of the recession and fall in property prices since 2008, additional funding is being requested from a contingency fund set up by the government.

(Ref. W4).

2.3.2 London Organising Committee of the Olympic Games

The London Organising Committee of the Olympic Games and Paralympic Games (LOCOG) is a limited company, owned by the Government of the United Kingdom, that will oversee the planning and development of the 2012 Summer Olympic and Paralympic Games. After the successful London 2012 Olympic bid, LOCOG was formed as a limited company to continue the work started by the bidding team. The International Olympic Committee (IOC) chose London as the host on 6 July 2005, narrowly beating the Paris bid, with LOCOG being officially established as the organisers at their first board meeting on 7 October 2005.

LOCOG works closely with the Olympic Delivery Authority (ODA), who is responsible for the planning and construction of new venues and infrastructure. Both organisations share offices in One Churchill Place, Canary Wharf.

(Ref. W5).

2.3.2.1 Board members

a) Lord Coe (chairman)
b) Paul Deighton (chief executive)
c) Keith Mills (vice-chairman)
d) Neil Wood (financial director)
e) Sir Craig Reedie (from the IOC)
f) Sir Philip Craven (from the IOC)
g) HRH The Princess Royal (from the IOC)
h) Simon Clegg (BOA representative)
i) Mike Brace (BPA representative)
j) Neale Coleman (from the Greater London Authority)
k) Mary Reilly (from the London Development Agency)
l) Howard Bernstein (from Manchester City Council)
m) Patrick Carter (from Sport England)
n) Jonathan Edwards (representative of the athletes)

2.3.2.2 Responsibilities

The ODA is building the theatre, while LOCOG is putting on the show

LOCOG is therefore responsible for staging a memorable Games in 2012.

LOCOG will ensure a real legacy and provide inspiration for people to join in.

LOCOG will let most of the contracts for services to deliver and run the Games.

As well as staging the 2012 Games, LOCOG will also be responsible for staging a series of test events in the year before the Games; recruiting and training volunteers; and overseeing the four year Cultural Olympiad leading up to the Games.

2.3.2.3 Finance

Funding for the Organising Committee comes mainly from the private sector. A total of £2 billion will be raised from sources including sponsorship, broadcasting rights and selling merchandise.

The London 2012 brand needs to be closely protected to ensure that these funds can be raised.

(Ref. W7)

3. SPORTING EVENTS (COMMONWEALTH GAMES)

3.1 COMMONWEALTH GAMES FEDERATION (CGF)

The Commonwealth Games is a world class, multi-sports event which is held once every four years. It is often referred to as the 'Friendly Games'.

The Commonwealth Games Federation (CGF) is the organisation responsible for the direction and control of all Commonwealth Games. Their mission is :

a) to ensure the successful organisation and celebration of the Commonwealth Games and
b) to promote the best interests of athletes participating in them and
c) to assist in the development of sport throughout the Commonwealth.

(Ref. W13)

3.2 THE BIDDING PROCESS

The bidding process begins some 8 years before the actual games with Candidate Cities, through their Commonwealth Games Association (CGA), notifying the Commonwealth Games Federation of their intention to bid.

The deadline for formal lodgement of bids to the Commonwealth Games Federation, in the form of a Candidate City File, will take place six months prior to the General Assembly. This part of the process has previously been marked by a bid lodgement ceremony in London. The lodgement is then followed by a visit by the Commonwealth Games Evaluation Commission who then produce a detailed report which is circulated to all CGAs and made public. Commonwealth Games Associations then have the opportunity to visit each Candidate City once to view facilities, venues, and receive presentations from the bid committee. The CGAs then congregate at the CGF's General Assembly and vote to award the Commonwealth Games. Each CGA is entitled to one vote each. After the votes have been cast and verified by independent scrutinisers, the President of the Commonwealth Games announces the decision to the Assembly and the people of the Commonwealth.

The CGF has developed a Candidate City Manual to guide Candidate Cities in the development of their Candidate City File. This Manual in conjunction with other CGF documents establishes the legal, financial and technical obligations of each Candidate City and Host City when selected and outlines the procedures, rules and timeline for bidding.

(Ref. W8)

3.3 THE BRAND

The core element of the Commonwealth Games brand is 'The Bar' which visually represents the Games' effort to raise the bar of sport for all humanity and a level playing field where athletes compete in a spirit of friendship and fair play.

The three converging points supporting the horizontal black bar represent the 'Trinity of Values' that symbolise the Games; unifying Humanity (red), giving all athletes a chance to realise their destiny (yellow) and promoting equality (blue).

'The Bar' was designed to be combined with text and emblems of the various organisations that make up the Commonwealth Games family and is never used on its own.

Consistent usage of the brand since its launch in 2000 has helped achieve the collective aspiration of all stakeholders within the Commonwealth Games movement, for the event to become more commercially successful and therefore sustainable.

With commercial success comes an even greater requirement to protect the Commonwealth Games Brand and further opportunity to enhance its value with future editions of the Games.

The Commonwealth Games Brand is the intellectual property of the Commonwealth Games Federation and rules protecting it are distinct from other multi-sport events.

CGF

FIGURE 1 THE COMMONWEALTH GAMES BRAND LOGO

(Ref. W13)

4. SPORTING EVENTS (FOOTBALL WORLD CUP)

4.1.1 The World Cup

The FIFA World Cup, occasionally called the Football World Cup, but usually referred to simply as the World Cup, is an international football competition contested by the men's national teams of the members of Fédération Internationale de Football Association (FIFA), the sport's global governing body. The championship has been awarded every four years since the first tournament in 1930, except in 1942 and 1946, because of World War II.

The current format of the tournament involves 32 teams competing for the title at venues within the host nation(s) over a period of about a month – this phase is often called the World Cup Finals. A qualification phase, which currently takes place over the preceding three years, is used to determine which teams qualify for the tournament together with the host nation(s). The World Cup is the most widely-viewed sporting event in the world, with an estimated 715.1 million people watching the 2006 final.

Of the 18 tournaments held, seven nations have won the title. Brazil are the only team that have played in every tournament and have won the World Cup a record five times. Italy are the current champions and have won four titles, and Germany are next with three. The other former champions are Uruguay, winners of the inaugural tournament, and Argentina, with two titles each, and England and France, with one title each.

The most recent World Cup was held in Germany in 2006. The next World Cup will be held in South Africa, between 11 June and 11 July 2010, and the 2014 World Cup will be held in Brazil.

(Ref. Wikipedia - W2)

4.1.2 FIFA

The Fédération Internationale de Football Association (French for International Federation of Association Football), commonly known by its acronym, FIFA , is the international governing body of association football. Its headquarters are in Zürich, Switzerland, and its current president is Sepp Blatter. FIFA is responsible for the organization and governance of football's major international tournaments, most notably the FIFA World Cup, held since 1930.

FIFA has 208 member associations, which is 16 more than the United Nations and three more than the International Olympic Committee, though five fewer than the International Association of Athletics Federations.

FIFA is responsible for the organization and governance of football's major international tournaments, most notably the FIFA World Cup.FIFA’s current president is Sepp Blatter.

FIFA has 208 member associations, which is 16 more than the United Nations and three more than the International Olympic Committee, though five fewer than the International Association of Athletics Federations.

(Ref. W3).

4.1.3 Structure

FIFA's supreme body is the FIFA Congress, an assembly made up of representatives from each affiliated member association. The Congress assembles in ordinary session once every year and, additionally, extraordinary sessions have been held once a year since 1998. Only the Congress can pass changes to FIFA's statutes.

Congress elects the President of FIFA, its General Secretary and the other members of FIFA's Executive Committee. The President and General Secretary are the main officeholders of FIFA, and are in charge of its daily administration, carried out by the General Secretariat, with its staff of approximately 280 members.

FIFA's Executive Committee, chaired by the President, is the main decision-making body of the organization in the intervals of Congress. FIFA's worldwide organisational structure also consists of several other bodies, under authority of the Executive Committee or created by Congress as standing committees. Among those bodies are the Finance Committee, the Disciplinary Committee, the Referees Committee, etc.

Aside from its worldwide institutions (presidency, Executive Committee, Congress, etc.) there are confederations recognised by FIFA which oversee the game in the different continents and regions of the world. National associations, and not the continental confederations, are members of FIFA. The continental confederations are provided for in FIFA's statutes. National associations must claim membership to both FIFA and the confederation in which their nation is geographically resident for their teams to qualify for entry to FIFA's competitions (with a few geographic exceptions listed below):

a) AFC—Asian Football Confederation in Asia and Australia
b) CAF—Confédération Africaine de Football in Africa
c) CONCACAF—Confederation of North, Central American and Caribbean Association Football in North America and Central America
d) CONMEBOL—Confederación Sudamericana de Fútbol in South America
e) OFC—Oceania Football Confederation in Oceania
f) UEFA—Union of European Football Associations in Europe.

Nations straddling the traditional boundary between Europe and Asia have generally had their choice of confederation. As a result, a number of transcontinental nations including Russia, Turkey, Cyprus, Armenia, Azerbaijan and Georgia have chosen to become part of UEFA despite the bulk of their land area being in Asia.

In total, FIFA recognises 208 national associations and their associated men's national teams as well as 129 women's national teams; see the list of national football teams and their respective country codes. Curiously, FIFA has more member states than the

United Nations, as FIFA recognises several non-sovereign entities as distinct nations, most notably the four Home Nations within the United Kingdom. The FIFA World Rankings are updated monthly and rank each team based on their performance in international competitions, qualifiers, and friendly matches. There is also a world ranking for women's football, updated four times a year.

(Ref. W3).

5. SPORTING EVENTS (UEFA EUROPEAN FOOTBALL CHAMPIONSHIP)

5.1 UEFA

The Union of European Football Associations is the administrative and controlling body for European football. It is almost always referred to by its acronym UEFA. UEFA represents the national football associations of Europe, runs Europewide national and club competitions, and controls the prize money, regulations and media rights to those competitions.

UEFA was founded on 15 June 1954 in Basel, Switzerland following discussions between the French, Italian and Belgian FAs. The headquarters was in Paris until 1959 when the organization moved to Bern. Henri Delaunay was the first General Secretary and Ebbe Schwartz the president. Its administrative center since 1995 is in Nyon, Switzerland. It was initially made up of 25 national associations. Currently there are 53 associations. The current UEFA President is Michel Platini.

UEFA is the biggest of six continental confederations of FIFA. Of all the confederations, it is by far the strongest in terms of wealth and influence over the global game. Virtually all of the world's top players play in European leagues in part due to the salaries available from the world's wealthiest football clubs, particularly in England, Spain, Italy and Germany. Many of the world's strongest national sides are in UEFA. Of the 32 available spots in the 2006 FIFA World Cup, 14 were allocated to UEFA national teams, and currently 12 of the top 20 teams in the FIFA World Rankings are UEFA members.

Several national football associations which are geographically in Asia or mostly in Asia belong to UEFA rather than the Asian Football Confederation (AFC). These nations are Armenia, Georgia, Kazakhstan, Turkey, Israel, Cyprus, Russia and Azerbaijan (Israel and Kazakhstan are former AFC members). Cyprus chose to be classed as a European football nation – it had the choice of Europe, Asia or Africa.

UEFA, as a representative of the national associations, has had a number of bruising clashes with the European Commission. In the 1990s the issues of television rights and especially international transfers (the Bosman ruling) have had to undergo some major changes to remain in line with European law.

(Ref. W9)

5.2 FOOTBALL CONFEDERATIONS

5.2.1 AFC (Asia)

Due to the geographical size of Asia, the AFC is subdivided into five sub-federations:

a) West Asian Football Federation (WAFF)
represents nations at the western extremity of the continent. The WAFF has six members, but the AFC groups those non members into a single geographical region.

b) East Asian Football Federation (EAFF)
represents nations generally agreed to constitute the "far east".

c) Central and South Asian Football Federation (CESAFA)
represents nations in central Asia and the Indian subcontinent.

d) ASEAN Football Federation (AFF)
represents nations from Southeast Asia, plus Australia

e) South Asian Football Federation (SAFF)
represents nations from South Asia

Afghanistan	Indonesia	Malaysia	Singapore
Australia	Iran	Maldives	Sri Lanka
Bahrain	Iraq	Mongolia	Syria
Bangladesh	Japan	Myanmar	Tajikistan
Bhutan	Jordan	Nepal	Thailand
Brunei	Korea DPR	Northern Mariana Islands	Timor-Leste
Cambodia	Korea Republic	Oman	Turkmenistan
China PR	Kuwait	Pakistan	United Arab Emirates
Chinese Taipei	Kyrgyzstan	Palestine	Uzbekistan
Guam	Laos	Philippines	Vietnam
Hong Kong	Lebanon	Qatar	Yemen
India	Macau	Saudi Arabia	

5.2.2 CAF (Africa)

Due to the geographical size of Africa, CAF is divided into six regional federations:

f) Council of East and Central African Football Associations (CECACAF)
represents nations generally regarded as forming the regions of East Africa and some nations of Central Africa.

g) Council of Southern African Football Associations (COSAFA)
represents nations generally regarded as forming Southern Africa, as well as island states off the coast of Southern Africa.

h) Union of West African Football Associations (WAFU)
one of two bodies that represent nations in West Africa.

i) Union of North African Federations (UNAF)
represents nations regarded as forming North Africa.

j) Union des Fédérations du Football de l'Afrique Centrale (UNIFFAC)
represents some of the nations that form Central Africa.

k) Union du Football de l'Ouest Afrique

one of two bodies that represent nations in West Africa.

Algeria
Angola
Benin
Botswana
Burkina Faso
Burundi
Cameroon
Cape Verde
Central African Republic
Chad
Comoros
Côte d'Ivoire
Congo
Congo DR
Djibouti
Egypt
Equatorial Guinea
Eritrea
Ethiopia
Gabon
Gambia
Ghana
Guinea
Guinea-Bissau
Kenya
Lesotho
Liberia
Libya
Madagascar
Malawi
Mali
Mauritania
Mauritius
Morocco
Mozambique
Namibia
Niger
Nigeria
Réunion
Rwanda
São Tomé and Príncipe
Senegal
Seychelles
Sierra Leone
Somalia
South Africa
Sudan
Swaziland
Tanzania
Togo
Tunisia
Uganda
Zambia
Zanzibar
Zimbabwe

5.2.3 CONCACAF (North and Central America and Caribbean)

The CONCACAF federation is divided into three regional federations that have responsibility for part of the region's geographical area:

a) Caribbean Football Union (CFU)
represents all nations in the Caribbean
b) North American Football Union (NAFU)
represents the three sovereign nations of North America
c) Union Centroamericana de Fútbol (UNCAF)
represents the seven nations of Central America

Anguilla
Antigua and Barbuda
Aruba
Bahamas
Barbados
Belize
Bermuda
British Virgin Islands
Canada
Cayman Islands
Costa Rica
Cuba
Dominica
Dominican Republic
El Salvador
French Guiana
Grenada
Guadeloupe
Guatemala
Guyana
Haiti
Honduras
Jamaica
Martinique
Mexico
Montserrat
Netherlands Antilles
Nicaragua
Panama
Puerto Rico
Saint Kitts and Nevis
Saint Lucia
Saint-Martin
Saint Vincent and the Grenadines
Sint Maarten
Suriname
Trinidad and Tobago
Turks and Caicos Islands
USA
U.S. Virgin Islands

5.2.4 CONMEBOL (South America)

Argentina
Bolivia
Brazil
Chile
Colombia
Ecuador
Paraguay
Peru

Uruguay
Venezuela

5.2.5 OFC (Oceania)

American Samoa
Cook Islands
Federated States of Micronesia
Fiji
Kiribati
New Caledonia
New Zealand
Niue
Palau
Papua New Guinea
Samoa
Solomon Islands
Tahiti
Tonga
Tuvalu
Vanuatu

5.2.6 UEFA (Europe)

Albania
Andorra
Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
England
Estonia
Faroe Islands
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Republic of Ireland
Israel
Italy
Kazakhstan
Latvia
Liechtenstein
Lithuania
Luxembourg
FYR Macedonia
Malta
Moldova
Montenegro
Netherlands
Northern Ireland
Norway
Poland
Portugal
Romania
Russia
San Marino
Scotland
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Turkey
Ukraine
Wales

(Ref. W9)

5.3 UEFA ORGANISATION

5.3.1 Overall Vision

UEFA is a representative democracy, comprised of 53 national football associations, and is itself recognised by FIFA as one of six continental federations. The organisation of the administration of football is based on a pyramid system of regulations, with FIFA the world governing body, UEFA the European governing body and national football associations the governing bodies at domestic level. Subsidiarity should be a guiding principle in this hierarchy of regulations, with international bodies regulating only where international, or in some cases, worldwide action is required.

Apart from national football associations who are in membership of UEFA, there are a variety of other organisations who contribute a great deal to football and whose interests need to be suitably recognised. Clubs are the bedrock of football at all levels. Leagues, particularly professional Leagues, are important in competition organisation and administrative management at national level. There is a wider acceptance now that players interests need to be taken into account in football administration. And we should not forget that the popularity of football is demonstrated through the enthusiasm of football fans across Europe.

UEFA has therefore the following vision of success: "A united European football family working together to improve enjoyment of the game"

(Ref. W14)

5.3.2 UEFA Mission

There are, of course, many tasks to accomplish to achieve that vision. Important new steps have been taken, for example, with the establishment of the Professional Football Strategy Council. At institutional level, there is now a greater recognition of the various and varying interests of different parts of the football family.

UEFA itself has a philosophy of Football First. Through our work in staging top class European competitions for national teams and staging the best club competitions in the world, right through to our work with national associations to develop coaching and grassroots football, UEFA carries out a wide range of activities to promote and develop European football. The role of UEFA – our core mission – can be expressed as follows: "To create the right conditions for the game in Europe to prosper and develop."

(Ref. W14)

5.3.3 Strategic Objectives

The activities undertaken by UEFA to fulfil its mission are driven by 4 Strategic Objectives – relating to Football, Governance, Revenue and Management. These strategic objectives are listed below, along with the primary activities currently being undertaken.These four strategic objectives form the basis for the new organisational structure of the administration, under the leadership of the General Secretary.

5.3.3.1 Football

To promote the game of football through organisation of the best European competitions for clubs and countries, the development of coaches and referees, and the encouragement of grassroots football.

a) Champions League
b) European Championships
c) UEFA Cup
d) Women's competitions
e) Youth competitions
f) Futsal
g) Coaching convention
h) Grassroots convention
i) Referee convention
j) Social responsibility

5.3.3.2 Governance

To establish closer relationships with member football associations, new frameworks of cooperation with clubs, leagues and players, and the raising of standards of governance of the game on an improved legal basis recognising the specific characteristics of sport.

a) New structures
b) Hat-Trick programme
c) European Union issues
d) TEP
e) Specificity of sport
f) Club licensing

5.3.3.3 Revenue

To optimise revenues from TV, sponsorship and other commercial contracts for the benefit of football, and to service the needs of commercial partners to their satisfaction.

a) Marketing strategies
b) New media technologies
c) TV sales process
d) Sponsor programmes
e) New commercial opportunities
f) Brand development

5.3.3.4 Management

To manage UEFA staff and resources efficiently, to provide first-class administrative support to the work of all UEFA Committees, and to communicate efficiently internally and externally.

a) Budget management
b) Objective setting
c) Staff management
d) IT support
e) Internal control systems
f) Forward planning

(Ref. W12)

6. CULTURAL EVENTS (MUSIC)

7. CULTURAL EVENTS (FILM)

8. CULTURAL EVENTS (DANCE)

9. CULTURAL EVENTS (SEASONAL)

10. POLITICAL EVENTS

11. APPENDIX A – TABLE OF FIGURES

12. APPENDIX B - DOCUMENT ADMINISTRATION

12.1 VERSION HISTORY

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(0)	11/09/2009	Tony Haynes	N/A	First Draft – Extracted from other Annexes
0.00.00(1TH)	30/11/2009	Tony Haynes	N/A	Aligned with Generic Template
0.00.00(2TH)	30/11/2009	Tony Haynes	N/A	Recovered from WORD problems
0.00.00(3TH)	30/11/2009	Tony Haynes	N/A	Added Commonwealth Games
0.00.00(4TH)	17/12/2009	Tony Haynes	N/A	Aligned Configuration Management with QM Proposal

APPENDIX B

12.2 REFERENCED DOCUMENTS

12.2.1 Document References

Ref. Document Title	Document Ref.	Version	Location
A1.			
A2.			

12.2.2 Web References

Ref. Document Title	Web Ref.	Location
W1. Olympic Games	STAD-EXT-WEB-0101	http://en.wikipedia.org/wiki/Olympics
W2. World Cup	STAD-EXT-WEB-0311	http://en.wikipedia.org/wiki/FIFA_World_Cup
W3. FIFA	STAD-EXT-WEB-0312	http://en.wikipedia.org/wiki/FIFA
W4. Olympic Delivery Authority	STAD-EXT-WEB-2101	http://en.wikipedia.org/wiki/Olympic_Delivery_Authority
W5. London Organising Committee of the Olympic Games	STAD-EXT-WEB-2102	http://en.wikipedia.org/wiki/LOCOG
W6. Olympics Bidding Process	STAD-EXT-WEB-0102	http://en.wikipedia.org/wiki/2012_Summer_Olympics_bids
W7. London Organising Committee of the Olympic Games (2)	STAD-EXT-WEB-2201	http://www.london-2012.co.uk/LOCOG/
W8. CG Bid Process	STAD-EXT-WEB-0200	http://www.commonwealthgames.com/
W9. UEFA	STAD-EXT-WEB-0321	http://en.wikipedia.org/wiki/UEFA
W10. Guidelines from FIFA-Com	STAD-EXT-REF-6101	http://www.fifa.com/mm/document/tournament/competition/fifa_wc_south_africa_2010_regulations_en_14123.pdf
W11. FIFA Stadium Regulations	STAD-EXT-REF-6102	http://www.fifa.com/mm/51/54/11/stadium_tech_rec_req_guide_to_lighting_en_7306.pdf
W12. The UEFA Organisation	STAD-EXT-WEB-6402	http://www.uefa.com/uefa/aboutuefa/index.html
W13. Official CWG Website	STAD-EXT-WEB-0203	http://thecgf.com/
W14. UEFA Vision	STAD-EXT-WEB-0322	http://www1.uefa.com/countries/organisation/aboutuefa/index.html

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12.3 ANNEXED DOCUMENT

Ref. Document Title	Document Ref.	Version	Location
A3.			
A4.			

12.4 SUPPLEMENTS

Ref. Document Title	Document Ref.	Version	Location
S2.			
S3.			

APPENDIX B

12.5 DISTRIBUTION

12.5.1 Distribution for Review

Date	Name	Version	Purpose

12.5.2 Distribution for Information

Date	Name	Version	Purpose

12.6 TEMPLATE

Document Ref.	Template Title	Template Version
STAD-TEM-DOT-0007	STAD Generic Annex Template	0.00.00(9TH)

End of Document

Transport For London

STADIUM

2006 Commonwealth Games Event Report Annex

Author:	**Tony Haynes**
Organisation:	**TfL**
Version :	0.00.00(4TH)
Version Date :	02/12/2009
Document Reference :	**STAD-DEL-WP2-1121**
Document Category :	Deliverable

Phase: Analysis & Design

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0. PREFACE

0.1 AUTHOR (S)

Name
Tony Haynes

0.2 THIS VERSION[1]

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(4TH)	02/12/2009	Tony Haynes	N/A	Correct Styles after TfL Network problems. Further adjustments to text location & format.

0.3 AUTHORISATION

a) This is a controlled document once issued. All revisions are subject to change control.
b) All revisions of this document must be endorsed by at least one peer (to ensure that the document is fit for review).
c) All revisions of this document must be reviewed by at least one subject matter authority.
d) All revisions of this document must be approved by the TfL Stadium Project Manager.
e) All revisions of this document must be accepted by the GCS Programme Manager before being issued.

Role	Name	Signature	Date
Reviewed By: Subject Matter Authority			
Approved By: TfL Stadium Project Manager			
Accepted By: GCS Programme Manager			

[1] Version History at Appendix B

0.4 CHANGES FORECAST

None

0.5 VERSION NUMBERING

The review history of all documents follows the pattern:

a)	Author draft(s)	[0.00.00(nAA)]
b)	Endorsement	[0.00.0n(0)]
c)	Review	[0.00.1n(0)]
d)	Approval	[0.00.2n(0)]
e)	Acceptance	[0.00.3n(0)]
f)	Issue	[n.nn.00(0)]

1. INTRODUCTION

1.1 PURPOSE

1.1.1 Document Purpose

To deliver an appraisal of the 2006 Commonwealth Games Large Event.

1.1.2 Functional Purpose

To understand how Intelligent Transport Systems were used to support the mobility aspects of the 2006 Commonwealth Games Large Event in Melbourne and to elicit information that will contribute to the recommendations in the main 'State Of The Art' Large Event Report.

1.2 SCOPE

The 2006 Commonwealth Games Large Event

a) The context and background of the event
b) The challenges of the event
c) Planning
d) Mobility Management
e) Ticketing Technologies utilised
f) The Provision Of Customer Information
g) Security

1.3 DOCUMENT EXCLUSIONS

This document does not repeat information captured in other documentary products. Where such information is relevant those documents will be clearly referenced within the annex.

2. CONTEXT

2.1 COMMONWEALTH GAMES EVENTS

A summary of the generic organisation and objectives of the Commonwealth Games will be found in the main report Annex ‘Event Characteristics’ (See Ref. R1)

2.2 THE BIDDING PROCESS

This process commenced in January 1996, when a decision was made by the Australian Commonwealth Games Association (ACMA) to put forward Melbourne in October. This decision followed a national competition among all Australian State and Territory Governments to identify the best Australian candidate.

A detailed document called "The Bid Book" was prepared by the Melbourne 2006 Commonwealth Games Bid Committee. It was presented to the Commonwealth Games Federation (CGF) in March 1999, six months prior to the CGF General Assembly where the decision was taken to hold the Games in Melbourne. The following information was included in this document :

a) dates and proposed duration of the Games
b) climate record of Melbourne
c) data on Melbourne - size, population, etc
d) transport infrastructure including airport
e) telecommunications and Broadcasting capacity
f) popular support for Games among Melbournians and Australians
g) government support - Federal, State of Victoria and Melbourne City Council
h) experience in hosting events of a similar size in Melbourne and Australia
i) proposed Constitution and legal status of Organising Committee including relationship with governments
j) experience of persons who will be responsible
k) capacity for gaining support from volunteers
l) understanding of Commonwealth Games operations
m) proposed sports on the program including events
n) existing facilities including proposed upgrading - amount of spectator capacity and inclusion of facilities for officials, athletes and the media
o) new facilities to be constructed including timeline - amount of spectator capacity and inclusion of facilities for officials, athletes and the media
p) experience of sports event organisers and facility planners/builders
q) location, type and after use of Athletes Village
r) transport to and from village with respect to airport, Games venues, training venues, recreation areas, city, etc
s) construction schedule for village either for establishment and/or upgrade
t) number of CGF Officials, Technical Officials, 'Extra' Officials and representatives of the media which will be provided for
u) amount, type and level for domestic and overseas visitors
v) any proposed 'control' of accommodation availability and costs
w) details of proposed Games Budget - close scrutiny of income and expenditure

x) understanding of Capital and Operating Budgets for the Games - specifics of government underwriting

There are two areas of particular interest to transport operators, namely, transport infrastructure including airports, and transport from the village to the airport, Games venues, training venues, recreation areas, city, etc. However clearly the most of these issues focus on the event delivery capability, rather than simply transport.

The right to host the Commonwealth Games in Australia in 2006 was granted to the ACGA in October 1999.

(Ref. W12)

2.3 SCALE OF THE EVENT

More than 4,500 athletes from 71 nations and territories competed during the Games. Along with the athletes, an estimated 1,500 team officials, 1,200 technical officials and 3,100 media representatives attended.

Although the Games lasted for just 12 days, they required a complex deployment of Australian civilian resources, second only to what was required for the Sydney 2000 Olympics. The Melbourne 2006 Commonwealth Games Corporation (M2006), assisted by organisations such as the Australian Communication and Media Authority (ACMA), constructed the equivalent of a large, complex business within just three years—a challenging and confronting task, particularly because of the high expectations of the nation and the Commonwealth.

(Ref. R2)

Additionally the Melbourne 2006 Games included:

a) 5,000 service providers,
b) 1 million spectators,
c) 3,000 local and international media,
d) 15,000 volunteers,
e) 40,000 internal visitors,
f) 50,000 interstate visitors, and
g) 1 billion television viewers worldwide.

It was the biggest sporting event to take place in Australia since the Sydney Olympics in 2000

(Ref. W13)

2.3.1 Venues

A total of 16 sports were contested using 61 competition and training venues. Fifty five of these venues were located within the greater Melbourne area and six were located in regional Victorian.

(Ref. R2)

The competition venues were situated mainly in various precincts within Melbourne although some were also at Regional or Suburban centres The Melbourne Cricket Ground was the main venue for the opening and closing ceremonies. The sports which were played at each venue are listed after it.

2.3.1.1 Melbourne venues

a) Docklands Precinct:
Walks
b) Melbourne Cricket Ground:
Opening and Closing Ceremonies, and Athletics
c) Melbourne Convention and Exhibition Centre:
Badminton, Boxing and Weightlifting
d) Melbourne Gun Club:
Clay Target Shooting
e) Melbourne International Shooting Club:
Small Bore and Pistol Shooting
f) Melbourne Sports and Aquatic Centre:
Aquatics, Squash and Table tennis
g) Multi Purpose Venue (Melbourne Park):
Basketball Finals, Track Cycling and Netball Finals
h) Rod Laver Arena (Melbourne Park):
Gymnastics
i) Royal Botanic Gardens Circuit:
Cycling Road Race events
j) State Lawn Bowls Centre:
Lawn Bowls
k) State Netball and Hockey Centre:
Netball preliminaries and Hockey
l) St Kilda Foreshore and Beach Road:
Triathlon and Cycling Time Trial
m) Telstra Dome:
Rugby 7s

FIGURE 1 THE MELBOURNE CRICKET GROUND

2.3.1.2 Regional and suburban venues

a) Ballarat
   i) Ballarat Minerdome: Basketball
b) Bendigo
   i) Bendigo Stadium: Basketball
   ii) Wellsford Rifle Range: Full Bore Shooting
c) Geelong
   i) Geelong Arena: Basketball
d) Lysterfield Park
   i) State Mountain Bike Course: Mountain Bike Cycling
e) Traralgon
   i) Traralgon Sports Stadium: Basketball

2.3.2 Budget

In March 2003, the Victorian Government capped its contribution to the Games at $697 million. Following a review of security arrangements in 2004, all matters relating to security were removed, and the cap adjusted to $651.4 million.

The Auditor General confirmed that the Victorian Government recorded a net outlay of $601.3 million for the Games, $50.1 million under the revised budget cap of $651.4 million. In addition, an incident free Games ensured expenditure on security $28.8 million lower than the $118.7 million allocation. The Auditor General also confirmed the capital and operating cost of the Games, including contributions from the Federal Government, the City of Melbourne and revenues generated, was $1.055 billion – excluding security.

(Ref. W14)

2.3.3 General Initiatives

Creating new facilities and upgrading existing ones helped to make the Melbourne 2006 Commonwealth Games a success, as well as giving Victoria more world-class venues to watch and play sport. As Australia's sporting capital, the projects triggered by the Games helped to attract other major events in future.

a) MCG
b) MSAC (Melbourne Sports and Aquatic Centre)
c) State Mountain Bike Course
d) State Lawn Bowls Centre
e) William Barak Bridge
f) Games Village
g) Jolimont Station
h) Melbourne International Shooting Club
i) Melbourne Gun Club
j) State Netball Hockey Centre
k) Yarra Precinct Lighting
l) List of Games Venues
m) Case Study on Bowens

(Ref. W4)

3. CHALLENGES

3.1 GENERAL EVENT CHALLENGES

3.1.1 <Event Type> Challenges

3.1.2 Environment Challenges

The following paragraphs are common to all annexes

3.1.2.1 Growth

Any city that has a significant growth factor will be experiencing increased demand for transportation services. The balance between this, planned transport development and the demands of a large event will always be a serious challenge. There will also be a potential for increased car ownership adding to the problems of traffic congestion.

3.1.2.2 International Traffic

As a by-product of growth, there are increased demands for international traffic resulting in a need for increased facilities for international transport arrivals and transport departures. This also has an impact on border policing. A Large Event with an international flavour will put extra pressure on both of these aspects of international traffic.

3.1.2.3 Freight Expansion

Similarly, the growth of a city is likely to place extra demands on freight throughput. Such growth will lead to more congestion, slower travel speeds and increased emissions. Therefore the need for *integrated* transport becomes even more pressing.

3.1.2.4 Road Safety

With the increased transportation demands identified above, the potential for more accidents is an obvious corollary. There is therefore a need to *prevent* more accidents by whatever means possible. The safety of visitors to the city during a large event is also of paramount importance to the reputation of the city.

3.1.2.5 Pollution

Similarly, with the increased volumes of traffic there is a potential for there to be increased levels of pollution from emissions and noise. A city with high levels of pollution will not be favoured in any bidding process for hosting a large event.

3.2 CITY SPECIFIC CHALLENGES

The author should consider Culture, Geography, Security Threats, Antiquities, Politics and City Policies. It should be noted that the consideration of City Challenges is not limited to these features.

4. PLANNING & DESIGN

Some aspects of planning will not be explored by this report since these aspects do not impinge upon the use of technology. These aspects are:

a) Marketing Planning
b) Sponsorship Planning
c) Site & Venue Planning
d) Finance Planning
e) Programme Planning

4.1 ORGANISATIONAL STRUCTURE

4.1.1 OCGC

The Office of Commonwealth Games Coordination (OCGC) was established by the Victorian Government in February 2002. The role of OCGC was to ensure the effective delivery by the Victorian Government of the Commonwealth Games, through management and coordination of all relevant bodies involved.

In partnership with a range of other Government agencies such as Melbourne 2006, OCGC worked to ensure that the Games would deliver both the largest and most successful event in the State's history, and also lasting benefits for all Victorians. OCGC had the role of coordinating all areas of games activity, from ticketing to infrastructure, ensuring that Victoria was on track to deliver an outstanding event for all in March 2006.

(Ref. W1)

4.1.2 ACMA

ACMA played a significant part in the staging of the XVIII Commonwealth Games held in Melbourne in March 2006.

(Ref. R3)

The Australian Communications and Media Authority (ACMA) is a statutory authority within the federal government portfolio of Broadband, Communications and the Digital Economy.

The ACMA is responsible for the regulation of:

a) Broadcasting
b) The internet
c) Radio-communications
d) Tele-communications.

(Ref. W7)

Support was provided by ACMA under a service agreement with the Melbourne Commonwealth Games Corporation (M2006). Providing a reliable communications environment (both radio communications and telecommunications) was essential for the safety of all individuals involved and to enable the Games to be broadcast with minimal interference from external radio communications sources.

The Commonwealth Games Workforce set up by ACMA consisted of 33 technical and three administrative staff from its offices throughout Australia. The workforce provided on-site guidance and support to M2006 organisers about the operation of tele communications and radio communications equipment within Australian standards.

Key roles for the ACMA workforce were testing of communications equipment being used by media representatives at Games venues, allocation of radiofrequencies to M2006, including ceremonies and teams, and authorising short-term use of services by international media representatives, including issuing licences.

(Ref. R3)

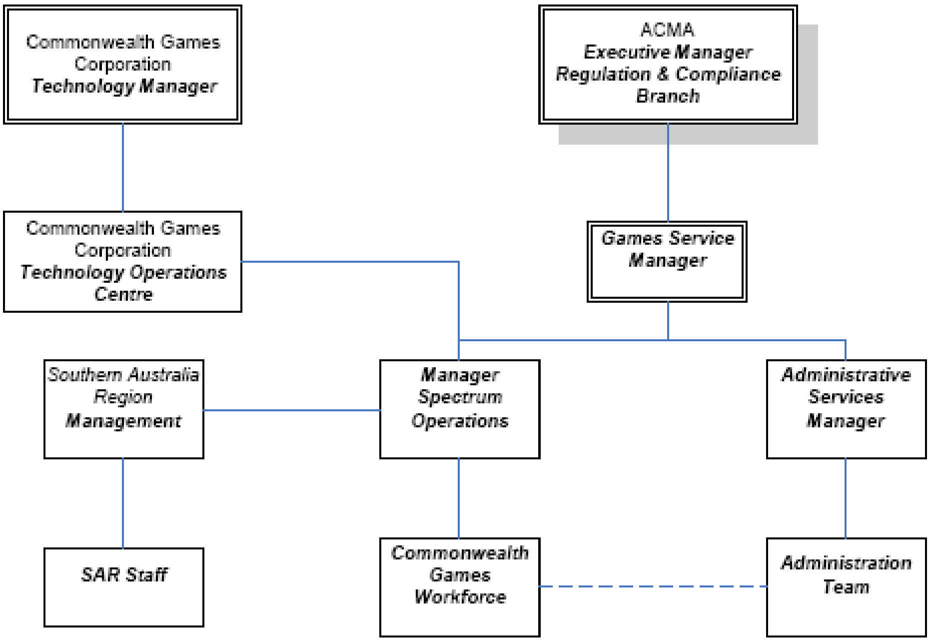


FIGURE 2 ACMA AND CGC

4.1.3 The Games Operation Centre (GOC)

The Games Operation Centre (GOC) was the overall coordination body for the Games, with each venue under the control of a Venue Manager, supported by managers of expert areas within that venue. ACMA's contact person at each venue was the Venue Technology Manager (VTM).

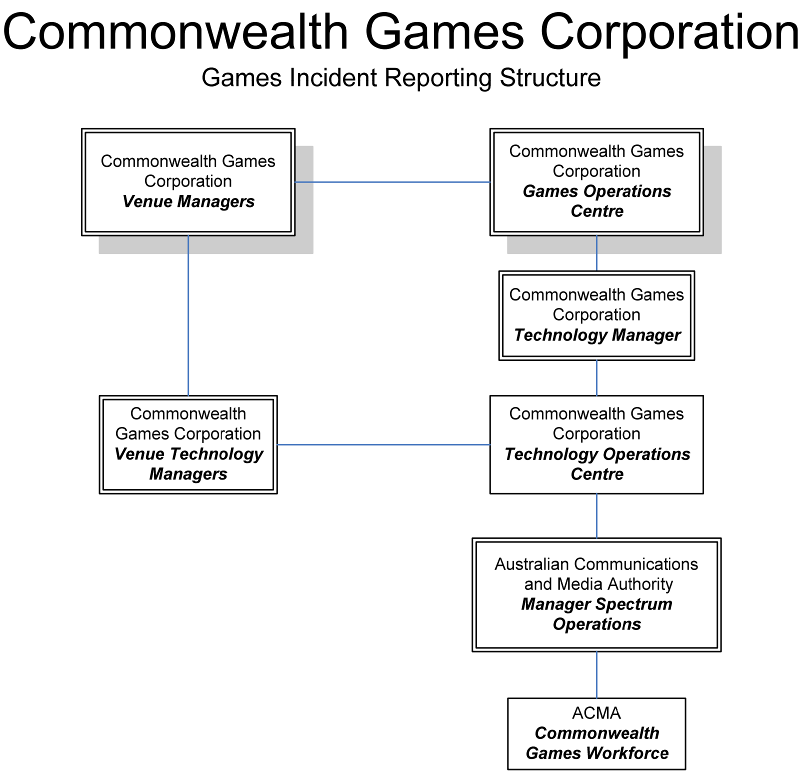


FIGURE 3 GAMES INCIDENT REPORTING STRUCTURE

(Ref. R2)

4.1.4 Reporting structures

In the early stages of the project ACMA formed a Commonwealth Games Steering Committee (CGSC) to oversee the CGPT. The CGPT reported to the CGSC primarily through monthly meetings. The establishment of a management committee was required under the service agreement between ACMA and M2006. The committee monitored and reviewed the progress under the agreement, the key regulatory and political issues and, through a consultative process, resolved potential and actual problems. The committee convened every two weeks. This arrangement led to a close working relationship between ACMA and M2006 with all issues resolved in a cooperative manner. ACMA was also a member of the M2006 Commonwealth Games Taskforce, which was chaired by the Department of Communications, Information Technology and the Arts (DCITA). The taskforce provided a high level of cooperation between the various government agencies. More information about the taskforce is under Information dissemination-public awareness in this report. ACMA worked closely with other key organisations involved in the staging of the Games.

These included:

a) M2006-the Technology Group, and program areas for the Queens Baton Relay and Ceremonies
b) Trans World International (TWI), the host broadcaster

c) Telstra, the radiocommunications and telecommunications service provider
d) Victoria Police and Emergency Services
e) The Department of Defence.

(Ref. R2

4.1.5 Project Management

Initially, Melbourne 2006 utilised Microsoft Office and Project Professional for project management and to assist in managing the preparations. By early 2004, however, Melbourne 2006 reached a critical milestone: with the event fast approaching and staff headcount set to dramatically increase, more sophisticated project management tools and techniques were required to handle the event's increasing complexity. The organisation needed a solution that would scale and could provide visibility of the programmes of work throughout the organisation.

Melbourne 2006 chose Avanade because of the strength and tools found in Avanade's global Delivery Management practice. Avanade's alliance with Microsoft, its deep technical skill with Microsoft products, and its broad experience implementing enterprise-scale software and infrastructure were also important considerations for Melbourne 2006. The work began in May 2004.

(Ref. W15)

Avanade is a business technology services provider dedicated to using the Microsoft platform to help enterprises achieve profitable growth. Through proven solutions that extend Microsoft products, Avanade helps enterprises increase revenue, reduce costs, and reinvest in innovation to gain competitive advantage. Unique connections with Accenture and Microsoft enhance Avanade's ability to deliver effective mission-critical solutions for organizations in all industries. A joint venture between Accenture and Microsoft, Avanade was formed to merge the strengths of both companies – Accenture's consulting and Microsoft's technology expertise – into a single company. Avanade is privately held.

(Ref. W2)

Avanade's solution used Microsoft Project Server 2003 as its foundation. Integration with SharePoint makes all data available via a web browser, using custom views designed by Avanade to enable staff in different departments to enjoy access to the information most relevant to their needs and roles.

The solution allows for:

a) Real-time access to the status of schedules, risks, and issues;
b) Common interface and processes throughout the enterprise for all aspects of tracking project schedules;
c) A holistic view of the project schedules;
d) A secure environment for the management of sensitive risks and issues.

The Avanade-built solution quickly became the central tool Melbourne 2006 used to manage its event preparations.

(Ref. W15)

4.2 TIME FRAME

The Melbourne 2006 XVIII Commonwealth Games (the Games) were staged in Melbourne from 15 March to 26 March 2006. The opening ceremony was followed by 11 days of competition in Melbourne and regional Victoria.

(Ref. R2)

4.3 SIMULTANEITY

4.4 STRATEGIC APPROACH

4.4.1 Mobility

4.4.1.1 Considerations

The traffic and transport plans developed for Games time took into consideration a range of issues. These include:

a) the safe transportation of athletes and officials,
b) spectator transport,
c) Games vehicles access,
d) venue deliveries,
e) access for spectator buses, charter coaches, sponsor coaches, taxis and hire cars,
f) motorbike and bicycle access,
g) pedestrian access,
h) access for people with disabilities,
i) expected crowd numbers,
j) competition schedules, and
k) other Games activities such as the Festival Melbourne 2006 programs.

All of these issues must be considered in the context of existing road users and the potential for impact on businesses and local communities. Traffic arrangements have been designed to facilitate efficient travel to and from each venue, and each venue has a specific set of circumstances to consider.

(Ref. R4)

4.4.1.2 Initiatives

a) there will be no parking at major Games venues,

b) public transport on Melbourne's trains, trams and buses (Metcard services only) will be free for Games ticket holders on the day of the event,
c) 28,000 additional public transport services will operate during the Games,
d) NightRider Bus services will operate every night of the Games,
e) Victorian School holidays will coincide with the Games,
f) information will be provided directly to local residents and businesses and will be available through local newspapers,
g) temporary signs and VMS signs will be installed to help communicate traffic arrangements,
h) diversion routes for key events will be developed,
i) the Victorian Government is working with the business community and key industry groups to inform key stakeholders of Games arrangements and identify solutions where practical,
j) the Business Ready program will encourage businesses to plan for Games time arrangements and minimise travel,
k) an advertising and media campaign will communicate key arrangements and encourage road and public transport users to plan for the Games and minimise travel, particularly during peak periods, and
l) a central traffic coordination centre will be established during the Games to monitor traffic and transport

(Ref. R4)

4.4.2 Operations

4.4.2.1 Managing congestion

Plans set out by the Victoria Government in 2004 set out the priorities for tackling everyday transport issues in Melbourne. This document makes reference to the city's role as the venue for the 2006 Commonwealth Games being relevant to the overall context of the plan.

Rising levels of road congestion are one of the frustrations of urban living. Increasing road capacity through road building programs alone cannot solve traffic congestion. Instead, the Government proposed a range of complementary approaches. These include :

a) better management of the existing road system,
b) improving the performance of the public transport system, and
c) actively promoting travel by public transport, walking and cycling.

(Ref. R6)

4.4.2.2 2006 Commonwealth Games, Melbourne SEP Pedestrian Modelling

In 2003, the Halcrow consultancy was employed by the Department of Infrastructure, Victoria to develop a pedestrian model, encapsulating the Sports and Entertainment Precinct, which was bounded by Flinders St Station, Richmond Station and Jollimont Station, and incorporated the Melbourne Cricket Ground; the Rod Laver Arena; the

Vodafone Arena; and Federation Square. This was with a specific focus on examining the impact of the 2006 Commonwealth Games.

(Ref. W16)

4.4.2.3 Operations Rooms

After the Games, in August 2006, the Australian Communications and Media Authority produced a Melbourne 2006 Commonwealth Games report. Amongst other things the report described the Incident Management structure for the Games as well as the Communication and Control structure. These descriptions, however, largely refer to technology issues related to the events themselves, rather than transport issues which may have occurred beyond the actual venues.

The Games Operation Centre (GOC) was the overall coordination body for the Games, with each venue under the control of a Venue Manager, supported by managers of expert areas within that venue. ACMA's contact person at each venue was the Venue Technology Manager (VTM).

All incidents were reported to the GOC, which was located at the M2006 Games headquarters in the Melbourne Central Business District. The Technology Operations Centre (TOC) reported to the GOC. The TOC coordinated the support of organisations such as ACMA that provided technology. Incident management for Games services was coordinated through the TOC, using a Games Information Management System (GIMS) to log and track technology incidents throughout the Games.

(Ref. R2)

4.4.3 Information

4.4.4 Environmental

See also Post Event Planning

4.4.5 Security

ACMA's key messages were that:

a) Each radio device you operate must be licensed;
b) Cordless telephones are not permitted at the games unless compliant with Australian standards;
c) Communications equipment must be compatible with Australia's power supply;
d) Communications cabling must be done by a registered or licensed cabler;
e) Communications equipment cannot be connected to a telecommunications network unless properly authorised

to contact the Australian emergency call service, dial ‘000’.

(Ref. R2)

4.4.6 Health & Safety

4.4.7 Staging

4.4.8 Post Event Planning

5. MOBILITY

5.1 SERVICES PROVIDED

As major competitions were held at venues near the Melbourne Central Business District (CBD), all members of Australian Communication and Media Authority's (ACMA) Games Workforce (GWF) were issued with Zone 1 Metcard tickets, which enabled them to use public transport to and from the Melbourne metropolitan venues.

Cab charges were provided to Melbourne-based staff, as required, at the end of the evening shift.

5.1.1 Spectator Transport

For the most part, timetabled services were unchanged.

(Ref. R2)

Spectator Shuttle Buses were provided for those venues not within walking distance of a public transport point

Shuttle bus service operated from the following locations:

a) Federation Square
to the Melbourne Cricket Ground, Rod Laver Arena and Multi-Purpose Venue (Melbourne Park)

b) Southern Cross Station
to the Melbourne Exhibition Centre and Melbourne Sports and Aquatic Centre

c) Southern Cross Station
to St Kilda (Triathlon and Cycling Time Trial)

d) Hallam Station
to the State Mountain Bike Course at Lysterfield Park

e) Princes Park Park 'n' Ride
to the State Netball and Hockey Centre.

(Ref. W3)

5.1.2 Participant Transport

5.1.3 Management Transport

Three ACMA vehicles were usually required for each shift, but seven vehicles were registered with M2006 (See Security) to allow for stand-by vehicles for emergency back-up, if required.

The Mobile Service Teams required two vehicles fully fitted with equipment for interference investigation with a third vehicle on stand-by. One vehicle was made available for the GSM.

(Ref. R2)

5.1.4 Background Transport

As timetabled services were for the most part unchanged they suffered due to higher loads.

(Ref. R2)

5.1.5 Freight Transport

5.1.6 Parking

5.1.6.1 Parking For Official Vehicles

Overnight parking was provided in the secure ACMA Melbourne Office car park and M2006 provided ACMA with:

a) One parking space at each of the Games Headquarters, the Melbourne and Olympic Parks Precinct and the Melbourne Sports and Aquatic Centre;
b) Short-term parking at the Games Headquarters for the afternoon shift handover;
c) Access to parking for a minimum of two hours at each venue to allow ACMA personnel to complete interference investigations; and
d) Access to vehicle pick-up and drop-off points to allow movement of equipment.

(Ref. R2)

5.1.6.2 Parking For Spectator Vehicles

There was no parking at major Games venues for spectators.

(Ref. W5)

A) Park & Train

To assist Games spectators, ‘park and train’ options will be provided at three suburban stations. There will be free parking for 1500-plus vehicles available at Caulfield Racecourse (for Caulfield Station) and space for about 400 vehicles at both Victoria Park Station (railway siding) and West Footscray Station. Park the car and take a short train ride to your destination.

(Ref. R4)

B) Park & Ride

Park & Ride services were provided at various car parks with direct shuttle buses to specific competition venues.

5.2 MECHANISMS

5.2.1 More Services

a) More public transport services, more often were planned to help transport more than one million spectators expected to attend the Games in March 2006.
b) More than 28,000 additional services were planned to operate during the Games.

(Ref. R5)

5.2.2 Multimodal Transport

5.2.3 Road Transport

5.2.3.1 <u>Buses</u>

A) City Routes

a) Upgraded services.
10 city bound routes will be boosted throughout the Games.
b) Extended evening services.
These 10 routes will have extra services running after 7.00pm, with the last buses to leave the city at 12.30am, extended to 1.15am on the night of the Opening Ceremony and 1.30am on the night of the Closing Ceremony.
c) More bus routes.
More than 60 metropolitan and city bus routes will be extended beyond standard finishing times.

B) Suburban Routes

a) Upgraded services.
More than 50 suburban routes will be upgraded on all weekdays during the Games connecting to major railway stations.
b) Links to evening trains.
Last services on these routes will be extended to meet the last train services on all weekdays during the Games.

C) Spectator Shuttle Buses

For those venues not within walking distance of a public transport point, spectator and accessible shuttle buses will operate from a nominated train station to the venue. Shuttle buses will operate from:

a) Fairfield Station
to the State Lawn Bowls Centre, Thornbury
b) Hallam, Glen Waverley and Ringwood Stations
to the State Mountain Bike Course at Lysterfield Park

c) Southern Cross Station
to the Melbourne International Shooting Club, Port Melbourne

d) Lilydale Station
to the Melbourne Gun Club in Lilydale

e) Ballarat, Bendigo, and Traralgon train stations
to regional basketball venues.

f) Park and Ride location at Princes Park
to State Netball Hockey Centre

g) Park and Ride location at Bendigo Harness Racing Club
to Wellsford Rifle Range.

D) Nightrider

a) More services.
1,100 extra NightRider services will operate during the Games including running on the weekend and after the Opening and Closing Ceremonies with buses operating every night of the Games from 12.30 am – 4.30 am. Normal fares will apply.

b) Higher frequency.
NightRider will run on a 30 minute frequency on all routes when operating on weekends and on Opening and Closing Ceremony nights. An hourly NightRider service will operate on all other nights during the Games

(Ref. W6)

5.2.3.2 Trams

a) More evening services.
Extra services on all city routes after 7.00pm, with trams running at least every 10 minutes between 10.00pm and 12.30am for spectators leaving evening events.

b) Extended evening services.
Last trams will leave the city at 12.30am each night, extended to 1.15am on the night of the opening ceremony and 1.30am on the night of the closing ceremony. Trams will run until 1am on Friday 17 March, Saturday 18 March, Friday 24 March and Saturday 25 March.

c) More weekend trams.
A Saturday level of service will apply on Sunday 19 March and Sunday 26 March.

d) Increased capacity.
Higher capacity trams will be used on routes to Games venues.

e) Shuttle tram services.
Shuttle trams will run to the MCG, Rod Laver Arena, Multi Purpose Venue, Telstra Dome and Melbourne Sports and Aquatic Centre.

f) More St Kilda bound services.
Extra shuttle trams will run to the Triathlon in St Kilda.

g) Enhanced customer service.
200 customer service officers along with Melbourne 2006 volunteers will staff major tram stops providing assistance to commuters.

(Ref. W6)

5.2.3.3 Exclusive Games Lanes

As a key element to the successful running of the Melbourne 2006 Commonwealth Games, dedicated lanes were introduced on selected roads to ensure vehicles transporting athletes and officials would arrive at their destination on schedule. Exclusive Games Lanes were located on the most suitable and direct routes between the Commonwealth Games Athletes' Village and two major Games venues. They were for use by authorised Games vehicles only although some sections were 'shared zones' to enable access to local commercial and residential properties.

The lanes operated from the Village to the Sport & Entertainment Precinct (MCG, Melbourne Park and Olympic Park) and back, and from the Village to the Melbourne Sports & Aquatic Centre and back. Authorised Games vehicles also had a priority arrangement on the Tullamarine Freeway and CityLink between Tullamarine Airport and the Village.

The map shows the routes. The lanes caused reduced carrying capacity on some roads along the route and drivers were advised to consider an alternative route.

FIGURE 4 EXCLUSIVE GAMES LANES

The Exclusive Games Lanes:

a) operated on a 24-hour basis from Sunday 12 to Sunday 26 March
b) were exclusively for the use of authorised vehicles - all other vehicles, including bicycles, are not allowed to travel in the lanes
c) could be accessed by emergency services vehicles at all times
d) could be crossed by general road users, but only authorised vehicles could travel in the lanes
e) were identified by blue lines on the road; signs were also be installed to alert drivers
f) were enforced by Victoria Police; unauthorised use incurred a fine of $165
g) The ‘shared zones’ were signed ‘Authorised Games Vehicles and Local Access Only’. Local Access Only areas were for people who had a legitimate reason to be there and residents and businesses did not require a permit.

All vehicles using the lanes will be required to follow normal road rules and obey traffic lights.

FIGURE 5 LANE SIGNAGE

(Ref. R7)

5.2.4 Rail Transport

5.2.4.1 <u>Metropolitan Trains</u>

a) More trains.
More than 400 extra services to and from Flinders Street Station, will run during the Games, mostly in the evenings and targeted during periods of peak demand.
b) Shuttle services.
A further 300 shuttle services will operate to the State Netball Hockey Centre at Royal Park.
c) More drivers.
An additional 21 new permanent drivers and 39 other drivers will boost Melbourne’s train driver workforce.
d) More evening services.
Trains from the city will run every 20 minutes after 7.00pm on all days from 15 March apart from the last day (26 March) when services will run every 30 minutes. A 50% increase in train frequencies after 7.00pm which equates to a 300% increase in capacity.
e) Extended evening services.

Last trains will leave Flinders Street Station at 12.30am each night, extended to 1.15am on the night of the Opening Ceremony and 1.30am on the night of the Closing Ceremony.

f) An additional outbound trains.
60 outbound trains will operate between 11.30 pm and 1.15 am on the night of the Opening Ceremony. An additional 80 outbound services will operate between 11.30 pm and 1.30 am on the night of the Closing Ceremony.

g) More weekend trains.
A Saturday level of service will apply on Sunday 19 & 26 March.

h) Increased capacity.
All trains will operate with six carriages from first to last service every day of the Games.

i) City loop stations remain open.
All city loop stations will remain open every day throughout the Games from first to last service.

j) Enhanced customer service.
City stations and those near Games venues will have extra staff available to provide assistance to the travelling public.

(Ref. W6)

5.2.5 Regional Trains

a) Extra regional services.
More than 180 additional regional train services will run during the Games. There will also be an additional 24 V/Line coach services.

b) Cheaper tickets.
V/Line passengers with a Commonwealth Games ticket will be eligible for a ticket costing no more than $10 return on the day of their event.

c) Extended evening services.
V/Line trains will leave the city at 12.30am each night, extended to 1.15am on the night of the Opening Ceremony and 1.30am on the night of the Closing Ceremony.

(Ref. W6)

5.2.6 Water Transport

5.2.7 Air Transport

Quantas provided Travel Packages including Air Travel and Event Tickets.

(Ref. W18)

5.3 MANAGEMENT & CONTROL

5.3.1 Control And Command Centres

5.3.2 Operational Integration

5.3.3 Intelligent Transport Systems

In 2002, Mi Services Group of South Perth was involved in the customised software, such as :

a) Melbourne's RAPID which facilitates bus priority at traffic signals and provides passengers with the latest information on the expected arrival time of their bus (The project was sponsored by CSIRO – the Commonwealth Scientific and Industrial Research Organisation).

b) BLISS is a computer program that monitors traffic volume at key intersections and changes the timing of traffic signals to ensure the most speedy and efficient traffic flow.

Also in 2002, VicRoads installed a computer controlled dynamic speed limit system on the Western Ring Road in Melbourne. This system monitors traffic congestion and calculates the best traffic speed that will optimise traffic flow. The speed limits are transmitted to drivers via a series of 80 roadside electronic signs. VicRoads also advised the committee that the Geelong Road Project would also incorporate a number of ITS applications.

(Ref. R8)

Mi Services was involved in the custom development of complex software for projects such as Melbourne's CityLink Central Control System and the Perth Traffic Control Centre's traffic management and control system that integrates freeway ITS facilities (such as closed circuit television, incident detection and variable message signs) with urban traffic signal control.

5.3.4 Other Systems

6. TICKETING

6.1 TICKET TYPES PROVIDED

6.1.1 Transport Tickets

V/Line (trains and bus services in the State of Victoria from outside Melbourne) offered a special $10, same day return ticket for Games ticket holders on the day of the event.

(Ref. W9)

6.1.2 Events Tickets

The event ticket acted as a travel ticket. Games volunteers were also given free travel. Their accreditation acted as their ticket.

6.1.3 Combined Tickets

A ticket to the Commonwealth Games was also a ticket to ride Melbourne's trains, trams and buses (all services that accept Metcards) on the day of the event. Travellers needed to have their Games ticket with them when travelling and they needed to retain their Games ticket for the journey home.

(Ref. W6, W9)

6.1.4 Travel Packages

6.1.4.1 <u>Qantas Holidays</u>

Travel packages including top Games tickets, air travel and accommodation were available through licensed travel agents.

6.2 TECHNOLOGIES USED

6.2.1 Paper Tickets

Metcard is the brand name of an integrated ticketing system used to access public transport in Melbourne, Australia. It is a universal ticket which allows users to ride on the city's Metlink network, consisting of suburban trains, trams, and buses, including the NightRider network. The Metcard is a credit card sized ticket made out of cardboard and uses a magnetic strip to store fare data. Metcard is operated by OneLink Transit Systems under a contract to the State Government which is managed by the Transport Ticketing Authority. Metcard will eventually be replaced by the myki contactless smartcard ticketing system, which is progressively being rolled out throughout Victoria. (See Section 6.2.3)

(Ref. W10)

FIGURE 6 A METCARD

6.2.1.1 Metcard types

There are many different types of Metcards available so depending on travel patterns, there will always be a Metcard to meet public transport journey needs.

The table below outlines each different Metcard type and its availability.

Type	Validity
2 hour	2 hour Metcards allow unlimited train, tram and bus travel for at least two hours within selected zones and are available from all outlets. 2 hour Metcards expire two hours from the next full hour after they are first validated eg: validate at 8.55am - expires 11am validate at 9.05am - expires 12pm validate after 6pm and a 2 hour ticket will be valid until 3am the next morning. Available from: Premium Station ticket windows, train station large and small Metcard ticket machines, Metcard retail outlets, the MetShop, online, the Metcard Helpline, and on board trams and buses. Consider a Value Metcard option: 10 x 2 hour
10 x 2 hour	10 x 2 hour Metcards allow ten 2 hour trips in a single ticket at a discounted price, but can only be used by one person at a time. No more than two 2 hour periods will be deducted per day. For example, a ticket validated at 9.05am will expire at 12pm. If the ticket is used again at 1.30pm on the same day, it will then be valid until 3am the following day. Available from: train station large Metcard ticket machines, Metcard retail outlets, the MetShop, online, the Metcard Helpline and Premium Station ticket windows.
Daily	Daily Metcards allow unlimited train, tram and bus travel for a whole day within selected zones. Available from: train station large Metcard ticket machines, Metcard retail outlets, the MetShop, online, the Metcard Helpline, Premium Station ticket windows and on board trams and buses. Consider a Value Metcard option: 5 x Daily
5 x Daily	The 5 x Daily Metcards include five Daily Metcards in a single ticket at a discounted price, but can only be used by one person at a time. Available from Premium Station ticket windows, train station large Metcard ticket machines, the MetShop, online, the Metcard Helpline and Metcard retail outlets.

TICKETING

Type	Validity
5 x Weekend Daily	The 5 x Weekend Daily Metcard is a single ticket allowing five days of unlimited train, tram and bus travel in Zones 1 and 2 on either Saturdays or Sundays for $15.00 ($3.00 per day). This Metcard provides great savings and flexibility for weekend passengers. It can only be used by one person at a time. Available from Metcard retail outlets, Premium Station ticket windows, the MetShop, online and the Metcard Helpline.
Weekly	Weekly Metcards allow for seven consecutive days of unlimited train, tram and bus travel within selected zones. Weekly Metcards can be used for weekend travel across Zones 1 and 2 irrespective of selected zones on tickets. Available from: Premium Station ticket windows, train station large Metcard ticket machines, Metcard retail outlets, the MetShop, online, and the Metcard Helpline.
Monthly	Monthly Metcards allow for unlimited train, tram and bus travel for one month within selected zones. Monthly Metcards can be used for weekend travel across Zones 1 and 2 irrespective of selected zones on tickets. Available from: Premium Station ticket windows, train station large Metcard ticket machines, Metcard retail outlets, the MetShop, online and the Metcard Helpline.
Yearly	Yearly Metcards allow for unlimited train, tram and bus travel for one year within selected zones. Yearly Metcards can be used for weekend travel across Zones 1 and 2 irrespective of selected zones on tickets. Available from the MetShop and Premium Station ticket windows.
Sunday Saver	Sunday Saver Metcards allow unlimited train, tram and bus travel across Zones 1 and 2 on Sundays for only $3.10. Available from Premium Station ticket windows, the Metcard Helpline, online, the MetShop and Metcard retail outlets. Consider a Value Metcard option: 5 x Weekend Daily
City Saver	City Saver Metcards are designed for travel around the city centre as well as to key Melbourne landmarks. You can use a City Saver Metcard for a single journey on a tram, bus or for train travel between any two stations within the City Saver area. Available within the City Saver area from train station small Metcard ticket machines and Premium Station ticket windows and on board trams in the City Saver area. Consider a Value Metcard option: City Saver x 10
City Saver x 10	City Saver x 10 Metcards allow for ten trips for less than the price of eight in a single ticket and are eligible for use within the designated City Saver area. Available within the City Saver area from Metcard retail outlets, Premium Station ticket windows. Also available at the MetShop, online and from the Metcard Helpline.
Seniors Daily	Seniors Daily Metcards are available to Seniors Card holders from any Australian State or Territory and can be used for travel all day on trains, trams and buses across Zones 1 and 2. Available from: train station large and small Metcard ticket machines, Premium Station ticket windows, Metcard retail outlets, the MetShop, online, the Metcard Helpline and on board trams and buses. Consider a Value Metcard option: 5 x Seniors Daily
5 x Seniors Daily	The 5 x Seniors Daily Metcard is available to Seniors Card holders from any Australian State or Territory. It is a single ticket programmed with five separate days of travel. Costing $16.50 ($3.30 per day), this Metcard can be used by one person at a time for all day travel on trains, trams and buses in Zones 1 and 2. Available from: Premium Station ticket windows, train station large Metcard ticket machines, the MetShop, online, the Metcard Helpline and Metcard retail outlets.
Off Peak Daily	Off-Peak Daily (Zone 1+2) Metcards purchased in Zone 2 are valid on all trains, trams and buses in Zones 1 and 2 after 9am on weekdays (not valid on Saturday, Sunday or public holidays). Available from train station large and small Metcard ticket machines and Premium Station ticket windows.

Type	Validity
Sunday Pass	Allows unlimited free train, tram and bus travel from 4am on Sundays until 3am on Monday mornings within Zones 1 and 2; or on town bus services of Ballarat, Bendigo, or Geelong. The ticket is only available to Victorians who receive a Disability Support Pension or are Carers Payment or are Seniors Card Holders, and expires one full year from the day it was first validated. Available from Premium Station ticket windows
Seniors Sunday Pass	Allows unlimited free train, tram and bus travel from 4am on Sundays until 3am on Monday mornings wholly within Zones 1 and 2; or travel wholly within the Ballarat Transit System; or Bendigo Transit System; or Geelong Transit System; or the town bus services of Mildura, Moe, Morwell, Traralgon and Warrnambool. The ticket is only available to holders of a Victorian Seniors Card, and expires one full year from the day it was first validated. Available from Premium Station ticket windows
10 x Early Bird	The 10 x Early Bird Metcard is a single ticket which may be used for 10 journeys between any two stations on electrified train services operated by Metro. It can be used on weekdays for journeys that reach their destination prior to 7am. The 10 x Early Bird Metcard is free and passengers can obtain a total of two Metcards at any one time. For maximum savings, it is recommended passengers purchase a 10 x 2 hour Metcard for the return trip home. Available from Premium Station ticket windows including City Loop stations.
Pre-paid Travel Authority	Allows groups of 12 or more to travel together at concession fares on train, tram and bus services on any day of the week. Details and bookings can be made at Premium Station ticket windows and the MetShop.
Special event ticketing	In some circumstances, event organisers can include public transport in the cost of event tickets by prior arrangement with the Director of Public Transport. Event organisers interested in applying, should view the Victorian Fares and Ticketing Manual.

6.2.1.2 Journey Extensions

Passengers must have a single valid ticket for their entire journey. Exceptions to this are Yearly, Date-to-Date, Monthly and Weekly ticket holders who may, for particular journeys, use that ticket beyond the zones or locations for which the ticket is valid by purchasing a 2 hour, Daily or Single ticket for the additional zones or locations.

The ‘extension ticket’ must be purchased before the journey. If this is not possible, the ticket must be purchased as soon as there is a reasonable opportunity to do so during or after the journey.

If the extention ticket is a Metcard, then it must be validated as soon as there is reasonable opportunity during the journey, or as soon as taking all reasonable steps will permit after the journey. See the Victorian Fares and Ticketing Manual for more information

Passengers holding valid Metcards are permitted to use Economy class V/Line services within Zones 1and 2, with the exception of city bound services between 7am and 9am (Mon–Fri) and outbound services between 3pm and 7pm (Mon–Fri). However, passengers may travel on V/Line services to or from Ardeer, Deer Park, Rockbank, Melton, Diggers Rest, Sunbury and Pakenham with a valid Metcard at any time. To ensure safety of passengers, the Conductor may deny Metcard customers access to V/Line services if it would result in overcrowding.

Valid V/Line tickets may be used on Latrobe Valley Busline services between Moe, Morwell and Traralgon.

(Ref. W11)

6.2.2 E-tickets

The only example of an e-ticket found, entitled Little Athletics members to free entry into the Sydney Track Classic.

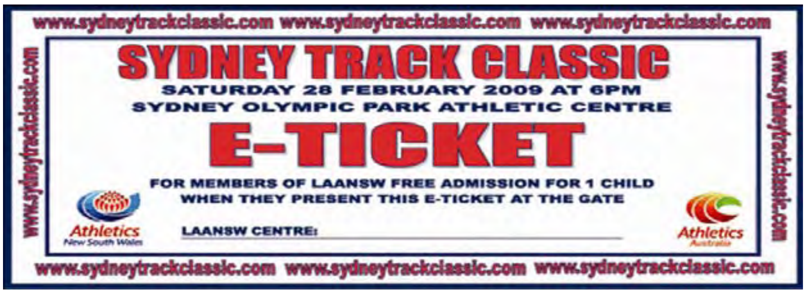


FIGURE 7 SYDNEY TRACK CLASSIC E-TICKET

(Ref. R9)

6.2.3 Smartcard

MYKI (pronounced My-Key) is the name of the contactless smartcard ticketing system currently being introduced on public transport in Victoria, Australia. myki is designed to replace a number of ticket systems in Victoria, primarily the current Metcard (metropolitan Melbourne) and V/Line (regional) ticketing systems.

MYKI is already operating on bus services in Geelong (including the Bellarine Peninsula), Ballarat, Bendigo, Seymour, Moe, Morwell, Traralgon and Warragul. It will also operate on rail services throughout Victoria and bus and tram services in Melbourne. The Skybus Super Shuttle Melbourne Airport service (with its own, premium fares) will also accept myki. The myki system is being provided by Kamco (Keane Australia Micropayment Consortium), a wholly owned subsidiary of the American company Keane Inc.

MYKI was not a feature of the 2006 Commonwealth Games.

FIGURE 8 MYKI LOGO

(Ref. W19)

6.2.4 Personal Digital Devices

There is no indication that Personal Digital Devices were used as any form of ticketing.

6.2.5 Ticket Purchase

During the Games, those who were seeking to buy public transport tickets, particularly Melbourne residents, were advised to buy Metcards in advance. To avoid queuing, they were encouraged to pre-purchase Metcards.

7. INFORMATION

7.1 INFORMATION PROVIDED

7.1.1 Travel Information

A set of Tips were published on the OCGC Website.

7.1.1.1 Tips for Commuters

a) Try to avoid travelling during peak times. Talk to your boss about your work hours, consider taking public transport outside the hours of 7am – 9am to avoid the crowds.
b) Be patient. Allow for more time to reach your destination.
c) School holidays. Coinciding with school holidays, consider taking leave during the Games.
d) Walk or cycle. If you live near work why not walk or cycle to work.
e) Buy Metcards in advance. To avoid queuing, pre-purchase Metcards.
f) Get a lift. Station car parks will be busy so instead of parking at the station, consider getting a lift or catching the bus there, car pooling or walk if you live nearby.
g) Be a host. Share the excitement of hosting the largest event in the State's history and help visitors in need of directions.

(Ref. W5)

7.1.1.2 Tips for Spectators

a) Plan your trip now. Public transport will be busy during the Games and you may not always be able to catch the first train, tram or bus that comes along.
b) Leave the car at home. There will be no parking at major Games venues.
c) Get there early. There will be extra security measures in place so arrive early.
d) Use public transport. Public transport is your best travel option as there will be no parking at Games venues and a ticket to the Commonwealth Games is also your ticket to ride Melbourne's trains, trams and buses for the day of your event

(Ref. W5)

7.1.1.3 Tips for Drivers

a) Plan your trip. Lane closures and traffic changes will mean some of the routes you are used to using may be altered.
b) Allow extra time to reach your destination. Changes to road conditions mean there may be extra traffic on some routes, so ensure you leave enough time.
c) Be patient. Melbourne will be busy, but it is all part of hosting the biggest event in Victoria's history.
d) Consider alternate modes of transport. Wherever possible consider using public transport, walking or cycling.
e) Respect Exclusive Games Lanes. Priority lanes will be marked on direct routes between key venues for official Games vehicles.

f) Minimise travel. Particularly in inner Melbourne and during peak periods. (Ref. W5)

7.1.1.4 Timetables

Timetable information for VLine was provided on the Metlink Website

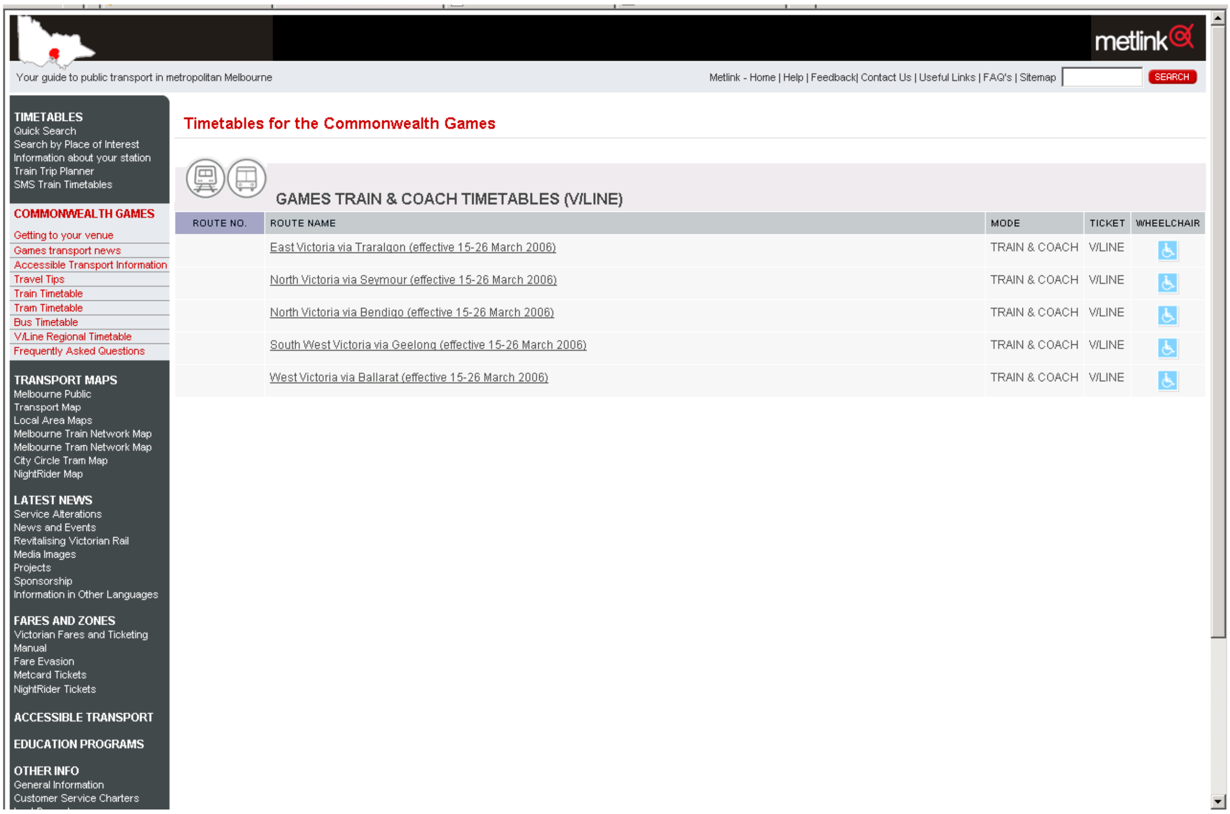


FIGURE 9 VLINE TIMETABLE INFORMATION

7.1.2 Event Information

7.1.2.1 Event Ticket Information

Ticket information was provided on the Melbourne 2006 Website.

FIGURE 10 EVENT TICKET INFORMATION

7.1.2.2 Event Schedules

Event Schedules were provided on the M2006 Website:

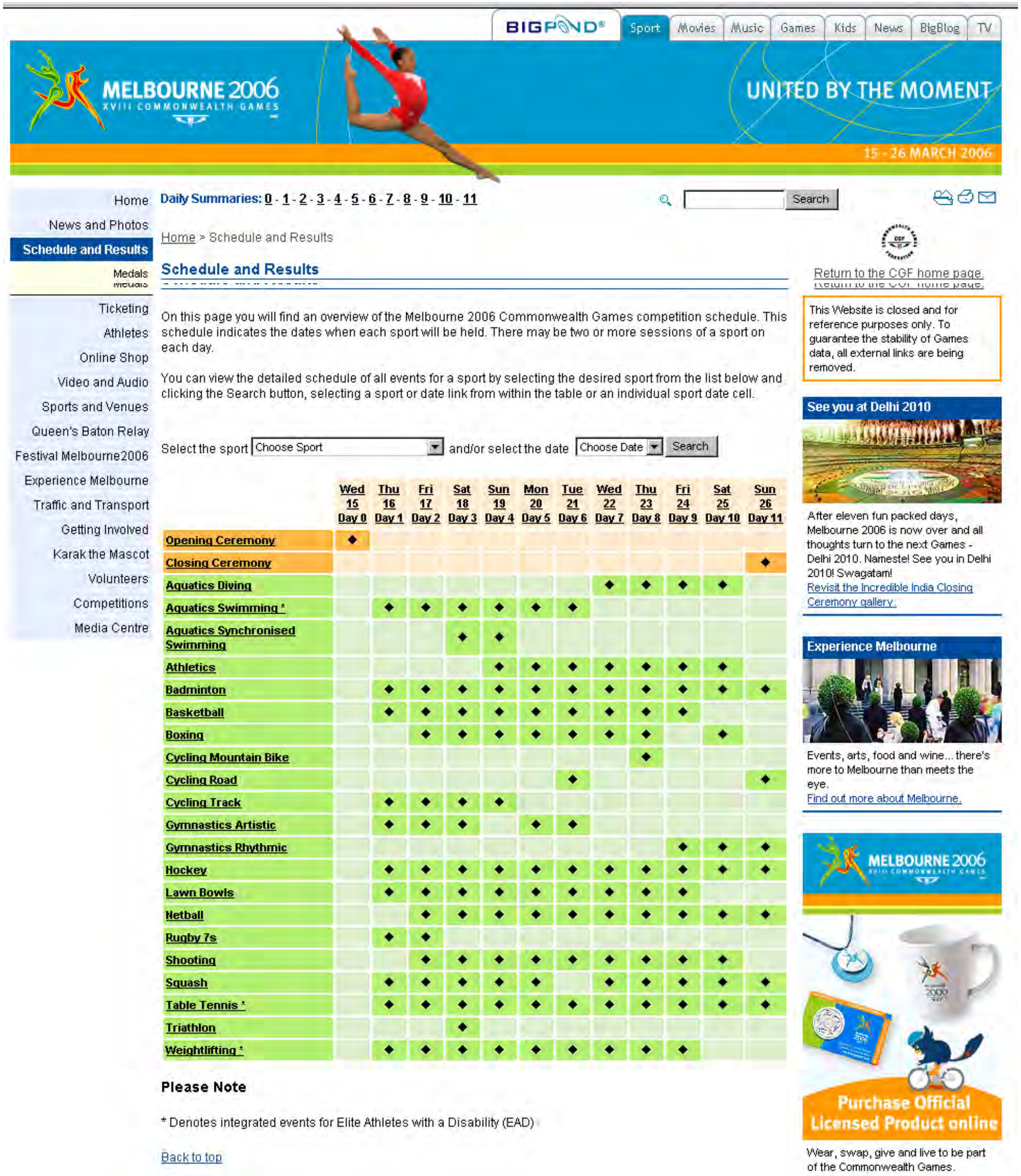


FIGURE 11 EVENT SCHEDULE INFORMATION

7.2 INFORMATION DELIVERY

With large numbers of overseas media, visitors, athletes and officials expected to be in Melbourne for the Games, a key responsibility for ACMA was to provide visitor information for a wide audience to raise awareness about ACMA's role at the Games.

Target groups included:

a) The general Australian public and general visitors to Australia;
b) National and international sporting federations;
c) Rights and non-rights holding broadcasters; and
d) Accredited and unaccredited media.

ACMA's approach involved a high level of cooperation with other parties, including the Communications Taskforce chaired by DCITA, M2006 through the ACMA/M2006 Management Committee and TWI, the host broadcaster. These contacts provided opportunities for ACMA to reach a wide visitor audience. The DCITA taskforce comprised representatives of government departments and agencies, such as the Australian Customs Service and the Australian Quarantine and Inspection Service. As part of the overseas visitor information campaign, the taskforce had oversight of production and distribution of printed and electronic information. ACMA contributed its key messages to a Chefs-de-Mission manual, which was sent to visitors to Australia.

(Ref. R2)

7.2.1 Self Service

As part of its internet-based approach, ACMA established a visitor's information page on its website. As well as links to the ACMA website the visitor information page also linked to other relevant websites, including the DCITA, Telstra and M2006 websites.

(Ref. R2)

Much of the functionality of games websites has subsequently removed but a lot of the material is still available through the Australian Web Archive – 'Pandorra'

(Ref. W20)

7.2.1.1 Main 2006 Games website

The main website for the 2006 Commonwealth Games in Melbourne was provided by Melbourne 2006 Commonwealth Games Corporation. (M2006)

(Ref. W22)

Microsoft, the Official Technology Partner for the Games, built and operated the Melbourne 2006 Commonwealth Games Corporation website between April 2005 and March 2006. Working with local partners Devtest, Readify, and Telstra, Microsoft

INFORMATION

Services consultants at the Microsoft Solutions Development Centre built the site on a wide range of Microsoft software.

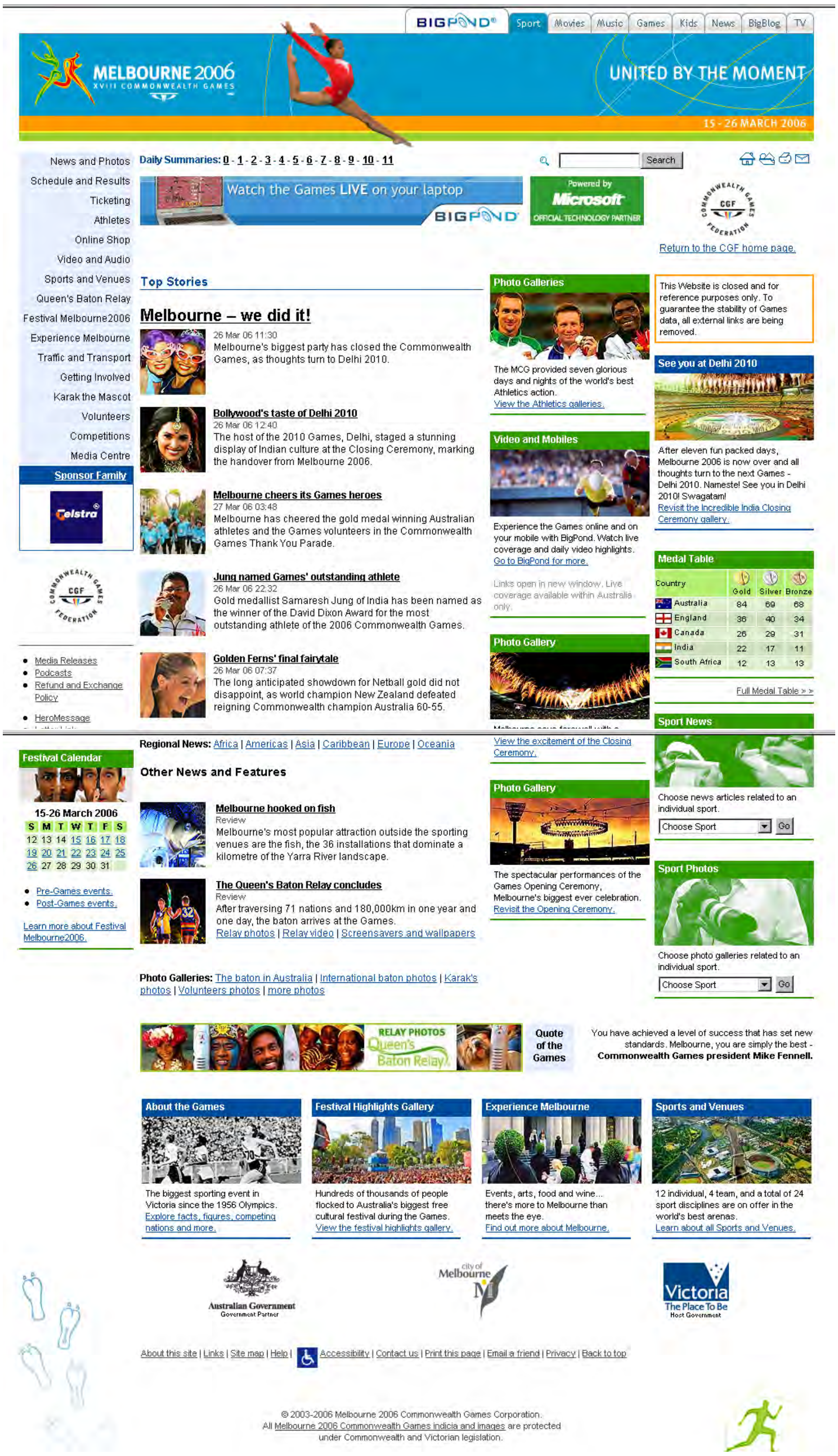


FIGURE 12 MAIN MELBOURNE 2006 WEBSITE HOMEPAGE

7.2.1.2 OCGC Website

The Office of Commonwealth Games Coordination (OCGC) was to ensure the effective delivery by the Victorian Government of the Commonwealth Games, through management and coordination of all relevant bodies involved. The OCGC Website provides access to the M2006 website.

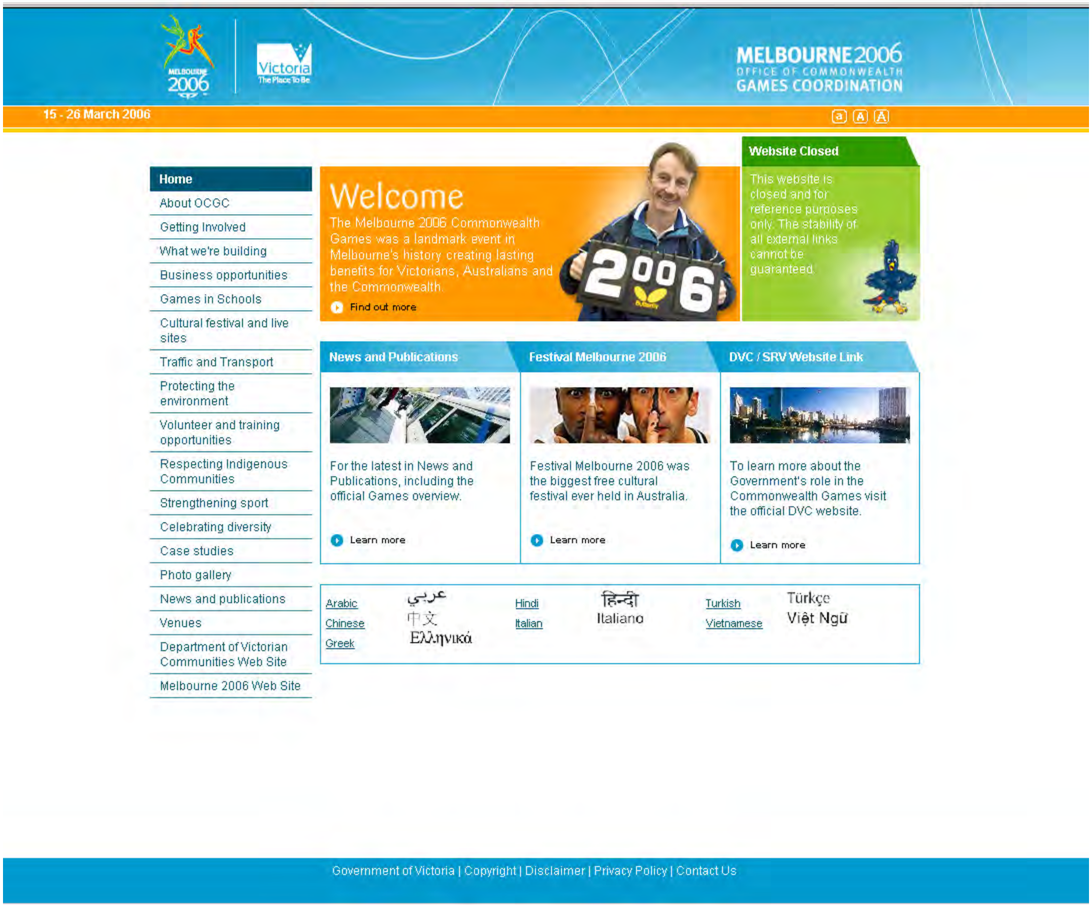


FIGURE 13 THE OCGC WEBSITE HOME PAGE

A) Transport and Traffic Guide

The Transport and Traffic Guides reached through the OCGC website contained information on the routes of the special Games Lanes for getting participants and officials to their venues from the village and the concomitant road closures. These are largely information guides for those who will be impacted by the existence of the events and the lanes, rather than for spectators or Games family.

(Ref. R4)

7.2.1.3 MetLink Website

The Metlink Website provides public transport information in metropolitan Melbourne. The website provided a guide to public transport in metropolitan Melbourne during the Games. The site includes a map of the V/Line network of rail and coach services across the state of Victoria (shown below) and details of the Nightrider bus services in Melbourne's city centre. .

The Home Page provides a Journey Planner.

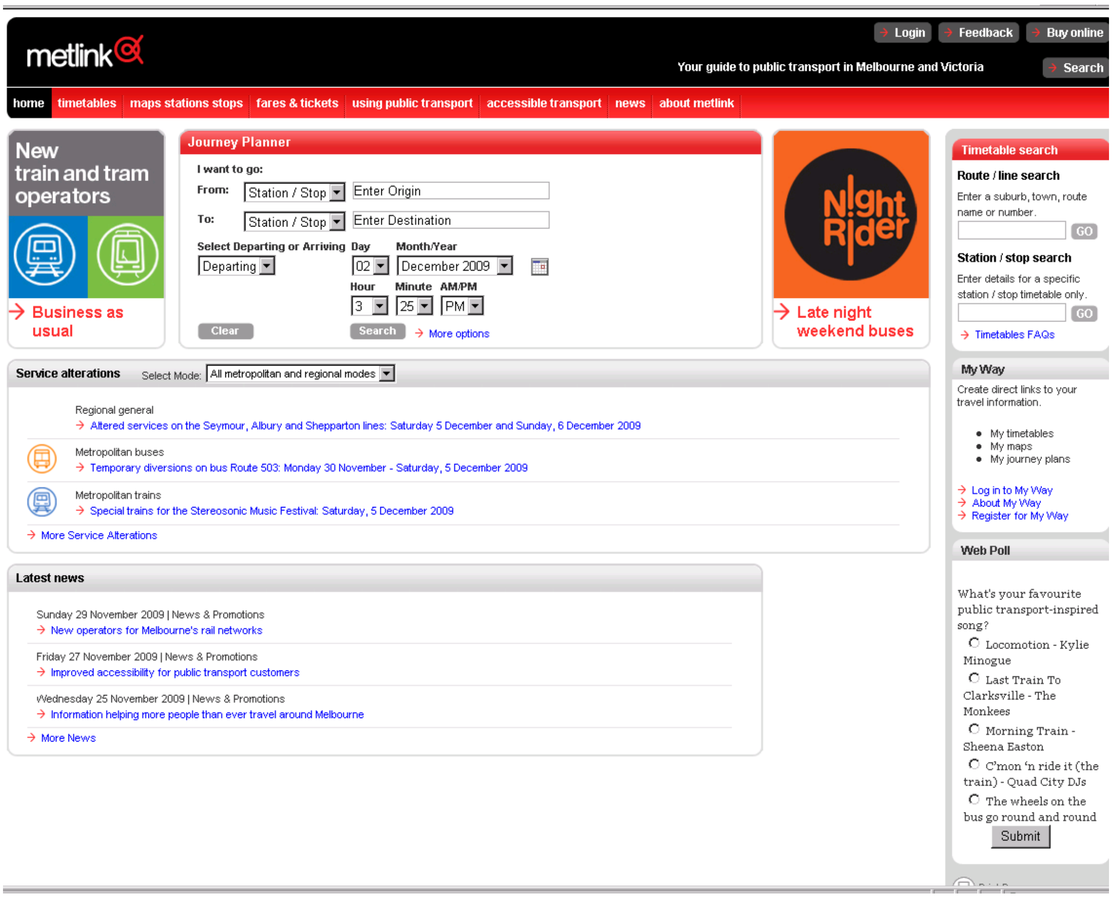


FIGURE 14 METLINK WEBSITE HOME PAGE

INFORMATION

During the games the website provided tailored information for accessing the games:

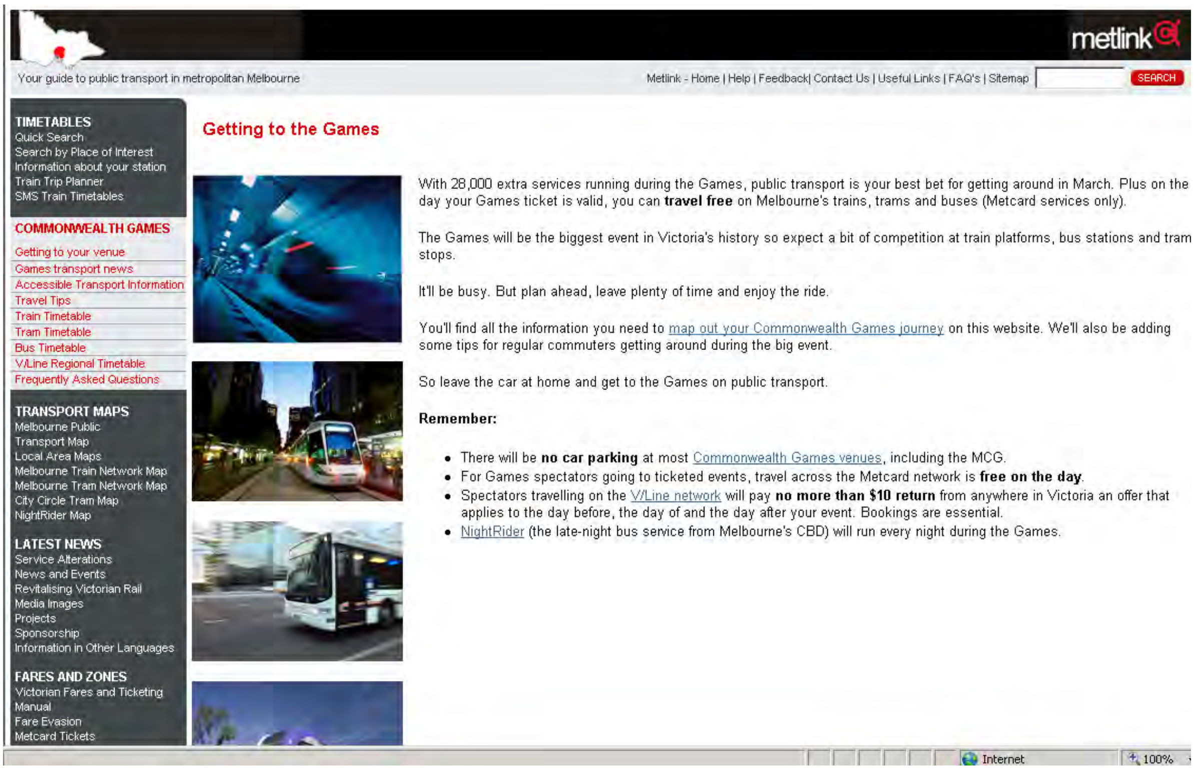


FIGURE 15 GAMES TRANSPORT INFORMATION ON METLINK WEBSITE

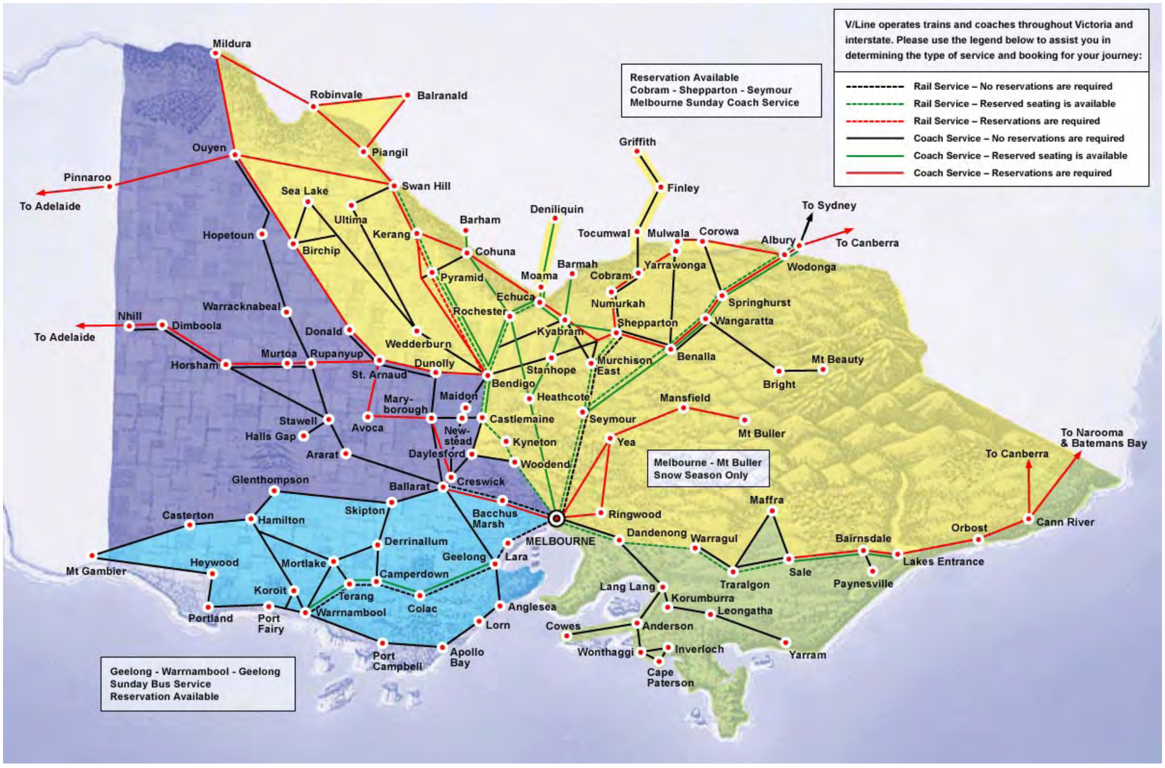


FIGURE 16 VLINE SERVICE MAP FROM METLINK WEBSITE

INFORMATION

The archived website contains a link to a rudimentary journey planner based on choosing a particular mode before entering information about the start and end of the trip.

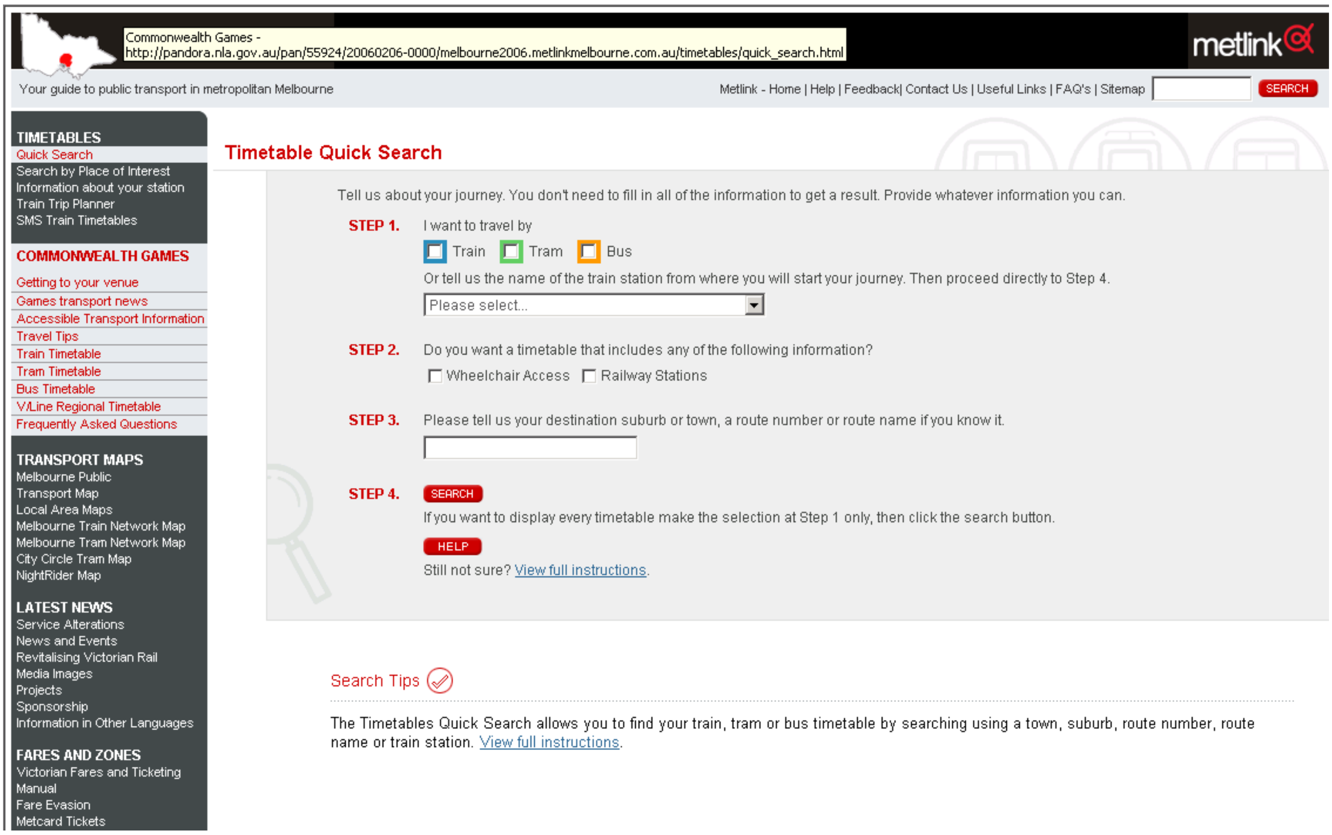
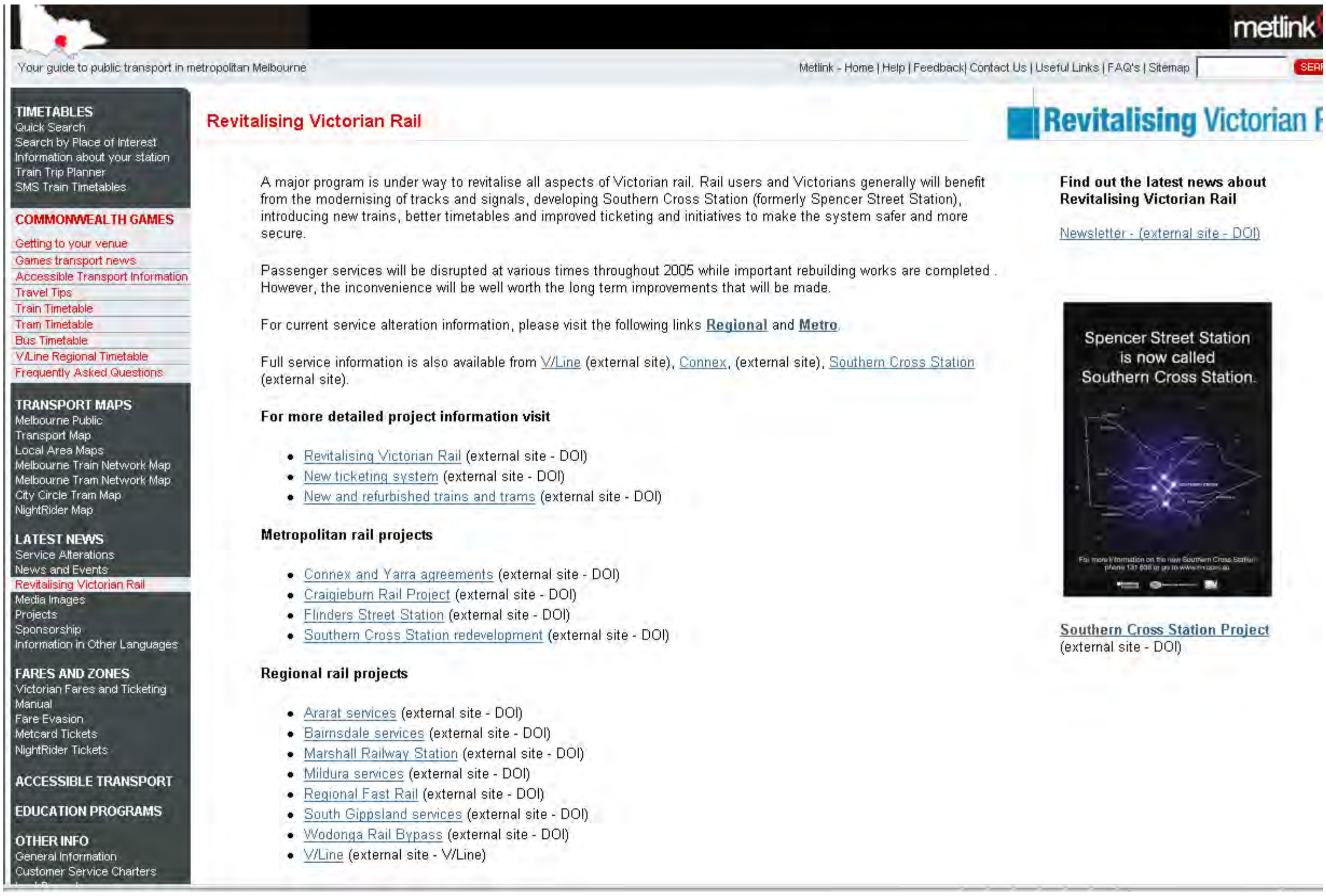


FIGURE 17 GAMESTIME RUDIMENTARY JOURNEY PLANNER

INFORMATION

The archived Metlink website also refers to a number of infrastructure improvement works related to planned transport improvements. It appears that these are works which were planned well in advance of the Games since they are described as occurring through 2005.

(Ref. W21)


metlink
Your guide to public transport in metropolitan Melbourne
Metlink - Home | Help | Feedback| Contact Us | Useful Links | FAQ's | Sitemap

TIMETABLES
Quick Search
Search by Place of Interest
Information about your station
Train Trip Planner
SMS Train Timetables

COMMONWEALTH GAMES
Getting to your venue
Games transport news
Accessible Transport Information
Travel Tips
Train Timetable
Tram Timetable
Bus Timetable
V/Line Regional Timetable
Frequently Asked Questions

TRANSPORT MAPS
Melbourne Public Transport Map
Local Area Maps
Melbourne Train Network Map
Melbourne Tram Network Map
City Circle Tram Map
NightRider Map

LATEST NEWS
Service Alterations
News and Events
Revitalising Victorian Rail
Media Images
Projects
Sponsorship
Information in Other Languages

FARES AND ZONES
Victorian Fares and Ticketing Manual
Fare Evasion
Metcard Tickets
NightRider Tickets

ACCESSIBLE TRANSPORT

EDUCATION PROGRAMS

OTHER INFO
General Information
Customer Service Charters

Revitalising Victorian Rail

A major program is under way to revitalise all aspects of Victorian rail. Rail users and Victorians generally will benefit from the modernising of tracks and signals, developing Southern Cross Station (formerly Spencer Street Station), introducing new trains, better timetables and improved ticketing and initiatives to make the system safer and more secure.

Passenger services will be disrupted at various times throughout 2005 while important rebuilding works are completed . However, the inconvenience will be well worth the long term improvements that will be made.

For current service alteration information, please visit the following links **Regional** and **Metro**.

Full service information is also available from V/Line (external site), Connex, (external site), Southern Cross Station (external site).

For more detailed project information visit

- Revitalising Victorian Rail (external site - DOI)
- New ticketing system (external site - DOI)
- New and refurbished trains and trams (external site - DOI)

Metropolitan rail projects

- Connex and Yarra agreements (external site - DOI)
- Craigieburn Rail Project (external site - DOI)
- Flinders Street Station (external site - DOI)
- Southern Cross Station redevelopment (external site - DOI)

Regional rail projects

- Ararat services (external site - DOI)
- Bairnsdale services (external site - DOI)
- Marshall Railway Station (external site - DOI)
- Mildura services (external site - DOI)
- Regional Fast Rail (external site - DOI)
- South Gippsland services (external site - DOI)
- Wodonga Rail Bypass (external site - DOI)
- V/Line (external site - V/Line)

Revitalising Victorian R

Find out the latest news about Revitalising Victorian Rail

Newsletter - (external site - DOI)

Spencer Street Station is now called Southern Cross Station.

Southern Cross Station Project
(external site - DOI)

FIGURE 18 INFRASTRUCTURE IMPROVEMENTS

7.2.1.4 VicRoads website

The OCGC website referred inquiries about traffic conditions to the VicRoads website. This provides road users with access to a daily calendar of road closure information, including maps and recommended diversion routes where applicable. This website currently looks like the screen shot below.

(Ref. W23)

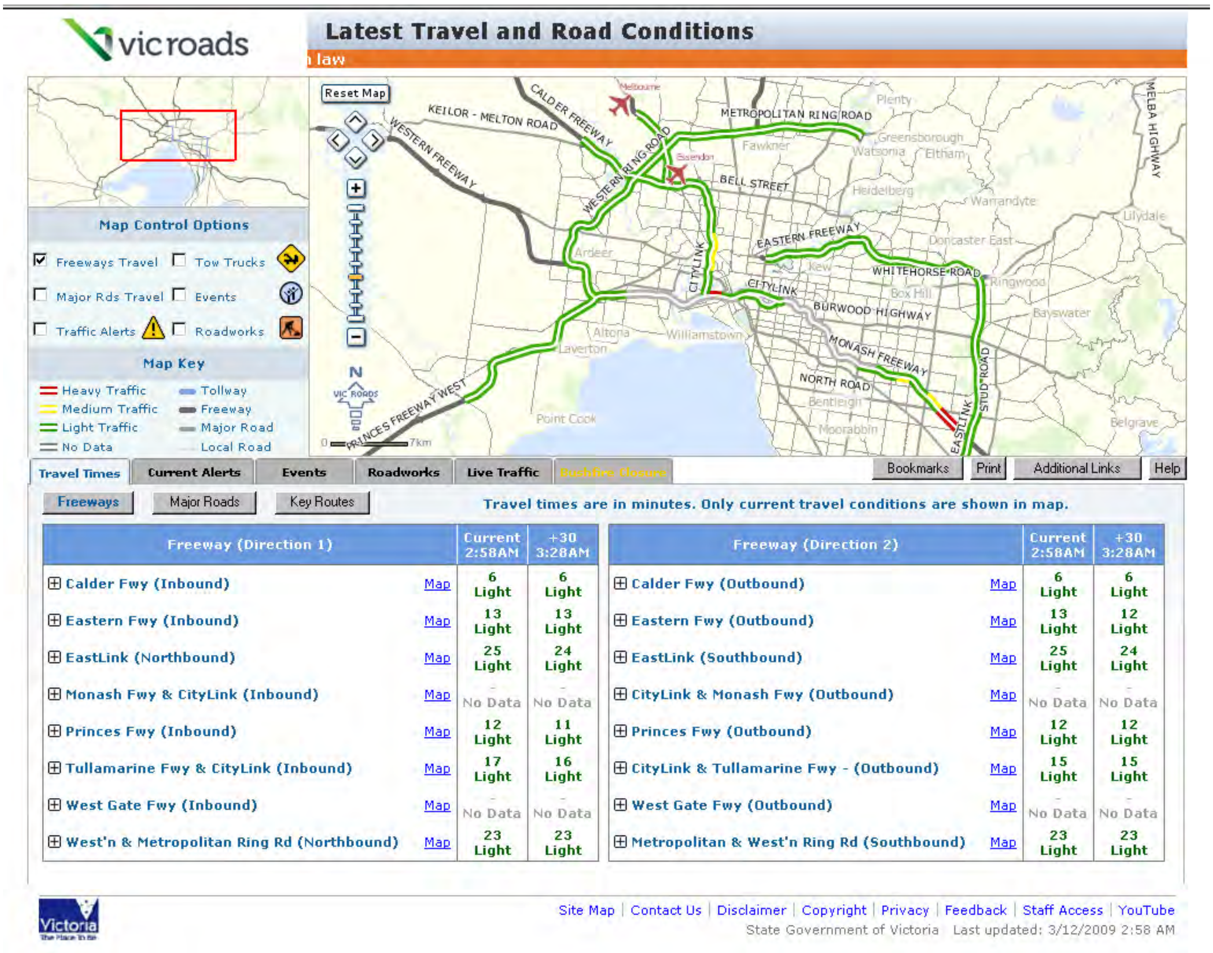


FIGURE 19 VICROADS WEBSITE

7.2.2 Customer Service

7.2.3 Public Signage

7.2.4 Personal Digital Devices

7.2.5 Hard Copy

ACMA published an information brochure The Winning Moment – Operating Communications Equipment at the Melbourne 2006 Commonwealth Games. The brochure was distributed by M2006 and sent to overseas media organisations through TWI, the host broadcaster.

(Ref. R2)

7.2.5.1 Driver Guide for Taxis, Hire Cars, Charter Buses and Tow Trucks

The Drivers Guide for taxis, hire cars, charter buses and tow trucks produced by the Office of Commonwealth Games Coordination includes :

a) the numbers of spectators expected at each of the venues,
b) the sport and event times, and
c) the maps of the relevant route and Games Lane.

The information also gave guidance on behaviours and where get information about the City.

(Ref. R10)

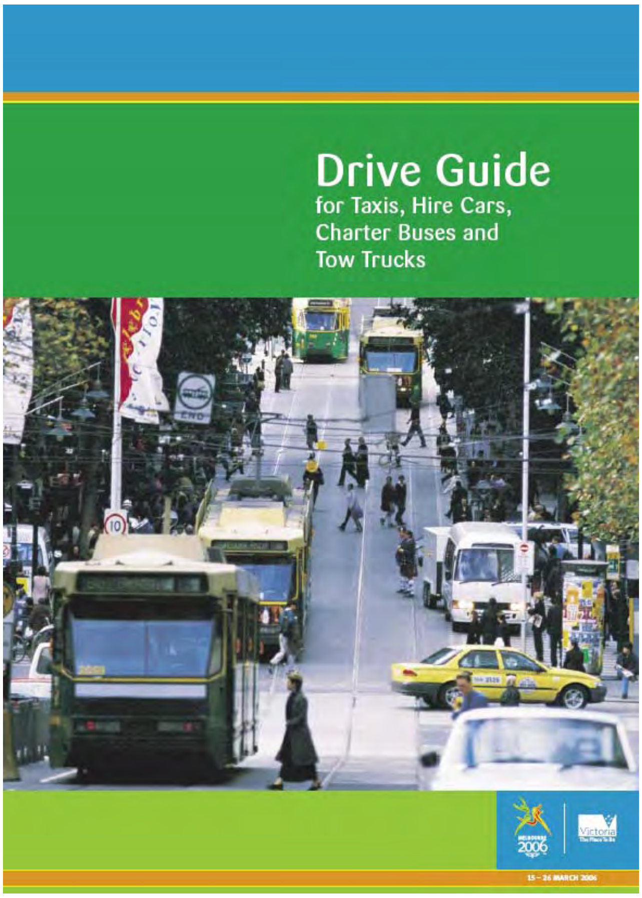


FIGURE 20 - DRIVE GUIDE

INFORMATION

The Contents of the guide is as follwos:

FIGURE 21 DRIVE GUIDE CONTENTS

Arrangements for taxi, hire car, charter bus and tow truck drivers

Your *Drive Guide* contains important information about temporary road and lane closures and changes to parking arrangements in areas surrounding Games venues. It can help you to plan ahead to minimise disruptions as you move about the city during this busy time.

Taxis

Taxis are not permitted to drop-off passengers at the entrance to Games venues. Taxi T and wheelchair accessible taxi WAT drop-off and pick-up locations are located within close walking distance to entrances and are marked on the maps in this guide.

Some venues have special arrangements in place for wheelchair accesible taxis, as follows. For other venues, use the standard taxi drop-off and pick-up points, located close to the entrance (see maps).

Special WAT arrangements

MCG drop-off and pick up point is located in Jolimont Terrace (west side). Access to this area is via Jolimont Road (via vehicle permit check point). WATs are permitted to enter this area without a permit (see map page 23).

State Netball Hockey Centre, Royal Park drop-off or pick-up at shuttle bus stop (east side of Royal Parade, Princes Park); a free shuttle bus will take passengers to venue. Venue taxi drop-off point is 800m from venue entrance, and is not recommended for passengers with special needs.

State Mountain Bike Centre, Lysterfield drop-off or pick-up at Hallam Station; free shuttle bus will take passengers to the venue

Wellsford Rifle Range, Bendigo drop-off or pick-up at the spectator car park (Bendigo Harness Racing Club); free shuttle bus will take passengers to venue.

Coach and charter buses

Drop-off and pick-up points are provided at all Games venues; access arrangements vary. A limited number of coach parking spaces will be provided at most venues (as indicated with C on maps in this guide).

Coach and charter bus drivers are advised to observe the directional and parking signs. Charter buses will be provided with allocated parking spaces.

Victorian hire cars - category A, B and C

The H symbol on the maps in this guide indicates the areas allocated for exclusive use by hire cars bearing VHA, VHB and VHC number plates.

The points will be clearly sign posted, and signs will also direct these vehicles into and out of venues along arterial roads.

Please allow for waiting times of approximately five minutes, and remember that parking arrangements will be different at each Games sporting venue.

Limousines that do not have VHA, VHB and VHC plates will be permitted to stop at designated areas **only** to drop off and pick up pre-booked passengers.

Tow trucks

Procedures for tow trucks called to a Tow-Away area will remain the same. All accident-attending tow truck bookings in the Melbourne metropolitan area will be received at the Accident Allocation Centre. In Geelong, all requests must go through the Geelong Accident Allocation Centre, telephone: 5277 2111. In Ballarat and Bendigo, local police will be contacted if access is required to a Games area.

10 www.melbourne2006.com.au

FIGURE 22 ADVICE WITHIN THE DRIVE GUIDE (1)

Tips for drivers – preparing for the Games

Tip: check daily newspapers and listen to radio traffic bulletins for the latest Games traffic updates.

Avoid Games areas. Traffic congestion is expected in inner Melbourne and around Games sporting and celebration venues. If you are not travelling to the Games, you should avoid these areas if possible. Plan an alternative route that avoids areas of congestion.

Observe the Exclusive Games Lanes. Taxis are not permitted to use these lanes. Look for the blue lines and signs. Respect Exclusive Games Lanes and do your bit to help Melbourne host a successful Commonwealth Games. (see page 14)

Know the Games venues. Take a look at the maps in this guide to find out where the passenger drop-off and pick-up points are – and where to enter and exit Games venues (note: special arrangements for wheelchair accessible taxis, see page 10).

Be security smart. Please help to protect yourself and others. If you see any suspicious packages or bags left around or bags left around or in your vehicle, please telephone 000 immediately.

Deliver lost property to Victoria Police. Taxi regulations require drivers to promptly deliver any property left in their vehicles to Victoria Police. Please also notify your taxi depot of any lost property.

Very busy roads – 15-26 March 2006

Tip: unless travelling to Games venues, avoid using these roads if at all possible, especially during morning and afternoon peak periods.

Melbourne:
- Exhibition Street: 15-26 March
- Princes Bridge: 15-26 March (note: closed after 7.00pm on 15 and 26 March)
- Spencer Street: 15-26 March (note: closed 10.00pm - 11.30pm on 16 and 17 March and 6.00am to noon on 18 March)
- Wellington Parade, East Melbourne: 20-26 March

Other:
- Swan Street (and Swanston Street Bridge): 15-26 March
- Mt Alexander Road, all suburbs - Flemington Road, Parkville: am and pm peaks, 15-26 March
- Park Street, Parkville - Royal Parade, Parkville – Brunswick Road, all suburbs: 15-26 March
- Fitzroy Street, St Kilda: 16, 18 (Triathlon) and 19 March (Marathon)
- Nepean Highway, all suburbs - Beach Road, St Kilda to Mentone: 20-21 March (Cycling Time Trial)
- Punt Road, all suburbs - Domain Road, South Yarra and Melbourne: 25-26 March (Cycling Road Race)

Note: the entire city and some inner suburbs will be particularly busy on 19 March for the staging of the Men's and Women's Marathon events.

www.melbourne2006.com.au 11

FIGURE 23 ADVICE WITHIN THE DRIVE GUIDE (2)

7.3 INFORMATION COLLECTION

8. SECURITY

Just seven months before the Games, concerns were raised that the Victorian Government and Games organisers were yet to name the security chief who will be responsible for the safety of 6,000 athletes and officials, along with hundreds of thousands of spectators. It is in contrast to the previous Olympic Games, where host cities were required to name a security chief.

Moreover, tenders for private security for the Games had to be reopened because there were insufficient tenderers. Transport unions were worried about the lack of security checks for contract cleaners who are responsible for collecting security camera tapes. This was in the climate of recent terrorist actions in places such as London, so this was considered a major threat in relation to Melbourne's Commonwealth Games.

As happened in the Athens and Sydney Olympics, a mix of State and Federal law enforcement, intelligence, military and government bodies were to be deployed on the ground. In Melbourne, they would be coordinated by the Victoria police. The police had refused to nominate a representative to be interviewed, quoting operational protocol, and declared no-one would be available to talk for at least another month.

Games organisers have had to reissue tenders calling for security guards to patrol Games venues in regional areas because of the poor response to the first request for tenders. And the timing of all of this also raised questions about whether the guards will be adequately prepared. Lessons from Salt Lake City, Athens and the Sydney Olympic Village were that one of the biggest failures is mainly at access control points where you see the people who are in control of the bag-searching operation. It was obvious in a lot of cases security staff were not well trained in their job and as a result there were long queues. They had not been told what to look for because they're looking in clutch bags instead of backpacks. There were also issues about security checking and training the large numbers of contract staff that were required and concerns about levels of security at transport depots.

(Ref. W24).

SECURITY

8.1 SECURITY PROVIDED

8.1.1 Venue Security

8.1.1.1 Accreditation & Security Passes

M2006 required all persons applying for accreditation for the Games to comply with its security vetting process. Following discussions with M2006, an exemption from the security vetting process was given to ACMA GWF members who held a current Australian Government National Security Clearance to the 'secret' level. The remaining staff were subject to M2006's vetting process.

Accreditation took place between September and December 2005 to allow for printing and distribution of accreditation passes to be completed by February 2006.

8.1.1.2 Games workforce passes

M2006 issued two-part accreditation passes for all Games personnel. The first part of each pass held individual identification details and the second part provided the level of access. After extensive negotiations, M2006 agreed to issue the ACMA GWF with two-part passes with infinity access. This allowed the GWF access to front-of-house, operations/back-of house, press and broadcast areas at all competition venues, as well as the GHQ (including the TOC), the IBC, the Commonwealth Games Village, and the Main Press Centre. This level of access gave ACMA the flexibility to deploy staff to locate any radio-communications interference, depending on demand.

If required, arrangements were in place for the Venue Technology Manager to issue upgrade passes to field of play and Games participants' areas within the venues.

8.1.1.3 Day passes

M2006 put special procedures in place for the issue of guest passes. These arrangements provided an opportunity for ACMA Authority and Executive members to visit the GWF at various work locations.

(Ref. R2)

8.1.1.4 Vehicles

ACMA vehicles used during the Games required accreditation to enter all venues and adjacent parking areas.

8.1.2 Municipal Security

8.1.3 Transport Security

8.1.4 Border Security

8.1.5 International Security

8.1.6 Other Security

As part of the strategy to deal with heightened security for the Games, ACMA was conscious of the risk that the information provided may inadvertently raise awareness about the kinds of mechanisms that can cause disturbance to the Games. Information material was prepared with this risk in mind.

(Ref. R2)

8.1.7 Integration

The level to which security was integrated with transport operations

8.2 TECHNOLOGY USED

8.2.1 Surveillance

8.2.1.1 Microsoft Gives Victoria Police a Bird's-Eye View of the 2006 Commonwealth Games

The Victoria Police was responsible for the overall security and smooth running of the Melbourne 2006 Commonwealth Games. Victoria Police required a robust incident management system that could monitor this high-risk 11-day event that involved 38 venues. Victoria Police worked with partner iComply to develop iProtect, a web-based incident management application written using ASP.NET. The application integrated easily with Victoria Police's existing servers and worked with familiar technologies including Microsoft SQL Server 2000, Microsoft Windows Server 2003 and Microsoft

An important responsibility for ACMA was the monitoring and inspection of Games venues, before and throughout the Games, to prevent radio communications interference. Some of the issues dealt with by ACMA were the use of uncoordinated wireless microphones, unlicensed two-way radios used by visiting hockey teams and monitoring the visit of international dignitaries.. This monitoring and inspection service was vital for the smooth functioning of the Games and ensuring minimal disruption within the Melbourne CBD. Safety of individuals was the primary concern for ACMA staff in carrying out their responsibilities, allowing emergency services, public transport and general users of radio communications equipment to continue their daily routines with minimal interference.

(Ref. R3)

8.2.2 Communication

9. HEALTH AND SAFETY

9.1 HEALTH AND SAFETY MEASURES PROVIDED

9.1.1 Venue H&S

Under the Occupational Health and Safety (Commonwealth Employment) Act 1991 (OH&S Act) ACMA has prime responsibility for the safety, prevention and rehabilitation of its employees. ACMA has a duty of care to provide a working environment that is safe and without risk to the safety and health of its personnel. Living and working arrangements In the lead-up to and during the Games, GWF members operated in a unique working and living environment.

Although not subject to the OH&S Act, M2006 was required to comply with Victorian Work Care arrangements to provide a safe working environment. Every effort was made to ensure that work areas, equipment and storage facilities complied with ACMA and Commonwealth standards.

In accordance with the service agreement, M2006 provided accommodation for interstate members of the GWF. ACMA inspected the proposed accommodation to ensure that the living conditions were safe and secure, and offered a reasonable level of comfort. The accommodation was provided at a commercial venue, which was obliged to comply with Victorian health and safety requirements.

Key OH&S practices Information was provided to the GWF reaffirming key OH&S practices to be observed during the Games including first aid measures, emergency procedures, safe driving guidelines and manual handling techniques. A member of the ACMA administrative staff was trained as a First Aid Officer and a Health and Safety Representative. Other officers were also trained in either first aid or health and safety procedures. In the event of a GWF member requiring first aid treatment, all personal medical information provided was treated as ‘medical-in-confidence’ and destroyed at the end of the Games period.

GWF members were required to familiarise themselves with emergency procedures at their accommodation premises and Games venues, and adhere to them if necessary.

GWF members operated in pairs while on duty at competition venues or in the Mobile Service Teams. Each team was required to maintain regular contact with the MSO. Special arrangements were implemented at the end of each evening shift to ensure that GWF members did not leave venues unaccompanied, but stayed together in pre-arranged groups. Wherever possible, staff were rotated through the different competition and non-competition venues to maintain alertness and interest levels, provide experience and minimise any possible stress arising at a particular venue.

Guidelines were developed for the Games that formed part of an information package for the GWF. The guidelines covered subjects including injury and hazard reporting procedures, emergency contact numbers and contact details for ACMA’s Employee

Assistance Program provider, which offered a counselling service to GWF staff and their families.

(Ref. R2)

9.1.2 Municipal H&S

9.1.3 Transport H&S

9.1.3.1 Vulnerable Road Users

At the 14th World Congress on ITS held in China in October 2007, a paper was presented about Vulnerable Road Users and the Melbourne Commonwealth Games.

(Ref. R11)

9.1.4 National H&S

9.1.5 International H&S

9.2 TECHNOLOGY USED

10. CONCLUSIONS

10.1 OVERALL SUCCESS OF THE EVENT

10.1.1 Lessons from the Games

The Australian Communications and Media Authority raised a number of lessons from its involvement in the Melbourne Games. These are rather detailed and relate to event organisation, rather mobility management, but may give insights in certain circumstances.

The steps identified as important to consider when planning for future major events include:

a) Raise awareness through a visitor information page on the website;
b) Publish an information brochure for distribution to international organisations involved in the event and overseas media;
c) Hold regular progress meetings with the event organising body, the host broadcaster and the security and emergency services;
d) Maintain ongoing consultation with relevant parties to identify spectrum requirements;
e) Appoint specialised staff to manage event-related frequency assigning to ensure coordination of radiofrequency spectrum requirements and increase the efficiency of the allocation process;
f) Employ strategies to meet the anticipated high level of demand for spectrum including placing an embargo on segments of the land mobile band, making agreements for short-term use of spectrum designated for defence, broadcasting and amateur use for the period of the event and identifying contractors who have licensed radio networks already in place;
g) Participate in test events and venue familiarisation before the event to provide staff training and the opportunity to evaluate procedures and technical equipment;
h) Operate an equipment testing centre during the pre-event week to deal with the influx of overseas equipment;
i) Negotiate an appropriate level of accreditation to provide the access to all venues at the event for staff involved;
j) Position staff involved in the event at strategic locations to enhance their ability to respond to interference incidents;
k) Provide mobile service teams to support the presence of teams at venues; and
l) Apply a consultative approach wherever possible in resolving interference issues.

(Ref. R2)

10.1.2 Public Transport Service Improvements

In relation to Melbourne's public transport system, Wikipedia reports that for the most part, timetabled services were unchanged but suffered due to higher loads. However, the plans clearly describe that more than 28,000 additional services will operate during the Games. The improvements to the public transport system are detailed in Appendix 4 and in the now-archived referenced link. These predominantly show increases in evening, weekend and night time services when capacity would have been available, and may explain why commuters felt load factors had increased.

(Ref. W25)

However, this report seems to conflict with all the modifications to services reported elsewhere.

10.2 USE OF ITS

10.3 ECONOMIC EFFICIENCY OF THE EVENT

10.4 MOBILITY ASSESSMENT

10.4.1 Transport Provision By Sector

10.4.2 Transport Provision By Mode

10.4.3 Management of Transport

10.5 TICKETING ASSESSMENT

10.5.1 Ticket Types

10.5.2 Ticketing Technology

10.6 INFORMATION ASSESSMENT

10.6.1 Content

The author should consider the level of personalisation of the information.

10.6.2 Delivery

The author should consider the accessibility of the delivery to customers with sensory disabilities.

10.7 SECURITY ASSESSMENT

10.7.1 Security Provision

10.7.2 Technologies used

11. APPENDIX A – TABLE OF FIGURES

12. APPENDIX B - DOCUMENT ADMINISTRATION

12.1 VERSION HISTORY

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(0)	15/09/2009	Tony Haynes	N/A	Skeleton For the Annex built from the agreed Annex Template. Populated from Original SOTA Report (MB)
0.00.00(1TH)	30/11/2009	Tony Haynes	N/A	Aligned with Generic Template
0.00.00(2TH)	30/11/2009	Tony Haynes	N/A	Reassigned Text to correct chapters
0.00.00(3TH)	01/12/2009	Tony Haynes	N/A	Further reorganisation of text Addition of new text to fill some of the gaps

APPENDIX B

12.2 REFERENCES

12.2.1 Document References

Ref.	Document Title	Document Ref.	Version	Location
R1.	SOTA Event Characteristics Annex	STAD-DEL-WP2-1912		
R2.	Melbourne 2006 Commonwealth Games Report	STAD-EXT-REF-0202		
R3.	Acmasphere7 - ACMA supports Melbourne's Commonwealth Games	STAD-EXT-REF-0203		
R4.	Traffic and Transport Guide, February 2006	STAD-EXT-REF-0206		
R5.	Transport Fact Sheet	STAD-EXT-REF-0208		
R6.	Managing Congestion	STAD-EXT-REF-0207		
R7.	Exclusive Games Lanes	STAD-EXT-REF-0209		
R8.	ITS in Australia	STAD-EXT-REF-0210		
R9.	Sydney Track Classic E Ticket	STAD-EXT-REF-0211		
R10.	Driver Guide for Taxis, Hire Cars, Charter Buses and Tow Trucks	STAD-EXT-REF-0212		
R11.	14th World ITS Congress	STAD-EXT-REF-0213		

12.2.2 Web References

Ref.	Document Title	Web Ref.	Location
W1.	OCGC	STAD-EXT-WEB-4201	http://www1.dvc.vic.gov.au/ocgc/index.htm
W2.	Avenade	STAD-EXT-WEB-4401	http://www.avanade.com/about/index.aspx
W3.	Games Time Fast Facts	STAD-EXT-WEB-4202	http://www1.dvc.vic.gov.au/ocgc/Traffic%20and%20Transport/key%20initiatives.html
W4.	What We're Building	STAD-EXT-WEB-4203	http://www1.dvc.vic.gov.au/ocgc/building/building.htm
W5.	Travel Tips	STAD-EXT-WEB-4204	http://www1.dvc.vic.gov.au/ocgc/Traffic%20and%20Transport/travel_tips.html
W6.	More Services to the Games	STAD-EXT-WEB-4301	http://pandora.nla.gov.au/pan/55924/20060206-0000/melbourne2006.metlinkmelbourne.com.au/latest_news_detailb1fb.html?id=2478
W7.	ACMA Overview	STAD-EXT-WEB-4402	http://acma.gov.au/WEB/STANDARD/pc=ACMA_ORG_OVIEW
W8.	Ticketing Information	STAD-EXT-WEB-4206	http://melbourne2006.com.au/Competition+Schedule/Schedules+and+Prices/

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Ref.	Document Title	Web Ref.	Location
W9.	Transport Tickets	STAD-EXT-WEB-4207	http://melbourne2006.com.au/Traffic+and+Transport/#vline
W10.	Metcard (Wikipedia)	STAD-EXT-WEB-4403	http://en.wikipedia.org/wiki/Metcard
W11.	Metcard Types	STAD-EXT-WEB-4302	http://www.metlinkmelbourne.com.au/fares-tickets/metropolitan-fares-and-tickets/metcard-types/
W12.	CG FAQs	STAD-EXT-WEB-0201	http://www.commonwealthgames.org.au/Templates/FAQs.htm
W13.	Case Study C2 : Transport security aspects of the Melbourne Commonwealth Games	STAD-EXT-WEB-4404	http://www.infrastructure.gov.au/department/annual_report/2005_2006/casestudy_3.aspx
W14.	Victoria Government Press Release	STAD-EXT-WEB-4405	http://www.dpc.vic.gov.au/domino/Web_Notes/newmedia.nsf/b0222c68d27626e2ca256c8c001a3d2d/033c70128d7b6bb9ca2571ea00033f91!OpenDocument
W15.	Avenade Customers	STAD-EXT-WEB-4406	http://www.avanade.com/customers/detail.aspx?id=131
W16.	Halcrow - Pedestrian Modelling	STAD-EXT-WEB-4407	http://www.halcrow.com/html/our_projects/projects/2006_common.htm?zoom_highlight=Melbourne+Commonwealth+Games
W17.	Wikipedia - Commonwealth Games	STAD-EXT-WEB-0202	http://en.wikipedia.org/wiki/2006_Commonwealth_Games
W18.	Travel Packages	STAD-EXT-WEB-4208	http://www.melbourne2006.com.au/Ticketing/Travel+Packages/
W19.	MyKi Smartcard	STAD-EXT-WEB-4408	http://en.wikipedia.org/wiki/Myki
W20.	Australia's Web Archive - Pandorra	STAD-EXT-WEB-4409	http://pandora.nla.gov.au/col/8800
W21.	Revitalising Victorian Rail.	STAD-EXT-WEB-4410	http://pandora.nla.gov.au/pan/55924/20060206-0000/melbourne2006.metlinkmelbourne.com.au/revitalising_victorian_rail/index.html
W22.	Melbourne 2006	STAD-EXT-WEB-4205	http://melbourne2006.com.au/Channels/
W23.	VicRoads Website	STAD-EXT-WEB-4303	http://traffic.vicroads.vic.gov.au/viewer.htm
W24.	Security Issues	STAD-EXT-WEB-4411	http://www.abc.net.au/7.30/content/2005/s1435813.htm
W25.	2006 Commonwealth Games - Wikipedia	STAD-EXT-WEB-4412	http://en.wikipedia.org/wiki/2006_Commonwealth_Games

APPENDIX B

12.3 ANNEXED DOCUMENT

Ref. Document Title	Document Ref.	Version	Location
A1.			

12.4 SUPPLEMENTS

Ref. Document Title	Document Ref.	Version	Location
S1.			

12.5 DISTRIBUTION

12.5.1 Distribution for Review

Date	Name	Version	Purpose

12.5.2 Distribution for Information

Date	Name	Version	Purpose

12.6 TEMPLATE

Document Ref.	Template Title	Template Version
STAD-TEM-DOT-9002	STAD Generic Annex Template	0.00.00(8TH)

13. APPENDIX C - ARCHIVE OF AUSTRALIAN WEBSITES

The State Library of Victoria website provides archives of the websites including those of the Australian Commonwealth Games Association, the Melbourne 2006 Games, and the Office of Commonwealth Games Coordination.

It also includes specific references to the accessibility issues related to transport provision, e.g. for wheelchair users. [4.24, 4.25]

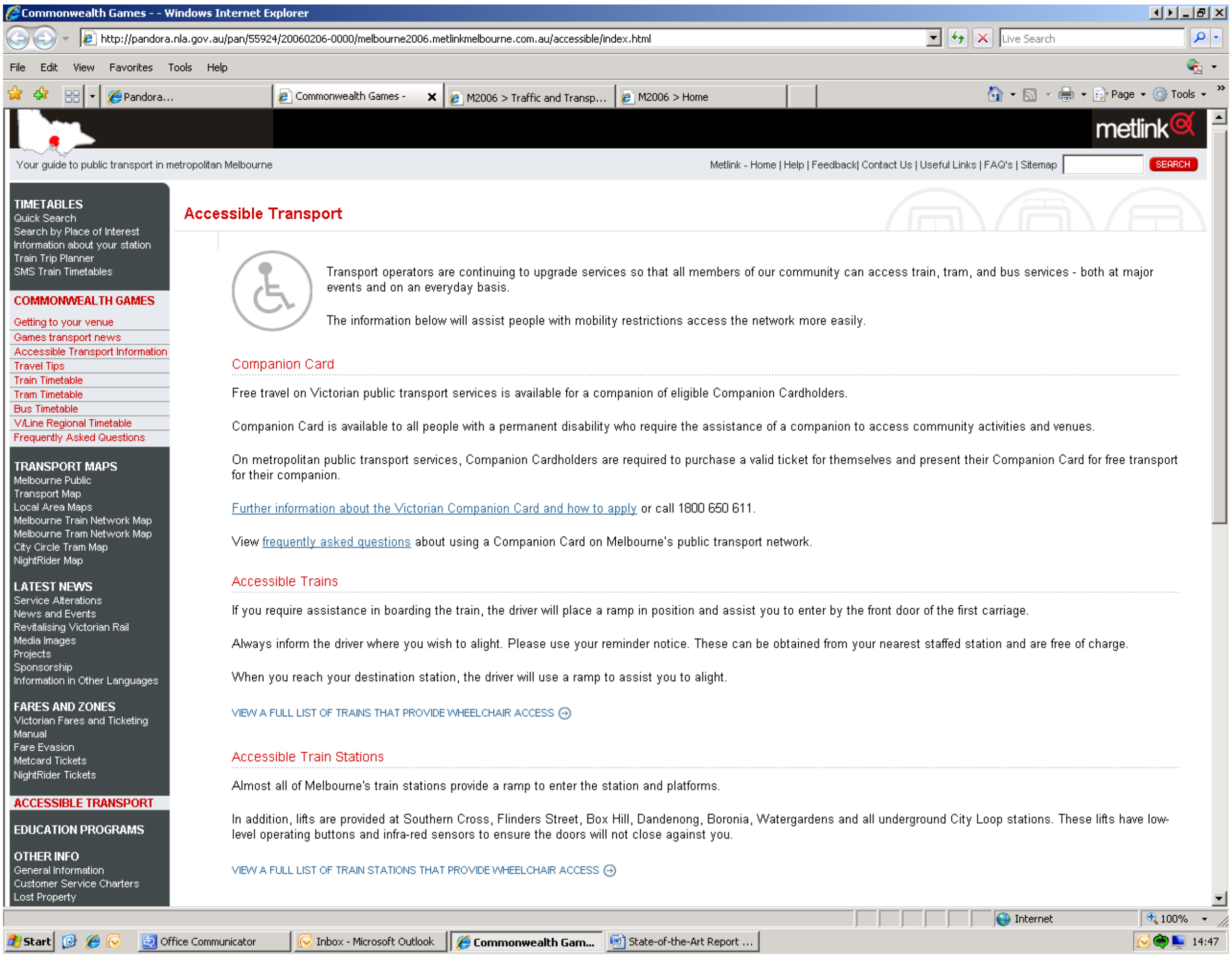
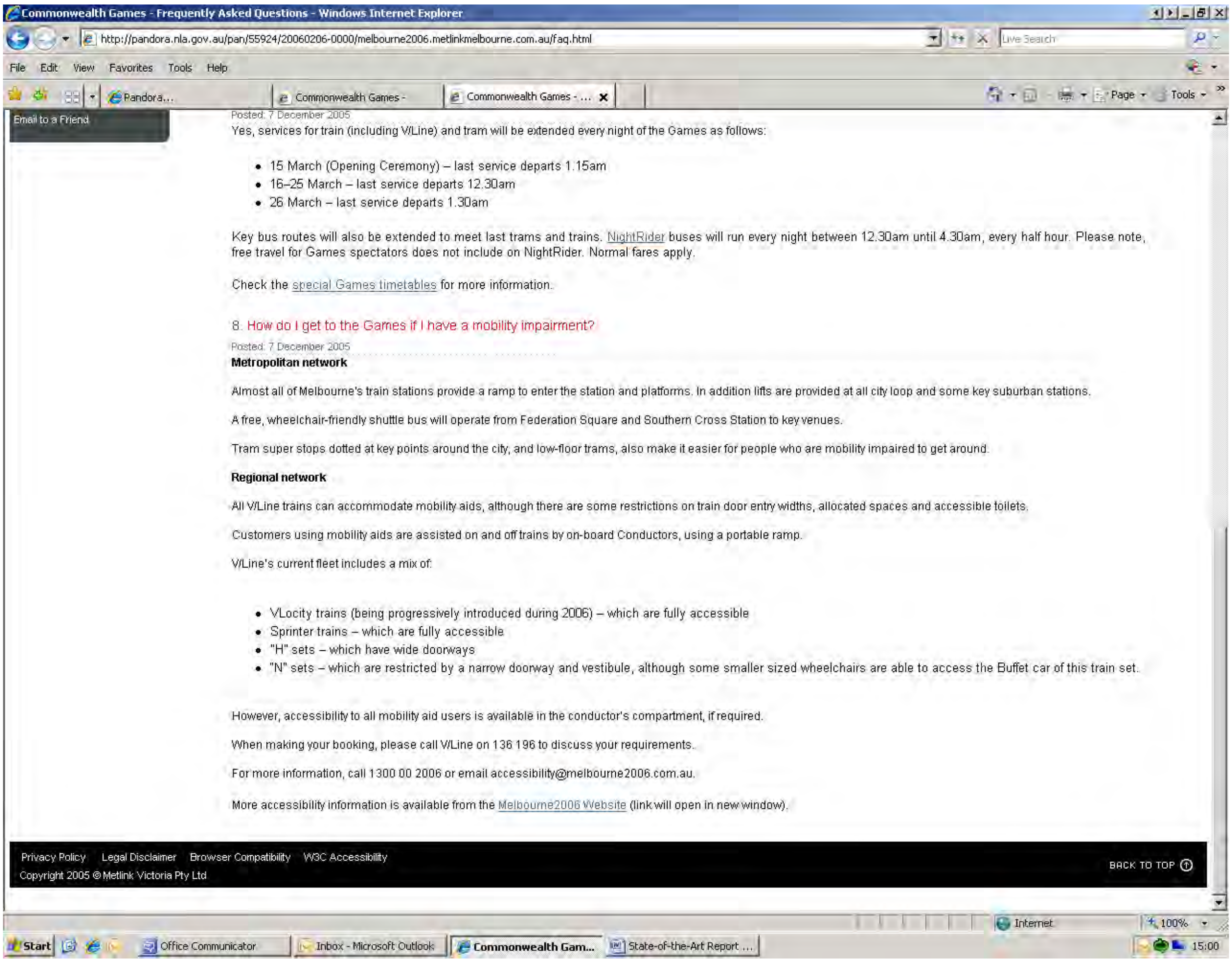


FIGURE 24 ACCESSIBILITY (1)



Posted: 7 December 2005

Yes, services for train (including V/Line) and tram will be extended every night of the Games as follows:

- 15 March (Opening Ceremony) – last service departs 1.15am
- 16–25 March – last service departs 12.30am
- 26 March – last service departs 1.30am

Key bus routes will also be extended to meet last trams and trains. NightRider buses will run every night between 12.30am until 4.30am, every half hour. Please note, free travel for Games spectators does not include on NightRider. Normal fares apply.

Check the special Games timetables for more information.

8. How do I get to the Games if I have a mobility impairment?

Posted: 7 December 2005

Metropolitan network

Almost all of Melbourne's train stations provide a ramp to enter the station and platforms. In addition lifts are provided at all city loop and some key suburban stations.

A free, wheelchair-friendly shuttle bus will operate from Federation Square and Southern Cross Station to key venues.

Tram super stops dotted at key points around the city, and low-floor trams, also make it easier for people who are mobility impaired to get around.

Regional network

All V/Line trains can accommodate mobility aids, although there are some restrictions on train door entry widths, allocated spaces and accessible toilets.

Customers using mobility aids are assisted on and off trains by on-board Conductors, using a portable ramp.

V/Line's current fleet includes a mix of:

- VLocity trains (being progressively introduced during 2006) – which are fully accessible
- Sprinter trains – which are fully accessible
- "H" sets – which have wide doorways
- "N" sets – which are restricted by a narrow doorway and vestibule, although some smaller sized wheelchairs are able to access the Buffet car of this train set.

However, accessibility to all mobility aid users is available in the conductor's compartment, if required.

When making your booking, please call V/Line on 136 196 to discuss your requirements.

For more information, call 1300 00 2006 or email accessibility@melbourne2006.com.au.

More accessibility information is available from the Melbourne2006 Website (link will open in new window).

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FIGURE 25 ACCESSIBILITY (2)

End of Document

EUROPEAN COMMISSION
DG RESEARCH
SEVENTH FRAMEWORK PROGRAMME
Theme 7 - Transport
Collaborative Project – Grant Agreement Number 234127

STADIUM

Smart Transport Applications Designed for large events with Impacts on Urban Mobility

SOTA REPORT ANNEX A5
UEFA 2000 BELGIUM

Project Start Date and Duration	01 May 2009, 48 months
Deliverable no.	D2.1 (Annex)
Dissemination level	P
Planned submission date	30 November 2009
Actual submission date	30 May 2011
Responsible organization	Transport For London

Document Title: SOTA Report Annex A5			WP number: 2	
Document History	Version	Comments	Date	Authorized by
	0.00.10(0)	Prepared for WQA Review	10/11/2010	Tony Haynes
	0.00.20(0)	Prepared for WQA Approval	22/11/2010	Tony Haynes

Number of pages:	57
Number of annexes:	0

Responsible Organization: Transport For London Contributing Organization(s): - -	Principal Author(s): Ian Johnson Contributing Author(s):

Peer Review	Partner	Date
Version	**IMPACTS**	**30 March 2011**

Approval for delivery	ISIS	Date
Version	**Coordination**	**25 May 2011**

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LIST OF TERMS AND ABBREVIATIONS

Term/Abbreviation	Explanation
Touring Club	A national automobile club (e.g. AA, ADAC, ANWB)
Group Stage	First round of matches in the UEFA Championship
TTB	Trains, Trams and Buses
SNCB	Société Nationale des Chemins de fer Belges
STIB	Société des Transports Intercommunaux de Brussels
IOC	International Olympic Committee
CEAC	Conférence Européenne de l'Aviation Civile
VAB-VTB	Belgian automobile association

REFERENCE DOCUMENTS

The present document refers to the following STADIUM documents:

No	Document Title	Report No.	Published By
S1.		NONE	

No	Document Title	Document Reference	Published By
A1.		NONE	

1. INTRODUCTION

1.1 PURPOSE

1.1.1 Document Purpose

To deliver an appraisal of the 2000 UEFA European Football Championship (Euro 2000) co-hosted by Belgium and the Netherlands. The focus of this document is upon activities within Belgium.

1.1.2 Functional Purpose

To understand how Intelligent Transport Systems were used to support the mobility aspects of the 2000 UEFA European Football Championship (Euro 2000) Large Event in Belgium and to elicit information that will contribute to the recommendations in the main 'State Of The Art' Large Event Report.

1.2 SCOPE

The 2000 UEFA European Football Championship (Euro 2000).

a) The context and background of the event
b) The challenges of the event
c) Event Community Activities
   i) Event Planning
   ii) Event Mobility Needs
   iii) Event Ticketing
   iv) Event Information
   v) Event & Venue Safety & Security
d) Municipal Community Activities
   i) Hosting Planning
   ii) Hosting Mobility solutions
   iii) Ticketing Technologies
   iv) Hosting Information
   v) Municipal Safety & Security

1.3 DOCUMENT EXCLUSIONS

This document does not repeat information captured in other documentary products. Where such information is relevant those documents will be clearly referenced within this annex.

1.4 APPROACH

Each event has been analysed against a generic process model for Event Management which has been devised from UITP documentation and various academic sources including Ref. B1

The Event Research Annexes do not explore all of the processes defined in the Stadium Process Model since event management *per se* is outside of the terms of reference of the Stadium Project. Nevertheless Event Management processes that impinge upon the hosting community, especially in the context of mobility have been researched wherever possible.

The Event Processes not reported in the annexes are:

a) Initialise Event
b) Event Organisation Planning
c) Event Activity Planning
d) Prepare For Participation
e) Prepare For Sponsorship
f) Participate In Event
g) Cover Event Under Contract
h) Cover Event Not Under Contract
i) Monitor Event Performance
j) Evaluate Event Performance

2. EXECUTIVE SUMMARY

2.1 OVERALL SUCCESS OF THE EVENT

The UEFA2000 Championship was a great organisational success. It demonstrated, for the first time, that the event could be co-hosted by two countries (See section 4.5) and that the transport and mobility issues this raise can be mastered. The National Mobility Plan made it possible to separate the supporters from different countries, so no major incident was reported.

2.2 ECONOMIC ASSESSMENT

Costs associated with establishing and delivering the mobility plan for Belgium were modest with those for signalling and public transport being the main components.

Across the three regions these were:

	Brussels-Capital	Flanders	Wallonie
Signalling	1.2m FB	7.8m FB	19.5m FB
Transport	23.0m FB	8.0m FB	18.0m FB

Costs of providing road signs were considered an investment for the future and many remain in use a decade later.

2.3 MOBILITY ASSESSMENT

The National Mobility Plans for Belgium and The Netherlands were coordinated through steering groups with devolved control in the field being managed by local host-city control centres. The Mobility Plans were seen as a reference document for immediate decisions in the field.

The “Plan National Mobilitié – Belgique” (Ref. R2) and its “Rapport d’Evaluation” (Ref. R3) provide a comprehensive and pragmatic overview for mobility management at large events.

In future, each time a large event with significant traffic flows takes place in Belgium wide collaboration with the touring clubs is recommended. It is also recommended that, as envisaged in the National Plan of Mobility, all work on the motorways and the major roads and between host cities should be banished for the duration of the event.

Traffic management throughout the event went smoothly with increased demand being managed by provision of additional public transport services, whilst road congestion was alleviated through the removal of all road works on major routes.

2.4 TICKETING ASSESSMENT

Ticketing for the event relied largely upon conventional and existing systems although an event specific BEFOOT public transport ticket was created. Uptake of this was limited though the public transport operators expressed a recommendation that travel be included in Stadium tickets at future events.

2.5 INFORMATION ASSESSMENT

Spectator information was largely provided by static low-tech sources delivered via information points at key transport interchanges and through 1.2 million multilingual brochures customised for each host city.

There were examples of real-time information provision through radio broadcasts particularly focussed on congestion on the road network.

Language independence of route signage and collaboration with touring clubs and neighbouring country traffic information centres was seen to be an effective tool in overcoming congestion and smoothing traffic flows to stadiums and between host cities. Internet information also proved useful, though statistics on its usage are limited.

2.6 SECURITY ASSESSMENT

Security was approached in a comprehensive manner. Municipal, National & International security was covered. The event appears to have passed away with no major incidents thanks in part to the segregation of supporters provided by the mobility plan.

2.7 HEALTH & SAFETY ASSESSMENT

No documentation on this aspect has been found.

2.8 USE OF ITS

No specific ITS systems have been reported as being specifically developed for UEFA 2000. The coordinators of the respective national mobility plans relied upon existing systems deployed within their respective traffic control centres and strong communication between the bodies concerned.

Effort appears to have been directed mainly towards efficient coordination of effort between the respective agencies and a strong communication plan to inform the public through radio broadcasts and media briefings. The static information points could be delivered today through real time information displays and push technologies to mobile devices.

2.9 LESSONS LEARNT

2.9.1 Planning

Planning was a major strength of this event. A key lesson for the future is to establish a comprehensive control structure to support local decision making on the day. Both host countries developed clearly elaborated National Mobility Plans that relied on host-city based control centres teams to deliver local management. The national mobility plan was carried out with the collaboration of the federal authorities, regional and local qualified, the services of gendarmerie and police force, the companies of public transport national, regional and local, the authorities airport and maritime. Its success was due to the efforts of approximately 200 people.

2.9.2 Communications

Information and communication channels were considered essential. Daily press briefings were considered useful and these supported the dissemination of 1,200,000 copies of a multi lingual brochure which described for each host city, the coordinates of the matches, BEFOOT ticketing, the road network and a route to approach host cities.

2.9.3 Infrastructure

Maximising the available capacity of the road and public transport networks is essential. To reduce congestion on major routes it is recommended that all road works be removed for the duration of the event and that traffic control centres monitor flows to facilitate communication of navigation advice to supporters.

Utilisation of the public transport infrastructure is to be encouraged although this inevitably results in short periods of excess demand after matches. Planning for exceptional capacity with very high frequency services and integrated interchange alleviated potential problems and added significantly to the perception of a successful event.

3. CONTEXT

3.1 EVENT CHARACTERISTICS

The UEFA Championships are a major International football competition that involves the movement of large numbers of supporters, media and officials between multiple cities within a country (typically between 4 or more host cities).

2000 was the first time the UEFA Championship had been jointly hosted by two countries, which introduced additional coordination and mobility considerations.

3.2 EVENT LOCATION(S)

For this event 4 host cities from each country were involved:

Brussels, Bruges, Charleroi and Liege in Belgium, and

Amsterdam, Arnhem, Eindhoven and Rotterdam in The Netherlands.

3.3 LOCATION DEMOGRAPHICS

Belgium is a multilingual country with both Dutch and French official languages.

The city of Brussels lies at the heart of the Brussels-Capital Region. The metropolitan area has a population of over 1.8 million, making it the largest in Belgium. Other host cities for Euro2000 included Bruges (population 250,000), Charleroi (population 200,000) and Liege (population 750,000).

3.4 SCALE OF THE EVENT

The 2000 UEFA European Football Championship (Euro 2000) was co-hosted by Belgium and the Netherlands between 10 June and 2 July 2000. As such it had a broad geographic coverage which introduced mobility considerations on the transport system.

CONTEXT

Figure 1   Location of Host Cities

The Group stage games, followed by knock-out games involved 31 matches that generated flows of supporters, not only to the individual grounds but also between venues and countries. To address these mobility issues a National Mobility Plan was created taking account of road, rail, air and maritime movement in the host cities, between the cities, at interchange points (e.g. airports & stations) and to country boarders. Interconnection of the Belgian and Dutch National Plans was managed to avoid bottlenecks in movement between countries.

The mobility plan covered in this Annex relates to Belgium.

Within Belgium 3 venues had a capacity of 30,000 spectators and the one in Brussels 50,000. Over the 15 games this represents an estimated 550,000 spectator movements plus VIPs, accredited personnel, suppliers, sponsors etc.

In Belgium the Group stage games occurred from 10^{th} to 21^{st} June 2000 with Quarter finals on 24^{th} and 25^{th} June and the Semi-final on 28^{th} June 2000. The Final was held in Rotterdam.

4. CITY SPECIFIC CHALLENGES

4.1 TRANSPORT

The host cities all have good road, and rail networks, with a choice of airports for international communication.

The main challenge presented to those organising mobility was to ensure the available public transport offer was adequate to the task.

With many fans remaining in the host cities for more than the match day (and 40% more than two days) public transport was considered likely to be heavily used. A campaign to promote public transport to supporters through initiatives at Federal, Regional and local levels was considered essential. A special BEFOOT public transport ticket (at much reduced prices) was offered to everyone.

4.2 LANGUAGE BARRIERS

Language was considered a major barrier given the diversity of nationalities attending the event and the need to facilitate their movement within and between cities. Managing spectator movement was, therefore, seen as requiring language independent signage to aid car drivers to reach host cities, and then to navigate the last leg to the stadium and its designated parking facilities. Similarly, those arriving by public transport, or on foot need clear wayfinding information customised to segregate opposing fans.

4.3 ACCOMMODATION

Host cities have limited accommodation, so displacement of spectators to adjacent towns (within say a 20km radius) is to be expected. This calls for shuttle bus facilities to collect fans and get them to the stadiums. Examples of such cities are Antwerp and Namur located between two venues.

4.4 COMMUNICATION

Getting appropriate and timely information to supporters was considered vital to the success of the event.

Good information and communication channels were, therefore, essential. Daily press briefings were considered useful. These supported the dissemination of 1.2 million copies of a multi lingual brochure which described for each host city, the coordinates of the matches, BEFOOT ticketing, the road network and a route to approach host cities.

Internet and radio broadcasts were also used to get the message out.

4.5 CO-HOSTING

As the first occasion on which the UEFA Championship was co-hosted by two countries the host cities were subjected to additional coordination issues and had to expect extra demands on the transport system as supporters followed teams from city to city.

5. EVENT COMMUNITY RESEARCH – PLANNING

5.1 EVENT PLANNING

Some aspects of planning will not be explored by this report since these aspects do not impinge upon the use of technology. These aspects are:

a) Marketing Planning
b) Sponsorship Planning
c) Site & Venue Planning
d) Finance Planning
e) Programme Planning

5.2 STRATEGIC APPROACH

Strategic planning and the implementation of the national mobility plan were carried out by the Ministère des Communications et de l'Infrastructue who brought together a diverse team of experts.

The national mobility plan was carried out with the collaboration of the federal authorities, regional and local qualified, the services of gendarmerie and police force, the companies of public transport national, regional and local, the authorities airport and maritime. Its success was due to the efforts of approximately 200 people.

5.3 EVENT TIMING

5.3.1 Time Frame

From notification of award of the UEFA Championship to its hosting permitted several years of planning. This was important given the multi-national context and complexity of the coordination of agencies.

5.3.2 Simultaneity

It is important to remember that this event was jointly hosted by Belgium and The Netherlands, so although this annex concentrates on planning in Belgium similar coordinated activity was occurring in The Netherlands.

Joint meetings were held between the planning teams to ensure National Plans meshed together appropriately.

5.3.3 Organisation Structure

Coordination of the event involved three partners: the two national bodies and UEFA.

For practical reasons organisation of mobility plans was performed at national level with close liaison between the respective teams, including regional and local bodies, the services of gendarmerie and police force, the companies of public transport national, and airport and maritime authorities. International collaboration was also ensured through liaison with neighbouring country traffic control centres and touring clubs.

The following diagram illustrates the coordination group structure in Belgium.

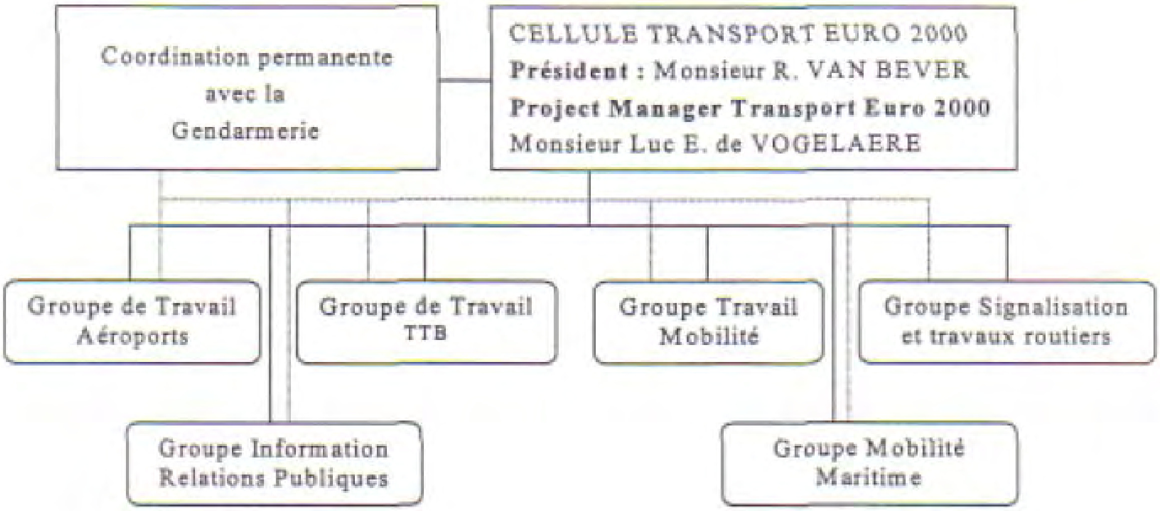

Figure 2 Organisation Structure

5.4 EVENT ORGANISATION

No information available.

5.5 EVENT ACTIVITY

In Belgium the Group stage games occurred from 10th to 21st June 2000 with Quarter finals on 24th and 25th June and the Semi-final on 28th June 2000. The Final was held in Rotterdam.

The following table shows the schedule for the matches and start times in Belgium.

Date	Bruges	Brussels	Charleroi	Liege
June 10		18:45		
June 11	16:00			
June 12				16:00
June 13			18:45	
June 14		18:45		
June 16	16:00			
June 17			18:45	
June 18				18:45
June 19		18:45		
June 20			18:45	
June 21	16:00			
June 21				18:45
June 24		18:45		
June 25	10:45			
June 28		18:45		

The opening game took place in Brussels with the Final in Rotterdam.

6. EVENT COMMUNITY RESEARCH – MOBILITY & ACCESS

6.1 EVENT MOBILITY

6.1.1 General Approach

With event locations spread throughout Belgium and associated events in The Netherlands it meant mobility plans had to cover movements:

a) To and from each match;
b) Between venues as spectators followed their teams in the knock-out stages;
c) International flows, including those transiting through Belgium by road and rail to matches in The Netherlands.

All these movements need to be achieved without unduly disrupting normal traffic conditions.

Choice of travel mode (air, rail, bus or car) to the event was largely expected to be dependent upon the proximity of home country to Belgium, with flows from the UK adding a maritime dimension. Overall expectations were for 7% air, 33% rail, 30% bus/coach and 30% car.

The anticipated distribution of arrival and departures was 50% on day of match, 20% staying 2 days, 15% staying a week, 10% staying 2 weeks and 5% long term. This suggested an elevated level of non-resident travel within host cities on non match days.

Overall, for Belgium movement of spectators by mode was estimated to be:

Mode	Supporters
Air	28,500
Rail	237,600
Bus/Coach	190,000
Car	190,400
TOTAL	646,500

For further details see chapter 15

6.1.2 Participant Transport

Participant transport was organised by the national teams, not the host community.

6.1.3 Management Transport

Transport for VIPs, officials and management staff relied on private hire vehicles.

6.2 EVENT TICKETING

Match tickets were controlled by UEFA and were not integrated with transport tickets.

6.3 TRANSPORT TICKETS

See Section 16.1.1

7. EVENT COMMUNITY RESEARCH – INFORMATION

Event information was provided through a website, media broadcasts and static information points. The website was set up for self-service Event Information, but this no longer exists and there is no documentation concerning it that is currently available.

7.1.1 Travel Information

See Section 18.1.1

7.1.2 Event Information

7.1.2.1 Scheduling Information

In Belgium the Group stage games occurred from 10th to 21st June 2000 with Quarter finals on 24th and 25th June and the Semi-final on 28th June 2000. The Final was held in Rotterdam.

See section 9.3 for Match schedules.

7.1.2.2 Ticket Information

No information available.

7.1.2.3 City Information

No information available.

7.1.2.4 Venue Information

No information available.

7.1.2.5 Regulation Information

No information available.

7.1.2.6 Help Line Information

No information available.

8. EVENT COMMUNITY RESEARCH – SAFETY & SECURITY

8.1 HEALTH AND SAFETY

No information available.

8.1.1 Venue Health &Safety

No information available.

8.1.2 Food safety

No information available.

8.1.3 Participant Health & Safety

No information available.

8.1.4 Staff Health & Safety

No information available.

8.2 SECURITY

No information available.

8.2.1 Venue Security

No information available.

8.2.2 Participant Security

No information available.

8.2.3 Staff Security

No information available.

9. EVENT COMMUNITY RESEARCH – ENVIRONMENT & VENUES

9.1 EVENT ENVIRONMENT

Environmental impacts from the event were minimal since UEFA 2000 did not involve the construction of new stadiums or accommodation specifically for participants. The King Baudouin Stadium having been redeveloped several years earlier on the old Heysel Stadium site.

9.2 EVENT VENUES

Within Belgium football matches were hosted at 4 venues – Bruges, Brussels, Charleroi, and Liege. Three venues had a capacity of 30,000 spectators and the one in Brussels 50,000.

Over the 15 games this represents an estimated 550,000 spectator movements plus VIPs, accredited personnel, suppliers, sponsors etc.

Overall, a plethora of supporters attended the championship; estimated by the foundation Euro 2000 at more than 1,200,000, with over half of these fans present in Belgium.

9.3 EVENT STAGING

No Information Available.

10. EVENT COMMUNITY RESEARCH – POST EVENT PLANNING

No information available.

11. EVENT COMMUNITY RESEARCH –OPERATIONS AND MONITORING

No information available.

12. EVENT COMMUNITY RESEARCH – EVENT COVERAGE

The championships were extensively covered by global media.

13. EVENT COMMUNITY RESEARCH – EVENT EVALUATION

No published information available from UEFA.

14. HOST COMMUNITY RESEARCH – PLANNING & ORGANISATION

14.1 MUNICIPAL ORGANISATION

Belgium comprises 589 municipalities grouped into five provinces in each of two regions and into a third region, the Brussels-Capital Region, comprising 19 municipalities that do not belong to a province. In most cases, the municipalities are the smallest administrative subdivisions of Belgium, but in municipalities with more than 100,000 inhabitants, on initiative of the local council, sub-municipal administrative entities with elected councils may be created. As such, only Antwerp, having over 460,000 inhabitants, became subdivided into nine districts. The Belgian arrondissements an administrative level between province (or the capital region) and municipality, or the lowest judicial level, are in English sometimes called districts as well.

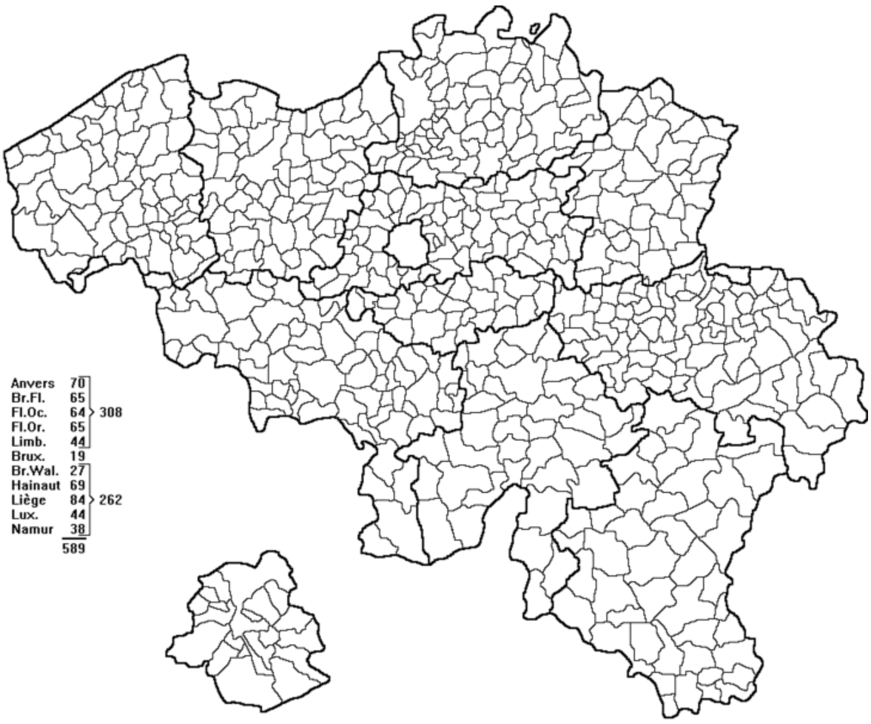

FIGURE 3 BELGIAN PROVINCES AND MUNICIPALITIES

14.2 EVENT PLANNING

Planning for the event was carried out over several years, coordinated by the Ministère des Communications et de l'Infrastructue. It drew together a broad team of experts from all relevant agencies including:

a) Federal authorities;
b) Regional and local authorities;
c) Gendarmerie and police force;
d) Companies providing public transport at a national, regional and local level;
e) Aviation authorities and airport operators; and
f) Port operators.

In total over 200 people were involved in the planning.

15. HOST COMMUNITY RESEARCH – MOBILITY

15.1 MOBILITY PLANNING

The following diagram illustrates the coordination group structure in Belgium.

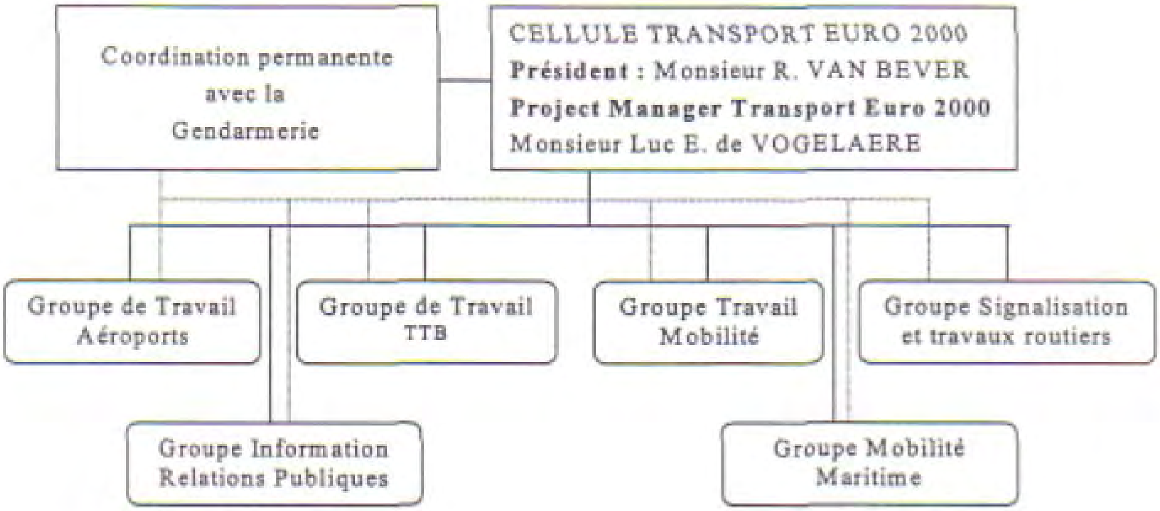

Figure 4 Mobility Planning

15.2 PRE-EVENT SERVICES

Transport systems within the host cities and between them include the full spectrum of modes, with a good road and rail network.

Taking Brussels as an example of a host city the transport systems of Société Nationale des Chemins de fer Belges (SNCB) and Société des Transportts Intercommunaux de Brussels (STIB) are integrated with the mobility plan of the city and work in symbiosis. SNCB providing the rail network within the city and out to the surrounding region, whilst STIB provide Metro, Tram and Bus networks. A traffic control centre coordinates and manages the road network.

Aviation links in the 4 host cities exist at the following airports:

- Brussels National for Brussels;
- Charlerloi-Gosselies for Charlerloi;
- Liège-Bierset for Liège; and
- Ostende for Bruges.

In addition, since the town of Antwerp plays a pivotal role between two city-hosts in the Netherlands (Rotterdam and Eindhoven) and of two city-hosts in Belgium (Brussels and Bruges) the airport of Antwerp-Deurne was important for the mobility plan.

15.3 EVENT SERVICES

15.3.1 Transport Sectors

The SOTA report has adopted the International Olympic Committee (IOC) five level categorisation of participating delegations, that is, T1–T5.

Levels T1–T3 are presidents, vice-presidents, general secretaries, and officials of the event organisers, presidents, vice-presidents, general secretaries of all the member states, heads of delegations, group leaders of delegates, top state officials, top officials from auspices agencies, officials with the event organising committee, the organising committees of the last and next session of the event, and officials from the bidding cities. Level T4 included participants (athletes) and officials coming with their delegations, technical officials, BOB relay agencies, entitled relay agencies, accredited literal media, and auspices agencies. T5 refers to spectators, event staff, volunteers, and visitors.

The 'tiers' equate to the SOTA Report categories as follows:

T1 – Management Transport

T2 – Management Transport

T3 – Management Transport

T4 – Participant Transport

T5 – Spectator Transport

15.3.2 Spectator Transport

Spectator transport comprised private cars, bus/coach and rail services. Emphasis was placed on encouraging use of public transport where additional services were provided, in particular after evening matches to facilitate dispersion of supporters.

15.3.3 Participant Transport

See section 6.1.2

15.3.4 Management Transport

See section 6.1.3

15.3.5 Background Transport

The mobility plan for the event focussed on reducing impacts on normal day-to-day and keeping background traffic moving. During the competition period road works on the principal routes were removed to minimise impacts on traffic circulation.

As each host city experienced only a short period of intense traffic associated with a match no specific plans were implemented to address other sector specific transport needs (e.g. daily freight management).

15.3.6 Mechanisms

15.3.6.1 Road Transport

Bus services were operated by several companies, but notably Société des Transportts Intercommunaux de Brussels (STIB) and De Lijn. Operators worked with the coordination team to ensure maximum utilisation of public transport throughout the event period. In particular, special efforts were made to increase service frequency and number of buses on match days, especially after games to disperse supporters quickly. Further coordination with rail operators ensured interchange was effective.

15.3.6.2 Rail Transport

Rail transport is composed of heavy rail[1] operated by of Société Nationale des Chemins de fer Belges (SNCB) for the whole of Belgium, whilst the Société des Transportts Intercommunaux de Brussels (STIB) provide light rail services in the form of metro and tram within Brussels.

These rail services are integrated with the mobility plan of the city and work in symbiosis.

15.3.6.3 Water Transport

Maritime transport facilities are relevant to flows from the UK to Belgium which makes the ports of Ostende and Zeebruges important. Both ports host passenger and car ferry links. In addition, the close proximity of the port of Calais was included with its motorway links into Belgium. No specific changes to services or operations were implemented for Euro 2000.

[1] Main Line

15.3.6.4 Air Transport

Managing the connection between airports stadiums and city centres has to consider arrivals by both scheduled and charter flights, which create different demand patterns as charter flights represent high peak flows. The Conférence Européenne de l'Aviation Civile (CEAC) helped with coordination and installation of a strategic plan in order to accommodate the charter flights. In this way all Charter flights were directed to the airport closest to the match venues for first round matches.

Aviation was an important factor in the arrival of spectators in Belgium for the event. Euro 2000 traffic for the five Belgian airports is:

Airport	Flights	Passengers
Anvers - Deurne	60	1122
Bruxelles -National	114	6107
Charleroi-Bruxelles-Sud	181	4573
Liège Bierset	32	1338
Ostende	96	2915
Total	483	16055

In addition, the charter airline traffic for Euro 2000 distributed between the airports of Brussels National, Charleroi Brussels Southern, Liege and Ostend accounted for 128 arrivals and 130 departures.

16. HOST COMMUNITY RESEARCH - TICKETING

16.1 TICKET TYPES PROVIDED

16.1.1 Transport Tickets

Most transport tickets for the event were those conventionally provided to the public by the transport operator, or by supporters clubs for charter flights.

Integrated ticketing for the event was not used. However, a BEFOOT public transport ticket was introduced by the hosts to encourage travel by public transport within Belgium.

An event specific BEFOOT series of tickets (at much reduced prices) were offered for use on public transport for 1, 2, 5, 10 or 30 days. These included:

BEFOOT CITY 1/30 Price 1.74 €

BEFOOT CITY 2/30 Price 3.74 €

BEFOOT MATCH 1/30 Price 12.39 €

BEFOOT 5/30 & 10/30 Price 76.85 € & 148.74 €

BEFOOT 30/30 Price 268.96 €

BEFOOT 30/30 MASS MEDIA Price 268.96 €

BEFOOT ticket take-up was limited. According to SNCB, this was because the majority of the supporters used conventional transport documents not related to the Euro 2000. The following table demonstrates the extent of BEFOOT ticket usage:

Type of ticket	Number sold
BEFOOT 1/30	11
BEFOOT 5/30	55
BEFOOT 10/30	2
BEFOOT 30 / 30	448
BEFOOT 30 / 30 Mass Média	2
BEFOOT Match Bruges	1561
BEFOOT Match Charleroi	2917
BEFOOT Match Liège	1137
BOOT Match Bruxelles	1898

16.1.2 Events Tickets

Event tickets were paper based. Transport ticketing was not integrated with match tickets, although for future events such a strategy is recommended by those coordinating the mobility plan.

16.1.3 Parking Permits

Parking in the immediate vicinity of the stadiums was restricted for security reasons. Permits were issued to VIPs, Media etc to access the controlled zones.

16.1.4 Combined Tickets

Tickets combining match attendance and travel were not used.

16.2 TECHNOLOGIES USED

16.2.1 Paper Tickets

No information available.

16.2.2 E-tickets

Electronic tickets were not used.

16.2.3 Smartcard

Smartcard were not used.

16.2.4 Personal Digital Devices

This technology was not sufficiently advanced in 2000 to be considered.

17. HOST COMMUNITY RESEARCH – COMMAND & CONTROL

17.1 TRAFFIC MANAGEMENT

The National Mobility Plans for Belgium and The Netherlands were coordinated through steering groups with devolved control in the field being managed by local host-city control centres. The Mobility Plans were seen as a reference document for immediate decisions in the field.

The "Plan National Mobilitié – Belgique" and its "Rapport d'Evaluation" provide a comprehensive and pragmatic overview for mobility management at large events.

17.2 TRANSPORT MANAGEMENT

17.2.1 Bus Operations

Société des Transports Intercommunaux de Brussels (STIB) and De Lijn provide Metro, Tram and Bus networks.

17.2.2 Rail Operations

Société Nationale des Chemins de fer Belges (SNCB) provided the rail network within the city and out to the surrounding region.

17.3 CONTROL AND COMMAND CENTRES

Command and control teams were established for each host city to facilitate local planning and enable immediate decisions to be taken in the field. The National Plan was used as a reference document to guide control and command decisions.

Existing traffic control centres provided the necessary infrastructure for mobility management with strong communication channels between centres, motoring associations and transport operators.

The Belgian and Dutch services responsible for radio operator guidance were asked to act in concert in order to inform supporters in their respective territories of any obstacle or event likely to disturb their journey to the host cities; thus avoiding bottlenecks and generating fluid and optimal mobility. In addition, conscious of the central geographical situation of Belgium a collaboration was essential as regards radio operator guidance with France (country of transit for Spain and Portugal, two participating countries), Germany (country of transit for in particular Turkey, Slovenia, Denmark, Sweden, Italy…) and England in order to ask them to collaborate in this initiative. It was indeed imperative that supporters were well informed of any major obstacle likely to slow down journeys before reaching the Belgian border.

The various approaches to mobility issues were managed via co-ordinated bi-national meetings and existing trans-border co-operation not specifically related to the event itself.

In the case of Belgium these facilities were further supported through a series of links with other bodies to collect information on supporters. For example:

a) for air travel, via the CEAC and airline companies to obtain the complete information concerning the flights charters Euro 2000;
b) for lorry drivers via associations such as VAB-VTB and their foreign counterparts;
c) for the coach services, the Belgian Federation and its foreign counterparts;
d) for the railway via SNCB and its foreign counterparts.

Although less elaborate in detail some aspects of coordination with countries bordering Belgium (and countries participating in the tournament) took place.

17.4 INTELLIGENT TRANSPORT SYSTEMS

No specific ITS systems have been reported as being specifically developed for UEFA 2000. The coordinators of the respective national mobility plans relied upon existing systems deployed within their respective traffic control centres and strong communication between the bodies concerned.

Static information points were installed at stations, on trains, airports, planes, boats, etc to guide to support spectators.

In terms of route guidance reliance was placed upon physical signage and multilingual information booklets to aid supporters in finding their way to host cities and the stadiums. Much of this signage remains in place today (e.g. for parking around stadiums). With today's technology it could be delivered through variable message signs, hand held applications and in vehicle navigation systems.

18. HOST COMMUNITY RESEARCH – INFORMATION

18.1 INFORMATION PROVIDED

18.1.1 Travel Information

Travel information was provided in advance of the event through a website and throughout the event via the media and national automobile clubs.

Radio guidance messages were broadcast for drivers to warn of congestion with useful links being provided from neighbouring country traffic control centres.

Leaflets (see example below) were distributed.

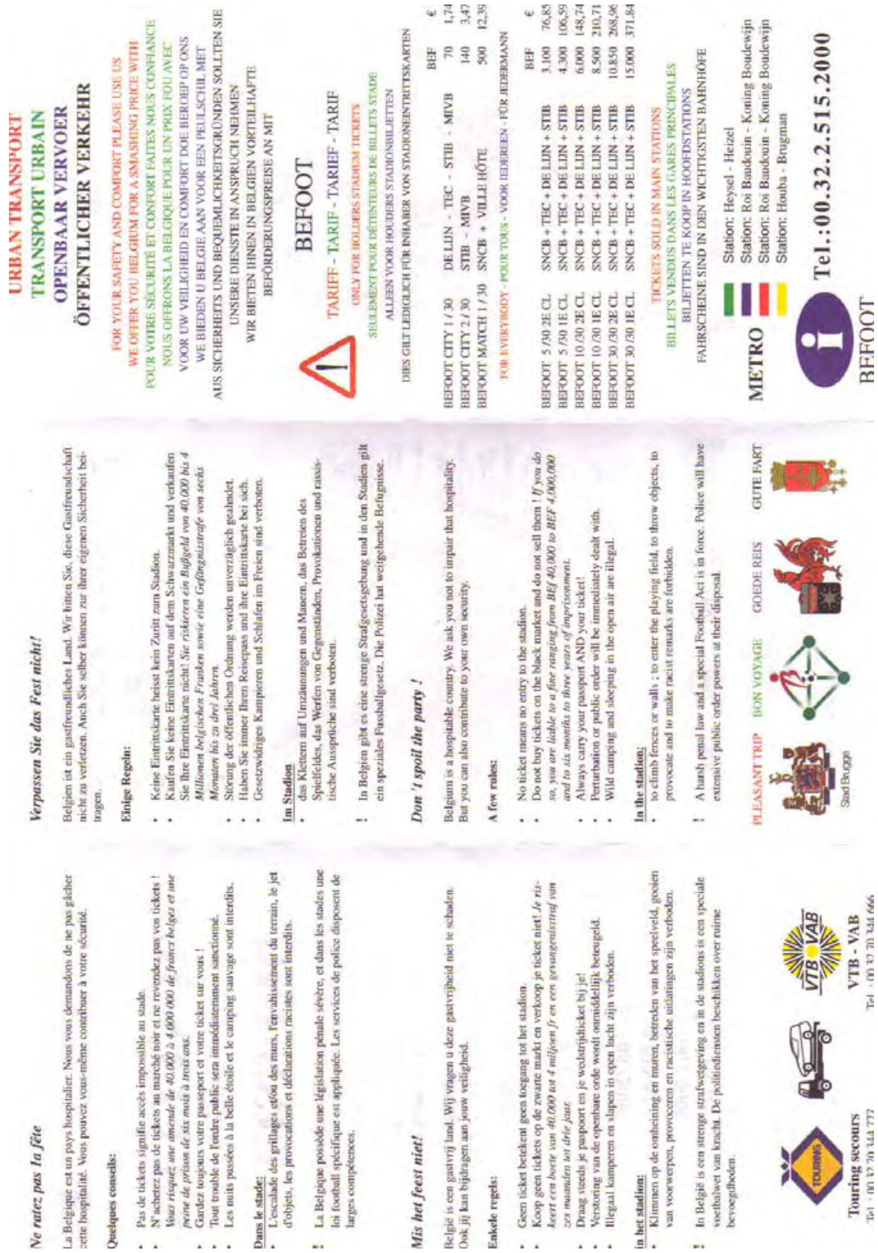

Figure 5 Information Leaflet

18.1.2 Event Information

See chapter 7

18.2 INFORMATION DELIVERY

18.2.1 Self Service

In advance of the event static information points were established at all major transport interchanges to provide route guidance to host cities and event venues. These were supported by a widespread distribution of leaflets to supporters explaining the public transport options and special BEFOOT tickets. In addition, an internet site was created to disseminate the same information to supporters prior to their journey.

A website was created for the event to support the conventional leaflet distribution and static information points. The extent of its use is not fully known, though the post event assessment indicates it had value and with today's technology would be more important.

18.2.2 Customer Service

There is no documentation of any Customer Call Centres either specifically established for EURO 2000 or extended to support Euro 2000.

18.2.3 Broadcast

To keep traffic on the road network moving radio guidance was offered through traffic control centres and the national automobile touring clubs. To further strengthen advance warning of congestion coordination with traffic centres in neighbouring countries was facilitated.

18.2.4 Public Signage

Event specific transport signage was designed and installed on all major routes within the country and in the proximity of the event venues. These were simple language independent signs utilising colour coded symbols linked to match tickets. They guided supporters between host cities and helped navigation to the parking lots at stadiums. Many of these signs remain in use today as a testament to their success.

Information to facilitate supporter mobility was provided through single page brochures for each host city as illustrated below. These depicted the Stadium location, and colour coded signs (tied to the match tickets) to direct drivers to designated parking zones.

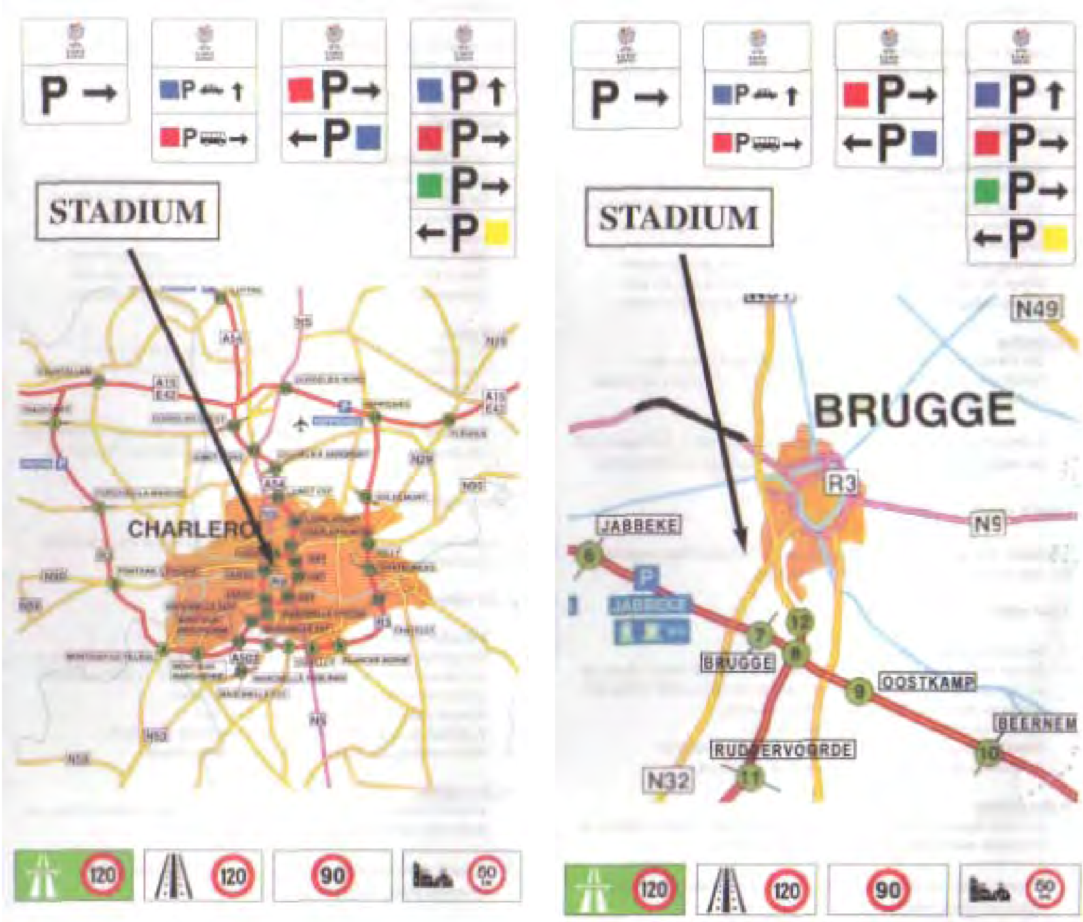

Figure 6 Public Signage

18.2.5 Personal Digital Devices

No information available on use of these devises.

18.3 INFORMATION COLLECTION

Real time information collection was limited to that routinely collected by the transport services through induction loops and traffic cameras, or available from transport operators.

19. HOST COMMUNITY RESEARCH - SECURITY

19.1 SECURITY PROVIDED

19.1.1 Venue Security

Security zones were established around each venue to restrict traffic movement and assist in dispersal of rival supporter groups after matches. Parking and entry into the security zones was controlled by permits.

The following map illustrates the location and scale of security zone around the stadium in Liege.

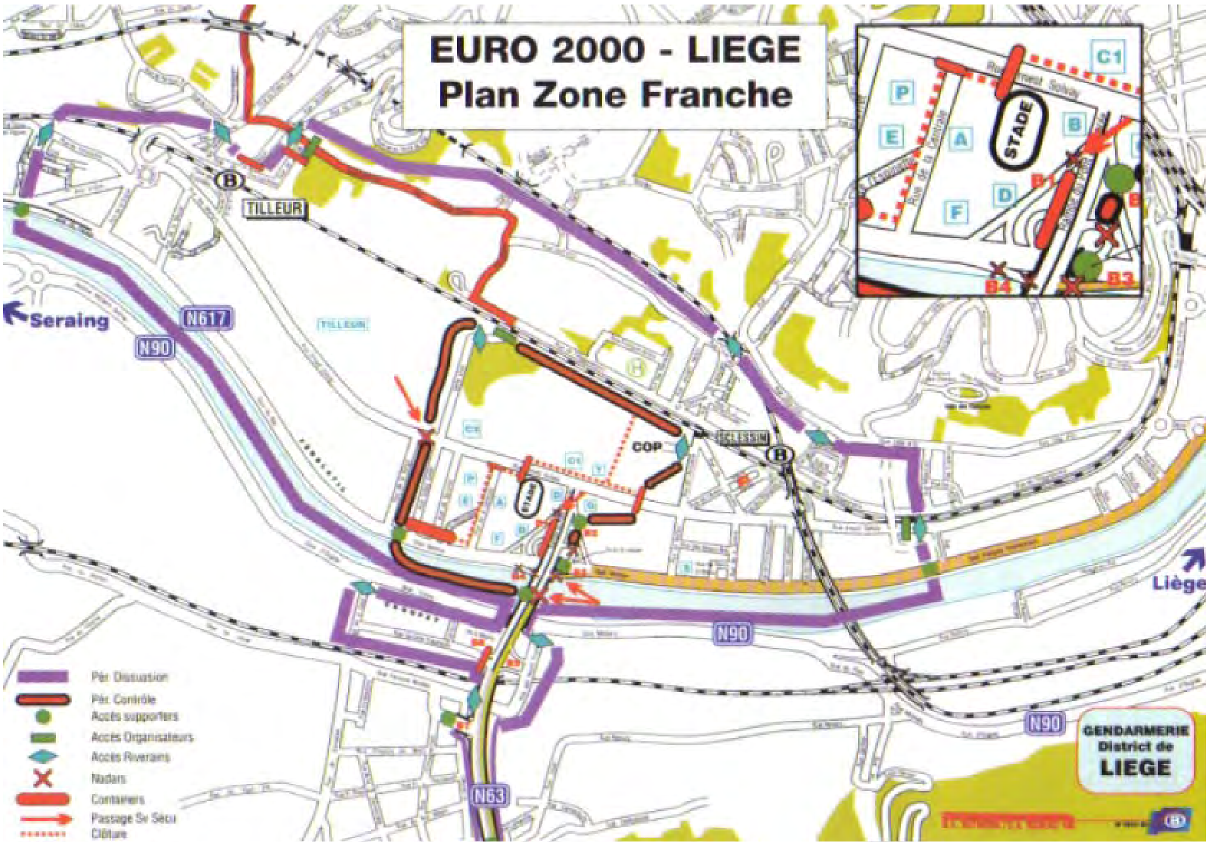

Figure 7 Venue Security

Similar restrictions were implemented in Brugge and Charleroi as shown below:

HOST COMMUNITY RESEARCH - SECURITY

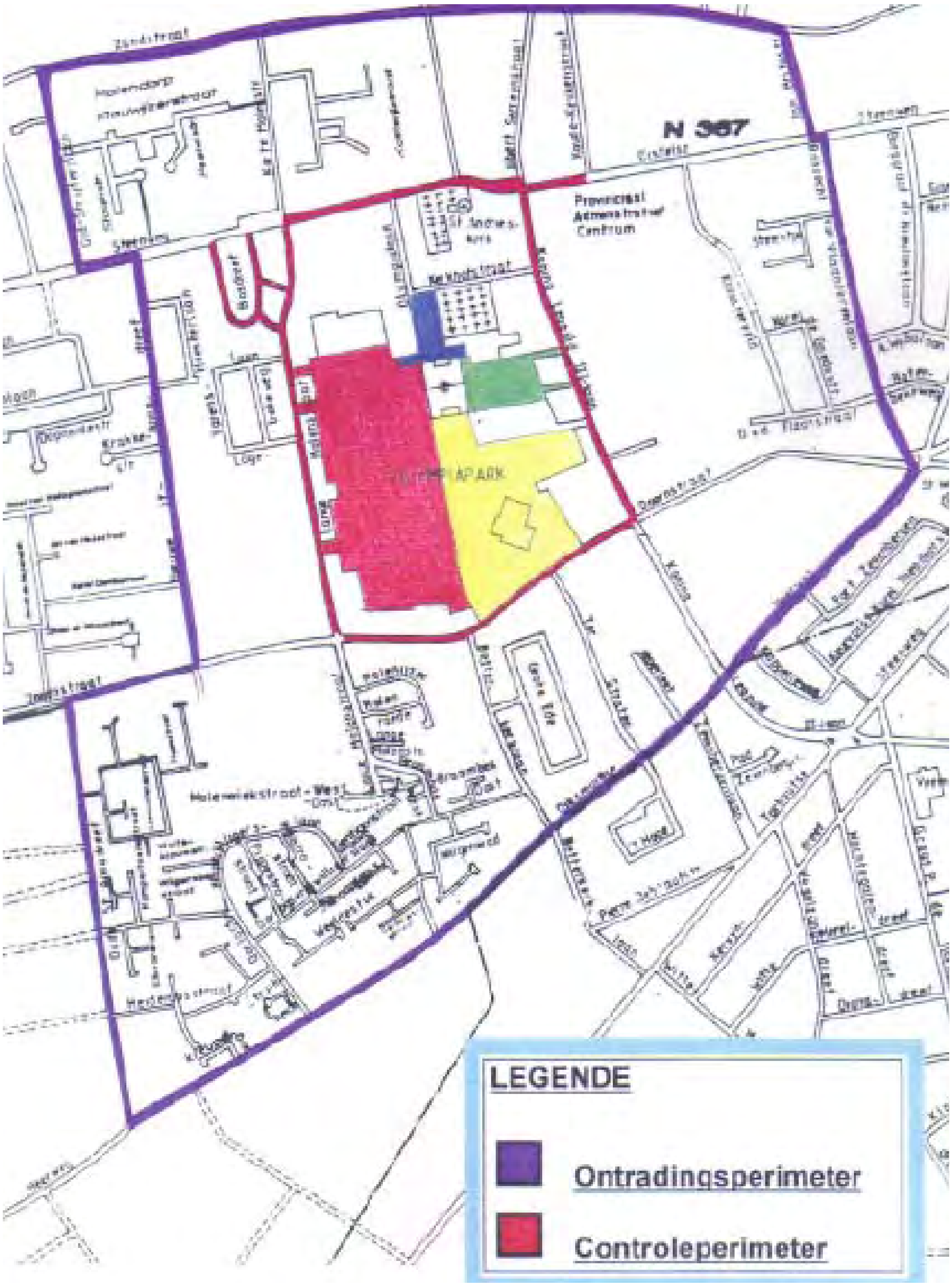

Figure 8 Outer Perimeter and Control Perimeter around Brugge Stadium

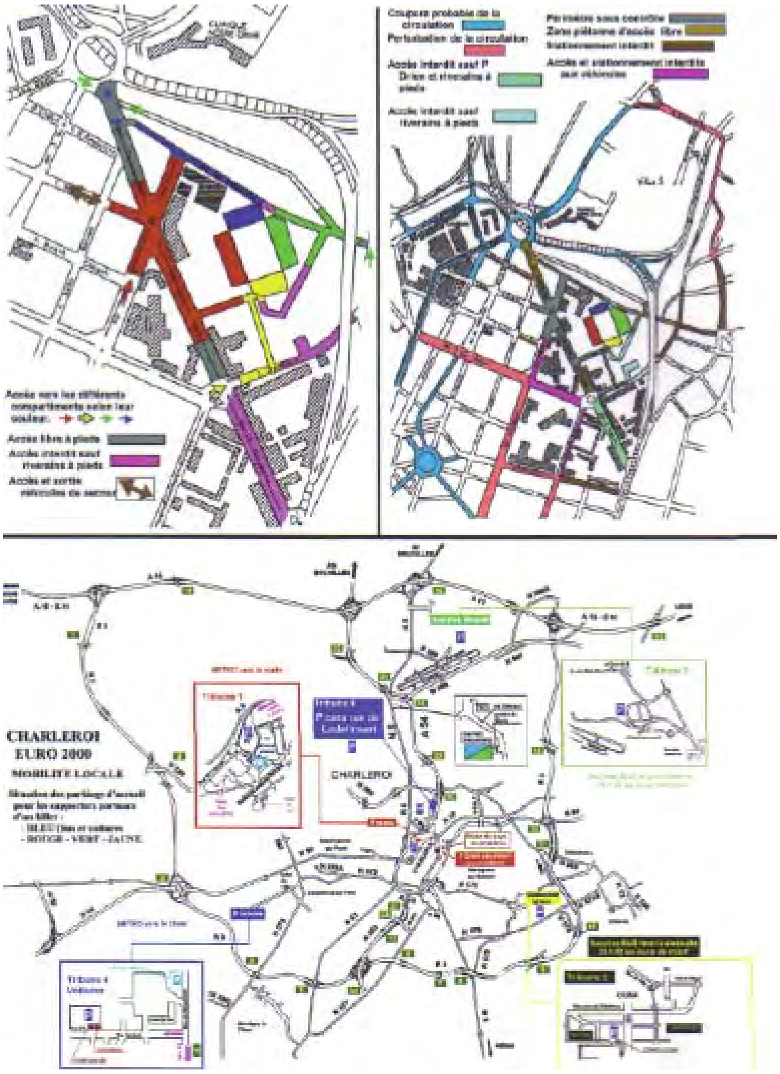

Figure 9 Mobility constraints around Charleroi Stadium

19.1.2 Municipal Security

No information available other than it was provided by the gendarmerie and police force.

19.1.3 Transport Security

Security services were coordinated between the gendarmerie and police force. Close coordination with the operators and police services was ensured in the national plan.

19.1.4 Border Security

No information available to suggest it differed from normal operation.

19.1.5 International Security

No information available to suggest it differed from normal operation.

19.1.6 Other Security

No additional information available.

19.2 TECHNOLOGY USED

19.2.1 Surveillance

No information available.

19.2.2 Communication

No information available.

20. HOST COMMUNITY RESEARCH – HEALTH & SAFETY

20.1 HEALTH AND SAFETY MEASURES PROVIDED

20.1.1 Venue Health & Safety

No information available.

20.1.2 Municipal Health & Safety

No information available.

20.1.3 Transport Health & Safety

No information available.

20.1.4 National v International Health & Safety

No information available.

21. HOST COMMUNITY RESEARCH – ENVIRONMENT

21.1 ENVIRONMENTAL STRATEGY

The National Mobility Plans did not contain specific environmental planning. However, the plan did seek to encourage sustainable transport[2] with an emphasis on use of public transport and the routing of charter flights to airports closest to event venues.

21.2 ENVIRONMENTAL PLANNING

No information available.

[2] Any means of transport with low impact on the environment

22. HOST COMMUNITY RESEARCH - FINANCE

22.1 THE RESOURCES OF THE ORGANISING COMMITTEE (BUDGET)

Budget for the organising committee to put in place the National Mobility Plan was 652,489 BF.

22.2 THE SPEND (INVESTMENTS)

Reported expenditure was:

Federal:	
Ministère des Communications et de l'Infrastructue	654,489 BF
SNCB	50,104,373 BF
SNCB	50,104,373 BF
Brussels Capital:	
Signalling	1,200,000 BF
STIB	23,000,000 BF
Flanders:	
Signalling	7,800,000 BF
De Lijn	8,000,000 BF
Wallonie:	
Signalling	19,500,000 BF
TEC	18,000,000 BF
Studies	1,100,000 BF

23. HOST COMMUNITY RESEARCH – EVENT SPECIFIC DEVELOPMENT

23.1 PROJECT(S) OVERVIEW

No information available

23.2 SYSTEM ARCHITECTURE

No information available

23.3 TECHNOLOGIES USED

No information available

24. HOST COMMUNITY RESEARCH – OPERATIONS

Transport operations relied upon existing traffic and transport operator control centres to ensure smooth management.

Although no new technology infrastructure was implemented (other than an event Internet site) substantial efforts were made to enhance coordination between existing centres and various service providers. In particular, communication channels were maintained with neighbouring countries and between each host city.

The National Plan also delivered decentralised coordination as each host city maintained its local control team to implement the agreed procedures. This appears to have been a very successful strategy, facilitating prompt decision making on a match day.

24.1 TRANSPORT OPERATIONS

24.1.1 Public Transport Operation During UEFA 2000

Public transport operations ran smoothly throughout the event with only limited modifications to the frequency of services at specific match times. Transport operators utilised established communication channels to coordinate provision which enabled enhanced connections/interchange between services (especially for late night matches).

24.1.2 Transport Operation To Venues

Over the four days during which De Lijn was in charge of the transport of the supporters for the 3 matches of the first round, it operated 70 special buses per match to transport on average 12,000 to 13,000 supporters. Over the whole of Euro 2000, the shuttles from the stadium to the car parks transported a total of 146,000 people.

In **Liege** shuttle buses transported 37.800 people to the stadium using up to 60 buses per match. In **Charleroi** 35,240 supporters were transported using 112 articulated standard buses and 15 articulated trams.

STIB reported 83,000 supporters used public transport for the journey to the stadium in Brussels and 75,000 on the return; representing at least 45% of the stadium capacity.

24.1.3 Opening and Closing Ceremonies

Transport operations for these ceremonies were no different to other match days.

24.2 SECURITY OPERATIONS

No information available.

24.3 CUSTOMER SERVICE OPERATIONS

No information available.

25. HOST COMMUNITY RESEARCH – MONITORING

25.1 TRAFFIC MONITORING

Traffic monitoring was carried out on a continual basis by the various control centres based on their normal practice.

25.2 TRANSPORT MONITORING

Transport monitoring was undertaken using existing induction loops and CCTV. There was no specific monitoring for punctuality and capacity with a view to being reactive with 'situation' solutions. The transport system had been expanded to 100% capacity and there was, therefore, no resource contingency for incidents.

25.2.1 Planning

The national mobility plan was conceived in such way that it served as a reference for any immediate decision that needed to be taken in the field.

The mobility plan dealt very well with the transport needs of supporters from their arrival on the Belgian territory to the host city by guaranteeing optimal mobility both for the outward and return journey.

25.2.2 Observed Statistics

The number of supporters transported mainly by the STIB and De Lijn exceeded all expectations, reaching more than 50% of the stadiums' capacity. SNCB also provided additional train services after the night matches.

Although public transport was the main means of travel the marketing of specialised event ticketing (BEFOOT) had little impact, since most supporters simply paid for and used public transport anyway.

Over the four days during which De Lijn was in charge of the transport of the supporters for the 3 matches of the first round, it operated 70 special buses per match to transport on average 12,000 to 13,000 supporters. Over the whole of Euro 2000, the shuttles from the stadium to the car parks transported a total of 146,000 people.

In **Liege** shuttle buses transported 37.800 people to the stadium using up to 60 buses per match. In **Charleroi** 35,240 supporters were transported using 112 articulated standard buses and 15 articulated trams.

STIB reported 83,000 supporters used public transport for the journey to the stadium in Brussels and 75,000 on the return; representing at least 45% of the stadium capacity.

Aviation was an important factor in the arrival of spectators in Belgium for the event. Euro 2000 traffic for the five Belgian airports encompassed 483 flights accounting for over 16,000 supporters.

25.3 SECURITY MONITORING

No information available.

25.4 ENVIRONMENT MONITORING

No information available.

25.5 INTEGRATED MONITORING

No information available.

26. HOST COMMUNITY RESEARCH – EVALUATION

An ad-hoc post-event evaluation on the implementation of the national mobility plan was carried out by the Ministère des Communications et de l'Infrastructue in order that lessons learned might be retained for future events. The key messages from that process have since been used to help develop the Belgium bid for the World Cup 2018.

The following conclusions can be drawn in relation to the management of mobility during the event:

An excellent climate of collaboration between the federal, the regional and the host cities enabled the success of the mobility measures set up during the Euro 2000.

Use of the road network was high and the system of coloured signs installed by the regional and local authorities helped to separate flows to the venues and respected the mobility plan of the host cities.

For the 15 matches of Euro 2000 which took place in the four Belgian host cities signage made it possible to deal with road traffic flows of supporters in order to guide them towards the car parks corresponding to the colour of their ticket. From there, either by foot, or in shuttles they could go to the stadium and reach the gate corresponding to their ticket. No bottlenecks were reported.

Separation of car parks facilitated a more effective dispersion of traffic after the matches.

The system made it possible to separate the supporters from different countries, so no major incident was reported. All interested parties expressed the opinion that this is to be recommended as essential for major events.

Costs of providing road signs are considered an investment for the future.

In future, each time a large event with significant traffic flows takes place in Belgium wide collaboration with the touring clubs is recommended. It is also recommended that, as envisaged in the National Plan of Mobility, all work on the motorways and the major roads and between host cities should be banished for the duration of the event.

Public transport operators expressed a recommendation that travel be included in Stadium tickets at future events.

27. APPENDIX A - TABLE OF FIGURES

28. APPENDIX B – DOCUMENT ADMINISTRATION

28.1 REFERENCES

28.1.1 Document References

Ref.	Document Title	Document Ref.	Version	Location
R1.	Traffic Operation during Beijing Olympic Games	STAD-EXT-REF-1118		http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B8H0W-4VDRVV0-1&_user=9483614&_coverDate=12%2F31%2F2008&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1406031871&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=9483614&md5=7e04cd4bf1d8eb1b57ff2e1217db329c
R2.	Plan National Mobilitié – Belgique	STAD-EXT-REF-6501		
R3.	Rapport d'Evaluation	STAD-EXT-REF-6502		

28.1.2 Book References

Ref.	Document Title	Document Ref.	Author	Publisher
B1.	Events Management	STAD-EXT-BOK-1001	Glenn Bowdin	Elsevier Butterworth Heineman

28.1.3 Web References

Ref.	Document Title	Web Ref.	Location
W1.			

28.2 DISTRIBUTION

28.2.1 Distribution for Review

Date	Name	Version	Purpose

28.2.2 Distribution for Information

Date	Name	Version	Purpose

29. APPENDIX C – TFL ADMINISTRATION

29.1 VERSION NUMBERING

The review history of all documents follows the pattern:

a)	Author draft(s)	[0.00.00(nAA)]
b)	Prepared For Work-Package Review	[0.00.10(0)]
c)	Prepared For Work-Package Approval	[0.00.20(0)]
d)	Prepared For Work-Package Acceptance	[0.00.30(0)]
e)	Prepared For Consortium Review	[0.00.40(0)]
f)	Prepared For Consortium Approval	[0.00.50(0)]
g)	Prepared For EU Acceptance	[0.00.60(0)]

29.2 THIS VERSION

Version	Date	Author	CC Ref.	Changes Since Previous Version
0.00.20(0)	22/11/2010	Document Controller	N/A	Baselined for WQA Approval

29.3 FULL VERSION HISTORY

Version	Date	Author	CC Ref.	Changes Since Previous Version
0.00.00(1IJ)	02/11/2010	Ian Johnson	N/A	N/A First Draft
0.00.00(2TH)	04/11/2010	Tony Haynes	N/A	Updated in line witrh 'QA' telecon Inserted Figure captions Prepared Abbreviations Table Inserted Co-Hosting Heading Inserted cross references Initialised Reference Table
0.00.00(3IJ)	04/11/2010	Ian Johnson	N/A	Completed Abbreviations Table Inserted Missing Text
0.00.10(0)	08/11/2010	Document Controller	N/A	Prepared for WQA
0.00.11(0)	08/11/2010	Document Controller	N/A	Prepared for Author Updates
0.00.11(1IJ)	18/11/2010	Ian Johnson	N/A	Author Updates transferred to DC
0.00.11(2TH)	22/11/2010	Tony Haynes	N/A	Updates undertaken by proxy by TH
0.00.12(0)	22/11/2010	Document Controller	N/A	WQA Review Complete

APPENDIX C – TFL ADMINISTRATION

Version	Date	Author	CC Ref.	Changes Since Previous Version

29.4 TEMPLATE

Template Ref.	Template Name	Template Version
STAD-TEM-DOT-0011	Consortium SOTA Annex Template	0.00.00(13TH)

29.5 CHANGES FORECAST

None

29.6 TFL AUTHORISATION

a) This is a controlled document once issued. All revisions are subject to change control.
b) All revisions of this document must be reviewed by at least one work package subject matter authority.
c) All revisions of this document must be approved by the TfL Project Board.
d) All revisions of this document must be reviewed by at least one consortium authority.
e) All revisions of this document must be approved by the Designated Consortium Authority.

Role	Name	Signature	Date
Reviewed By Work package : Subject Matter Authority			
Approved By Work package: TfL Project Board			
Reviewed By Consortium :			
Approved By Consortium: Designated Consortium Authority			

EUROPEAN COMMISSION
DG RESEARCH

SEVENTH FRAMEWORK PROGRAMME

Theme 7 - Transport

Collaborative Project – Grant Agreement Number 234127

STADIUM

Smart Transport Applications Designed for large events with Impacts on Urban Mobility

SOTA REPORT ANNEX A6
UEFA 2008 AUSTRIA & SWITZERLAND

Project Start Date and Duration	01 May 2009, 48 months
Deliverable no.	D2.1 (Annex)
Dissemination level	P
Planned submission date	30 November 2009
Actual submission date	30 May 2011
Responsible organization	Transport For London

Document Title: SOTA Report Annex A6			WP number: 2	
Document History	Version	Comments	Date	Authorized by
	0.1	Prepared for WQA Review	08/11/2010	Tony Haynes
	0.2	Prepared for WQA Approval	22/11/2010	Tony Haynes

Number of pages:	31
Number of annexes:	0

Responsible Organization: Transport For London Contributing Organization(s): - -	Principal Author(s): Ian Johnson Contributing Author(s):

Peer Review	Partner	Date
Version 0.-2	**IMPACTS**	**30 March 2011**

Approval for delivery	ISIS	Date
Version 0.2	**Coordination**	**30 May 2011**

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LIST OF TERMS AND ABBREVIATIONS

Term/Abbreviation	Explanation
AGIRE	GIS based application for real time traffic management
CCDJP	Conference of Directors (Ministers) of Cantonal Justice and Police Departments
CFF	Chemins de Fer Fédéraux
DCTI	Département des Constructions et des Technologies de l’Information
DGM	Direction Générale de la Mobilité
IKAPOL	Intercantonal arrangement for Policing
IOC	International Olympics Committee
PAS	Public Authority Structure
SMGN	Société des Mouettes Genevoises
SNCF	Société Nationale des Chemins de Fer Français
TER	Transport Express Régional
TPG	Transports Publics de Genève
TPN	Transports Publics de Nyon
UEFA	Union of European Football Associations
UNIRESO	Mobilité et Transports pour Genève et Régions
VMS	Variable Message Signs

REFERENCE DOCUMENTS

The present document refers to the following STADIUM documents:

No	Document Title	Report No.	Published By
S1.		NONE	

ANNEXES

No	Document Title	Document Reference	Published By
A1.		NONE	

1. INTRODUCTION

1.1 PURPOSE

1.1.1 Document Purpose

To deliver an appraisal of the 2008 UEFA European Football Championship (Euro 2008) co-hosted by Austria and Switzerland. The focus of this document is upon activities within Geneva.

1.1.2 Functional Purpose

To understand how Intelligent Transport Systems were used to support the mobility aspects of Euro 2008 and to elicit information that will contribute to the recommendations in the main 'State Of The Art' Large Event Report.

1.2 SCOPE

The Euro 2008 Large Event

a) The context and background of the event
b) The challenges of the event
c) Event Community Activities
   i) Event Planning
   ii) Event Mobility Needs
   iii) Event Ticketing
   iv) Event Information
   v) Event & Venue Safety & Security
d) Municipal Community Activities
   i) Hosting Planning
   ii) Hosting Mobility solutions
   iii) Ticketing Technologies
   iv) Hosting Information
   v) Municipal Safety & Security

1.3 DOCUMENT EXCLUSIONS

This document does not repeat information captured in other documentary products. Where such information is relevant those documents will be clearly referenced within this annex.

1.4 APPROACH

Each event has been analysed against a generic process model for Event Management which has been devised from UITP documentation and various academic sources including Ref. B1

The Event Research Annexes do not explore all of the processes defined in the Stadium Process Model since event management *per se* is outside of the terms of reference of the Stadium Project. Nevertheless Event Management processes that impinge upon the hosting community, especially in the context of mobility have been researched wherever possible.

The Event Processes not reported in the annexes are:

a) Initialise Event
b) Event Organisation Planning
c) Event Activity Planning
d) Prepare For Participation
e) Prepare For Sponsorship
f) Participate In Event
g) Cover Event Under Contract
h) Cover Event Not Under Contract
i) Monitor Event Performance
j) Evaluate Event Performance

2. EXECUTIVE SUMMARY

2.1 OVERALL SUCCESS OF THE EVENT

The UEFA2008 Championship was a great organisational success demonstrating again that such an event can be co-hosted by two countries (See section 4.3) and that the transport and mobility issues this raise can be mastered. Key to success is strong coordination of planning between host cities with national plans to handle inter city and country mobility issues.

2.2 ECONOMIC ASSESSMENT

No information available.

2.3 MOBILITY ASSESSMENT

The 2008 UEFA European Football Championship (Euro 2008) was jointly hosted by Austria and Switzerland. Euro 2008 ran from 7th to 29th June 2008 in the Swiss cities of Geneva, Basel, Berne and Zurich and in the Austrian cities of Vienna, Salzburg, Innsbruck and Klagenfurt. The two countries split organisation of the event between themselves with host cities planning their own organization of transport in accordance with the national concept.

Overall the mobility plans for the event in each host city were considered a success delivering on the ambition to promote sustainable transport[1] and environmental goals.

2.4 TICKETING ASSESSMENT

The success of the Kombiticket made it possible for public transport to have an exceptionally high modal share of spectator travel, exceeding the Confederation's demands. The public transport modal share of long distance travel on match days was 67% against the target of 60%. The public transport and non-motorised transport modal share was 80% for the last stage of the journey to access the stadium (including car park shuttles), in keeping with forecasts. It was therefore the great success story of the transport concept that was put in place for Euro 2008.

2.5 INFORMATION ASSESSMENT

The communications plan for the event provided access to a variety of information delivered through various media channels.

Language independence of route signage and coordination neighbouring country traffic information centres was seen to be an effective tool in overcoming congestion and smoothing traffic flows to stadiums and between host cities.

2.6 SECURITY ASSESSMENT

The event was generally seen as a success. In the case of Geneva available statistics demonstrate that the Geneva police's decision to deal with this event in a friendly but firm manner turned out to be effective.

[1] Any means of transport with low impact on the environment

2.7 HEALTH & SAFETY ASSESSMENT

No documentation on this aspect has been found.

2.8 USE OF ITS

Existing traffic control centres in the host cities already deploy a conventional ITS systems for traffic management. However, in some cased additional ITS application coverage was developed to enhance these facilities. For example in Geneva a GIS based application (AGIRE) for real time traffic management was given wider geographic coverage.

Other systems used included VMS, road sensors, cameras, vehicle counters, occupation rates of parking areas, etc). With the aid of all the information received in real time a global view of the state of the traffic and the occupation rate of the different parking areas was maintained which aided in decision-making.

2.9 LESSONS LEARNT

2.9.1 Planning

The need to use the long lead time to carry out detailed planning and testing was validated by experience at Euro 2008. Test events in Geneva enabled the plans to be refined which contributed towards the success of hosting the Championship.

2.9.2 Communications

Efficient communication channels both between the various host cities and agencies' delivering the event and the spectators is vital. Euro 2008 again demonstrated that attention must be paid to clear information dissemination in advance of the event, and to good language independent signage on the streets.

2.9.3 Infrastructure

Maximising the available capacity of the road and public transport networks is essential. Utilisation of VMS on major routes is recommended both to reduce congestion and to guide traffic to designated parking sites.

Utilisation of the public transport infrastructure proved effective with only short periods of predictable excess demand after matches. The adoption of integrated ticketing probably contributed substantially to this result.

3. CONTEXT

3.1 EVENT CHARACTERISTICS

The UEFA Championships are a major International football competition held every 4 years that involves the movement of large numbers of supporters, media and officials between multiple cities within a country (typically between 4 or more host cities). The introduction of two neighbouring countries co-hosting the event has become a common feature which introduces an additional dynamic to mobility management throughout the championship.

3.2 EVENT LOCATION(S)

For this event 4 host cities from each country were involved:

the Swiss cities of Geneva, Basel, Berne and Zurich; and

Vienna, Salzburg, Innsbruck and Klagenfurt in Austria.

3.3 LOCATION DEMOGRAPHICS

Split between Austria and Switzerland the championships embrace a multi lingual host population (predominantly German and French speaking, with a notable Italian speaking contingent).

The host cities vary considerably in size. The municipality of Geneva has a population of around 185,000 whilst the wider metropolitan area has 1,240,000 residents. Other host cities for Euro2008 include: Basel (population 166,000), Berne (population 660,0000, Zurich (population 380,000), Vienna (population 1.7 million and 2.3 million in the wider metropolitan area), Salzburg (population 150,000), Innsbruck (population 118,000) and Klagenfurt (population 90,000).

3.4 SCALE OF THE EVENT

The 2008 UEFA European Football Championship (Euro 2008) was jointly hosted by Austria and Switzerland. Overall Euro 2008 is a “multisite” mega-event, with 31 matches spread out across 8 Swiss and Austrian cities.

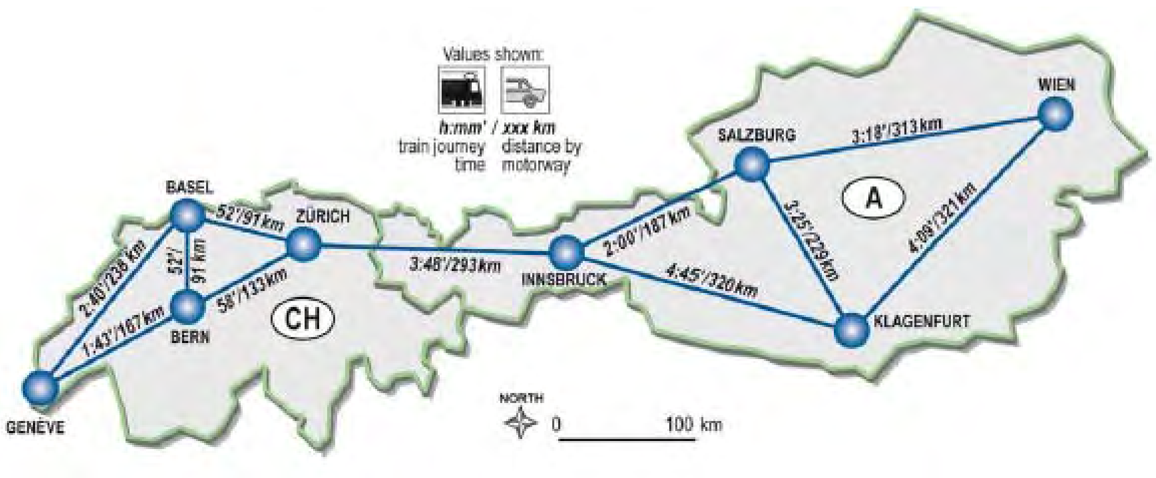

FIGURE 1 SCALE OF THE EVENT

CONTEXT

Euro 2008 ran from 7th to 29th June 2008 in the Swiss cities of Geneva, Basel, Berne and Zurich and in the Austrian cities of Vienna, Salzburg, Innsbruck and Klagenfurt.

The two countries split organisation of the event between themselves with host cities planning their own organization of transport in accordance with the national concept.

4. CITY SPECIFIC CHALLENGES

4.1 TRANSPORT

The host cities all have good road, and rail networks, with a choice of airports for international communication. From a travel point of view, each host city becomes an entry point for international spectators. Experience from the EURO2004 in Portugal and the 2006 Football World Cup in Germany helped validate estimated traffic flows relevant to planning needs.

4.2 LANGUAGE BARRIERS

Language is a major barrier given the diversity of nationalities attending the championships and the need to facilitate their movement within and between cities. Managing spectator movement was, therefore, seen as requiring language independent signage to aid car drivers to reach host cities, and then to navigate the last leg to the stadium and its designated parking facilities.

Consideration was given to creation of event specific signs and awareness material based upon a common concept in both host countries.

4.3 CO-HOSTING

The UEFA Championship has been co-hosted by two countries before and although this introduces additional coordination issues for the host cities it has been found to be manageable. It requires both countries and their respective cities to work very closely to common plans.

5. EVENT COMMUNITY RESEARCH – PLANNING

5.1 EVENT PLANNING

Some aspects of planning will not be explored by this report since these aspects do not impinge upon the use of technology. These aspects are:

a) Marketing Planning
b) Sponsorship Planning
c) Site & Venue Planning
d) Finance Planning
e) Programme Planning

5.2 STRATEGIC APPROACH

The overall organisation of Euro 2008 is an initiative of the UEFA (non-profit-making association), which created Euro 2008 SA, a Swiss public company. This company has a board of directors consisting of 9 members from the UEFA and the Swiss and Austrian national football federations. Euro 2008 SA essentially deals with negotiating television, marketing and ticket sales rights, but also takes part in organising matches and welcoming teams and sponsors.

Coordination on **a national scale** (at the Confederation level), was provided by a public authority structure (PAS) specific to the Euro. This structure was put in place at the request of the cantons and Euro host sites.

5.2.1 PAS

The PAS:

a) coordinates all operational activities falling with the remit of the public authorities and implements them with the partners' help;
b) coordinates cooperation with the ASF, Euro 2008 SA, private law partners and their counterparts in Austria.

The PAS was formed of several work groups, including one dedicated to infrastructure and transport, the 02 sector. Management of the 02 sector was entrusted to the federal office of transport.

The PAS mainly developed the following points:

i) overall transport concept,
ii) estimates of influxes and modal distribution for stadiums and *Fan Zones* (based on the experiences of the 2006 world cup in Germany, these estimates turned out to be accurate on average),
iii) promotion of public transport in coordination with the CFFs
iv) directives on parking organisation,
v) directives for air traffic, particularly to authorise night flights (return flights after matches),
vi) information coordination,
vii) road, pedestrian and cycling signage concept.

5.3 EVENT TIMING

5.3.1 Time Frame

From notification of award of a UEFA Championship to its hosting permits several years of planning. This was important given the multi-national context and complexity of the coordination of agencies.

Transport planning of UEFA Euro 2008 in Geneva lasted for 4 years.

2005-2006 Strategic transport planning group: transport round table constituted by small group of Transport Mega Event experts and transport consultants and coordinated by most important local transport authorities and public transport operators.

2006-2007 Operational transport planning

2007 Test Events

2008 UEFA Euro 2008 management and monitoring

After-event debriefing and monitoring statistics

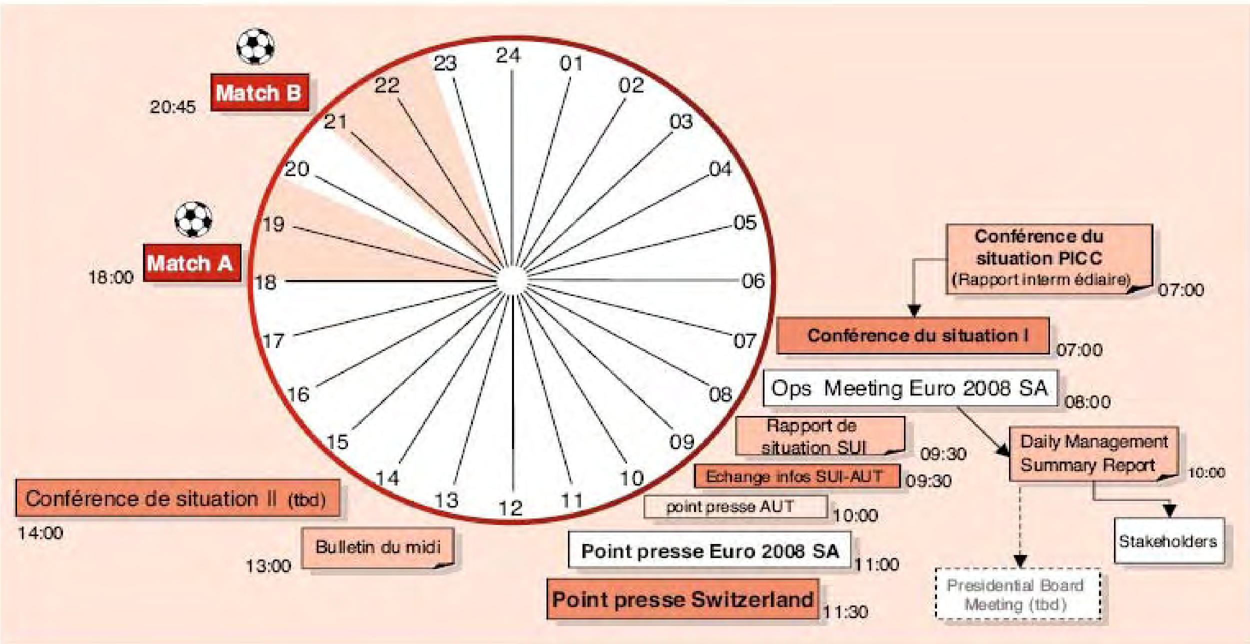

FIGURE 2 TIMINGS

5.4 EVENT ORGANISATION

Everything that takes place outside of the stadiums and their immediate surroundings is managed by local organisational structures.

On a local scale, the host cities each planned their own way of organising transport in keeping with the national concept. To accomplish this mission successfully, the Canton of Geneva appointed CITEC transport engineers, who were involved with the transport work group, led by a State delegate and attached to the general organisation of EURO in Geneva.

The work group had the advantage of bringing together events mobility specialists who were used to working together on events. The general organisational diagram of the coordination system put in place for Euro is shown below.

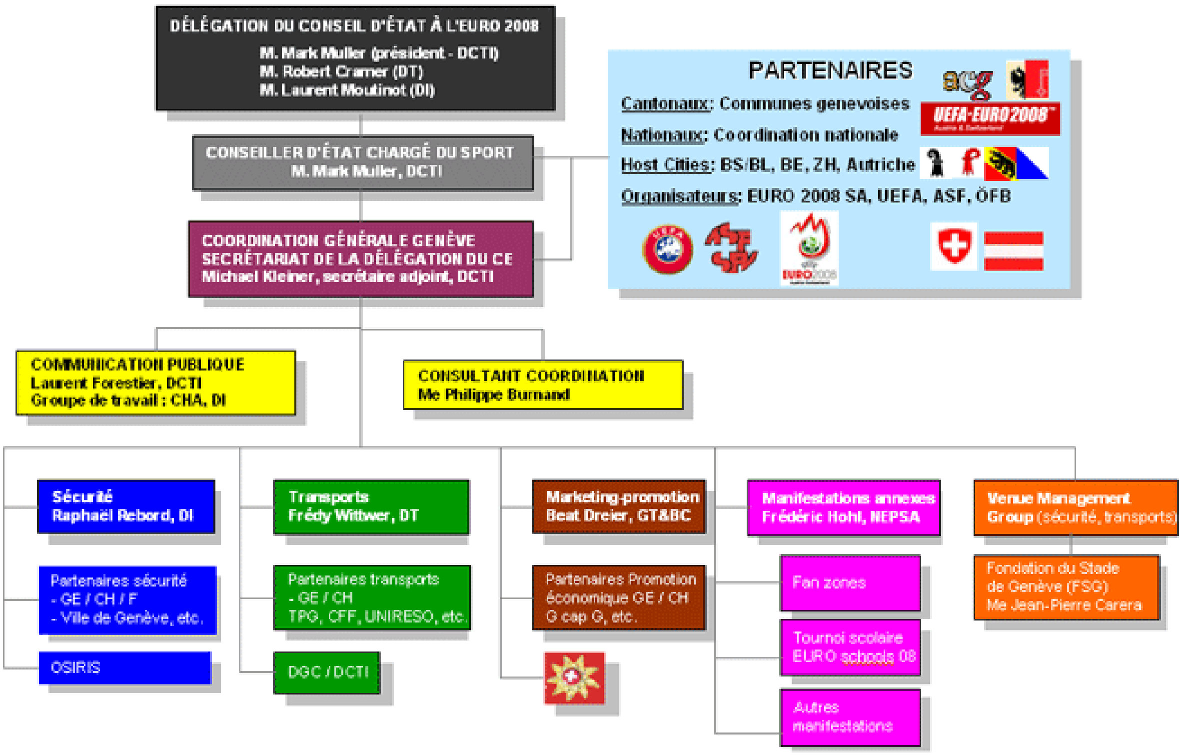

FIGURE 3 EVENT ORGANISATION

The Transport work group was managed by Mr. Wittwer, who coordinated staff:

a) From the Police (road safety brigade),
b) From the tariff community of the Geneva region, UNIRESO,
c) From the transport engineering firm CITEC.

5.5 EVENT ACTIVITY

The following table shows the schedule and times for the matches.

Date	Geneva	Basel	Berne	Zurich	Vienna	Salzburg	Innsbruck	Klagenfurt
June 7	20:45	18:00						
June 8					18:00			20:45
June 9			20:45	20:45				
June 10						20:45	18:00	
June 11	18:00	20:45						
June 12					20:45			18:00
June 13			20:45	18:00				
June 14						20:45	18:00	
June 15	20:45	20:45						
June 16					20:45			20:45
June 17			20:45	20:45				
June 18						20:45	20:45	
June 19		20:45						
June 20					20:45			
June 21		20:45						
June 22					20:45			
June 25		20:45						
June 26					20:45			
June 29					20:45			

The opening game took place in Basel with the Final in Vienna.

6. EVENT COMMUNITY RESEARCH – MOBILITY & ACCESS

6.1 EVENT MOBILITY

The Confederation's transport concept defines recommendations and principles relating to matters of national interest in the area of transport, on a national scale.

This concept pursues the following objectives:

a) coordinating the activities of all transport stakeholders,
b) promoting public transport,
c) effectively channelling and controlling flows of expected visitors and spectators.

For Geneva the cantonal institutions were involved in organising transport for Euro 2008. The Department for Construction and Information Technology (*Département des Constructions et des Technologies de l'Information* - DCTI) finances and monitors building work for major cantonal infrastructure projects. It works in collaboration with the Directorate-General for Mobility (*Direction Générale de la Mobilité* - DGM) which oversees studies relating to infrastructure or mobility management on cantonal territory.

Other bodies concerned with event mobility for Geneva include:

i) Geneva International Airport (AIG), an independent public establishment which manages and operates Geneva airport. It currently has traffic of 11.4 million passengers per year, and offers over 100 direct flights to various destinations (including frequent connections to Africa, the Middle East and North America and Asia).
ii) Geneva Public Transport (*Transports Publics de Genève* - TPG), an independent public body which manages and operates the urban public transport network of Geneva and its suburbs. The transport provision to be supplied by the TPG is defined in the service agreement between the TPG and the State of Geneva.
iii) UNIRESO, the tariff community of the Geneva cross-border region, which allows passengers to travel with a single ticket in the canton of Geneva and the neighbouring cross-border region (district of Nyon in the canton of Vaud, the Agglomeration Community of Annemasse, the Pays de Gex Community of Communes, and the Genevan Community of Communes in neighbouring France). UNIRESO encompasses the various public transport operators of the cross-border region: the CFFs, TPG, SMGN (Société des Mouettes Genevoises, a public boat transport in Geneva), TPN (*Transports Publics de Nyon* – Nyon Public Transport), TAC (*Transports de l'agglomération d'Annemasse* – Annemasse Agglomeration Transport), the TER network (*Transport Express Régional* – Express Regional Transport) in Annemasse and SAT/Frossard (operator of interurban transport lines between Geneva, Evian and Annecy).
iv) The Chemins de Fer Fédéraux (CFF), a company that manages and operates the Swiss rail network.
v) The Société Nationale des Chemins de Fer Français (SNCF), a company that manages and operates the French rail network.

vi) The Fondation des Parkings, a public foundation created by the State of Geneva in 1969 with the aim of promoting, building and operating car parks.
vii) The Police services of the canton of Geneva.

6.1.1 Participant Transport

Participant transport was organised by the national teams, not the host community.

In Geneva for several categories (e.g. VIP, sponsors, officials, teams, logistics, media, staff, disabled people, etc.), who make up 25% of spectators at the stadium, stadium access was designed to meet everyone's demands. These categories are entitled to use reserved parking facilities next to the stadium, which have a total of 1,750 spaces for cars, coaches and lorries. The spaces are allocated in advance, with each car park being numbered and displaying this number.

6.1.2 Management Transport

Transport for VIPs, officials and management staff relied on private hire vehicles.

6.2 EVENT TICKETING

Match tickets were controlled by UEFA who also introduced a travel component.

The flagship measure was the "Kombiticket". It was a match ticket offering free travel on the day of the match and the day after until midday on all transport networks. With this *Kombiticket*, co-funded by the Confederation and the organiser Euro 2008 SA, along with additional services (mainline and regional CFF trains + urban transport, particularly at night), ambitious modal share targets were set for the matches' "general public" spectators:

A 60% minimum modal share for public transport for long-distance travel on match days. The target was exceeded with a public transport modal share of 67%.

An 80% minimum modal share for public transport + non-motorised transport for the last leg of the journey to the stadium (including car park shuttles). The target was met.

The success of the Kombiticket made it possible for public transport to have an exceptionally high modal share of spectator travel, exceeding the Confederation's demands. It was therefore the great success story of the transport concept that was put in place for Euro.

6.3 TRANSPORT TICKETS

See Section 16.1.1

7. EVENT COMMUNITY RESEARCH – INFORMATION

Event information was provided through a website. The website was set up for self-service Event Information, but this no longer exists and there is no documentation concerning it that is currently available.

7.1.1 Travel Information

See Section 18.1.1

7.1.2 Event Information

7.1.2.1 Scheduling Information

The Group stage games took place between 7th and 18th June 2008 with Quarter finals on 19th to 22nd June, the Semi-finals on 25th and 26th June 2000. The Final was held in Vienna on 29th June.

See section 5.5 for Match schedules.

7.1.2.2 Ticket Information

No information available.

7.1.2.3 City Information

No information available.

7.1.2.4 Venue Information

No information available.

7.1.2.5 Regulation Information

No information available.

7.1.2.6 Help Line Information

No information available.

8. EVENT COMMUNITY RESEARCH – SAFETY & SECURITY

8.1 HEALTH AND SAFETY

No information available.

8.1.1 Venue Health &Safety

No information available.

8.1.2 Food safety

No information available.

8.1.3 Participant Health & Safety

No information available.

8.1.4 Staff Health & Safety

No information available.

8.2 SECURITY

For Geneva security within the stadium, at training locations and the teams' hotels was directly managed by the Euro 2008 SA company with private security guards assisted by the local police. At the approach to the stadium and the rest of the city, the canton was in charge of security.

In Switzerland, there is practically no national police. For major event security, they rely on an intercantonal arrangement (IKAPOL) administered by the Conference of Directors (Ministers) of Cantonal Justice and Police Departments (CCDJP). Cantonal police staff numbers were inadequate for the event, so the French and German State police services were called upon. Moreover, there was generalised use of "spotters" (police officers accompanying supporters from their own country) to identify potential troublemakers.

8.2.1 Venue Security

Security within the stadium, at training locations and the teams' hotels was directly managed by the Euro 2008 SA company with private security guards assisted by the local police. At the approach to the stadium and the rest of the city, the canton was in charge of security.

In Geneva the stadium was part of a "security perimeter" which could only be accessed on foot, with a ticket and after a body search. Around this initial perimeter, a free zone is set up before matches, marked off by a "traffic perimeter" encompassing access routes. Transit traffic is prohibited from entering this perimeter. The configuration of the district, surrounded by the railway tracks of the freight station, offers little clearance around the stadium, but has the advantage of being easy to cordon off as it only has three points of entrances from the adjoining districts. Another specific feature is the A1a motorway opening into the very centre of the perimeter, which it crosses as a viaduct with several entrances and exits.

The concept is based on the following rules:

a) Permission is required for all vehicle access to the traffic perimeter.

b) Spectators arrive at the stadium on foot, channelled along the wide, traffic-free roads.
c) Special categories access the reserved car parks by an access corridor away from the traffic, directly connected to the motorway.

Spectators arriving are distributed across the three gates:

i) North, Carrefour de l'Etoile crossroads: CFF Lancy-Pont-Rouge stop, 2 tram lines, north coach car park.
ii) East, Avenue Vibert: end of the EURO 2008 pedestrian route (*Fan zone, Fan Village*).
iii) South, Carrefour du Bachet crossroads: 3 tram lines, shuttles from the 3 "general public" car parks, south coach car park.

For the end of the match, spectator flows leave along the same axes, which are still closed off to traffic.

Supporter coach parking was designed so that supporters of the two teams that are playing against each other do not meet.

8.2.2 Participant Security

Supporter coach parking was designed so that supporters of the two teams that are playing against each other do not meet.

For Geneva spectators arriving are distributed across the three gates:

a) North, Carrefour de l'Etoile crossroads: CFF Lancy-Pont-Rouge stop, 2 tram lines, north coach car park.
b) East, Avenue Vibert: end of the EURO 2008 pedestrian route (*Fan zone, Fan Village*).
c) South, Carrefour du Bachet crossroads: 3 tram lines, shuttles from the 3 "general public" car parks, south coach car park.

For the end of the match, spectator flows leave along the same axes, which are still closed off to traffic.

8.2.3 Staff Security

No information available.

9. EVENT COMMUNITY RESEARCH – ENVIRONMENT & VENUES

9.1 EVENT ENVIRONMENT

A sustainable development concept shared by Switzerland, Austria and the UEFA was developed for Euro 2008, as an initiative of the host countries. This concept took the three dimensions of sustainable development into account:

a) Eco-friendliness,
b) Economic performance,
c) Social solidarity.

Due to its transversal nature, the sustainable development concept could be implemented in all the issues that arose when organising Euro. For the ecological component, measures were developed in the following areas:

Transport, with the promotion of public transport by introducing the Kombiticket,

Cutting waste, using reusable cups instead of disposable cups, or selling PET bottles without caps,

Energy, with all stadiums and supporter perimeters supplied with “naturemade star” label certified eco-friendly electricity, and a significant reduction in the use of diesel generators by Euro 2008 SA.

9.2 EVENT VENUES

Within Austria football matches were hosted at 4 venues – Vienna, Salzburg, Innsbruck and Klagenfurt. Three venues had a capacity of 31,000 spectators and the Ernst Happel Stadium in Vienna 53,000.

In Switzerland football matches were hosted at 4 venues – Geneva, Basel, Berne and Zurich. Three venues had a capacity of between 30,000 and 32,000 spectators whilst the St. Jakob Park in Basel had a capacity of 42,000

9.3 EVENT STAGING

No information available.

10. EVENT COMMUNITY RESEARCH – POST EVENT PLANNING

No information available.

11. EVENT COMMUNITY RESEARCH –OPERATIONS AND MONITORING

No information available.

12. EVENT COMMUNITY RESEARCH – EVENT COVERAGE

The championships were extensively covered by global media through agreements created by UEFA.

In earlier championships UEFA sold the rights to the tournament through the European broadcasting Union, however, for the 2008 event a sales agency Sportfive was used to negotiate rights with each market individually. UEFA was therefore able to secure greater revenue for the right, including €410 million from four of the biggest markets (UK, France, Germany, Italy) and overall some 30% more than from the previous games in Lisbon in 2004.

All games were broadcast on the internet.

Broadcasting was generally satisfactory. However, there was a serious loss of coverage in the semi-finals when a thunderstorm over Vienna caused technical difficulties in the International Broadcasting Centre, which relayed the television feed from the match in Basel, Switzerland. National broadcasters took emergency contingency measures reverting to radio broadcasting. Only in Switzerland with its direct feed was coverage maintained.

13. EVENT COMMUNITY RESEARCH – EVENT EVALUATION

No published information available from UEFA.

14. HOST COMMUNITY RESEARCH – PLANNING & ORGANISATION

14.1 SWISS MUNICIPAL ORGANISATION

The 26 cantons of Switzerland are the member states of the federal state of Switzerland. Each canton was a fully sovereign state with its own borders, army and currency from the Treaty of Westphalia (1648) until the establishment of the Swiss federal state in 1848. The most recently created canton is the Canton of Jura, which separated from the Canton of Bern in 1979.

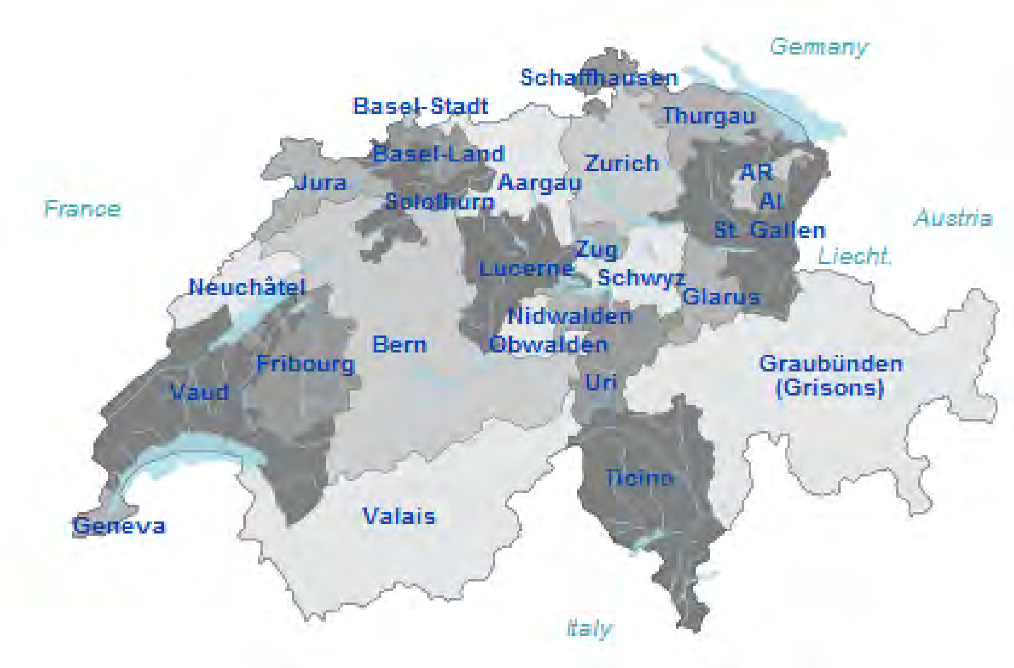

FIGURE 4 SWISS CANTONS

Each canton has its own constitution, legislature, government and courts.Most of the cantons' legislatures are unicameral parliaments, their size varying between fifty-eight and two hundred seats. A few legislatures are general assemblies known as Landsgemeinden. The cantonal governments consist of either five or seven members, depending on the canton. For the names of the institutions, see List of legislative and executive councils of the Cantons of Switzerland.

The Swiss Federal Constitution declares the cantons to be sovereign to the extent their sovereignty is not limited by federal law. The cantons also retain all powers and competencies not delegated to the Confederation by the Constitution. Most significantly, the cantons are responsible for healthcare, welfare, law enforcement and public education; they also retain the power of taxation. The cantonal constitutions determine the degree of autonomy accorded to the municipalities, which varies but almost always includes the power to levy taxes and pass municipal laws. The sizes of the cantons vary from 37km² to 7,105km²; the populations vary from 15,471 to 1,244,400.

Abbr	Canton	Since	Capital	Population	Area	Density	Munic.	Languages
ZH	Zürich	1351	Zürich	1,307,567	1,729	701	171	German
BE	Bern	1353	Bern	962,982	5,959	158	388	German, French
LU	Lucerne (Luzern)	1332	Lucerne	363,475	1,493	233	88	German
UR	Uri	1291	Altdorf	34,989	1,077	33	20	German
SZ	Schwyz	1291	Schwyz	141,024	908	143	30	German
OW	Obwalden	1291	Sarnen	33,997	491	66	7	German
NW	Nidwalden	1291	Stans	40,287	276	138	11	German
GL	Glarus	1352	Glarus	38,237	685	51	25	German
ZG	Zug	1352	Zug	109,141	239	416	11	German
FR	Fribourg	1481	Fribourg	263,241	1,671	141	168	French, German
SO	Solothurn	1481	Solothurn	250,240	791	308	122	German
BS	Basel-Stadt (Basel-City)	1501 (part of Basel until 1833)	Basel	185,227	37	5,072	3	German
BL	Basel-Landschaft (Basel-Country)	1501 (part of Basel until 1833)	Liestal	269,145	518	502	86	German
SH	Schaffhausen	1501	Schaffhausen	74,527	298	246	27	German
AR	Appenzell Ausserrhoden (Appenzell Outer Rhodes)	1513 (part of Appenzell until 1597)	Herisau	52,654	243	220	20	German
AI	Appenzell Innerrhoden (Appenzell Inner Rhodes)	1513 (part of Appenzell until 1597)	Appenzell	15,471	173	87	6	German
SG	St. Gallen	1803	St. Gallen	465,937	2,026	222	85	German
GR	Graubünden (Grigioni, Grischun, Grisons)	1803	Chur	188,762	7,105	26	180	German, Romansh, Italian
AG	Aargau (Argovia)	1803	Aarau	581,562	1,404	388	220	German
TG	Thurgau (Thurgovia)	1803	Frauenfeld	238,316	991	229	80	German
TI	Ticino	1803	Bellinzona	328,580	2,812	110	169	Italian
VD	Vaud	1803	Lausanne	672,039	3,212	188	375	French
VS	Valais	1815	Sion	298,580	5,224	53	143	French, German

Abbr	Canton	Since	Capital	Population	Area	Density	Munic.	Languages
NE	Neuchâtel	1815	Neuchâtel	169,782	803	206	53	French
GE	Geneva	1815	Geneva	438,177	282	1,442	45	French
JU	Jura	1979 (previously part of Bern)	Delémont	69,555	838	82	64	French
CH	Switzerland		Bern	7,593,494	41,285	174	2,596	German, French, Italian, Romansh

The two-letter abbreviations for Swiss cantons are widely used, e.g. on car license plates.

14.2 AUSTRIAN MUNICIPAL ORGANISATION

Austria, officially the Republic of Austria is a landlocked country of roughly 8.3 million people in Central Europe. It is bordered by Germany and the Czech Republic to the north, Slovakia and Hungary to the east, Slovenia and Italy to the south, and Switzerland and Liechtenstein to the west. The territory of Austria covers 83,872 square kilometres (32,383 sq mi) and has a temperate and alpine climate. Austria's terrain is highly mountainous due to the presence of the Alps The majority of the population speaks German which is also the country's official language.

Austria is a parliamentary representative democracy comprising nine federal states. The capital and largest city, with a population exceeding 1.6 million, is Vienna. Austria is one of the richest countries in the world, with a nominal per capita GDP of $43,723 (2010 est.). The country has developed a high standard of living and in 2010 was ranked 25th in the world for its Human Development Index. Austria has been a member of the United Nations since 1955, joined the European Union in 1995 and adopted the European currency, the euro, in 1999.

As a federal republic, Austria is divided into nine states These states are then divided into districts and statutory cities. Districts are subdivided into municipalities.Statutory Cities have the competencies otherwise granted to both districts and municipalities. The states are not mere administrative divisions but have some legislative authority distinct from the federal government, e.g. in matters of culture, social care, youth and nature protection, hunting, building, and zoning ordinances.

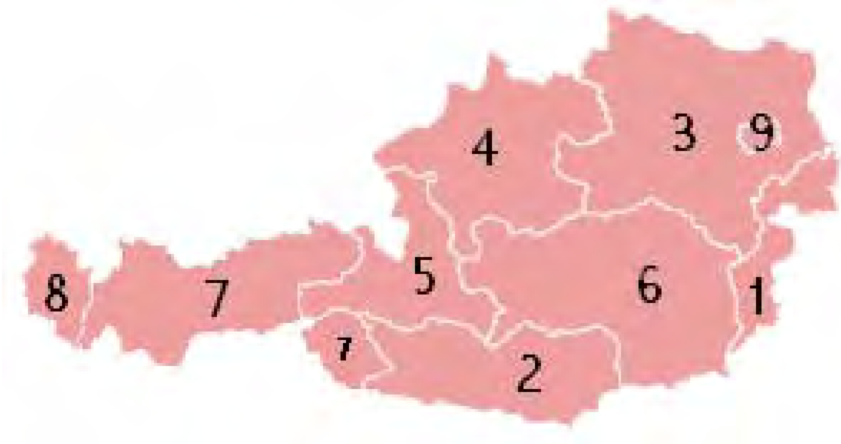

FIGURE 5 AUSTRIAN STATES

	State (Bundesland)	Capital	Area	Population	Rank
1	Burgenland	Eisenstadt	3,966 km²	280,350	9
2	Carinthia (Kärnten)	Klagenfurt	9,536 km²	560,753	6
3	Lower Austria (Niederösterreich)	St. Pölten	19,174 km²	1,588,545	2
4	Upper Austria (Oberösterreich)	Linz	11,980 km²	1,405,986	3
5	Salzburg	Salzburg	7,154 km²	529,085	7
6	Styria (Steiermark)	Graz	16,392 km²	1,203,986	4
7	Tyrol (Tirol)	Innsbruck	12,648 km²	698,472	5
8	Vorarlberg	Bregenz	2,601 km²	364,611	8
9	Vienna (Wien)	Vienna (Wien)	414.90 km²	1,660,534	1

14.3 EVENT PLANNING

Planning for the event was carried out over several years drawing together a broad team of experts from all relevant agencies including:

a) Federal authorities;
b) Regional and local authorities;
c) Police force;
d) Companies providing public transport at a national, regional and local level;
e) Aviation authorities and airport operators.

Taking Geneva as an example, the cantonal institutions were involved in organising transport for Euro 2008. The Department for Construction and Information Technology (*Département des Constructions et des Technologies de l'Information* - DCTI) finances and monitors building work for major cantonal infrastructure projects. It works in collaboration with the Directorate-General for Mobility (*Direction Générale de la Mobilité* - DGM) which oversees studies relating to infrastructure or mobility management on cantonal territory.

The process involved test events to validate the plans.

15. HOST COMMUNITY RESEARCH – MOBILITY

15.1 MOBILITY PLANNING

The host cities each took control of the way they organised transport in keeping with the national concept. We concentrate here on the city of Geneva as an example.

To accomplish their mission successfully, the Canton of Geneva appointed CITEC transport engineers, who were involved with the transport work group, led by a State delegate and attached to the general organisation of EURO in Geneva.

The work group had the advantage of bringing together events mobility specialists who were used to working together on events. The general organisational diagram of the coordination system put in place for Euro is shown below.

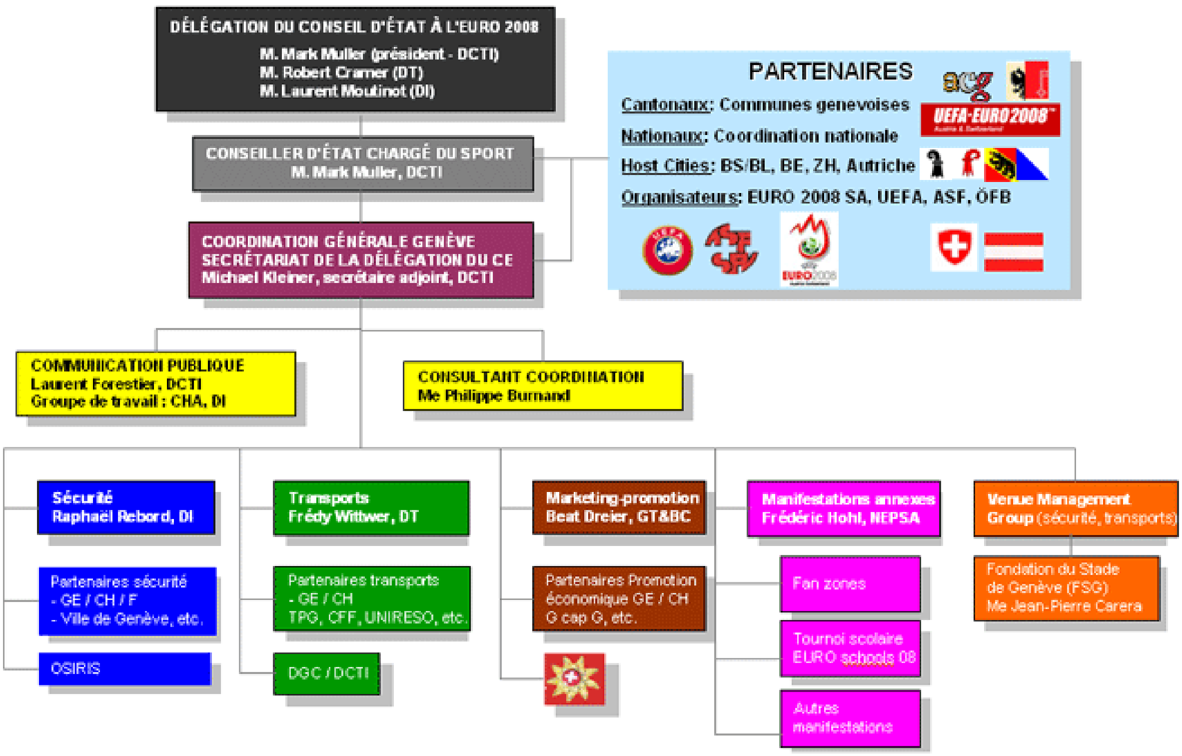

FIGURE 6 MOBILITY PLANNING

The transport concept developed for the event takes all modes of transport into account. It is about providing transport for people from the entrances to the city to the various sites, and between the sites themselves. The celebration sites themselves are also the object of local traffic concepts.

For Geneva traffic diversions were put in place, varying according to days and times. Ten or so people working in the area of transport, at the regional and cantonal levels, took part in coordination meetings to develop the strategic plan, which was tested and improved following several important events at the Geneva Stadium.

15.2 PRE-EVENT SERVICES

All the host cities had good transport services prior to the event. For example, Geneva has Genève Cointrin airport, Cornavin station and major motorways as the main gateways to get spectators, players and football team staff into the city.

The A1 motorway connects Geneva to the main cities of the rest of Switzerland and the A40 provides connections with France and Italy. The bypass which encircles the city connects the A1 and A40 motorways.

The rail network provides connections with the rest of Switzerland, and the international TGV high-speed train network via France.

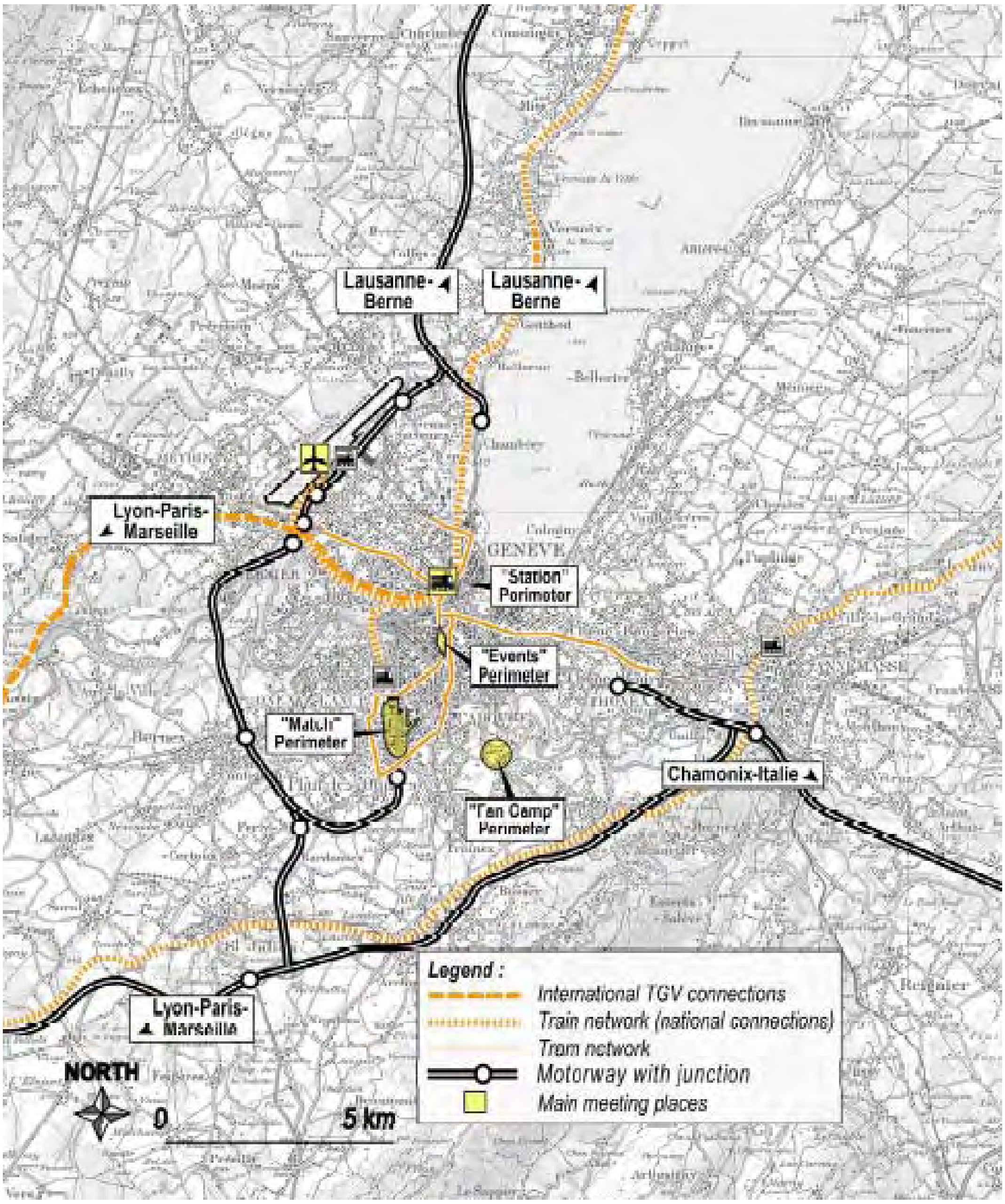

Figure 7 Transport infrastructure serving Geneva

15.3 EVENT SERVICES

The public transport service was based on the existing network, which itself had additional services for the event at the connections between sites and towards the station and the airport.

The rail network connects the airport to the station, with five trains per hour. A regional CFF line connects the stadium (from the Lancy-Pont-Rouge stop at the North entry to the stadium) and Cornavin station, with two trains per hour.

Five tram lines serve the stadium (of which 3 go from the station) on two routes, one going via the north of the stadium, the other via the south. During the day they offered a normal capacity of 8,000 places/h between the *Fan Zone* at Plainpalais and the stadium.

The bus network completes the system with routes serving the stadium and the *Fan Village*, and a special direct Station – *Fan Zone – Fan Village* shuttle bus. There were also night buses every day.

The following table shows transport provision for access to the sites and the additional services provided for return journeys from the stadium.

Journey	Means of transport	Trips/hour	Duration	Places/hour
Access to sites (normal operation according to timetable):				
Airport > Station	Train	5	6 min	5,500
Station > Fan Zone	Tramway	16	7 min	5,000
Fan Zone > Stadium	Tramway	27	8 – 13 min	8,000
Station > Stadium	Tramway	16	15 – 20 min	5,000
Station > Stadium	Train	2	5 min	1,200
Returning from stadium (enhanced service):				
Stadium > Fan Zone	Tramway	Max 60	8 – 13 min	~20,000
Stadium > Station	Tramway	Max 35	15 – 20 min	~15,000
Stadium > Station	Train	Max 5-6	5 min	~3,500

Overall public transport services were increased by 10% on average during Euro2008.

Existing Park and Ride (P+Rs) and temporary car parks were used to encourage spectators to park their vehicle and use public transport. In total, just over 2,500 free temporary spaces for cars were added to the existing P+R spaces. The P+Rs were already served by the urban public transport network. The temporary car parks were connected to the city's various celebration sites by shuttle buses created for the occasion.

Two parking areas for coaches were planned at the North and South entrances to the stadium, with capacity for 100 coaches each.

Finally, cycle parks were set up at the station and at every celebration site. Cycling is recognised as being an element of the spectator travel chain. It is mainly aimed at locals but also visitors who had the option to borrow a bicycle for free in the areas surrounding the nerve centres of the event: Cornavin station, the Fan Zone and the Fan Village. The cycling concept included:

a) 100 temporary signposts to mark out the routes between the celebration sites;
b) 2,000 temporary parking spaces;
c) 150 new bicycles for hire (Fanmove programme) in addition to the 225 bicycles offered by the basic self-service “Genève Roule” scheme.

Bicycles could be hired by ½ day, by day, by week or for the entire duration of the event.

Walking only applies where distances are relatively short, and that was a major asset for Geneva as celebration sites were short distances from each other. The *Fan Zone* was only 1.2 km from Cornavin CFF station. From there, the stadium and *Fan Village* were both 2 km away. These are short distances on the scale of the event. To make the journey more pleasant and encourage people to walk, a pedestrian route showcasing the city was proposed. It was signposted with 180 temporary signs. This route also made it possible to control mass flows and spontaneous gatherings of supporters, since it was defined to avoid sensitive places and remains at a distance from the main traffic axes and public transport intersections.

The following figure shows the locations of the sites and the distances between sites with the pedestrian route in place.

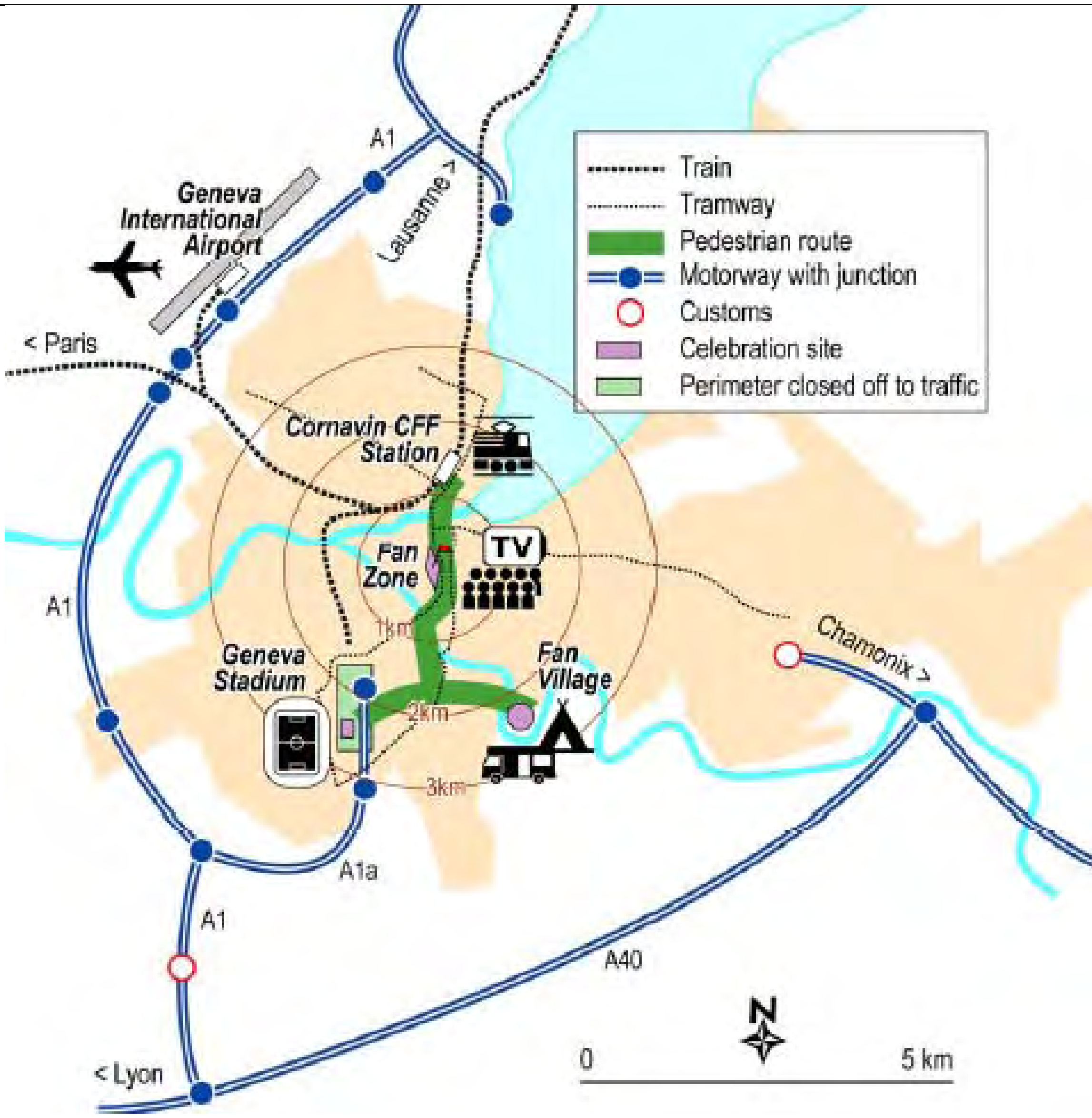

FIGURE 8 EVENT TRANSPORT SERVICES

In total, 6km of pedestrian routes were put in place in the city, of which 4.5km was along the main Station-Fan Zone-Stadium axis. Special signage was developed, including:

a) 150 signposts,
b) 250 entertaining and informative signs on the ground.

15.3.1 Transport Sectors

The SOTA report has adopted the International Olympic Committee (IOC) five level categorisation of participating delegations, that is, T1–T5.

Levels T1–T3 are presidents, vice-presidents, general secretaries, and officials of the event organisers, presidents, vice-presidents, general secretaries of all the member states, heads of delegations, group leaders of delegates, top state officials, top officials from auspices agencies, officials with the event organising committee, the organising committees of the last and next session of the event, and officials from the bidding cities. Level T4 included participants (athletes) and officials coming with their delegations, technical officials, BOB relay agencies, entitled relay agencies, accredited literal media, and auspices agencies. T5 refers to spectators, event staff, volunteers, and visitors.

The 'tiers' equate to the SOTA Report categories as follows:

T1 – Management Transport

T2 – Management Transport

T3 – Management Transport

T4 – Participant Transport

T5 – Spectator Transport

15.3.2 Spectator Transport

Spectator transport comprised private cars, bus/coach, rail services and cycle hire facilities. Emphasis was placed on encouraging use of public transport where additional services were provided.

15.3.3 Participant Transport

See section 6.1.1

15.3.4 Management Transport

See section 6.1.2

15.3.5 Background Transport

Plans for the event focussed on reducing impacts on normal day-to-day and keeping background traffic moving.

Most of the stadiums host an audience that has come from a long way away, whereas for a normal match, the audience is mainly local. Traffic management may be made easier by this as supporters coming from a long way away use the plane then a coach or public transport, unlike local supporters who can easily come by car.

Supporters may also be there for several days, travelling in the city where they have come to see the match during the day, and travelling between cities in the evening after the match or on the following days.

On the other hand, apart from supporters with tickets, an event like the Euro 2008 attracts a growing number of visitors without tickets. Hosts must organise this spontaneous demand from the audience (be they local or visiting) who want to "be in the event" without being in the stadium. Thus, there is travel throughout the entire city and not only between the entrances to the city and the main celebration sites (Stadium and Fan Zone).

15.3.6 Mechanisms

15.3.6.1 Road Transport

In the case of Geneva, public transport service was based on the existing network, which itself had additional services for the event at the connections between sites and towards the station and the airport.

The bus network provided routes serving the stadium and the *Fan Village*, and a special direct Station – *Fan Zone – Fan Village* shuttle bus. There are also night buses every day.

Road traffic management required:

a) 50 signs on the motorway and 150 on the cantonal road network to ensure the accessibility of the different parking facilities (cars, coaches, *target groups*),
b) 10 variable message signs near the stadium and the *Fan Zone*,
c) 300 temporary barriers and 100 moveable signs for diversions and street closures,
d) over 200 people mobilised for each match (Police, Civil Protection, volunteers, etc.).

15.3.6.2 Rail Transport

In the case of Geneva, the rail network connects the airport to the station, with five trains per hour. A regional CFF line connects the stadium (from the Lancy-Pont-Rouge stop at the North entry to the stadium) and Cornavin station, with two trains per hour.

Five tram lines serve the stadium (of which 3 go from the station) on two routes, one going via the north of the stadium, the other via the south. During the day they offer a normal capacity of 8,000 places/h between the *Fan Zone* at Plainpalais and the stadium.

15.3.6.3 Water Transport

No information available on the use of this mode.

15.3.6.4 Air Transport

Air transport provided a major means of reaching host cities who were well connected with public transport services to the city centre.

16. HOST COMMUNITY RESEARCH - TICKETING

16.1 TICKET TYPES PROVIDED

16.1.1 Transport Tickets

Several special travel options were offered during Euro to encourage spectators to use public transport.

The CFFs put special Euro 2008 travel options in place for the season tickets that they normally offer. This way, a general season ticket and a special Euro half-price season ticket were created for the occasion. With reduced fares compared to classic season tickets, the general season ticket offered the option to travel freely on the whole railway network and many buses, trams, boats and railways across the whole of Switzerland, throughout June 2008. It also offered a half-price fare in Austria.

A special Euro 2008 half-price season ticket was also offered for June 2008, enabling half-price travel in Switzerland and Austria on all railway and urban public transport networks, and certain private networks.

Finally, the Euro 2008 special Cityticket offered football lovers travelling to the host cities the chance to benefit from a travel ticket valid until midday the next day, including urban public transport in the host city.

16.1.2 Events Tickets

For details of event Tickets see section 6.1.1

16.1.3 Parking Permits

Parking in the immediate vicinity of the stadiums was restricted for security reasons. Permits were issued to VIPs, Media etc to access the controlled zones. For example in Geneva several categories (e.g. VIP, sponsors, officials, teams, logistics, media, staff, disabled people, etc) were entitled to use reserved parking facilities next to the stadium, which have a total of 1,750 spaces for cars, coaches and lorries. The spaces are allocated in advance, with each car park being numbered and displaying this number.

16.1.4 Combined Tickets

The flagship ticketing measure was the “Kombiticket” covering both Austria and Switzerland. It was a match ticket offering free travel on the day of the match and the day after until midday on all transport networks. With this *Kombiticket*, co-funded by the Confederation and the organiser Euro 2008 SA, along with additional services (mainline and regional CFF trains + urban transport, particularly at night), ambitious modal share targets were set for the matches’ “general public” spectators:

a) A 60% minimum modal share for public transport for long-distance travel on match days. The target was exceeded with a public transport modal share of 67%.

b) An 80% minimum modal share for public transport + non-motorised transport for the last leg of the journey to the stadium (including car park shuttles). The target was met.

A special Euro 2008 half-price season ticket was also offered for June 2008, enabling half-price travel in Switzerland and Austria on all railway and urban public transport networks, and certain private networks.

16.2 TECHNOLOGIES USED

16.2.1 Paper Tickets

The ticket sales system for stadium matches reserves a majority of places for supporters from countries that are taking part in the event. They make up around two-thirds of audiences in the stadiums.

16.2.2 E-tickets

No information available.

16.2.3 Smartcard

No information available.

16.2.4 Personal Digital Devices

No information available.

17. HOST COMMUNITY RESEARCH – COMMAND & CONTROL

17.1 TRAFFIC MANAGEMENT

Geneva has a well developed traffic control system. Accessibility by road, which stems from the general transport concept, is managed jointly as several sub-concepts:

a) "general public" parking,
b) coach parking,
c) dealing with "special category" vehicles,
d) signage.

These sub-concepts were developed in collaboration with the Geneva Police, who manage event traffic flows.

17.2 TRANSPORT MANAGEMENT

17.2.1 Bus Operations

Bus operations remained in the normal control of operators.

17.2.2 Rail Operations

Rail operations remained in the normal control of operators

17.3 CONTROL AND COMMAND CENTRES

Control centres existed in each host city. See 17.4 below for a description of how ITS applications were developed to enhance these existing facilities in Geneva.

17.4 INTELLIGENT TRANSPORT SYSTEMS

Taking Geneva as an example the host city has a well developed ITS system for traffic control.

All car parks were signposted from the Geneva motorway bypass with special EURO 2008 signage. Some 500 signposts were put up across the whole road network (motorways, cantonal network and municipal network). This signage was supported by dynamic information displays on variable message signs. The Police, who controlled the signs directly, could set up relief routes ready to absorb the traffic in the event of disruptions.

In order to manage the traffic in the area of the stadium, the Geneva police were able to rely on a GIS, AGIRE application, which was created by the company ARX IT in Geneva (www.arxit.com) and developed with the expertise of CITEC, in collaboration with the Geneva Canton (Transport and Geomatics Department). AGIRE had been specifically developed for the traffic management around the exhibition centre Geneva Palexpo that hosts the Motor show and many other large exhibitions. The EURO 2008 gave the opportunity to extend the geographic coverage of the software to the whole Geneva Region and thus include the stadium area.

To ensure good traffic management during these events, the Police put in place a complex monitoring system, which included a centralised control unit and several teams in action on the ground. The centralised unit received information from the teams on the ground and especially from sensors installed around the site which supply data in real time (cameras, vehicle counters, occupation rates of parking areas, etc). The AGIRE application, with the aid of all the information received in real time, provides a global view of the state of the traffic and the occupation rate of the different parking areas. It also offers its users a module to aid in decision-making. This involves pre-configuring the application with scenarios which develop in function of the situation observed. For example, when a given car park becomes full, an alert informs the system manager and suggests the implementation of a scenario to redirect traffic to another car park. This traffic redirection is operated by adapting the road signs on the various main roads through an update of the VMS (Variable Message Signs) messages concerned.

AGIRE offers numerous advantages for the management of major events. First of all, its great simplicity of use puts it within reach of everyone. The contribution of a GIS is therefore decisive in AGIRE's approach to development. In fact, the possibility of visualising all the data in a cartographic interface where every object (road sections, car parks, VMS, buildings) is geo-referenced renders their manipulation very intuitive.

The system is relatively complex, as it combines a large number of very different technologies, such as road traffic counters, traffic cameras, VMS, the transmission of secured SMS messages, the web and its spatial data bases. The strength of the system thus lies in its capacity to concentrate all the data received in a single data base (Oracle / ArcSDE), before distributing them to the different people concerned. Thanks to the independence between the hardware and the software, the application is very flexible, and integrates with numerous other information systems. In addition, as the application is used in the context of events controlled by the police, the level of security in data exchanges is very high.

18. HOST COMMUNITY RESEARCH – INFORMATION

18.1 INFORMATION PROVIDED

18.1.1 Travel Information

To ensure the success of the action plan for Geneva set up to serve the stadium and the other sites (Fan Zone, Station, Airport), communication is an essential element.

The measures of the action plan were broadly communicated via the usual channels aimed at visitors (Internet, brochures) but also to the local population and businesses (press, information sessions). The high level of media coverage of the event had a very positive effect on traffic, as match days were quieter than usual on the roads. This anticipation effect among the population made it possible to manage the match of Wednesday 11 June at 6 pm perfectly, although commuter traffic had given cause for concern.

Geneva also set up a new control centre, where management staff from the different professions involved (Police, TPG, CFF, ViaSuisse) were able to coordinate interventions amongst themselves, in real time and in keeping with the multimodal concept.

18.1.2 Event Information

See Section 7.1.2

18.2 INFORMATION DELIVERY

18.2.1 Self Service

18.2.1.1 <u>Hard Copy</u>

For Geneva the CITEC agency produced sheets with information on traffic modifications connected to Euro 2008 on the conurbation level and in sensitive sectors:

a) The Fan Zone,
b) The approach to the Geneva Stadium,
c) The Plan-les-Ouates Industrial Zone, which served as a peripheral car park for spectators,

Themed information sheets were also produced on the following topics:

i) Car and coach parking in Geneva during Euro,
ii) Travelling on foot between celebration sites,
iii) Final access to the stadium.

Each information sheet explained the main traffic difficulties to be anticipated, the special routes put in place, related public transport services etc. by topic.

18.2.1.2 Website

All these info sheets were made available to the public on the State of Geneva's website.

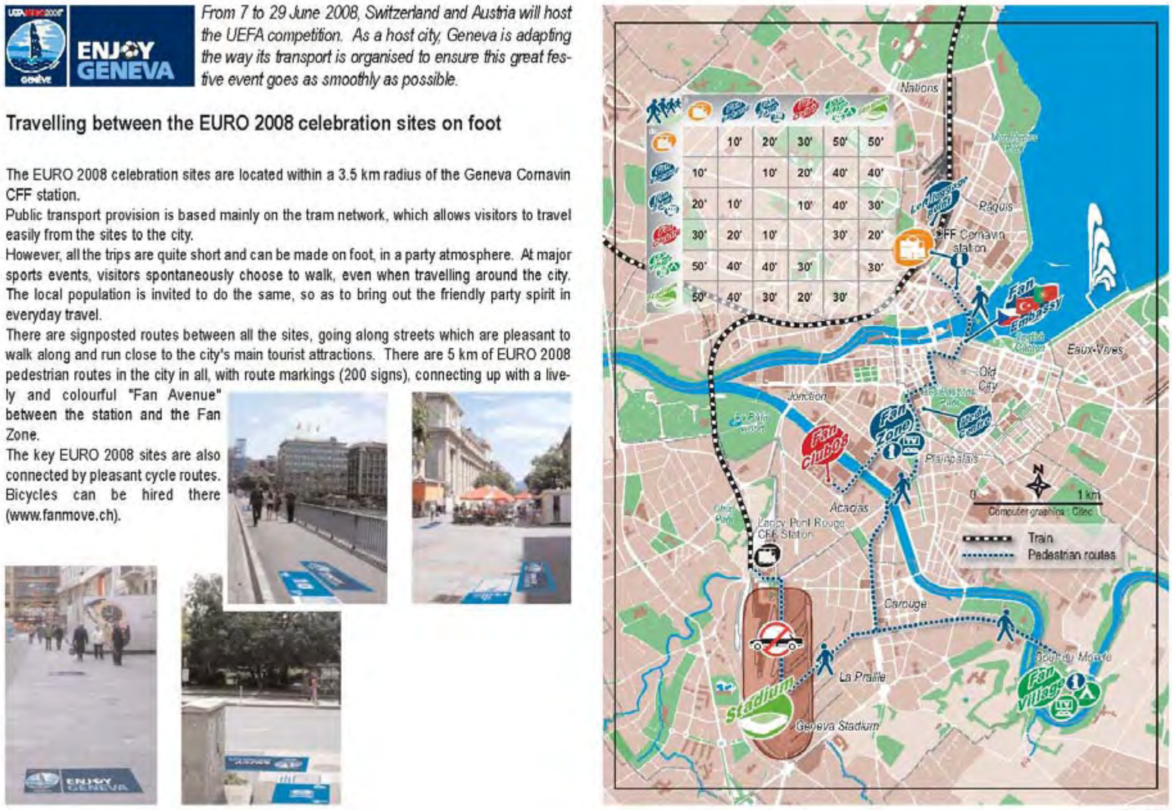

FIGURE 9 WEBSITE

18.2.2 Customer Service

18.2.2.1 Face To Face

Putting traffic restriction measures in place in some sectors meant that information sessions needed to be organised. It was a question of announcing the measures that would be put in place and explaining what the impacts on the district's accessibility would be to the affected residents.

Such sessions are vital for securing acceptance of the measures put in place and ensuring compliance with them.

The following information sessions were thus organised:

a) Fan Zone residents' information session,
b) Information session for businesses in the Plan-les-Ouates Industrial Zone,
c) Information session for businesses in the La Praille district (the district around the stadium).

18.2.2.2 Call Centre

There is no documentation of any Customer Call Centres either specifically established for EURO 2008 or extended to support Euro 2008.

18.2.3 Public Signage

18.2.3.1 <u>Fixed Signage</u>

A road, pedestrian and cycling signing concept was defined by the confederation to put in place a uniform signing system for the whole of Switzerland. In this way, supporters travelling from one city to another to follow their team can keep the same reference points. The same signage concept has been implemented in Austria.

The following illustrations demonstrate the utilisation of language independent signage for pedestrians and drivers.

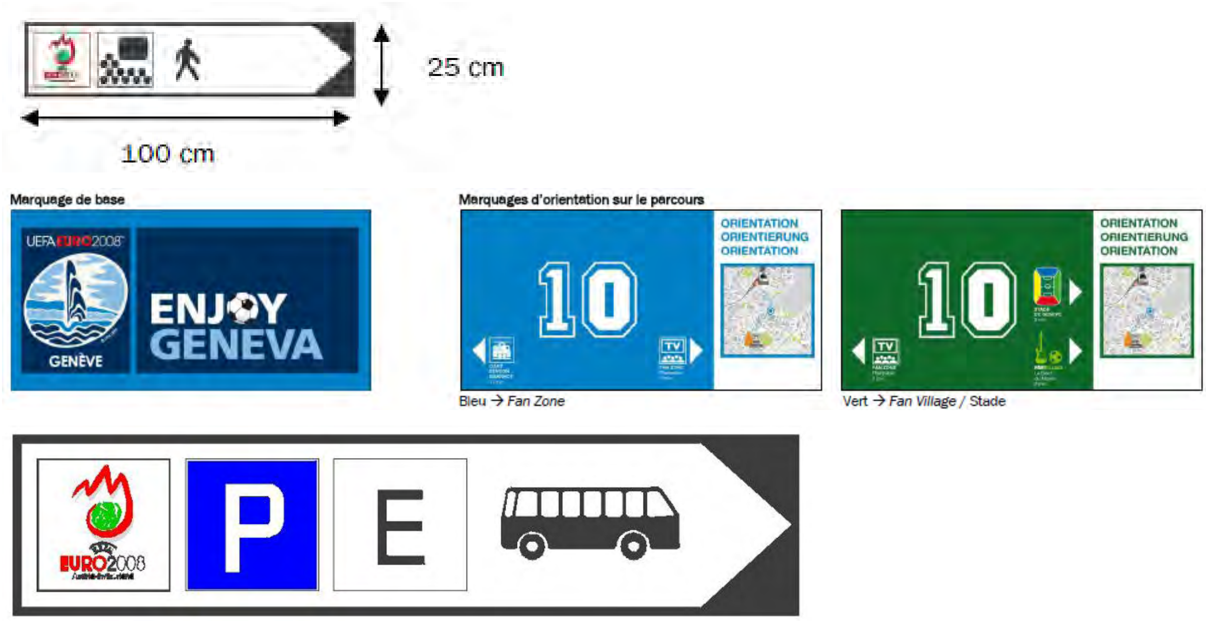

FIGURE 10 FIXED SIGNAGE

The example above gives parking zone specific information for coaches.

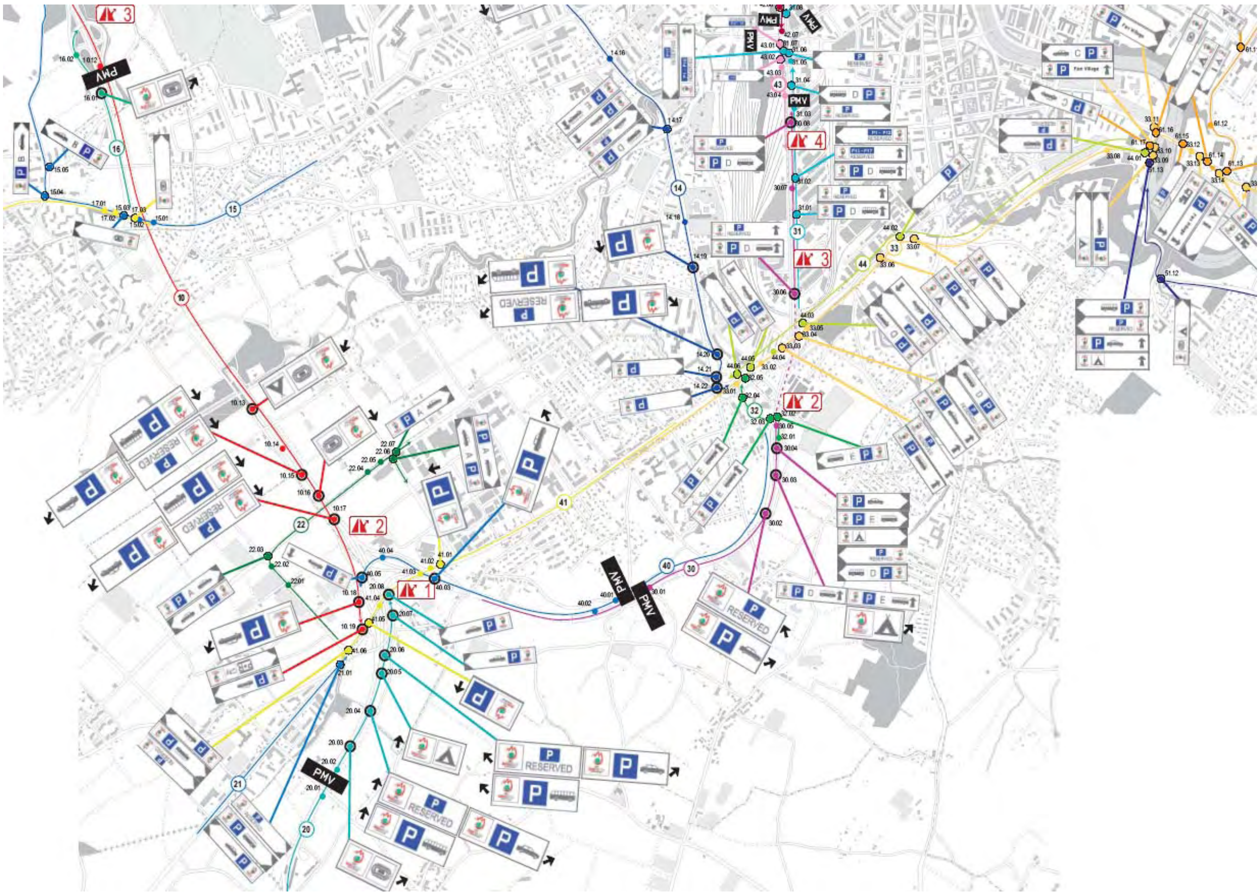

FIGURE 11 THE SIGNAGE PLAN FOR GENEVA

18.2.3.2 Variable Message Signs

The traffic redirection was operated by adapting the road signs on the various main roads through an update of the VMS (Variable Message Signs) messages concerned.

18.2.4 Personal Digital Devices

No information available.

18.3 INFORMATION COLLECTION

Crowd movement and traffic information was collected and utilised by the authorities for security and mobility management. This relied upon existing ITS systems (induction loops, CCTV cameras, etc) as described in section 17.4.

19. HOST COMMUNITY RESEARCH - SECURITY

19.1 SECURITY PROVIDED

19.1.1 Venue Security

See section 8.2.1

19.1.2 Municipal Security

In Switzerland, there is practically no national police. For major event security, they rely on an intercantonal arrangement (IKAPOL) administered by the Conference of Directors (Ministers) of Cantonal Justice and Police Departments (CCDJP). Cantonal police staff numbers were inadequate for the event, so the French and German State police services were called upon. Moreover, there was generalised use of “spotters” (police officers accompanying supporters from their own country) to identify potential troublemakers.

19.1.3 Transport Security

No information available.

19.1.4 Border Security

No information available.

19.1.5 International Security

No information available.

19.1.6 Other Security

No information available.

19.2 TECHNOLOGY USED

19.2.1 Surveillance

No information available.

19.2.2 Communication

No information available.

20. HOST COMMUNITY RESEARCH – HEALTH & SAFETY

20.1 HEALTH AND SAFETY MEASURES PROVIDED

20.1.1 Venue Health & Safety

See Section 8.1.1

20.1.2 Municipal Health & Safety

No information available.

20.1.3 Transport Health & Safety

No information available.

20.1.4 National v International Health & Safety

No information available.

21. HOST COMMUNITY RESEARCH – ENVIRONMENT

21.1 ENVIRONMENTAL STRATEGY

A sustainable development concept shared by Switzerland, Austria and the UEFA was developed for Euro 2008, as an initiative of the host countries. This concept took the three dimensions of sustainable development into account:

a) Eco-friendliness,
b) Economic performance,
c) Social solidarity.

Due to its transversal nature, the sustainable development concept could be implemented in all the issues that arose when organising Euro 2008. For the ecological component, measures were developed in the following areas:

i) Transport, with the promotion of public transport by introducing the Kombiticket,
ii) Cutting waste, using reusable cups instead of disposable cups, or selling PET bottles without caps,
iii) Energy, with all stadiums and supporter perimeters supplied with “naturemade star” label certified eco-friendly electricity, and a significant reduction in the use of diesel generators by Euro 2008 SA.

21.2 ENVIRONMENTAL PLANNING

No information available.

22. HOST COMMUNITY RESEARCH - FINANCE

22.1 THE RESOURCES OF THE ORGANISING COMMITTEE (BUDGET)

No information available.

22.2 THE SPEND (INVESTMENTS)

No information available.

23. HOST COMMUNITY RESEARCH – EVENT SPECIFIC DEVELOPMENT

23.1 PROJECT(S) OVERVIEW

No information available.

23.2 SYSTEM ARCHITECTURE

No information available.

23.3 TECHNOLOGIES USED

No information available.

24. HOST COMMUNITY RESEARCH – OPERATIONS

Transport operations relied upon existing traffic and transport operator control centres to ensure smooth management.

Some new/enhanced control centres were implemented and substantial efforts were made to enhance coordination between existing centres and various service providers. In particular, communication channels were maintained between the two host countries and between each host city.

24.1 TRANSPORT OPERATIONS

24.1.1 Public Transport Operation During The Games

Public transport operation throughout the games went smoothly, without disruption to normal services.

The outcome was very satisfactory, with a high level of public transport use and car travel kept under control.

The event brought together a total of 2.8 million people at the closed celebration sites (0.5 million in the stadiums and 2.3 million in the Fan Zones, i.e. 25,000 people per evening and per city on average). In addition to this there were around 2 million people at open sites (public spaces with no access controls such as the Fan Village).

The success of the Kombiticket made it possible to meet and even exceed the modal share targets that had been set. Thus, the public transport modal share of long distance travel on match days was 67% against the target of 60%. The public transport and non-motorised transport modal share was 80% for the last stage of the journey to access the stadium (including car park shuttles), in keeping with forecasts.

24.1.2 Transport Operation To Venues

The general increase in overall provision made it possible to respond to all users' requests under the best possible conditions. The maximum amount of seats/ km was offered at the end of the match and at the Fan Zone exits. Offering maximum provision in this way requires a high level of staffing from the company that operates the urban public transport network, but ensures an excellent service under all circumstances. Night-time provision for the return journey on trains coming from other Swiss cities was very well received by users. Pedestrian/public transport vehicle conflicts were managed perfectly by Police action at difficult points (in the city centre, at the main transport network interfaces).

Provision from the Swiss railway network (CFF) always met demand. The capacity used rarely exceeded 100% except for the railway shuttles between the stadium and Cornavin station at the end of the matches, which was perfectly predictable. Geneva's excellent railway service to Geneva meant that all passengers were transported under the best possible conditions.

Extending timetables into the night after matches meant that many spectators could go home to sleep after 2 or 3 hours on the train from all the Swiss host cities.

24.1.3 Opening and Closing Ceremonies

Transport operations for these ceremonies were no different from other match days.

24.2 SECURITY OPERATIONS

The Geneva police's decision to deal with this event in a friendly but firm manner turned out to be effective. There was no upsurge in crime, in any area, in June 2008. This is especially due to a significant amount of preventative work upstream and a large police presence in the field.

The figures for EURO 2008 covering the period of 7 to 29 June speak for themselves:

a) 54 people were taken in for questioning in connection with EURO 2008,
b) 87 people were put into a drying-out cell,
c) 43 people received treatment at the Les Vernets military first aid command post,
d) 5 people were put in the detention room at Geneva Stadium.

The entire Geneva police force was mobilised in June, not just to provide security in connection with EURO 2008, but also with a view to continuing to offer the usual services to the population of Geneva. To this end, all leave and holidays was suspended in June. Cooperation with the various foreign police forces, particularly *spotters* and forces for the maintenance of order, went admirably well.

Commander Christian Cudré-Mauroux described the general security outcome as "very good": "The structures that were in place at the supracantonal, national and international levels bore fruit. The way that Geneva organised disaster security once more proved itself in partnership terms."

24.3 CUSTOMER SERVICE OPERATIONS

No information available.

25. HOST COMMUNITY RESEARCH – MONITORING

25.1 TRAFFIC MONITORING

Traffic monitoring was carried out on a continual basis by the various control centres based on their normal practice using cameras, induction loops, vehicle counters, occupation rates of parking areas, etc.

25.2 TRANSPORT MONITORING

25.2.1 Techniques

Similar techniques ton those used from Traffic Monitoring were applied to Transport monitoring including cameras and vehicle counters

25.2.2 Statistical Output

Measurement of transport mode share is available from the mobility survey carried out in Geneva. It shows the main means of getting to Geneva was by plane, for nearly 40% of respondents.

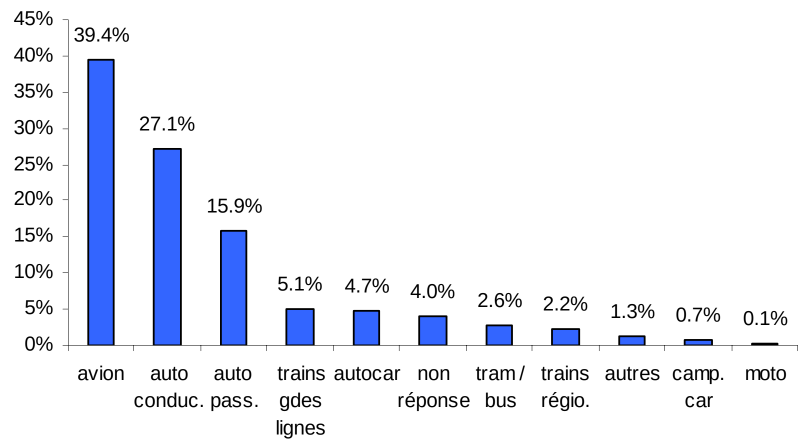

FIGURE 12 TRANSPORT MODES

Public transport formed the main means of transport used for travelling around Geneva, followed by walking.

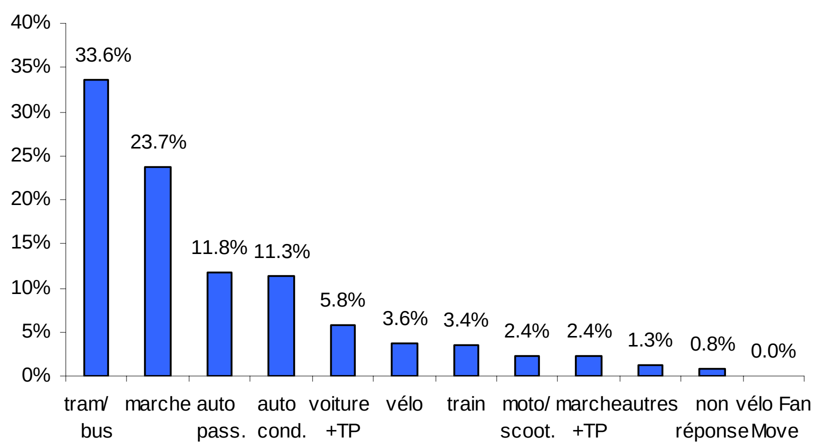

FIGURE 13 PUBLIC TRANSPORT USAGE

Different means of transport were used depending on the destination, as the graph below shows.

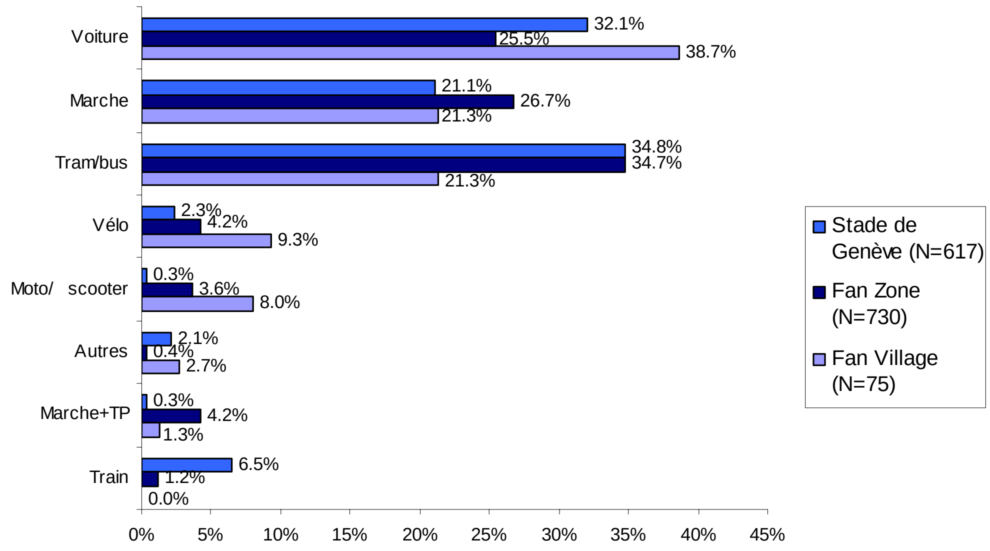

FIGURE 14 DESTINATION IMPACTS

The differences can mainly be explained by the access options for each site. Out of the three sites, the Fan Zone was the least accessible by car, because of its central position and the difficulty in parking at the approach to the site. At the stadium it was not possible to park within a wide perimeter around the stadium, but peripheral car parks served by shuttles meant people could get to the stadium by public transport. Finally, the Fan Zone had large car parks nearby.

25.3 SECURITY MONITORING

No information available.

25.4 ENVIRONMENT MONITORING

No information available.

25.5 INTEGRATED MONITORING

No information available.

26. HOST COMMUNITY RESEARCH – EVALUATION

A visitor mobility survey conducted by the University Mobility Observatory of the University of Geneva and other post event evaluations show a very satisfactory outcome, with a high level of public transport use and car travel kept under control.

Throughout Euro, total attendance at the celebration sites in Geneva was very high:

a) 626,000 people went to the Fan Zone,
b) 24,000 went to the Fan Village,
c) Nearly 5,500 people stayed at the Fan Camp,
d) Around 38,000 people were counted in the Fan Club 08.

Attendance at the celebration sites was very uneven over the period. The three match days in Geneva (which were also the days when the Swiss team was playing in Berne) were record days in terms of attendance, peaking at 75,000 people in the Fan Zone on Wednesday 11 June, at the Swiss vs Turkey match. Attendance on this day exceeded forecasts of a maximum of 60,000 people in the Fan Zone. During this crazy night of football, for the only time ever the Fan Zone had to be closed a little before 10 pm, as the enclosure had in fact reached full capacity. Additional visitors were redirected to the Fan Village to follow the match.

Attendance at the Fan Village, on the other hand, was lower than hoped for. Sunday 29 June was the busiest day, with 3,000 people for the Euro final. The bad weather during the first ten days of EURO 2008 and the relative remoteness of the site contributed to this result.

The Fan Camp (Fan Village camp site) fully accomplished its mission of offering affordable accommodation to EURO 2008 visitors. The Czech supporters and French Swiss schoolchildren from EUROSCHOOLS 2008 in particular helped bring up the number of overnight stays to nearly 5,000. The Fan Club 08 found its audience, as overall attendance added up to nearly 38,000 clubbers. Crowds even exceeded 3,800 people on Saturday 7 and 14 June.

The figure below illustrates the modal split and utilisation of transport on the day of a match.

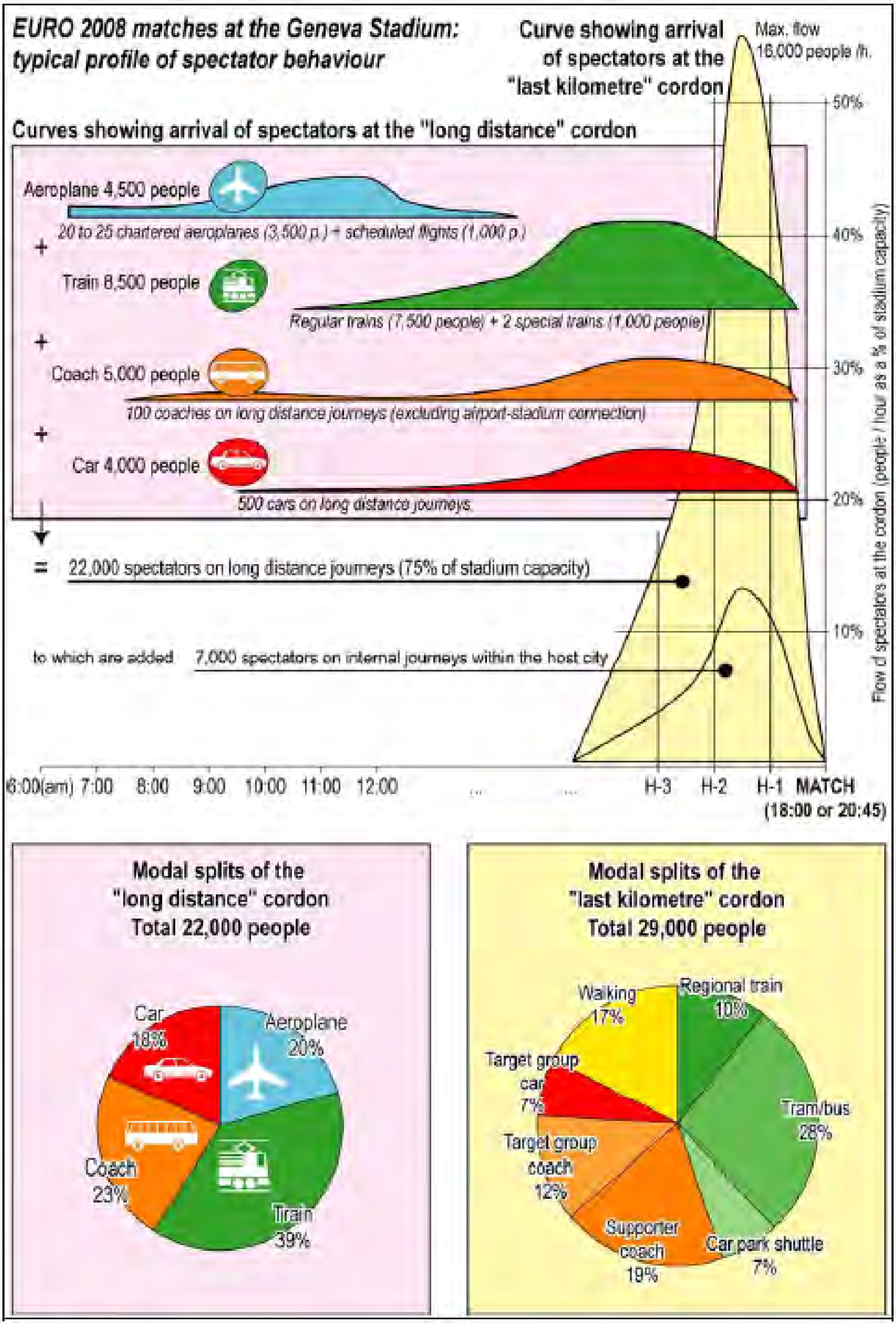

FIGURE 15 SPECTATOR BEHAVIOUR

The success of the Kombiticket made it possible for public transport to have an exceptionally high modal share of spectator travel, exceeding the Confederation's demands. The public transport modal share of long distance travel on match days was 67% against the target of 60%. The public transport and non-motorised transport modal share was 80% for the last stage of the journey to access the stadium (including car park shuttles), in keeping with forecasts. It was therefore the great success story of the transport concept that was put in place for Euro.

Usage values for parking facilities reflect a general tendency of all the host cities to have oversized parking provision. On average only 40% of the free temporary parking spaces provided for spectators at the outskirts of the city were filled. This situation was found in all Swiss cities where the modal share of car travel was very low, compensated for by widespread use of public transport. In the city centre, traditional car parks were always available with free spaces.

Use of parking facilities reserved for special categories (UEFA reserved access categories: sponsors, VIP, corporate hospitality, media) set up next to the stadium was also lower (on average 55%) than forecast.

The high level of media coverage of the event had a very positive effect on traffic, as match days were quieter than usual on the roads. This anticipation effect among the population made it possible to manage the match of Wednesday 11 June at 6 pm perfectly, although impacts on commuter traffic had given cause for concern at the planning stage.

Closing the motorway near the stadium, removing urban public transport stops within the perimeter and motorbike parking facilities meant that the various types of access for logistics, VIP vehicles and coaches, security vehicles and delivery vehicles from the industrial zone could be managed with a great deal of room for manoeuvre.

The traffic strategy also freed up parking space for supporters' coaches very near to the stadium, ensuring very fast, secure evacuation of supporters who had come by coach. The configuration of the transport network also made it possible to clearly separate arriving supporters by team (with separate tram lines and coach parking areas). The traffic strategy meant that practically all contact between pedestrians and accredited vehicles was avoided.

The general increase in overall public transport provision made it possible to respond to all users' requests under the best possible conditions. The maximum amount of seats/ km was offered at the end of the match and at the Fan Zone exits. Night-time provision for the return journey on trains coming from other Swiss cities was very well received by users.

Provision from the Swiss railway network (CFF) always met demand and capacity used rarely exceeded 100% except for the railway shuttles between the stadium and Cornavin station at the end of the matches, which was predictable.

Despite unfavourable weather, the bicycle rental service was highly popular during the entire event.

27. APPENDIX A - TABLE OF FIGURES

28. APPENDIX B – DOCUMENT ADMINISTRATION

28.1 REFERENCES

28.1.1 Document References

Ref.	Document Title	Document Ref.	Version	Location
R1.	Traffic Operation during Beijing Olympic Games	STAD-EXT-REF-1118		http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B8H0W-4VDRVV0-1&_user=9483614&_coverDate=12%2F31%2F2008&_rdoc=1&_fmt=high&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1406031871&_rerunOrigin=google&_acct=C000050221&_version=1&_urlVersion=0&_userid=9483614&md5=7e04cd4bf1d8eb1b57ff2e1217db329c
R2.				

28.1.2 Book References

Ref.	Document Title	Document Ref.	Author	Publisher
B1.	Events Management	STAD-EXT-BOK-1001	Glenn Bowdin	Elsevier Butterworth Heineman

28.1.3 Web References

Ref.	Document Title	Web Ref.	Location
W1.			

28.2 DISTRIBUTION

28.2.1 Distribution for Review

Date	Name	Version	Purpose

28.2.2 Distribution for Information

Date	Name	Version	Purpose

29. APPENDIX C – TFL ADMINISTRATION

29.1 VERSION NUMBERING

The review history of all documents follows the pattern:

a)	Author draft(s)	[0.00.00(nAA)]
b)	Prepared For Work-Package Review	[0.00.10(0)]
c)	Prepared For Work-Package Approval	[0.00.20(0)]
d)	Prepared For Work-Package Acceptance	[0.00.30(0)]
e)	Prepared For Consortium Review	[0.00.40(0)]
f)	Prepared For Consortium Approval	[0.00.50(0)]
g)	Prepared For EU Acceptance	[0.00.60(0)]

29.2 THIS VERSION

Version	Date	Author	CC Ref.	Changes Since Previous Version
0.00.20(0)	22/11/2010	Document Controller	N/A	Baselined for WQA Approval

29.3 FULL VERSION HISTORY

Version	Date	Author	CC Ref.	Changes Since Previous Version
0.00.00(1IJ)	03/11/2010	Ian Johnson	N/A	N/A First Draft
0.00.00(2TH)	05/11/2010	Tony Haynes	N/A	Adjusted placement of text
0.00.00(3IJ)	05/11/2010	Ian Johnson	N/A	Up-versioned & Completed missing text
0.00.00(4IJ)	08/11/2010	Ian Johnson	N/A	Recovered from Word Crash
0.00.10(0)	08/11/2010	Document Controller	N/A	Prepared for WQA
0.00.11(0)	18/11/2010	Document Controller	N/A	Prepared for WQA Responses
0.00.11(1IJ)	19/11/2010	Ian Johnson	N/A	WQA Updates deferred to TH
0.00.11(2TH)	22/11/2010	Tony Haynes	N/A	WQA Updates by TH as proxy for IJ
0.00.12(0)	22/11/2010	Document Controller	N/A	WQA Review Completed

29.4 TEMPLATE

Template Ref.	Template Name	Template Version
STAD-TEM-DOT-0011	Consortium SOTA Annex Template	0.00.00(13TH)

29.5 CHANGES FORECAST

None

29.6 TFL AUTHORISATION

a) This is a controlled document once issued. All revisions are subject to change control.
b) All revisions of this document must be reviewed by at least one work package subject matter authority.
c) All revisions of this document must be approved by the TfL Project Board.
d) All revisions of this document must be reviewed by at least one consortium authority.
e) All revisions of this document must be approved by the Designated Consortium Authority.

Role	Name	Signature	Date
Reviewed By Work package : Subject Matter Authority			
Approved By Work package: TfL Project Board			
Reviewed By Consortium :			
Approved By Consortium: Designated Consortium Authority			

Transport For London

stadium ITS for large events

STADIUM

Event Report Live 8 2005 Annex

Author: **Tony Haynes**
Organisation: **TfL**

Version : 0.00.00(3TH)
Version Date : 17/12/2009

Document Reference : **STAD-DEL-WP2-1211**
Document Category : Word Template

Phase: Analysis & Design

TABLE OF CONTENTS

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0. PREFACE

0.1 AUTHOR (S)

Name
Tony Haynes

0.2 THIS VERSION[1]

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(3TH)	17/12/2009	Tony Haynes	N/A	Aligned Configuration Management with QM Proposal

0.3 AUTHORISATION

a) This is a controlled document once issued. All revisions are subject to change control.
b) All revisions of this document must be reviewed by at least one work package subject matter authority.
c) All revisions of this document must be approved by the TfL Stadium Project Manager.
d) All revisions of this document must be accepted by the GCS Programme Manager before being issued.
e) All revisions of this document must be reviewed by at least one consortium authority.
f) All revisions of this document must be approved by the designated consortium authority.

Role	Name	Signature	Date
Reviewed By Work package : Subject Matter Authority			
Approved By Work package: TfL Stadium Project Manager			
Accepted By Work package: GCS Programme Manager			
Reviewed By Consortium :			
Approved By Consortium:			

[1] Version History at Appendix B

PREFACE

0.4 CHANGES FORECAST

None

0.5 VERSION NUMBERING

The review history of all documents follows the pattern:

a)	Author draft(s)	[0.00.00(nAA)]
b)	Workpackage Review	[0.00.01(0)]
c)	Workpackage Approval	[0.00.10(0)]
d)	Consortium Review	[0.00.20(0)]
e)	Consortium Approval	[0.00.30(0)]
f)	Issue	[n.nn.00(0)

1. INTRODUCTION

1.1 PURPOSE

1.1.1 Document Purpose

To deliver an appraisal of the Live 8 2005 Large Event.

1.1.2 Functional Purpose

To understand how Intelligent Transport Systems were used to support the mobility aspects of the Live 8 2005 Large Event in London, Paris, Rome, Philadelphia, Moscow, Canada and to elicit information that will contribute to the recommendations in the main 'State Of The Art' Large Event Report.

1.2 SCOPE

The Live 8 2005 Large Event

a) The context and background of the event
b) The challenges of the event
c) Planning
d) Mobility Management
e) Ticketing Technologies utilised
f) The Provision Of Customer Information
g) Security

1.3 DOCUMENT EXCLUSIONS

This document does not repeat information captured in other documentary products. Where such information is relevant those documents will be clearly referenced within the annex.

2. CONTEXT

2.1 CONCEPTUALISATION

Live 8 was a string of benefit concerts that took place in the G8 states and in South Africa. Run in support of the aims of the UK's Make Poverty History campaign and the Global Call for Action Against Poverty, the shows planned to pressure world leaders to drop the debt of the world's poorest nations, increase and improve aid, and negotiate fair trade rules in the interest of poorer countries. On 7 July the G8 leaders pledged to double 2004 levels of aid to poor nations from US$25 to US$50 billion by the year 2010. Half of the money was to go to Africa.

Live Aid and Band Aid organiser Bob Geldof announced the event on 31 May. Many former Live Aid acts offered their services to the cause. Prior to the official announcement of the event many news sources referred to the event as Live Aid 2. However Geldof and co-organiser Midge Ure have since explicitly said they don't think of the event as the same as Live Aid. Geldof said "This is not Live Aid 2. These concerts are the start point for The Long Walk To Justice, the one way we can all make our voices heard in unison." Many of the Live 8 backers were also involved in the largely forgotten NetAid concerts.

Organizers of Live 8 presented the "Live 8 List" to the world leaders at the Live 8 call that politicians take action to "Make Poverty History" www.live8list.com. Names from the list also appeared on the giant televisions at each concert during the broadcast.

An official Live 8 DVD set was released on 7 November 2005 internationally, 8 November 2005 in the United States. It was released almost a year to the day after the release of the DVD of Live Aid on 8 November 2004.

(Ref. W1)

2.2 SCALE OF THE EVENT

Ten simultaneous concerts were held at the following locations:

a) UK
Hyde Park, London
The Eden Project
b) France
Palais de Versailles, Paris
c) Germany
Siegessäule, Berlin
d) Italy
Circus Maximus, Rome
e) USA
Museum of Art, Philadelphia
f) Canada
Park Place, Barrie
g) Japan
Makuhari Messe, Tokyo
h) South Africa
Mary Fitzgerald Square, Newtown, Johannesburg
i) The Russian Federation
Red Square, Moscow

(Ref. W3)

More than 1,000 musicians performed at the concerts, which were broadcast on 182 television networks and 2,000 radio networks.

(Ref. W1)

As many of the musicians were in groups the total number 'artists' was just over 350. A full Listing is provided in Chapter 13 Annex C.

(Ref. W19)

Forty minutes worth of material was accessed by 37 broadcasters with 174 Gigabytes of content being accessed from 1245 downloads, and 3.3 Gigabytes from 750 streams. In addition a fibre optic link was provided for use by the Philadelphia event producers and US broadcasters, with a similar link used to send material to Paris for use by French event producers and broadcasters.

(Ref. W17)

3. CHALLENGES

3.1 GENERAL EVENT CHALLENGES

3.1.1 Music Event Challenges

3.1.2 Environment Challenges

The following paragraphs are common to all annexes

3.1.2.1 Growth

Any city that has a significant growth factor will be experiencing increased demand for transportation services. The balance between this, planned transport development and the demands of a large event will always be a serious challenge. There will also be a potential for increased car ownership adding to the problems of traffic congestion.

3.1.2.2 International Traffic

As a by-product of growth, there are increased demands for international traffic resulting in a need for increased facilities for international transport arrivals and transport departures. This also has an impact on border policing. A Large Event with an international flavour will put extra pressure on both of these aspects of international traffic.

3.1.2.3 Freight Expansion

Similarly, the growth of a city is likely to place extra demands on freight throughput. Such growth will lead to more congestion, slower travel speeds and increased emissions. Therefore the need for *integrated* transport becomes even more pressing.

3.1.2.4 Road Safety

With the increased transportation demands identified above, the potential for more accidents is an obvious corollary. There is therefore a need to *prevent* more accidents by whatever means possible. The safety of visitors to the city during a large event is also of paramount importance to the reputation of the city.

3.1.2.5 Pollution

Similarly, with the increased volumes of traffic there is a potential for there to be increased levels of pollution from emissions and noise. A city with high levels of pollution will not be favoured in any bidding process for hosting a large event.

3.2 CITY SPECIFIC CHALLENGES

The author should consider Culture, Geography, Security Threats, Antiquities, Politics and City Policies. It should be noted that the consideration of City Challenges is not limited to these features.

4. PLANNING & DESIGN

Some aspects of planning will not be explored by this report since these aspects do not impinge upon the use of technology. These aspects are:

a) Marketing Planning
b) Sponsorship Planning
c) Site & Venue Planning
d) Finance Planning
e) Programme Planning

4.1 ORGANISATIONAL STRUCTURE

Bob Geldof was responsible for the organisation of this events using his company 'Ten Alps'

Ten Alps Plc is a factual media company – TV, online and print. It was founded by Live Aid and Live 8 projects creator, musician in the Boomtown Rats and entrepreneur Bob Geldof.

Ten Alps Plc creates and manages factual media. Because the audience is now multi-platform, the content is targeted to audiences and customers across all the media outlets including television and radio programmes, websites, online TV, live events and over 750 specialist publications.

(Ref. W11)

4.2 TIME FRAME

Ten simultaneous concerts were held on 2 July and one on 6 July.

(Ref. W1)

4.3 SIMULTANEITY

The concerts were timed to precede the G8 Conference and summit held at the Gleneagles Hotel in Auchterarder, Scotland from 6-8 July 2005; they also coincided with the 20th anniversary of Live Aid.

(Ref. W1)

4.4 STRATEGIC APPROACH

4.4.1 Mobility

There is no recorded planning for Mobility Management at any of the locations.

4.4.2 Operations

There is no recorded operational planning with respect to mobility.

4.4.3 Information

A Mini Website was Planned for London (Transport for London) but this website is no longer accessible.

4.4.4 Environmental

There is no recorded planning for the Environment in connection with the event at any of the locations.

4.4.5 Security

4.4.6 Health & Safety

4.4.7 Staging

4.4.8 Post Event Planning

There is no recorded post event planning at any of the locations.

5. MOBILITY

5.1 SERVICES PROVIDED

Standard (Business As Usual) Transport Services were provided at all locations.

5.2 MECHANISMS

5.2.1 Road Transport

5.2.2 Rail Transport

5.2.3 Water Transport

5.2.4 Air Transport

5.3 MANAGEMENT & CONTROL

Standard (Business As Usual) Transport Controls were provided at all locations.

6. TICKETING

LIVE 8 London ticketing was facilitated by O2, with all the UK's network operators getting behind the event and waiving their normal premium rate text charges. Although the concerts were free, 66,500 pairs of tickets for the Hyde Park concert were allocated from the 13 June 2005 to 15 June 2005, to winners of a mobile phone text message competition that began on Monday, 6 June 2005. Entry involved sending the answer to a multiple choice question via a text message costing £1.50. Winners were drawn at random from those correctly answering the question. Over two million messages were sent during the competition, raising £3m. Thus entrants had a roughly one-in-28 chance of winning a pair of tickets.

Some ticket-winners immediately placed their tickets for sale on the Internet auction site eBay, and were heavily criticised by the organisers of the event, including Bob Geldof. Initially, eBay defended its decision to allow the auctions to go ahead, stating that there were no laws against their sale. It was later announced that eBay, under pressure from the British government, the public, as well as Geldof himself, would withdraw all auctions of the tickets. Similar touting situations arose for the Edinburgh and Canadian shows, and eBay halted sales of those tickets as well. In fact, the 35,000 free tickets for the Canadian show were all distributed in just 20 minutes on 23 June 2005, Ticketmaster reported.

(Ref. W3)

Online auction site eBay removed listings for Live 8 tickets from its pages after some appeared for sale priced at £1,000 a pair. The site's UK managing director, Doug McCallum, said the move came after it had listened to customers' concerns. Live 8 organiser Bob Geldof branded the attempted sale of the tickets as "sick profiteering" and welcomed the move. He said people had realised that "the weakest people on our planet" were being exploited and they were "sickened by that".

The minister for music, James Purnell, said he "wholeheartedly" shared Geldof's annoyance and had asked the site to halt the sales. Live 8 promoter Harvey Goldsmith launched a wider attack on eBay, saying the company had a general problem with ticket sales. "They have got to get their act together and decide what they are - they cannot be black-marketeers of tickets," he said.

(Ref. W20)

Another 55,000 free tickets to see the star-studded LIVE 8 concert in London's Hyde Park this Saturday were issued at the last minute. The additional places were not for the concert itself but for an area with giant screens south of the Serpentine Lake to allow people to catch the excitement of the event. Organisers said pairs of tickets would be handed out free of charge from 3pm on Wednesday at selected venues in London and around the UK. Tickets were restricted to two per person issued on a first-come, first-served basis, at the following locations in London: Carling Hammersmith Apollo; Stargreen Tickets (Argyll Street); The Apollo Victoria; The Dominion Theatre.

TICKETING

For fans outside London, tickets were also handed out under the same conditions starting at 3pm on Wednesday at: Birmingham Alexandra Theatre; Bristol Hippodrome; Cardiff International Arena; Manchester Palace Theatre; Oxford New Theatre; Southampton Guildhall.

(Ref. W3)

It is assumed that these were all Paper Tickets. There is no report available on the ticketing mechanisms apart from what is reported above.

7. THE PROVISION OF INFORMATION

7.1 INFORMATION PROVIDED

7.1.1 Travel Information

7.1.1.1 London

Live8 ticket holders were strongly advised to pre-plan their journeys both to and from the concert, and leave themselves plenty of time to get home.

(Ref. W6)

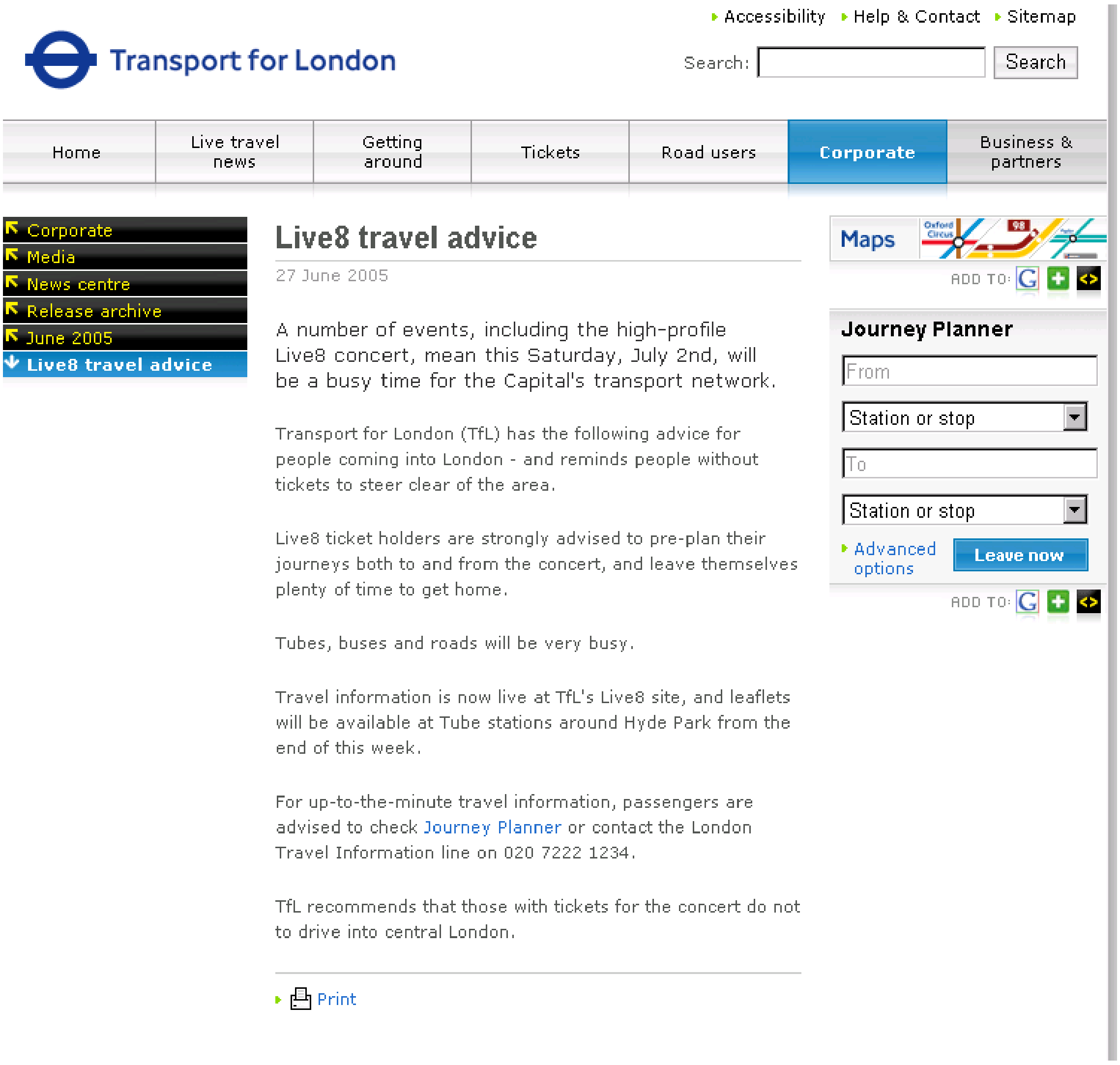


FIGURE 1 LIVE 8 TRAVEL ADVICE , LONDON

7.1.2 Event Information

7.1.2.1 General

Information about the concert venues and about the objectives of running the concerts was provided on the Live 8 Website. See Below.

7.2 INFORMATION DELIVERY

7.2.1 Self Service

7.2.1.1 General

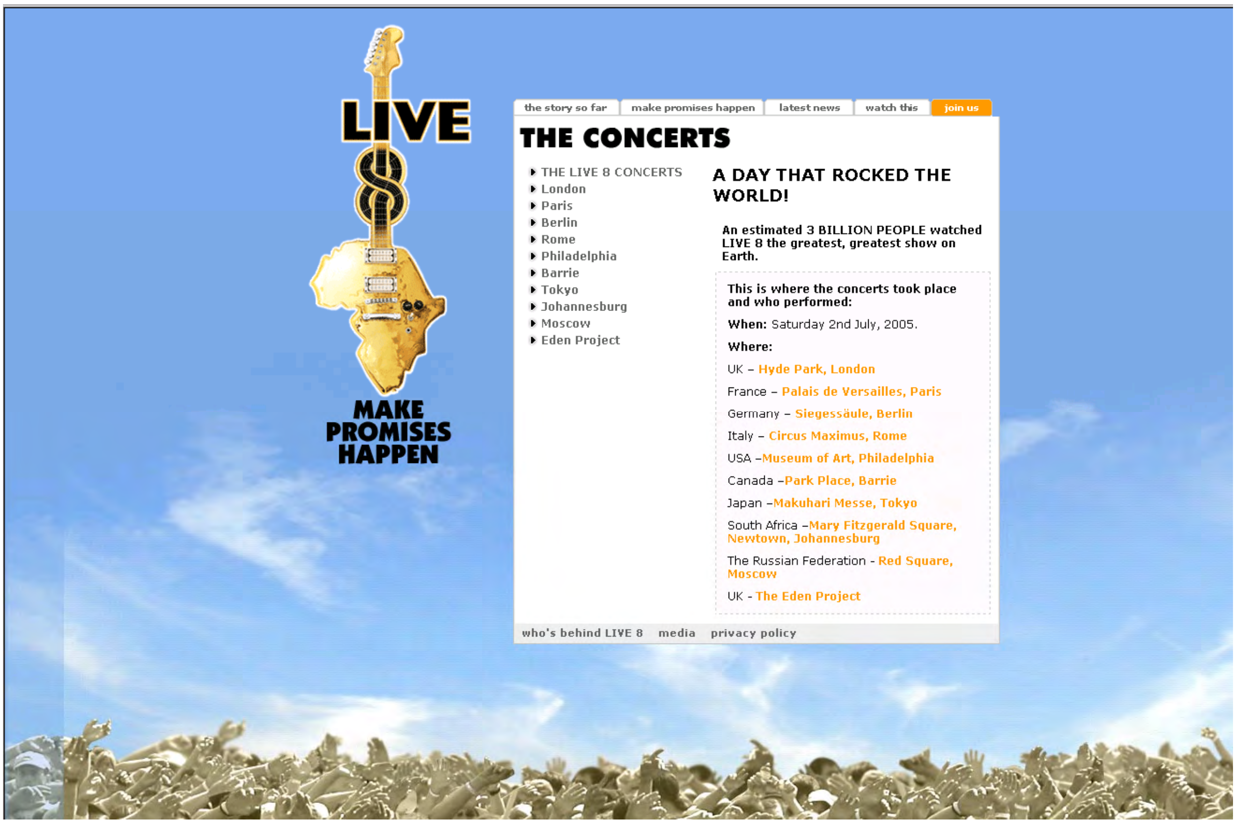
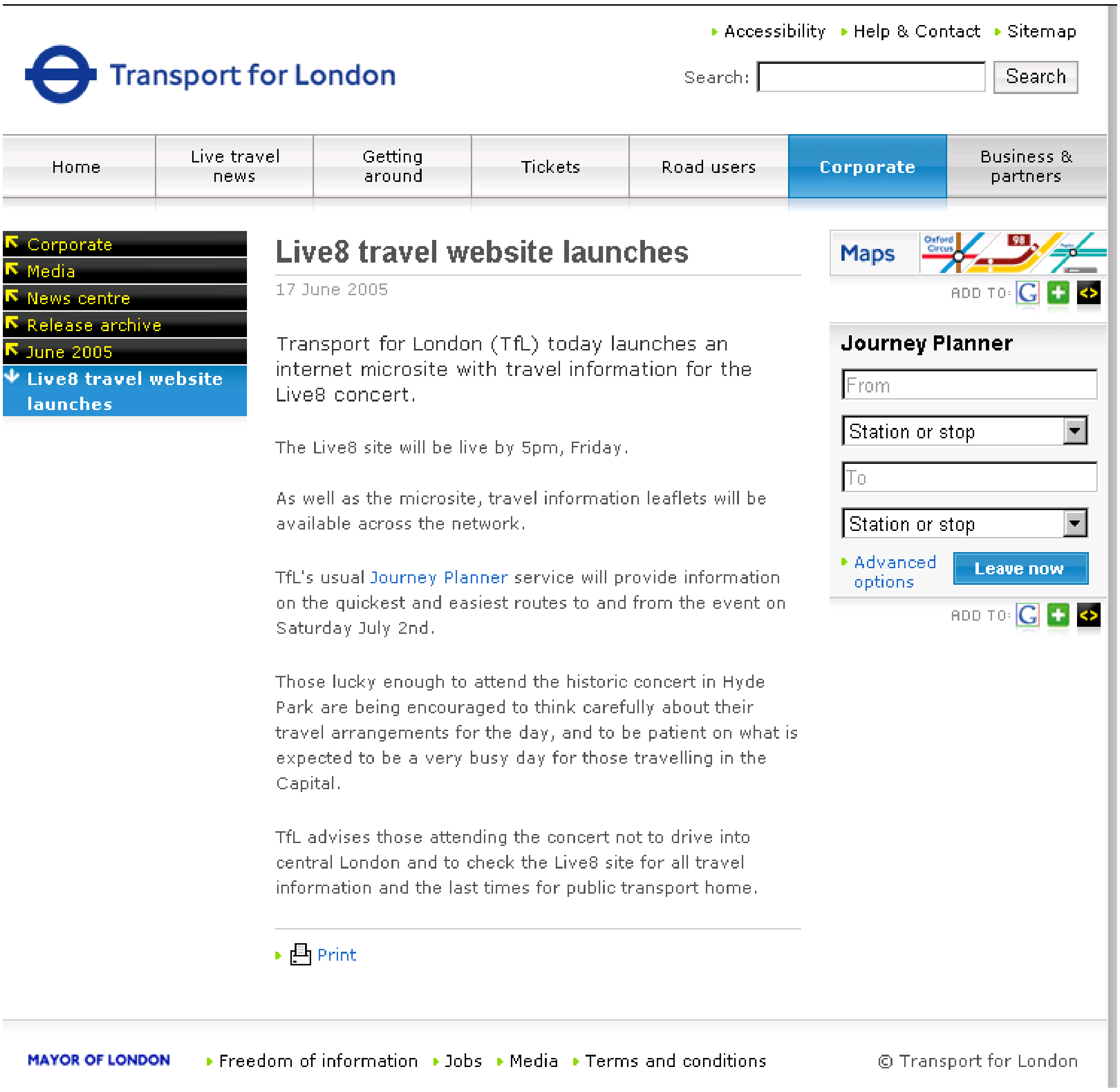


FIGURE 2 LIVE 8 WEBSITE

7.2.1.2 London

Additionally The TfL Mini-site….no longer accessible. However, TfL has archived the notice that it would be available:



Accessibility · Help & Contact · Sitemap

Transport for London

Search: Search

Home | Live travel news | Getting around | Tickets | Road users | Corporate | Business & partners

- Corporate
- Media
- News centre
- Release archive
- June 2005
- Live8 travel website launches

Live8 travel website launches

17 June 2005

Transport for London (TfL) today launches an internet microsite with travel information for the Live8 concert.

The Live8 site will be live by 5pm, Friday.

As well as the microsite, travel information leaflets will be available across the network.

TfL's usual Journey Planner service will provide information on the quickest and easiest routes to and from the event on Saturday July 2nd.

Those lucky enough to attend the historic concert in Hyde Park are being encouraged to think carefully about their travel arrangements for the day, and to be patient on what is expected to be a very busy day for those travelling in the Capital.

TfL advises those attending the concert not to drive into central London and to check the Live8 site for all travel information and the last times for public transport home.

Print

Maps

ADD TO:

Journey Planner

From

Station or stop

To

Station or stop

Advanced options

Leave now

ADD TO:

MAYOR OF LONDON · Freedom of information · Jobs · Media · Terms and conditions · © Transport for London

7.2.2 Customer Service

7.2.3 Public Signage

7.2.4 Personal Digital Devices

7.3 INFORMATION COLLECTION

8. SECURITY

8.1 SECURITY PROVIDED

8.1.1 Venue Security

8.1.1.1 UK

Event Security South West have nation-wide experience of working closely with police, licensing and emergency services, with understanding of event health and safety procedures. Event Security South West has worked at many of the big UK music festivals and sporting events, including The Isle of Wight Festival, T in the Park, Live 8 and Silverstone.

(Ref. W22)

8.1.1.2 Philadelphia

When the Dave Matthews Band, Stevie Wonder and dozens of other musicians took the stage over the July 4 holiday weekend for the Philadelphia portion of the free Live 8 concert series, the world was watching. And so was local law enforcement, with the aid of a video surveillance solution integrated by Decisive Business Systems. The four cameras, installed atop the Philadelphia City Hall along with the famous statue of William Penn, originally were deployed so visitors with disabilities could share the same panoramic view as those climbing to the top of the 548-foot tower. To aid with concert security, the cameras were retrained up a mile-long stretch of Ben Franklin Parkway to provide a view of the steps of the Philadelphia Museum of Art. Images were multicast into a temporary emergency operations centre monitoring the concert and several other holiday events, said Frank Punzo, superintendent of communications for the City of Philadelphia.

Tony Moreira, director of Decisive's new public sector business unit, said the cameras were installed two years ago and cost about $3,000 each. The VBrick video server appliances that they feed into cost $10,000 to $12,000.

(Ref. W21)

8.1.2 Municipal Security

8.1.3 Transport Security

8.1.4 Border Security

8.1.5 International Security

8.1.6 Other Security

8.1.7 Integration

The level to which security was integrated with transport operations

8.2 TECHNOLOGY USED

8.2.1 Surveillance

8.2.2 Communication

9. HEALTH AND SAFETY

9.1 HEALTH AND SAFETY MEASURES PROVIDED

9.1.1 Venue H&S

9.1.2 Municipal H&S

9.1.3 Transport H&S

Nothing beyond Business As Usual seems to have been provided.

9.1.4 National H&S

9.1.5 International H&S

9.1.5.1 <u>UK</u>

With Live 8 concerts taking place across the globe, and hundreds of UK residents expected to travel to the European events in Paris, Rome and Berlin, the Department of Health encouraged concert-goers to be prepared for health emergencies by getting an E111 from any post office before they travel.

The E111 form is free and entitles UK residents to receive reduced cost - sometimes free - medical treatment if they fall ill or have an accident whilst visiting European Countries

(Ref. W23)

9.2 TECHNOLOGY USED

None as far as can be identified.

10. CONCLUSIONS

10.1 OVERALL SUCCESS OF THE EVENT

10.2 USE OF ITS

10.3 ECONOMIC EFFICIENCY OF THE EVENT

10.4 MOBILITY ASSESSMENT

10.4.1 Transport Provision By Sector

10.4.2 Transport Provision By Mode

10.4.3 Management of Transport

10.5 TICKETING ASSESSMENT

10.5.1 Ticket Types

10.5.2 Ticketing Technology

10.6 INFORMATION ASSESSMENT

10.6.1 Content

The author should consider the level of personalisation of the information.

10.6.2 Delivery

The author should consider the accessibility of the delivery to customers with sensory disabilities.

10.7 SECURITY ASSESSMENT

10.7.1 Security Provision

10.7.2 Technologies used

11. APPENDIX A – TABLE OF FIGURES

12. APPENDIX B - DOCUMENT ADMINISTRATION

12.1 VERSION HISTORY

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(1TH)	04/12/2009	Tony Haynes	N/A	N/A First Draft
0.00.00(2TH)	07/12/2009	Tony Haynes	N/A	Added Security & Health & Safety text

APPENDIX B

12.2 REFERENCES

12.2.1 Document References

Ref. Document Title	Document Ref.	Version	Location
R1.			

12.2.2 Web References

Ref. Document Title	Web Ref.	Location
W1. Live 8 - Wikipedia	STAD-EXT-WEB-5101	http://en.wikipedia.org/wiki/Live_8
W2. Live 8 London - Wikipedia	STAD-EXT-WEB-5102	http://en.wikipedia.org/wiki/Live_8_concert,_London
W3. Live 8 Web Site	STAD-EXT-WEB-5201	http://www.live8live.com/theconcerts/
W4. The unofficial Live 8 Website	STAD-EXT-WEB-5202	http://www.thelive8concert.com/
W5. Live 8 Tickets	STAD-EXT-WEB-5203	http://www.live8live.com/tickets/
W6. Advance Notice of Busy Transport	STAD-EXT-WEB-5301	http://www.tfl.gov.uk/corporate/media/newscentre/archive/4042.aspx
W7. Advance Notice of Live 8 Travel Website	STAD-EXT-WEB-5302	http://www.tfl.gov.uk/corporate/media/newscentre/archive/4035.aspx
W8. Live 8 Event Plans - Geldof	STAD-EXT-WEB-5402	http://news.bbc.co.uk/1/hi/entertainment/music/4594865.stm
W9. Live 8 Success - Geldof	STAD-EXT-WEB-5403	http://news.bbc.co.uk/1/hi/entertainment/music/4645823.stm
W10. Harvey Goldsmith - Wikipedia	STAD-EXT-WEB-5404	http://en.wikipedia.org/wiki/Harvey_Goldsmith#Fundraising_post_Live_Aid
W11. Ten Alps Events - Live 8 - Bob Geldof	STAD-EXT-WEB-5405	http://www.tenalps.com/info.php?statid=33
W12. Live 8 News	STAD-EXT-WEB-5406	http://www.tenalps.com/news.php?id=236
W13. Royal Parks & Live 8 (1)	STAD-EXT-WEB-5407	http://www.royalparks.org.uk/news/
W14. Royal Parks & Live 8 (2)	STAD-EXT-WEB-5408	http://www.royalparks.org.uk/press/2005/press_release_89.cfm
W15. Tessa Jowel & Live 8	STAD-EXT-WEB-5409	http://www.culture.gov.uk/reference_library/media_releases/3002.aspx
W16. Live 8 Media Coverage	STAD-EXT-WEB-5410	http://news.bbc.co.uk/1/low/entertainment/4645097.stm
W17. Accent Media Group & Live 8 coverage	STAD-EXT-WEB-5411	http://www.ukscreenassociation.co.uk/news/articles.htm?aId=334
W18. AOL & Live 8 Media Coverage	STAD-EXT-WEB-5412	http://www.incitedmedia.com/successes_live8.php
W19. A line Up of the Artists	STAD-EXT-WEB-5416	http://www.bbc.co.uk/music/thelive8event/lineupandartists/
W20. EBay Ticket Auction	STAD-EXT-WEB-5417	http://news.bbc.co.uk/1/hi/entertainment/4090774.stm

APPENDIX B

Ref. Document Title	Web Ref.	Location
W21. Live 8 Security - Philadelphia	STAD-EXT-WEB-5414	http://www.crn.com/security/165700706;jsessionid=5HTGPNNTCF4ONQE1GHRSKHWATMY32JVN
W22. Events Security UK	STAD-EXT-WEB-5415	http://www.eventsecuritysouthwest.co.uk/
W23. UK Health Advice	STAD-EXT-WEB-5418	http://www.highbeam.com/doc/1G1-133652639.html

12.3 ANNEXED DOCUMENT

Ref. Document Title	Document Ref.	Version	Location
A1.			

12.4 SUPPLEMENTS

Ref. Document Title	Document Ref.	Version	Location
S1.			

APPENDIX B

12.5 DISTRIBUTION

12.5.1 Distribution for Review

Date	Name	Version	Purpose

12.5.2 Distribution for Information

Date	Name	Version	Purpose

12.6 TEMPLATE

Document Ref.	Template Title	Template Version
STAD-TEM-DOT-9002	STAD Generic Annex Template	0.00.00(7TH)

APPENDIX B

13. APPENDIX C – LINE UP AND ARTISTS

13.1 LONDON - HYDE PARK

a) Annie Lennox
b) Bob Geldof
c) Coldplay and Richard Ashcroft
d) Dido and Youssou N'Dour
e) Sir Elton John (with Pete Doherty)
f) Joss Stone
g) Keane
h) The Killers
i) Madonna
j) Mariah Carey
k) Ms. Dynamite
l) Sir Paul McCartney
m) Pink Floyd
n) Razorlight
o) REM
p) Robbie Williams
q) Scissor Sisters
r) Snoop Dogg
s) Snow Patrol
t) Stereophonics
u) Sting
v) Travis
w) U2
x) UB40
y) Velvet Revolver
z) The Who

13.2 PHILADELPHIA - MUSEUM OF ART

a) Alicia Keys
b) Black Eyed Peas
c) Bon Jovi
d) Dave Matthews Band
e) Def Leppard
f) Destiny's Child
g) Jars Of Clay
h) Jay-Z
i) Josh Groban
j) Kaiser Chiefs
k) Kanye West
l) Keith Urban
m) Linkin Park
n) Maroon 5

o) P Diddy
p) Rob Thomas
q) Sarah McLachlan
r) Stevie Wonder
s) Toby Keith
t) Will Smith

13.3 PARIS - PALAIS DE VERSAILLES

a) Andrea Bocelli
b) Axelle Red
c) Calogero
d) Cerrone/Nile Rogers
e) Craig David
f) Cure
g) Diam's
h) Disiz Lapeste
i) Faudel
j) Florent Pagny
k) Kool Shen
l) Kyo
m) Muse
n) Pascal Obispo
o) Placebo
p) Raphael
q) Shakira
r) Tina Arena
s) Yannick Noah
t) Youssou N'Dour
u) Zucchero

13.4 ROME - CIRCUS MAXIMUS

a) Articolo 31
b) Biagio Antonacci
c) Duran Duran
d) Faith Hill
e) Francesco De Gregori
f) Francesco Renga
g) Gemelli Diversi
h) Irene Grandi
i) Jovanotti
j) Laura Pausini
k) Le Vibrazioni
l) Max Pezzali
m) Negramaro

n) Nek
o) Noa
p) Tim McGraw
q) Tiromancino
r) Vasco Rossi

13.5 BERLIN - BRANDENBERG GATE

a) A-ha
b) Audioslave
c) Bap
d) Brian Wilson
e) Chris De Burgh
f) Die Toten Hosen
g) Green Day
h) Herbert Gronemeyer
i) Joana Zimmer
j) Juan Diego Florez
k) Juli
l) Katherine Jenkins
m) Reamonn
n) Renee Olstead
o) Roxy Music
p) Sasha
q) Silbermond
r) Sohne Mannheims
s) Wir Sind Helden

13.6 AFRICA CALLING - EDEN, CORNWALL

a) Akim El Sikameya
b) Angelique Kidjo
c) Ayub Ogada & Uno
d) Chartwell Dutiro
e) Coco Mbassi
f) Daara J
g) Emmanuel Jal
h) Frititi
i) Geoffrey Oryema
j) Kanda Bongo Man
k) Mariza
l) Maryam Mursal
m) Modou Diouf & O Fogum
n) Siyaya
o) Shikisha
p) Tinariwen

q) Thomas Mapfumo & the Blacks Unlimited
r) Youssou N'Dour

13.7 PARK PLACE, BARRIE, CANADA

a) African Guitar Summit
b) The Bachman Cummings Band
c) Barenaked Ladies
d) Blue Rodeo
e) Bruce Cockburn
f) Bryan Adams
g) Deep Purple
h) DobaCaracol featuring Kna'an
i) Gordon Lightfoot
j) Great Big Sea
k) Jann Arden
l) Les Trois Accords
m) Motley Crue
n) Neil Young
o) Our Lady Peace
p) Run DMC
q) Sam Roberts
r) Simple Plan
s) The Tragically Hip
t) Tom Cochrane

13.8 TOKYO - MAKUHARI MESSE

a) Bjork
b) Def Tech
c) Dreams Come True
d) Good Charlotte
e) McFly
f) Rize

13.9 JOHANNESBURG - MARY FITZGERALD SQUARE, NEWTOWN

a) 4Peace Ensemble
b) Jabu Khanyile and Bayete
c) Lindiwe
d) Luck Dube
e) Mahotella Queens
f) Malaika
g) Orchestre Baobab
h) Oumou Sengare

i) Zola

13.10 MOSCOW - RED SQUARE

a) Pet Shop Boys
b) Bravo
c) B-2
d) Moral Code X
e) Spleen
f) Valery Sutkin

End of Document

14. A4 LANDSCAPE LAYOUT

15. A3 LANDSCAPE LAYOUT

STADIUM

2006 UEFA Germany - Annex

Author:	**Tony Haynes**
Organisation:	**TfL**

Version :	0.00.00(2TH)
Version Date :	17/12/2009
Document Reference :	**STAD-DEL-WP2-1133**
Document Category :	Deliverable

Phase: Analysis & Design

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

0. PREFACE

0.1 AUTHOR (S)

Name
Tony Haynes

0.2 THIS VERSION[1]

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(2TH)	17/12/2009	Tony Haynes	N/A	Aligned Configuration Management with QM Proposal

0.3 AUTHORISATION

a) This is a controlled document once issued. All revisions are subject to change control.
b) All revisions of this document must be reviewed by at least one work package subject matter authority.
c) All revisions of this document must be approved by the TfL Stadium Project Manager.
d) All revisions of this document must be accepted by the GCS Programme Manager before being issued.
e) All revisions of this document must be reviewed by at least one consortium authority.
f) All revisions of this document must be approved by the designated consortium authority.

Role	Name	Signature	Date
Reviewed By Work package : Subject Matter Authority			
Approved By Work package: TfL Stadium Project Manager			
Accepted By Work package: GCS Programme Manager			
Reviewed By Consortium :			
Approved By Consortium:			

[1] Version History at Appendix B

0.4 CHANGES FORECAST

None

0.5 VERSION NUMBERING

The review history of all documents follows the pattern:

a)	Author draft(s)	[0.00.00(nAA)]
b)	Workpackage Review	[0.00.01(0)]
c)	Workpackage Approval	[0.00.10(0)]
d)	Consortium Review	[0.00.20(0)]
e)	Consortium Approval	[0.00.30(0)]

1. INTRODUCTION

1.1 PURPOSE

1.1.1 Document Purpose

To deliver an appraisal of the 2006 UEFA Large Event in Germany.

1.1.2 Functional Purpose

To understand how Intelligent Transport Systems were used to support the mobility aspects of the 2006 UEFA Large Event in Germany and to elicit information that will contribute to the recommendations in the main 'State Of The Art' Large Event Report.

1.2 SCOPE

The 2006 UEFA Large Event

a) The context and background of the event
b) The challenges of the event
c) Planning
d) Mobility Management
e) Ticketing Technologies utilised
f) The Provision Of Customer Information
g) Security

1.3 DOCUMENT EXCLUSIONS

This document does not repeat information captured in other documentary products. Where such information is relevant those documents will be clearly referenced within the annex.

2. CONTEXT

The 2006 World Cup tournament involved 64 games of football played across 12 stadia between 9 June and 9 July 2006.

FIGURE 1

CONTEXT

FIGURE 2

2.1 CONCEPTUALISATION

2.2 SCALE OF THE EVENT

3. CHALLENGES

3.1 GENERAL EVENT CHALLENGES

3.1.1 <Event Type> Challenges

3.1.2 Environment Challenges

The following paragraphs are common to all annexes

3.1.2.1 Growth

Any city that has a significant growth factor will be experiencing increased demand for transportation services. The balance between this, planned transport development and the demands of a large event will always be a serious challenge. There will also be a potential for increased car ownership adding to the problems of traffic congestion.

3.1.2.2 International Traffic

As a by-product of growth, there are increased demands for international traffic resulting in a need for increased facilities for international transport arrivals and transport departures. This also has an impact on border policing. A Large Event with an international flavour will put extra pressure on both of these aspects of international traffic.

3.1.2.3 Freight Expansion

Similarly, the growth of a city is likely to place extra demands on freight throughput. Such growth will lead to more congestion, slower travel speeds and increased emissions. Therefore the need for *integrated* transport becomes even more pressing.

3.1.2.4 Road Safety

With the increased transportation demands identified above, the potential for more accidents is an obvious corollary. There is therefore a need to *prevent* more accidents by whatever means possible. The safety of visitors to the city during a large event is also of paramount importance to the reputation of the city.

3.1.2.5 Pollution

Similarly, with the increased volumes of traffic there is a potential for there to be increased levels of pollution from emissions and noise. A city with high levels of pollution will not be favoured in any bidding process for hosting a large event.

3.2 CITY SPECIFIC CHALLENGES

The author should consider Culture, Geography, Security Threats, Antiquities, Politics and City Policies. It should be noted that the consideration of City Challenges is not limited to these features.

4. PLANNING & DESIGN

Some aspects of planning will not be explored by this report since these aspects do not impinge upon the use of technology. These aspects are:

a) Marketing Planning
b) Sponsorship Planning
c) Site & Venue Planning
d) Finance Planning
e) Programme Planning

4.1 ORGANISATIONAL STRUCTURE

4.2 TIME FRAME

4.3 SIMULTANEITY

4.4 STRATEGIC APPROACH

4.4.1 Mobility

Including a consideration of the maturity of mobility management and the use of ITS

4.4.2 Operations

4.4.3 Information

4.4.4 Environmental

See also Post Event Planning

4.4.5 Security

4.4.6 Health & Safety

4.4.7 Staging

4.4.8 Post Event Planning

4.5 SCOPE OF 2006 WORLD CUP

The 2006 Germany World Cup involved 64 international games of football which were all sold out. In total there were 3.36 million spectators over 12 stadium venues. In addition, the event required the planning and management of Fan Fests at each of the host cities where the stadia were situated. This involved a further 18.4 million spectators. The organisation was compounded since two and a half times as may visitors came to Germany than was expected.

The teams themselves required 2,240 hotel rooms each night. In addition to the participants, the event required 25,000 staff involved in hospitality and catered for over 18,000 media representatives. [3.13]

4.6 POST TOURNAMENT ANALYSIS

A number of changes were introduced for the 2006 World Cup compared to the previous tournament. Instead of having a central international media centre, the twelve stadium media centres were upgraded and offered the same working conditions, services and infrastructure. In addition, almost 15,000 accreditations were processed online. A password protected internal media channel served as a source of media-relevant information, such as the times and locations of team training sessions, access to these sessions, forthcoming events and logistical details such as transport for the journalists. This medium was a major success. We also improved the quality of the mixing zone by restricting access to it and reintroducing an official media conference in return. This move gave more journalists access to first-hand information.

More than 50 FIFA media officials were deployed in total, with at least four overseeing ticketing arrangements, seat allocations, information handouts and post match interviews at every game. For the first time in World Cup history, FIFA also allocated a media official to the debutants among the finalists to assist the association with its media work, an offer that was readily taken up and proved very successful.

ATTENDANCES PER VENUE/STADIUM

Stadium/Venue	Total games	Total spectators	Average spectators
Olympiastadion Berlin	6	429,000	71,500
FIFA World Cup Stadium Cologne	5	225,000	45,000
FIFA World Cup Stadium Dortmund	6	387,959	64,660
FIFA World Cup Stadium Frankfurt	5	240,000	48,000
FIFA World Cup Stadium Gelsenkirchen	5	260,000	52,000
FIFA World Cup Stadium Hamburg	5	249,480	49,896
FIFA World Cup Stadium Hanover	5	215,000	43,000
Fritz-Walter-Stadion Kaiserslautern	5	230,000	46,000
Zentralstadion Leipzig	5	210,000	42,000
FIFA World Cup Stadium Munich	6	396,000	66,000
Franken-Stadion Nuremberg	5	205,000	41,000
Gottlieb-Daimler-Stadion Stuttgart	6	312,000	52,000
TOTAL	**64**	**3,359,439**	**52,491**

FIGURE 3

The FIFA Report and Statistics produced after the tournament contains amongst other things details of the attendances at the venues, summaries on the organisation from the senior FIFA personnel and a summary of the security provisions. [3.4]

4.7 LESSONS LEARNT FROM THE 2006 WORLD CUP

In advance of the 2008 UEFA tournament. The Swiss Government carried out a comprehensive analysis and evaluation the transport experience of the 2006 World Cup. The most important conclusion from the cup is that public viewing (large-screen projections and events outside the stadia) established itself as a new dynamic and preventative element and must therefore be given due consideration in the planning.

Blocking off the stadium area to regular traffic: Given the enormous crowds of spectators expected around the stadia, maximum space should be provided for orderly and safe operations. This can only be provided by blocking off the areas around the stadia to regular traffic before and after matches (approx. four hours ahead of a match until approx. two hours afterwards). This measure will, not only create space for both pedestrian spectators and official vehicles, but will also ensure swifter access for the vehicles of blue-light organisations to and from the stadium and to the hospital in the event of an emergency. Moreover, this is also an important aspect from the point of view of security/safety.

Camper vans: A further phenomenon observed during the 2006 World Cup in Germany was the arrival of fans in camper vans which were parked in unauthorised areas at motorway service stations or in public thoroughfares in the cities. This blocked off important public spaces in areas where the necessary sanitary facilities were not available. Special parking facilities must therefore be firmly planned for these vehicles. During the 2008 European Cup, regular police patrols will operate at the motorway service stations in the vicinity of the cities to prevent unauthorised camping. [5.9]

PLANNING AND DESIGN

5. MOBILITY

5.1 TRANSPORTATION PROVIDED

5.1.1 Spectator Transport

5.1.2 Participant Transport

5.1.3 Background Transport

5.1.4 Freight Transport

5.2 TRANSPORT MECHANISMS

5.2.1 Multimodal Transport

5.2.2 Road Transport

5.2.3 Rail Transport

5.2.4 Water Transport

5.2.5 Air Transport

5.3 TRANSPORT MANAGEMENT & CONTROL

5.3.1 Control And Command Centres

5.3.2 Operational Integration

5.3.3 Intelligent Transport Systems

5.3.4 Other Systems

5.3.5 Aerial Traffic Data Collection

A report from the German Aerospace Centre (DLR) and Stuttgart University was presented at a transport conference in Washington DC in 2007. It demonstrated a novel technique integrating airborne traffic surveillance with traditional ground detection of traffic flow to yield valuable information for better management of big events. The report describes in detail the traffic sensing system as well the how automated image analysis was approached. Could this have implications for the London demonstrator? [3.8]

5.3.6 Preparations At German Airports, Particularly Berlin's Airports

This article published in July 2006 reviews preparations by 14 German airports serving the 12 host cities of the FIFA World Cup 2006. Information includes the number of visitors expected and the number of volunteers recruited. Many of them are recruited from ranks of paid employees who are soccer fans.

The three Berlin airports were expected to play an important role since they staged the finals: Schonefeld, Tegel and Tempelhof. Schonefeld is farthest away, but has an express rail service running trains to the city centre every half hour. Tegel, the city's main international gateway, is already operating beyond capacity, and so is expected to restrict use to those holding tickets and impose traffic curbs to keep access roads flowing. Tempelhof is the smallest of the three and serves commuter and executive travellers. It has the closest location to Berlin's Olympic Stadium. The preparations for airports in the other cities are also described. [3.9]

5.3.7 Traffic Management In Hanover

This paper, written just before the tournament, concentrated on the traffic management introduced in Hannover, where five of the games took place. One important part of the strategy was to separate different fans to ensure a large scale of security. This was guaranteed in Hannover by guiding all the individual traffic to the exhibition parking spaces at the outskirts of the city and using only rail for connection to the stadium. This approach sought to :

a) minimize congestion,
b) maximize the flexibility of the whole system,

c) separate the fans of the different teams, and
d) lead to a 100% public transport arrival.

But its success also depends on reliable information and guidance strategy as well as on a perfect operation of innovative ITS systems, on the way to the stadium and - maybe even more important - on the way back home. [3.11]

5.3.8 Simulation Of Traffic And Crowd Conflicts

Nobert Hadke and Hans-Peter Wyderka presented to the World Congress on ITS in November 2005 a paper entitled Traffic Management and Soccer World Cup 2006. Big events drawing big crowds can cause problems for those responsible for local traffic. In Germany, where preparations are underway for the 2006 World Cup, micro-simulation was being used to get the best from the existing road network. [3.12]

5.3.9 2006 FIFA Worldcup in Berlin used for pilot of floating phone data.

ERTICO and German Aerospace Centre (DLR) identified and validated the limits of using mobile phone data to monitor traffic by performing a field test during the World Cup in Berlin. When either an activated mobile phone moves from one cell to another, or a mobile phone in standby mode moves to different area, a handover is performed. If the route can be derived from the data, then a velocity can be calculated by using the time between two events. As a result, data from a huge number of mobile phones can shed light on the traffic situation.

The result was that the approach delivered very good results on motorways and major traffic routes, but it is more difficult to assign mobile phone to a route in the city or in an environment with parallel routes.

Under the administration of the Technical University Braunschweig, the DLR worked together with OECON, VMZ Berlin, Vodafone Group R&D and Volkswagen, The BMWi funded project was successfully completed in 2007. [3.29]

6. TICKETING

6.1 TICKET TYPES PROVIDED

6.1.1 Transport Tickets

6.1.2 Events Tickets

6.1.3 Combined Tickets

6.2 TECHNOLOGIES USED

6.2.1 Paper Tickets

6.2.2 E-tickets

6.2.3 Smartcard

6.2.4 Personal Digital Devices

6.3 TECHNOLOGIES USED

The Wikitravel site describes the specific ticketing arrangements set up for the 2006 World Cup. Deutsche Bahn (the German national railway company) offered some special deals for World Cup fans.

The Weltmeister-Ticket enabled travel from wherever a fan stayed in Germany to their match on second class trains. Taking the fast ICE trains or night trains required the payment of a supplement fee. The ticket was only valid in conjunction with a valid World Cup ticket. It costs, depending on the length of the journey, €54 (up to 200 km), €74 (from 201 - 350 km), or €90 (above 351 km) -- note that the prices reflect the years that Germany won the World Cup.

The Weltmeister-Pass is for anyone planning to travel a lot during the World Cup. No World Cup ticket is needed, and it is valid for the five weeks of the World Cup (from 7

June to 11 July 2006). It costs €349 for 2nd class travel and €549 for 1st class for unlimited journeys, including night trains with a supplement fee. Free transportation between the cities main train stations and their stadiums was provided to those with a train ticket or pass and a ticket to the event [3.5, 3.23, 3.26].

Of the various discount cards that German Rail offer, the one most likely to appeal to fans was the special Weltmeister Bahncard 25. For a one-off price of €19 (or £14), the Weltmeister Bahncard 25 offered a 25% discount on standard fares. If it had been used for a return journey over a weekend and for a group of 6 or more, the total discount could add up to 62.5%. The Weltmeister Bahncard 25 had to be bought before 9th June 2006. It was initially valid until the end of July, but its period of validity was extended by one month for every round of the tournament that Germany manage to get through (if they had won the World Cup, the Weltmeister Bahncard 25 would have remained valid until December 31 2006). If you have a BahnCard (discount card) and your train journey to the venue was 100km or more, then the ticket was valid for onward travel by bus, tram or underground in all cities, except Kaiserslautern or Leipzig. What was the situation in those cities? [3.23]

In addition, to the Weltmeister tickets explained below, German Rail also sold last-minute cheap returns to all 12 World Cup venues exclusively online in their 'Surf & Rail' low fares promotion. Unlike the Weltmeister ticket, these did not need a match ticket to buy a Surf & Rail World Cup Special return. Depending on distances involved, the return fares were €59, €69, €79 or €89, which can represent a big saving on standard fares.

Tickets were available for purchase at any time until the end of the tournament (including return travel from the final on either Monday 10th or Tuesday 11th July). The first day of travel allowed with these tickets was June 7th. It was possible to buy these tickets online and print them out yourself. The details of the Surf & Rail tickets were not shown in English on the German Rail website. [3.23]

FIGURE 4

FIGURE 5

6.4 UITP CASE STUDY IN MUNICH

After protracted negotiations, the FIFA organising committee and the Association of German Transport Companies reached agreement on a combi-ticket whereby an entry card to the stadium included the journey on Munich's public transport system. No agreement could be reached on a ticket that was valid for 3 days, though this was the intention. The income accruing from all matches was divided up between the companies involved using assumptions about spectator numbers and public transport usage. [3.2]

FIGURE 6

TICKETING

FIGURE 7

The above screen shot shows the ticket types available for public transportation provided by MVV (Munich Transport and Tariff Association) in Munich. [3.27]

7. THE PROVISION OF INFORMATION

7.1 INFORMATION PROVIDED

7.1.1 Travel Information

7.1.2 Event Information

Whilst in 2009, the information for spectators travelling to the tournament is no longer available, since the main websites have been closed down, there are some which indicate what information was available. The tournament's FIFA website (e.g. a route planner and travel information) and Federal Government website are now no longer available or have been updated.

Websites which continue to be available are the non-affiliated sites which were set up to provide football fans with information, e.g. wm2006.deutschland.de, wikitravel, goeurope, theworldcupingermany, sportsfanexplorer, www.2006-worldcup.biz and www.soccerphile.com. [3.5, 3.6, 3.15, 3.16]

Wikitravel has a specific site related to travel to the 2006 World Cup (although some links are now broken). This describes the main points of entry into the country and then directs inquiries towards sites containing information about each city site. (These have been updated since the tournament). The general on information regarding entry by air to Germany is as follows :

a) Several options exist for those flying directly to Germany for instance the main airports from the US are Frankfurt am Main (The major hub in Germany), Berlin, or Munich. Each of those cities hosted several games or once in fans can leave the city and take a train to another host city.
b) Some travellers may find arriving in another European city a more economical alternative. Occasionally travellers leaving from Philadelphia and flying to Paris and then taking a discount airliner to Frankfurt can save up to several hundred dollars. [3.5, 3.16]

The Wikitravel site then refers inquiries towards information about each of the 12 host cities : Berlin, Leipzig, Cologne, Munich, Frankfurt am Main, Dortmund, Hannover, Hamburg, Kaiserslautern, Nuremberg, Stuttgart, and Gelsenkirchen. These city sites have been updated since the tournament.

In addition, the site links to the official match schedule on the FIFA site but this link is also broken.

7.1.3 Berlin

When looking at the individual city sites, the current Berlin site has directions to a route planner [3.30] (in English) to get maps and schedules for the U-Bahn, buses, S-Bahn and trams, or to print your personal journey planner. It also says ‘Due to the football world cup in 2006 all public transportation staff got language training and should be able to help you in English’. [3.14]

In relation to travel by bicycle, the Berlin site says ‘In addition, the Deutsche Bahn (DB) placed many public bicycles throughout the city in 2003’ [3.31]. These could be unlocked by calling a number on the bicycle with a cellphone, after registering with the service. Since spring 2003, the bike service is available also in Frankfurt, Cologne, Munich, Stuttgart or Karlsruhe for bike pick-up from the ICE railway station. It is also possible to create your own bicycling maps online, optimized by less busy routes or fewer traffic lights or your favourite paving. [3.14, 3.32]

7.1.4 Cologne

Cologne has a very good subway/tram and bus network - "KVB" (Kölner Verkehrsbetriebe). A map of the network should be found at any station, and official Kölner Verkehrsbetriebe Cologne station maps are available online [3.33].

Cologne has, like Berlin, Munich and Frankfurt, a Call A Bike - System. After signing up, a credit-card can be used to pay per minute, and you can pick up or drop off one of the silver-red bikes anywhere in the city. [Other sites suggest it is only possible at ICE railway stations.] [3.17]

Other Cities generally offer maps for route planning.

7.1.5 Munich

The UITP produced a case study of this event focussed on Munich. It described MVG’s, Münchner Verkehrsgesellschaft, the Munich transport company’s, approach to information and communication during the World Cup. MVV (Munich Transport and Tariff Association) is a partner transport association to MVG which ensures regional public transport is convenient and easy to use. There is only one timetable. You can travel throughout the entire association’s network with only one ticket and pay according to the same tariff system, irrespective of how many transport companies’ services you use. It therefore provides an integrated travel information service for the urban area. It’s main website also offers a journey planner in German, English, Spanish, Italian and French. [3.18]

FIGURE 8

7.1.5.1 Information and Communication In Munich

The main tasks of MVG's communication strategy were defined as:

a) Providing proactive and effective passenger information with the aim of achieving the smoothest possible management of passenger flow to the stadium and Fan Park and back (Target group: passengers travelling to the stadium and Fan Park).

b) Representing MVG as a company that was not only cosmopolitan and friendly, but above all an effective and efficient transport company in the city. (Target group: MVG passengers, Munich's citizens, and politicians).

A cornerstone of this strategy was the production of the company's own information media, especially a highly simplified route map which was given mass circulation and displayed in all the underground stations. This illustration was also adopted on the official FIFA website.

Another important component was an image campaign (Welcome!) with portraits of people from the major guest nations ("Ecuador – Fröttmaning") which also promoted the underground line to the stadium (U6 – Your Munich Football Line). Posters constituted the main advertising medium.

Announcements were the direct means of contacting foreign visitors and these were made in English as well as the language of whatever guest nation was playing on the match day in question (Spanish, Portuguese, Swedish, Serbian, Arabic and French). These announcements took the form of a warm welcome. On the day of the opening ceremony the Lord Mayor's greeting was broadcast.

INFORMATION

The most important function however was to provide information and guide passengers on platforms. Here, specially trained staff were able to give specific instructions over the loudspeakers in up to four languages (German, English, and according to the guest teams). This was the only way that trains with different destinations (U6 to the stadium, and U3 to the Fan Park) could be filled in an orderly manner in the main underground station at Marienplatz.

Another service involved showing the half-time and full-time match results on electronic displays on the platforms. [3.2]

FIGURE 9

FIGURE 10

[3.2]

The transport system in Germany is characterised by the number of operators providing different elements of the system. Route planning information is usually required on an integrated basis. In Germany some cities are able to provide this through specific companies like MVV. Elsewhere operators also provide a route planning service on their website, like the one below. This screen shot shows the offering includes multi-modal options.

This does however look like a relatively recent site which has been sponsored by the federal government in Germany. Whilst the site presents taxi-based options, it does not seem to cover the option of travelling by private car – the car symbols refer to taxi options. Moreover the site is only available in German. [3.7]

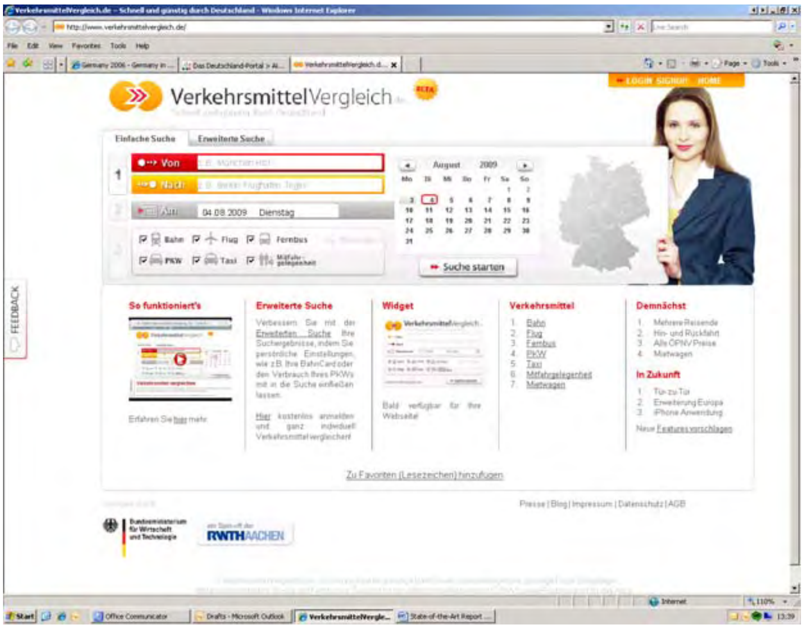


FIGURE 11

[3.7]

The National Rail operator – Deutsche Bahn – also has a station-to-station planner, but clearly this is limited in the degree to which it offers multi-modal options.

INFORMATION

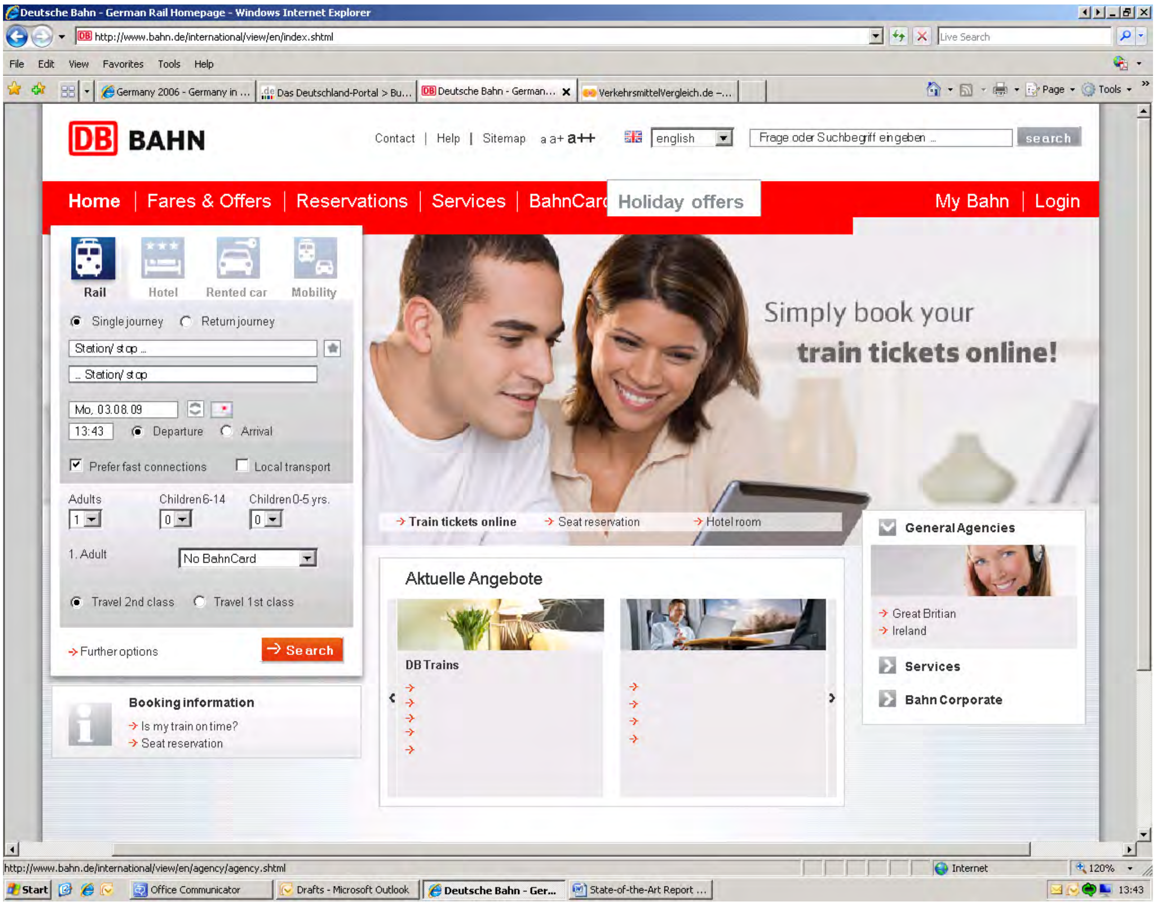


FIGURE 12

[3.21]

If travelling by private car, there was a 2006 World Cup related site which provided distance and route planning information by providing addresses and post codes of each of the 12 venues. This highlights the difficulty in providing useful information to visitors to a large event who are unlikely to be familiar with the local geography and travelling significant distances. [3.22, 3.23]

The comment below suggests some of the difficulties a visitor from abroad faces when using a journey planner. ‘Although the text on the screens of many of the public transport information systems linked to here have been translated into English, most still require place names to be entered in German, e.g. Main station = Hauptbahnhof’ [3.23]:

The Stadia themselves offer maps for accessing the venue, like the one below from the Berlin stadium. The stadium offers two maps, one for public transport and the other for private. The directions in relation to arriving by car say ‘On days without scheduled events, there are plenty of parking spots available around the Olympiastadion. On days with events scheduled, we urge you to use public transportation to visit the stadium.’ [3.24]

7.2 INFORMATION DELIVERY

7.2.1 Self Service

7.2.2 Customer Service

7.2.3 Public Signage

7.2.4 Personal Digital Devices

7.2.5 Olympic Stadium website.

FIGURE 13 DIRECTIONS TO THE STADIUM AS PROVIDED BY THE VENUE. [3.24]

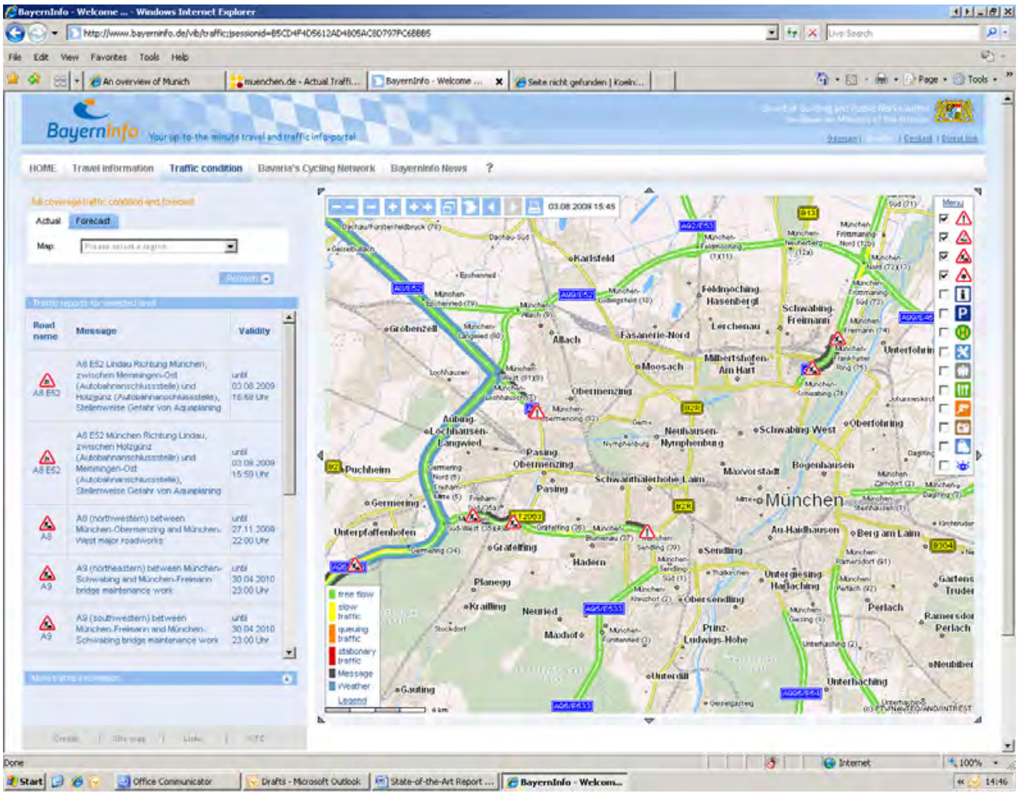


FIGURE 14

In Munich, the travel site offers information on prevailing traffic conditions on the road network in order to help route planning and navigation. This also contains details of current road works and the areas affected. This site is provided by the Bavarian Ministry of the Interior and therefore concentrates mainly on the region, e.g. it links to rail and air timetables but does not seem to cover the bus network. It also contains information about Bayern's Cycling route network which provides information about gradients as well as distances and routes. [3.25]

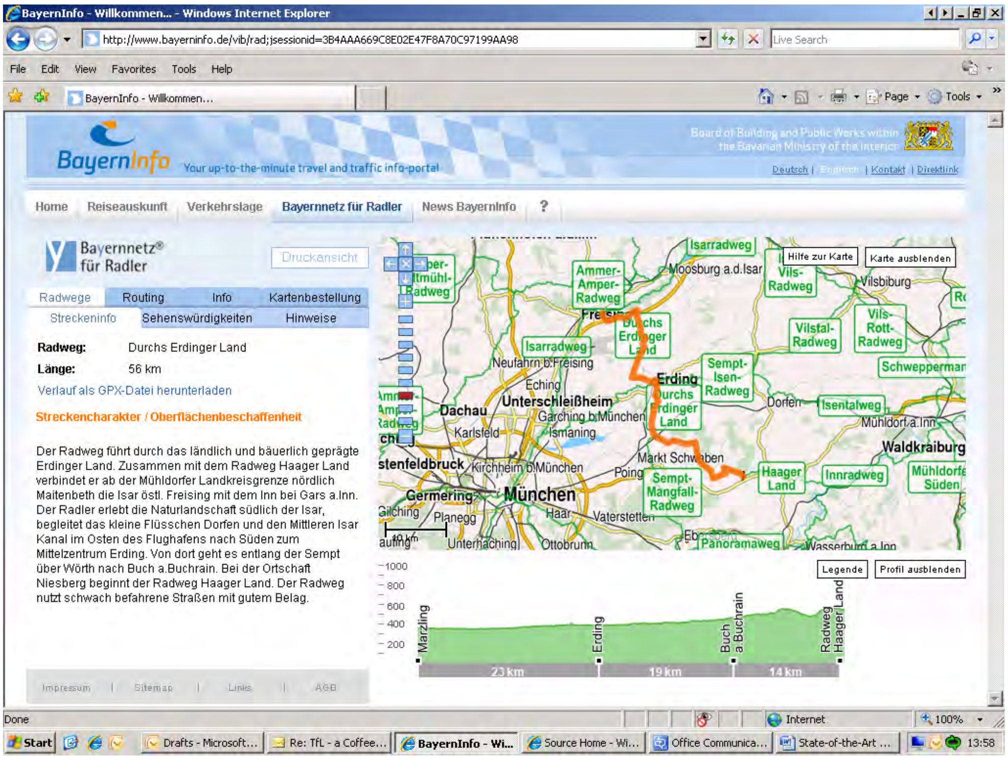


FIGURE 15

7.3 TRIP PLANNER FOR 2006 WORLD CUP.

In 2005, there was a report about an opportunity to speed up the installation of Road Telematic Systems. It was a joint project of Transport Ministry and ZVEI for the World Cup 2006 in Germany. It sought to combine existing traffic information of public and private transport – accessible via a service provider :

a) Visitors can plan their trips to the 12 World Cup venues, by car, by train and local public transport, based on up to date dynamic travel information

b) This will be the first nationwide traffic information service for intermodal transport including parking guidance

c) This should serve as a nucleus for a future nationwide and Europe-wide system.

ZVEI is the German Electrical and Electronic Manufacturers' Association, represents the economic, technological and environmental policy interests of the German electrical and electronics industry. [3.20]

7.4 INFORMATION COLLECTION

8. SECURITY

8.1 SECURITY PROVIDED

8.1.1 Venue Security

8.1.2 Municipal Security

8.1.3 Transport Security

8.1.4 Border Security

8.1.5 International Security

8.1.6 Other Security

8.1.7 Integration

The level to which security was integrated with transport operations

8.2 FAN PARKS

As part of the arrangements for this year's World Cup, all 12 venues organised an official 'fan park' in their city, where fans can gather, party and watch the games on giant screens.

Transport to and from these parks as well as disaster management plans and adequate security are all event management considerations. These would be similar to the blueprints developed for the various match stadiums.

Some cities in Germany placed their fan parks to the north, as their stadiums were to the south, for example, thereby splitting commuter streams, while others placed the fan park on the way to the stadium. However, the 2010 World Cup Local Organising Committee said this caused huge traffic congestion on match days. Ultimately, in Germany “fan parks became bigger events than the actual matches. [3.28]

8.2.1 Hamburg's Fan Park

The 'Fan Fest' in Hamburg took place on the Heiligengeistfeld (Holy Spirit Field) near to the city's famous Reeperbahn. The Heiligengeistfeld is a vast open area of land next to the stadium of Hamburg's second football team, FC St. Pauli. The Hamburg fan fest had a capacity for up to 50,000 fans to watch the games on a huge daylight screen (measuring 80 square metres). There was also a stage at the foot of the screen, on which a varied programme of entertainment was provided when no games were being played. [3.23]

8.2.2 Berlin Alternative Fan Venue

FIGURE 16

What you see above is the 'Waldbühne', a 20,000 capacity amphitheatre built as part of the Olympic Stadium complex in Berlin, just a javelin's throw from the back of the stadium itself. Our Berlin contacts tell us it's by far the best open-air venue in the city. The World Cup games were shown at the Waldbühne on an enormous 100m2 screen, which they claim will be the biggest in Berlin.

Tickets for the World Cup screenings at the Waldbühne could be bought in advance, costing €20.30 for earlier games and €31.80 for the final. These can be bought online from Kartenhaus.de, a subsidiary of the UK ticketing company Ticketmaster.

FIGURE 17

8.2.3 Cologne's Fan Park

The centre of Cologne is made up of narrow pedestrianised streets and hemmed-in squares. Rather than using one, large, out-of-town area for the fan park, the city council therefore planned to transform the whole of the inner city area into one big 'Fan Fest'! There were entertainers, games of keepy-uppy and numerous stages set up throughout the inner city, with the area between Heumarkt / Altermarkt and Wallraf Platz becoming the main place to stroll around, relax and, as FIFA would have us do, 'make friends'! Large screens were provided for live broadcast of the games at Roncalliplatz and Heumarkt. [3.23]

FIGURE 18 ALTER MARKT IN THE COMPACT CITY CENTRE

8.2.4 Frankfurt Fan Park

With the River Main flowing through the centre of Frankfurt, the city council decided to use this as the focal point for their fan park. A large pontoon with an enormous, double-sided video screen was moored in the middle of the river, while the areas on either bank were given a stadium look with tiered seating up against the quayside. In total, the 'Main Arena' has the capacity of a small football ground, c.15,000, with all World Cup games (except where 2 take place simultaneously) shown free of charge on the big screens. The park also included a small football pitch and stages for entertainers and musicians, with alternative entertainment laid on for the fans on days when there were no games. [3.23]

FIGURE 19

8.3 SECURITY ARRANGEMENTS IN MUNICH

General public order and safety was the responsibility of the police. MVG increased the use of underground security staff, however, in order to be able to react quickly in particular situations and to restrict access to the underground platforms if necessary. In order to safely dispatch trains from heavily used stations, dispatch staff were deployed on platforms, up to 30 per platform. For the purposes of calming down difficult situations, such as impatient passengers or groups of passengers, they also used direct announcements by staff on the platforms and on special raised „pulpits". [3.2]

8.4 TECHNOLOGY USED

8.4.1 Surveillance

8.4.2 Communication

9. HEALTH AND SAFETY

9.1 HEALTH AND SAFETY MEASURES PROVIDED

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10. CONCLUSIONS

10.1 OVERALL SUCCESS OF THE EVENT

10.2 USE OF ITS

10.3 ECONOMIC EFFICIENCY OF THE EVENT

10.4 MOBILITY ASSESSMENT

10.4.1 Transport Provision By Sector

10.4.2 Transport Provision By Mode

10.4.3 Management of Transport

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10.5.1 Ticket Types

10.5.2 Ticketing Technology

10.6 INFORMATION ASSESSMENT

10.6.1 Content

The author should consider the level of personalisation of the information.

10.6.2 Delivery

The author should consider the accessibility of the delivery to customers with sensory disabilities.

10.7 SECURITY ASSESSMENT

10.7.1 Security Provision

10.7.2 Technologies used

11. APPENDIX A – TABLE OF FIGURES

12. APPENDIX B - DOCUMENT ADMINISTRATION

12.1 VERSION HISTORY

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(a)	14/09/2009	Tony Haynes	N/A	Skeleton For the Annex built from the agreed Annex Template.
0.00.00(1TH)	18/11/2009	Tony Haynes	N/A	Aligned with revised annex template

APPENDIX B

12.2 REFERENCES

12.2.1 Document References

Ref. Document Title	Document Ref.	Version	Location
R1.			

12.2.2 Web References

Ref. Document Title	Web Ref.	Location
W1. Olympic Games	STAD-EXT-WEB-0101	http://en.wikipedia.org/wiki/Olympics
W2. World Cup	STAD-EXT-WEB-0301	http://en.wikipedia.org/wiki/FIFA_World_Cup
W3. FIFA	STAD-EXT-WEB-0302	http://en.wikipedia.org/wiki/FIFA

12.3 ANNEXED DOCUMENT

Ref. Document Title	Document Ref.	Version	Location
A1.			

12.4 SUPPLEMENTS

Ref. Document Title	Document Ref.	Version	Location
S1.			

APPENDIX B

12.5 DISTRIBUTION

12.5.1 Distribution for Review

Date	Name	Version	Purpose

12.5.2 Distribution for Information

Date	Name	Version	Purpose

12.6 TEMPLATE

Document Ref.	Template Title	Template Version
STAD-TEM-DOT-9002	STAD Generic Annex Template	0.00.00(9TH)

End of Document

Transport
For London

stadium
ITS for large events

STADIUM

2004 Summer Olympics Athens - Annex

Author:	**Marek Banasiac**
Organisation:	**TfL**
Version :	0.00.00(5TH)
Version Date :	17/12/2009
Document Reference :	**STAD-DEL-WP2-1111**
Document Category :	Deliverable

Phase: Analysis & Design

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0. PREFACE

0.1 AUTHOR (S)

Name
Marek Banasiac

0.2 THIS VERSION[1]

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(5TH)	17/12/2009	Tony Haynes	N/A	Aligned Configuration Management with QM Proposal

0.3 AUTHORISATION

a) This is a controlled document once issued. All revisions are subject to change control.
b) All revisions of this document must be reviewed by at least one work package subject matter authority.
c) All revisions of this document must be approved by the TfL Stadium Project Manager.
d) All revisions of this document must be accepted by the GCS Programme Manager before being issued.
e) All revisions of this document must be reviewed by at least one consortium authority.
f) All revisions of this document must be approved by the designated consortium authority.

Role	Name	Signature	Date
Reviewed By Work package : Subject Matter Authority			
Approved By Work package: TfL Stadium Project Manager			
Accepted By Work package: GCS Programme Manager			
Reviewed By Consortium :			
Approved By Consortium:			

[1] Version History at Appendix B

0.4 CHANGES FORECAST

None

0.5 VERSION NUMBERING

The review history of all documents follows the pattern:

a)	Author draft(s)	[0.00.00(nAA)]
b)	Workpackage Review	[0.00.01(0)]
c)	Workpackage Approval	[0.00.10(0)]
d)	Project Review	[0.00.20(0)]
e)	Project Approval	[0.00.30(0)]
f)	Issue	[n.nn.00(0)

1. INTRODUCTION

1.1 PURPOSE

1.1.1 Document Purpose

To deliver an appraisal of the Summer Olympics 2004 Athens Large Event.

1.1.2 Functional Purpose

To understand how Intelligent Transport Systems were used to support the mobility aspects of the 2004 Summer Olympics Large Event in Athens and to elicit information that will contribute to the recommendations in the main 'State Of The Art' Large Event Report.

1.2 SCOPE

The Summer Olympics 2004 Athens Large Event

g) The context and background of the event
h) The challenges of the event
i) The Provision Of Customer Information
j) Ticketing Technologies utilised
k) Security
l) Movement Management
m) Planning

1.3 DOCUMENT EXCLUSIONS

This document does not repeat information captured in other documentary products. Where such information is relevant those documents will be clearly referenced within the annex.

2. CONTEXT

2.1 CONCEPTUALISATION

2.2 SCALE OF THE EVENT

FIGURE 1

3. CHALLENGES

3.1 GENERAL EVENT CHALLENGES

3.1.1 <Event Type> Challenges

3.1.2 Environment Challenges

The following paragraphs are common to all annexes

3.1.2.1 Growth

Any city that has a significant growth factor will be experiencing increased demand for transportation services. The balance between this, planned transport development and the demands of a large event will always be a serious challenge. There will also be a potential for increased car ownership adding to the problems of traffic congestion.

3.1.2.2 International Traffic

As a by-product of growth, there are increased demands for international traffic resulting in a need for increased facilities for international transport arrivals and transport departures. This also has an impact on border policing. A Large Event with an international flavour will put extra pressure on both of these aspects of international traffic.

3.1.2.3 Freight Expansion

Similarly, the growth of a city is likely to place extra demands on freight throughput. Such growth will lead to more congestion, slower travel speeds and increased emissions. Therefore the need for *integrated* transport becomes even more pressing.

3.1.2.4 Road Safety

With the increased transportation demands identified above, the potential for more accidents is an obvious corollary. There is therefore a need to *prevent* more accidents by whatever means possible. The safety of visitors to the city during a large event is also of paramount importance to the reputation of the city.

3.1.2.5 Pollution

Similarly, with the increased volumes of traffic there is a potential for there to be increased levels of pollution from emissions and noise. A city with high levels of pollution will not be favoured in any bidding process for hosting a large event.

3.2 CITY SPECIFIC CHALLENGES

The author should consider Culture, Geography, Security Threats, Antiquities, Politics and City Policies. It should be noted that the consideration of City Challenges is not limited to these features.

4. PLANNING & DESIGN

Some aspects of planning will not be explored by this report since these aspects do not impinge upon the use of technology. These aspects are:

a) Marketing Planning
b) Sponsorship Planning
c) Site & Venue Planning
d) Finance Planning
e) Programme Planning

4.1 ORGANISATIONAL STRUCTURE

4.2 TIME FRAME

4.3 SIMULTANEITY

4.4 STRATEGIC APPROACH

4.4.1 Mobility

Including a consideration of the maturity of mobility management and the use of ITS

4.4.2 Operations

4.4.3 Information

4.4.4 Environmental

See also Post Event Planning

4.4.5 Security

4.4.6 Health & Safety

4.4.7 Staging

4.4.8 Post Event Planning

5. MOBILITY

5.1 TRANSPORTATION PROVIDED

5.1.1 Spectator Transport

5.1.2 Participant Transport

5.1.3 Background Transport

5.1.4 Freight Transport

5.2 TRANSPORT MECHANISMS

5.2.1 Multimodal Transport

5.2.2 Road Transport

5.2.3 Rail Transport

5.2.4 Water Transport

5.2.5 Air Transport

5.3 TRANSPORT MANAGEMENT & CONTROL

5.3.1 Control And Command Centres

5.3.2 Operational Integration

5.3.3 Intelligent Transport Systems

5.3.4 Other Systems

6. TICKETING

6.1 TICKET TYPES PROVIDED

6.1.1 Transport Tickets

6.1.2 Events Tickets

6.1.3 Combined Tickets

6.2 TECHNOLOGIES USED

6.2.1 Paper Tickets

6.2.2 E-tickets

6.2.3 Smartcard

6.2.4 Personal Digital Devices

7. THE PROVISION OF INFORMATION

7.1 INFORMATION PROVIDED

7.1.1 Travel Information

7.1.2 Event Information

7.2 INFORMATION DELIVERY

7.2.1 Self Service

7.2.2 Customer Service

7.2.3 Public Signage

7.2.4 Personal Digital Devices

7.3 INFORMATION COLLECTION

8. SECURITY

8.1 SECURITY PROVIDED

8.1.1 Venue Security

8.1.2 Municipal Security

8.1.3 Transport Security

8.1.4 Border Security

8.1.5 International Security

8.1.6 Other Security

8.1.7 Integration

The level to which security was integrated with transport operations

8.2 TECHNOLOGY USED

8.2.1 Surveillance

8.2.2 Communication

9. HEALTH AND SAFETY

9.1 HEALTH AND SAFETY MEASURES PROVIDED

9.1.1 Venue H&S

9.1.2 Municipal H&S

9.1.3 Transport H&S

9.1.4 National H&S

9.1.5 International H&S

9.2 TECHNOLOGY USED

10. CONCLUSIONS

10.1 OVERALL SUCCESS OF THE EVENT

10.2 USE OF ITS

10.3 ECONOMIC EFFICIENCY OF THE EVENT

10.4 MOBILITY ASSESSMENT

10.4.1 Transport Provision By Sector

10.4.2 Transport Provision By Mode

10.4.3 Management of Transport

10.5 TICKETING ASSESSMENT

10.5.1 Ticket Types

10.5.2 Ticketing Technology

10.6 INFORMATION ASSESSMENT

10.6.1 Content

The author should consider the level of personalisation of the information.

10.6.2 Delivery

The author should consider the accessibility of the delivery to customers with sensory disabilities.

10.7 SECURITY ASSESSMENT

10.7.1 Security Provision

10.7.2 Technologies used

11. APPENDIX A – TABLE OF FIGURES

12. APPENDIX B - DOCUMENT ADMINISTRATION

12.1 VERSION HISTORY

Version	Date	Author	CC Ref.	Changes since previous issue
0.00.00(a)	14/09/2009	Tony Haynes	N/A	Skeleton For the Annex built from the agreed Annex Template.
0.00.00(1TH)	30/10/2009	Tony Haynes	N/A	Aligned with generic template
0.00.00(2TH)	17/11/2009	Tony Haynes	N/A	Re-aligned with generic template
0.00.00(3TH)	18/11/2009	Tony Haynes	N/A	Aligned with Beijing Annex
0.00.00(4TH)	18/11/2009	Tony Haynes	N/A	Converted to New Template

APPENDIX B

12.2 REFERENCES

12.2.1 Document References

Ref. Document Title	Document Ref.	Version	Location
A1.			

12.2.2 Web References

Ref. Document Title	Web Ref.	Location
W1. Olympic Games	STAD-EXT-WEB-0101	http://en.wikipedia.org/wiki/Olympics
W2. World Cup	STAD-EXT-WEB-0301	http://en.wikipedia.org/wiki/FIFA_World_Cup
W3. FIFA	STAD-EXT-WEB-0302	http://en.wikipedia.org/wiki/FIFA

12.3 ANNEXED DOCUMENT

Ref. Document Title	Document Ref.	Version	Location
A2.			

12.4 SUPPLEMENTS

Ref. Document Title	Document Ref.	Version	Location
S1.			

12.5 DISTRIBUTION

12.5.1 Distribution for Review

Date	Name	Version	Purpose

12.5.2 Distribution for Information

Date	Name	Version	Purpose

12.6 TEMPLATE

Document Ref.	Template Title	Template Version
STAD-TEM-DOT-9002	STAD Generic Annex Template	0.00.00(9TH)

End of Document

13. A4 LANDSCAPE LAYOUT

14. A3 LANDSCAPE LAYOUT