Solving outstanding mega-event transport challenges: the Olympic experience

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How to explain the transport and traffic success of some of the most prestigious mega sport events such as the 2000 and 2004 Olympic Games and the last Football World Cup in Germany? These successful operations are somewhat of a surprise because many past mega events experienced severe transport problems; the Atlanta 1996 Olympic Games among others. They were criticized beforehand because of expected mega traffic chaos. Such criticisms are quite fair since most cities bidding to host mega events can hardly cope with normal traffic conditions. Additional traffic of the magnitude of 200,000 to 600,000 daily spectators, visitors and support logistics is certainly more than enough to trigger extensive congestion, adverse environmental impact and opposition by citizens.

This article addresses some of the outstanding issues to be dealt with to ensure reliable, performance and safe mega-event transport conditions. Learning and transfering knowledge are particularly interesting, and make each Olympic Games a live laboratory for future Games and other mega events. Since the Sydney 2000 Olympic Games, IOC has dedicated substantial resources to a 'knowledge transfer programme' aimed at developing higher performance transport schemes using past positive experiences, reducing operational risks and avoiding the usual 're-invention of the wheel' syndrome.

Sydney 2000 new transport policies

Sydney 2000 won its Olympic bid with a green Games platform. Minimization of car traffic and parking during the Games was one of the many 'green' aspects. Six main transport lessons can be drawn from these convivial and well-organized Games:

- ***Multi-modal centralized transport organization.*** To face the huge Olympic transport challenge, Sydney 2000 established an Olympic Road and Transport Authority, a fully multimodal public agency in charge of planning and delivering all Olympic transport services. For the first time in Sydney, a centralised public transport and road traffic control, command and communication centre was established for real time traffic management and permanent coordination with security.
- ***Major event and venue clustering.*** About 50% of all 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 capacity rail station was built to handle about 80% of Olympic generated traffic. Temporary Olympic express bus lines converging on Olympic Park carried the remaining 20%.
- ***Olympic accessibility 100% by free public transport.*** To reduce road traffic, no parking was provided at any Olympic venue. Ticketed spectators and accredited Olympic workforce and volunteers (more than 150,000 people to move daily) had 24-hour free transport. Only parts of the Olympic family, VIPs and logistic traffic had automobile access accreditations, less than 5% of all traffic. During the two week Games, rail traffic grew from 14 to 29.5 million passengers.
- ***OFF events to spread traffic loads.*** To allow people without Olympic tickets to enjoy the Games, live sites with huge screens were provided in various Sydney pedestrianized sites well served by public transport. This enabled traffic pressures to be eased away from Olympic venues.
- ***Olympic sport and transport systems pre-testing.*** To minimize organizational risks, all Olympic sites were tested prior to Games time. Sydney Olympic Park strong public transport system was tested by non-sport events drawing about 35% of the future estimated Olympic crowd. Tests resulted in major operational improvements, mainly in crowd management both within the public transport system and at Olympic cluster entrances.
- ***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

Left: Athens 2004 network of 160 kilometres of directional Olympic reserved lanes

Right: Athens 2004 substantially reinforced its rail system with metro line renovations and extensions, new suburban and light rail lines

Sydney as easy as during the 2000 Olympics!

Although Sydney Olympic transport systems worked particularly well, no significant operational legacy seems to remain. Strongly boosted to deliver a fantastic performance at Games time, suburban City Rail appears to be back in trouble. Other legacies slowly emerge as reported by Cushman.

Athens 2004 - a substantial transport legacy

Fears of chaotic transport and traffic conditions during the Athens 2004 Games were high. Indeed, most transport infrastructures were very late in being delivered and new public transport systems were untested. At least four main transport lessons can be learned from the Athens Games (see Bovy):

- ***Intelligent transfer of knowledge.*** Athens organizers, particularly in transport, were quick to understand the benefits of monitoring, analyzing and transferring, where appropriate, the best Sydney 2000 transport policies and techniques to Athens.
- ***Considerable transport infrastructure upgrade and legacy.*** Greek authorities used the Olympic Games as a major catalyst to renovate and extend Athens metropolitan area transport system. The long list of major transport improvements included the new international airport, rail public transport renovation and network extensions and major new urban road and motorway facilities. In about five years, Athens transport infrastructure recovered from twenty-five years of accumulated development delays.
- ***Client oriented transport subsystems.*** Sydney 2000 got close to a global system collapse with its huge Olympic fleet of 3450 buses. Athens 2004 was smarter, more efficient and less risky by splitting its Olympic transport operation in five sub systems, each with its rolling stock, staff and chain of command. Thus athletes, medias, Olympic Family, sponsors, spectators had their own transport systems.
- ***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 very successfully operated. The network had a total of 160km of directional median Olympic lanes which provided an extraordinary high 55km/h average operating speed.

Undoubtedly, Athens' Olympic transport legacy is great in metropolitan major road system consolidation and particularly in rail public transport (metro renovation and extensions, new suburban rail and new light rail systems).

Torino 2006 transport innovations

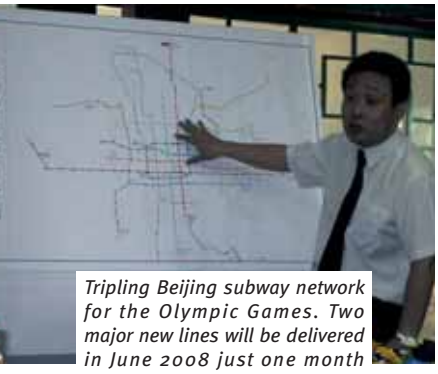
To a very large extent, Torino 2006 used transport best practice of the two previous Summer Games and applied it to specific Winter conditions and the particular situation of a 100km distance separating city ice venues from mountain snow venues. For the Games, Torino temporarily implemented 80km of directional Olympic lanes (Figure 3), five times the amount of existing bus reserved lanes, which worked very well. Two interesting transport innovations are of particular interest:

- ***Mountain rail shuttles.*** The habit of taking a train to go skiing was long lost in Italy. A Torino 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.
- ***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.

An 80km temporary Olympic reserved lane system proved efficient to move swiftly Olympic traffic flows in Turin

Taking the train to go to the Winter sports: boarding an Olympic shuttle in Turin main Porta Nova station

BRT in Beijing



Tripling Beijing subway network for the Olympic Games. Two major new lines will be delivered in June 2008 just one month before the Games start

Beijing 2008 Olympic transport challenges

Beijing, capital of China and home to 13-15 million, is experiencing one of the fastest motorization rates ever observed - about half a million cars per year. Major recent road and motorway developments - including four full ring motorways and a fifth ring under construction - can hardly cope with burgeoning traffic growth. Traffic congestion and pollution are increasing at an alarming rate.

With its 17,700 buses and trolleybuses, Beijing Bus transport carries about 75% of public transport passengers under increasingly difficult operating conditions. According to Beijing statistics, 67,000 taxis account for 11% of total public transport passengers - slightly more than Beijing subway with only 10% of traffic. With only two metro and a single suburban light rail for a total of 115km, the Beijing rail public transport system is currently extremely weak.

Four major elements are being developed to handle the Olympic transport challenge:

- ***Tripling Beijing urban rail transport capacity.*** Five new metro lines are being speedily constructed to be ready for the 2008 Games (Figure 5). Two of these lines, as well as a four-station Olympic metro connector, are built to serve the northern quadrant of Beijing where more than half Olympic events will take place. One new line will connect Beijing centre to its international airport whose capacity is being doubled with two new terminals and a new runway.
- ***Olympic venue clustering.*** The Beijing 2008 Olympic concept is quite similar to that of Sydney 2000 in that it has a strong concentration of competition venues, the new stadium of China, the Olympic Village and the Media Centre in an Olympic Green about 14km north of the Forbidden City. Beijing Olympic Green will be served by a dense system of public transport services.
- ***Olympic lane network.*** To combat the growing and severe traffic congestion, a network of more than 200km of Olympic lanes will be reserved for Olympic accredited vehicles (bus + vans + cars). This system will temporarily expand the first BRT (Bus Rapid Transit) lines now operational in Beijing (see next article). It will be operated by the Beijing traffic police with its powerful and expanded traffic management control and command centre. Without such an extensive and strongly enforced Olympic reserved lane system, the 2008 Olympic Games could not be held in such a congested metropolis.
- ***Olympic Games Global Impacts (OGGI).*** With Beijing 2008, IOC is initiating its first full global impact assessment programme. This nine-year research effort will assess over 150 indicators describing economic, environmental and societal impacts of the Olympic Games. It will also consider the 'early legacy' of the Games. Research results will be part of the official Olympic Games report of the Host City organizing committee, issued about one year after the Olympiad. This aim of this programme is to build a robust and dynamic database of all indicators and allow researchers in diverse fields to conduct an analysis of mega event preparation and delivery impacts as well as compare results with Host City bid expectations.

Public transport key role in mega events: risks and opportunities

Olympic experience shows that a highly robust and resilient public transport system is a prerequisite to handle exceptional Olympic mega event traffic demands. If the public transport system is not strong enough, substantial extensions and improvements must take place to make it Olympic worthy. These elements play an increasingly important role in the bidding process of cities competing to become Olympic Host City.

A strong public transport infrastructure is not enough. It must be accompanied by often innovative policies to reduce general automobile traffic on the primary Olympic transport network, to avoid congested conditions affecting public transport and to guarantee Olympic accredited vehicle free flow on a designated Olympic reserved lane network.

In the past, mega event transport has mostly been considered as a serious major operational risk. But as highlighted in this paper, global transport and traffic policies developed for mega events such as the Olympics have shown to be strong catalysts for accelerating public transport projects and for promoting more sustainable urban and regional mobility developments. From risk oriented planning, mega event transport can increasingly be considered as a unique opportunity to bolster sustainable transport developments at a comprehensive scale as currently shown by massive rail transport rehabilitation and extension projects in East London ahead of the London 2012 Games.

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