HITE-ATHENS

“Olympic Games Transport Transfer of Knowledge”

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1. Games to Games transfer of knowledge

Transport and traffic successes of prestigious mega sport events such as Sydney 2000, Athens 2004 Olympic Games and the 2006 Football World Cup in Germany are somewhat of a surprise. Indeed many mega event cities have often been criticized because of expected chaotic traffic compounded by their inability to cope with normal traffic conditions. Such was the case of Athens pre Olympic situation. It was considered that massive additional traffic would trigger citywide congestion, business access problems, severe negative environmental impacts and citizen’s opposition.

After Atlanta 1996 major Olympic transport failures, the International Olympic Committee (IOC) has dedicated substantial resources to such programs as “TOK - Transfer of knowledge” and “Games time observation” to develop a better understanding of mega event transport operations, innovations, enforcement efficiency and sustainability potentials. The aim is to improve transport quality of services and reduce operational risks.

As outlined in this paper, Athens 2004 learned a lot from Sydney 2000 transfer of knowledge. But Turin 2006, Beijing 2008 and London 2012 will directly benefit from Athens 2004 transport experiences and traffic management innovations.

2. Athens 1896 to 2004 Olympic growth

Athens 1896 to Athens 2004 Olympic Games growth trends and globalization patterns are shown in table A. First and Second World wars did not hinder the long range Olympic growth phenomenon. Since 1980, the number of bidding Cities is increasing. All parameters grow, from participating nations to athletes, from sports to numbers of events from accredited medias to TV rights.

These growth trends generate tremendous transport requirements for the extended Olympic Family logistics and for spectators, volunteers and general workforce. This requires careful planning and design of multiple Olympic Transport Plans and supporting Transport Operations Plans for each client groups with well defined transport quality, reliability and security priorities as shown by figure 1.

Steep growth trends lead to criticism of gigantism, pharaonic costs and waste of resources on often over-designed sport infrastructures without pre-planned post Games use also called the “white elephants”. Largest mega sport event in the world, the Olympic Games are confronted with this issue.

In its search for more sustainable development orientations, IOC produced a main policy paper entitled the “Games Study Commission Report”. Published in 2003, this report lists more than a hundred recommendations to master and sometimes reduce Olympic Summer Games growth patterns. Olympic venue location, design, clustering and support services must be rethought to minimize investments and operational costs. New sport and transport
infrastructures must be planned and justified with full consideration given to viable post-Games use and sustainable development (ref 15).

Olympic Games preparation is a seven-year process between bid success and Games delivery. This period is needed to finalize strategic planning, construct all needed sport and transport infrastructures, assemble operation schemes, procure equipment, install overlays and make “close to real scale” tests of Olympic venues and transport/security systems as shown by Figure 2.


Sydney 2000 won its Olympic bid with a green Games proposal. Reduction of car traffic and parking was one of many “green” policies. Coming after the 1996 Atlanta Olympics, Sydney had to do better, particularly in transport and traffic.

Six main transport lessons can be brought from these convivial and well-organized Games (ref. 2 and 17-23):

- **A multi-modal centralized transport organization.** To face the huge Olympic transport challenge and avoid some structural mistakes of previous Games, Sydney 2000 established an Olympic Road and Transport Authority (ORTA), a fully multimodal public agency in charge of planning and delivering Olympic transport services and coordinating general traffic during the Games. For the first time in Olympic history, a fully centralised public transport and road traffic control, command and communication centre was established and directly connected to security.

- **A strong Olympic Park cluster coupled with new rail and temporary express bus services.** Close to 50% of Olympic venues (Summer Olympics have 28 sports) were concentrated in Sydney Olympic Park, a regenerated industrial wasteland 10 miles West of Sydney City Centre. A new, high performance rail station was built to handle about 80% of Olympic generated traffic. A network of temporary Olympic express bus lines serving areas of Metropolitan Sydney not covered by suburban rail carried the remaining 20%.

- **Olympic competition venue accessibility 100% by free public transport.** To reduce road traffic, “zero parking” was provided at Olympic venues. Ticketed spectators and accredited Olympic workforce and volunteers (more than 150’000 accredited people moving daily) had 24-hour free transport. Only parts of the Olympic family, VIP’s and logistic traffic had automobile access accreditations, less than 5% of all traffic. During the two week Games, Sydney rail traffic grew from 14 to 29,5 million passengers.

- **“Live events” to spread traffic loads.** To give the possibility to non-ticketed people to enjoy the Games, live sites with huge screens were provided at various Sydney pedestrian sites well served by public transport. By careful choice of these sites, traffic pressures could be taken away from Olympic venues.

- **Sport and transport pre-testing.** To minimize organizational risks and mistakes, all Olympic sites were tested including Sydney Olympic much extended gateway airport. Already two years before the Games, Sydney Olympic Park new public transport system was tested by sports and non-sport events drawing up to 35% of the future estimated Olympic crowd. These tests resulted in major operational improvements, mainly in crowd management of very heavily loaded Sydney Central and Olympic Park rail stations and the connexion of the later with Sydney Olympic Park main entrance.

- **Traffic demand management.** Sydney used all available techniques to cut Games time traffic demands. Holiday periods were extended, some central business activities
were shifted to outlying areas, freight deliveries were pre-empted on a large scale, and curb-parking restrictions were applied to most of Downtown Sydney. All measures combined resulted in a background traffic reduction of about 20%. Never again was Sydney as easy, traffic wise, as during the 2000 Olympics!

Sydney Olympic transport systems worked particularly well, handling high traffic demands generated by an unexpected 6.7 million spectators or 90% of the 7.5 million tickets available, an Olympic record. In Sydney, outside the Olympic Park new rail connexion and station, very little new transport infrastructure was developed. Therefore after-Games significant impacts on metropolitan transport patterns could not be expected. However legacies slowly emerge in other domains as recently reported by Cushman’s book on Sydney 2000 Olympic Games legacy (ref. 2).

4. Athens 2004 successful Olympic traffic scheme and substantial transport legacy

Fears of chaotic transport and traffic conditions during the Athens 2004 Games were wide spread, both locally and internationally. Some world medias were particularly corrosive. Indeed, most transport infrastructures were very late and new transport systems untested.

Six main transport lessons can be learned from the Athens Games (ref. 3-4 and 8-14):

- **Efficient transfer of knowledge.** Athens organizers, particularly in transport, were quick to understand the advantages of monitoring, analyzing and transferring, when appropriate, the best Sydney 2000’s transport policies and techniques to Athens. A particularly efficient transfer of know how benefited Greek Olympic transport managers and top staff as they actively participated as “secondees” during the 2000 Sydney Olympic and Paralympic Games.

- **Strong Governmental – Games organizer partnership.** Although most Games sports and transport projected infrastructures and equipments were slow to get started, a tremendous task was carried out, particularly by the Ministries of Culture (sports equipment), Environment and Public Works, Transport and Public Order to deliver, just in time, all promised and required Games hardware (ref. 12). Among others, the full Athens Olympic Ring, central component of the bid, was fully operational at Games time. Drawbacks of late infrastructure delivery resulted in higher costs and of lack of time to complete necessary testing. Nevertheless, the Games took place without any significant accident or system failure.

- **Transport system renovation.** The Piraeus to Omonia and Kifissia metro line 1 (oldest Greek rail line) was the key diagonal rail line of the Olympic Master Plan serving coastal venues of Piraeus and Faliron, the City Centre and OAKA Olympic Park. While in service, this line underwent a full rehabilitation to substantially increase its capacity and safety, improve and augment its rolling stock and upgrade its 23 stations to modern standards. Densest Olympic traffic flows were handled by this metro line whose rehabilitation is a Games legacy.

- **Transport infrastructure extensions and new developments.** Authorities used the Olympic Games as a major catalyst to improve and vastly extend Athens metropolitan transport system. The long list of major public transport improvements includes the new international airport, two metro line extensions, a new suburban rail system and a new tramway line (Figure 3). The road system witnessed outstanding developments with new motorway facilities, new arterial road links and major road widenings such as the Marathon Road and Vari-Koropi Eastern Attica bypass (Figure 4). Some observers claim that thanks to the Olympics, it took only 5 years for Athens transport system to recover from twenty-five years of accumulated delays.

- **Client oriented transport organization and services.** Sydney 2000 got close to a system collapse with its huge centrally managed Olympic fleet of 3450 busses.
Athens 2004 Transport organization and management were smarter, more efficient and less risky by splitting Olympic transport operations in six sub systems, each with their own staff, rolling stock, depots and chain of command. As example, the athlete bus depot was efficiently located in a compound where bus drivers could be accommodated next to the clients' housing; the Olympic Village. Thus athletes and team officials (16'500), technical officials (2'500), medias (21'500), Olympic Family (5'500), sponsors (31'000), volunteers/staff/workforce (110'000) and spectators had their own tailor-made transport systems. The total number of accredited reached 187’000, a huge transport burden on top of spectator and visitor transport as shown by Figure 1.

- **Pioneering with the first large Olympic lane network.** To ensure fast and reliable movements of Olympic accredited vehicles, the most extensive Olympic priority network of any Games was introduced and successfully operated. The network had a total of 160 km of directional median Olympic lanes (figure 5), which provided an extraordinary high 50 to 55 km/h average operating speed (figures 6 and 7).

Athens and Attica Region transport legacy triggered by the Olympic Games will be recognized in the future. Regarding the Olympic transport heritage, it is already evident that key Athens 2004 transport operational concepts are considered as basic transport principles. Such is the case of Olympic lanes which facilitated Turin 2006 traffic (figure 8). Similarly Beijing 2008 will be rely heavily on Olympic lanes as indicated thereafter.

5. **Beijing 2008 searching for mega transport and congestion solutions**

Beijing, 13-15 million capital of China, is experiencing one of the fastest motorization process ever observed. Automobile growth is close to half a million cars per year. Beijing considerable recent road and motorway developments, with four full ring motorways and a fifth ring nearing completion, can hardly cope with extremely rapid traffic growth. Congestion and traffic-generated pollution are increasing at alarming rates.

With 17’700 buses and trolleybuses, the Beijing Bus Company carries about 75% of public transport passengers under increasingly difficult operating conditions. According to Beijing most recent statistics, 67’000 taxis account for 11% of total public transport passengers, slightly more than the Beijing subway with only 10%. With currently only two metro lines and a single suburban light rail for a total of 115 km, Beijing rail public transport system lacks capacity and city coverage.

Four major elements are being developed to cope with the outstanding Beijing Olympic transport challenge (ref 1):

- **Tripling Beijing urban rail transport capacity.** Five new metro lines are speedily constructed to be ready just before the 2008 Games. Two of these lines, as well as a short 4km, four station Olympic metro connector, are built to serve the northern quadrant of Beijing where about half of all Olympic events will take place. But contrary to Sydney Olympic Park, where 80% of general traffic was by rail, Beijing Olympic Green new metro line will have capacity for only 35%. Pressure on bus transport using the already overloaded road system will therefore be tremendous. One new light rail line will connect Beijing centre to the International Capital Airport whose capacity is being doubled to about 75 millions Pax with a new runway and two new terminals, one being temporarily dedicated to Olympic traffic.

- **Olympic venue clustering.** Beijing 2008 Olympic concept is quite similar to Sydney with many competition venues, the National stadium, the Olympic Village and the Media Centre all located in an Olympic Green 14km north of the Imperial Palace. Beijing Olympic Green of about 720 hectares will be served by a dense system of public transport services, both rail and bus as well as direct connections with Olympic lanes on the fourth and fifth ring roads.
• **Extensive Olympic lane network.** To overcome rapidly growing traffic congestion, a network of more than 200km of Olympic lanes will be reserved for Olympic accredited vehicles (bus + vans + cars). With the same operational concept, a first BRT (Bus Rapid Transit) line started operations at the beginning of 2006 and additional lines might be added prior to the Games. With its enlarged traffic management control and command centre, the Beijing traffic police will manage all Olympic traffic systems.

• **Olympic Games Global Impacts (OGGI).** With the Beijing 2008 Olympic Games, IOC starts its first global impact assessment full program. This 9-year research effort is structured around the assessment of more than 150 indicators describing Olympic Games economic, environmental and societal impacts. It will also consider the immediate post Games legacy. Research results will be part of the official Olympic Games report to be established by the Host City organizing committee about one year after the Olympiad. The primary aim of this program is to build an indicator database and allow researchers in diversified fields to conduct analysis of mega event preparation and delivery impacts as well as result comparisons with Host City bid expectations.

6. London 2012 redeveloping urban rail and searching for traffic legacies

London 2012 bid planners were well aware of London transport weaknesses in urban rail capacities, reliability and general quality of service. Systematic urban and metropolitan road congestion was also considered an overwhelming bid handicap. As part of London 2012 Olympic candidate City bid, a transport improvement package of more than 10 billion £ has been allocated by Government at various levels. Renovation and transport extension efforts will mostly be centred on East London where the bulk of new Olympic Games venues will be built.

The most significant Olympic triggered transport improvements, some of them already well under way, fall in three categories (ref 5-7):

• **New main rail infrastructure.** The main new rail development is the arrival in Central London St Pancras/Charring Cross station of the Channel tunnel high-speed line. A new station located 12 km East of London Centre, Stratford International, will be at London Olympic Park centre of gravity. This station is designed to accommodate both international through trains (London to Continent and vice and versa) and local express trains during the Games. With this rail service, East London will be less than 10 minutes—now closer to 45 min—away from the London Centre.

• **East London rail network and station rehabilitation.** The bulk of rail improvements will be rehabilitation and renovation of line safety and capacity equipment, rolling stock and rail stations. Many stations will undergo substantial redesign to offer better service and adequate connexions to East London urban redevelopment in conjunction with new Olympic Park. By far the biggest renovated station will be Stratford, one of the future busiest train stations of whole London with 8 lines, including Jubilee and Dockland Light Railroad.

• **Extensive Olympic route network development** To allow rather fast and reliable travel time for Olympic accredited vehicles, London 2012 planned a 240 km Olympic Route Network (ORN). This system has a core network of fully protected Olympic lanes and an outer network with selected Olympic priorities. Engineering and operational design of this system is a considerable task undertaken by Transport for London using most advanced Intelligent Traffic Systems available. Studies are being conducted with a double objective. Parts of the network will just provide temporarily improved traffic conditions for Olympic accredited travel during the Games. Other parts of the 240km ORN will be projected as permanent traffic management solutions integrated into London 2015 Transport Plan.
7. Transport transfer of knowledge to future Olympic Games

Although limited to Summer Olympic Games, presentations above show the transfer of knowledge dynamics from Games X to Games X+1 and X+2. These transfers have a significant influence on applicant and candidate Cities bid preparation.

Some of the most essential Olympic Summer Games transport teachings can be synthesized as follows:

• A robust high performance Host City public transport system is a pre-requisite to handle Olympic mega event traffic demands.

• If a bidding City public transport system is not strong enough, substantial extensions and improvements will have to be made to reach Olympic benchmarks.

• A strong public transport system is necessary but not enough. It must be accompanied by traffic management measures to reduce automobile traffic around Olympic venues and on Olympic corridors. Road congestion affecting public transport must be avoided.

• A “zero parking” policy at competition venues is widely recognized as desirable to promote “100%” shift of mega event travel demands towards substantially reinforced public transport.

• An Olympic reserved lane network must be implemented to guarantee best possible traffic flow conditions to Olympic accredited vehicles.

• It is desirable that ticketed spectators and accredited mega event volunteers, workforce and all logistics personal benefit from 24-hour network wide free transport services.

• Multi modal transport control, command and communication shall be integrated and mastered by a central coordinating unit directly linked to security.

• Competition venues and temporary or permanent new transport systems shall be fully tested with “almost real scale” events one year prior to the Games.

• New or rehabilitated transport systems shall be planned to sustain Olympic travel demands and, at the same time, provide a long lasting legacy towards more sustainable mobility.

From risk oriented planning, mega event transport can increasingly be considered a unique opportunity to promote sustainable transport developments.

Bibliography:


25. Other Olympic transport papers and teaching material can be downloaded from www.mobility-bovy.ch
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Prof. Ph. Bovy
Lausanne, Nov 16th 2006

Table A: Athens 1896 to Athens 2004 Games in numbers

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1. Number of NOC/nations
2. Number of competition/events
3. Number of competitors/athletes (±50)
4. Percentage of female athletes
5. Number of accredited medias (±100)
6. Number of volunteers (±500)
7. Number of spectators (millions)
8. Number of world TV viewers (billions)
9. Total TV rights (mio USS, ±5)
10. Total number of accredited (Olympic Family, medias, workforce, volunteers, other logistics)?????

By 9.11.2007

Figure 1: Superposition of Olympic “client group” specific Transport Plans; Sydney 2000 attendance numbers generating 1,5 to 1,8 million Olympic journeys per peak day

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