World mega-event global transport and traffic management

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1. Mega event key transport issues

- Mega-events generate an extraordinary high concentrations of “new” traffic superimposed on “usual” urban traffic for relatively short periods of time
- Mega events last 2-3 weeks (Olympics, Football World Cup, Asiatic Games, Commonwealth Games, etc) to 4-6 months (World Expo)
Olympic attendance and traffic size

- Summer Olympics are the World biggest two week event with 5 to 10 million ticketed spectators
- Sydney 2000 had 8 million spectators, daily peak Olympic spectator traffic of 500’000 and accredited support and logistics personals of 200’000 generating 1,5 million daily trips
Expo attendance and traffic size

- **Osaka 1970 Expo** had 64 million visitors, 77 participating countries on a 330 ha site
- **Lisbon 1998 Expo** had 10 million visitors (16 planned), 146 participating countries on a 60 ha site
- **Hannover 2000 Expo** had 18 million visitors (40 millions planned), 198 participating countries
- **Shanghai 2010 Expo** is planning 75 million visitors
...major issues and objectives

- Olympic/Expo/mega event accessibility and mobility is a challenge of “extraordinary” magnitude

- Olympic and Expo visitor/guest ease of access, comfort, conviviality, safety and global security are major goals

...mega event transport development

Mega event transport and traffic development elements:

1. Mega event transport organization
2. Mega event global program
3. Metropolitan, urban and transport context
4. Transport and traffic concept strategic and operational planning
5. Multiple transport interactions with other mega event functions and domains
…mega event transport development II

6. Mega event transport delivery operational mode
7. Transport and traffic management testing, risk and contingency planning, impacts and legacy
8. Mega event transport delivery by client groups
2. No spectator cars at mega events

- Most major mega event generators (Stadium of more than 75,000 capacity) tend towards a "NO or very limited CAR" access policy for spectators, workforce and support personals.

- This policy was applied since 1998 at the Grand Stade de France in Paris and in 2000 for the Sydney Olympic Games.

...very limited car access policy

- Sydney 2000 Summer Olympics, Athens 2004 and most probably Beijing 2008 will have "highly restricted or no car access" policies for spectators and others.

- This applies to the largest number of mega event users: all spectators, sponsor guests (whenever possible), most of workforce and support personals (volunteers).
...mega event accessibility

- Very high concentrations of traffic in space and time lead to “dangerous” traffic congestion and paralysis of both FOH and BOH access

- **FOH--Front of House**--is the public access side of mega events
- **BOH--Back of House**--is the service, support and logistical access side of mega events

...mega event dual access system

- All mega event activities shall be contained in a mega event “security perimeter” or multiple distinct security perimeters depending on the mega event layout

- Both FOH visitor traffic and BOH person accredited traffic must go through security checks (mag and bag)
- BOH vehicular traffic must be fully screened
…mega event public transport access

- For mega events, only “very high performance” public transport has the necessary capacity to meet the very peaked and high traffic demands

- Mega event “Front of House” accessibility shall be “totally” supplied by high capacity rail transport
… mega event logistical traffic

- FOH must be 100% public transport
- BOH is more complex: some user categories must use public transport and “sensitive” logistical and guest categories will use private transport means
- BOH is to take all logistical vehicular traffic (to be formerly accredited) and all goods freight, delivery and technical service traffic

… mega event parking

- No parking whatsoever for FOH spectators
- Parking entirely reserved for BOH logistical functions
- FOH and BOH shall have, as much as possible, clearly separated access routes for different transport modes
3. Key role of urban rail transport

- Mega events generate traffic demand peaks of **50’000 to an extremely high 200’000 persons/hour**
- Only very high performance urban rail transport systems can deliver such capacities
- Light rail (10’000 pass/h/dir) and medium capacity subway (25’000 p/h/d) help but are often not sufficient for mega events

... three metro lines for a Stadium

- The “Grand Stade de France” at the outskirt of Paris CBD has a seating capacity of 85’000 for sports
- Two RER (Regional Express Network) lines, 1 standard metro line, 5 bus lines serve this Stadium
- Highly controlled parking, maximum 5000 parking spaces with pre-booked ticket only
…dedicated high capacity rail

- Sydney Olympic Park, located 14km West of Sydney CBD
- Connection to the main Western rail 4 track trunk line
- One-way 2km side loop to Olympic Park station
- Station with three large platforms (separated train entries and exits) allowing for 45’000 passengers/hour/direction
4. Mega event traffic estimates

- Mega event traffic demands are a direct function of **mega event attendance forecasts**
- Mega event attendance forecasts generally define visitor quantities and distribution by five main parameters:

  a) **Visitor origin** (international, national, regional, local)

…traffic demand estimates II

b) **Visitor type** (single, family, adults, seniors, organised groups, Expo guests, VIP’s, medias and professional visitors, etc)

c) **Visitor profile and ticketing options** (single day or multiple consecutive day visits, multiple non consecutive visits, event visits, night visit only, etc)

d) **Visitor time distribution** (by month, short and long week ends, holidays, week, day with peak incoming and exiting patterns)
...traffic demand estimates III

e) Visitor transport mode choice (what public transport, shuttle buses, shuttle boats, chartered buses or minibuses, taxis, cars, motorized two wheels, bicycles, on foot, etc)

f) Visitor socio-economic characteristics (age, disposable income, etc)

...traffic demand estimates IV

• Preliminary attendance estimates of 75 million Shanghai 2010 Expo visitors

• By far the largest traffic demand of any mega event in the World

• For 75 million are FOH visitors…how many BOH support personals (logistic, security, medical, F&B services, technical and maintenance, cleaning, etc) on a daily basis? (75’000 to 150’000 staff)
…Expo attendance estimates

- Expo global attendance and variations very complex to estimate
- **Lisbon 1998** real attendance was 35% below official forecast. Visitors came massively during the last Expo month. Special event queues were incredibly long
- **Hanover 2000** real attendance was 55% below estimates. First four month attendance very low. Incentives had to be made to attract visitors

*Monthly number of visitors: comparison of 1997 forecasts and 1998 actual numbers*

*Source: Parque EXPO ’98.*
...mega event attendance policies

- All transport and traffic estimates depend on the overall mega event attendance policy
- Attendance policy $A = \text{maximum possible number of visitors}$
- Attendance policy $Z = \text{daily visitor volume limited to comfortable, safe and easy to manage traffic flow loads}$ in relation to Expo capacity of key “attracting events” and by Expo transport access capacities
…mega event attendance policy A

- Attendance policy A is the traditional “free, open access” policy
- As shown in recent major exhibits, this leads to incredibly long queues at the “most attractive events”
- Ineffective (and sometimes considerable) over design of infrastructures like transport and parking (Lisbon 1998 Expo parking were filled only one day of the entire Expo)

…mega event attendance policy Z

- Attendance policy Z limits visitors to “optimal” mega event functioning and to transport access reasonable capacities
- This is an “enclosed event” policy, like in any stadium or enclosed hall, attendance limited to the number of available seats
- This means a full reservation system linked to ticketing for Expo global attendance and specific event attendance
5. Mega event access systems

- Mega event location (mono or multi site) in relation to metropolitan existing and planned transport networks
- Mega event urban sites of more than 50’000 to 75’000 attendance require **high capacity rail public transport**
- With a seating capacity of 80’000 the Paris Grand Stade de France is served by two express rail line and one subway line

100% public transport modal split

- Sydney 2000, Athens 2004 and most certainly Beijing 2008 Olympic Games will be “**100% spectator**” by public transport or “no parking for spectators”
- Spectator and visitor “100% modal split by public transport” is considered the only way to handle very heavy traffic demands for mega events
...new infrastructure requirements

- Mega events require high performance transport infrastructures which are generally needed for metropolitan long range transport developments
- Athens 2004 Olympic Games “catalyzed” the construction of 155 km of modern 6 lanes expressways and enlargement to 4 lanes of existing road arterials
- Athens rail public transport system is being multiplied by 150%
New infrastructure requirements II

• For the 2008 Olympic Games, Beijing is developing his six ring road system and increasing its rail high performance transport system by more than 150%.

• Mega events are a catalyst for main metropolitan transport infrastructure developments which are needed but would otherwise been constructed in a much longer time frame.
Mega event parking infrastructure

- For mega events, parking is needed for logistical and mega event support functions
- “No or very limited on site spectator parking” policies are more and more common
- Parking infrastructures shall be built only if “after use” in the interest of urban community development is found necessary

...event security perimeter

- A **security perimeter** separating “City domain” from “mega event domain” is compulsory
- All people must be controlled (mag and bag like in airports) and be ticketed or accredited. Vehicles shall be accredited and will have to be screened
- Organization of front of house (FOH) and back of house (BOH) functions require large movement and terminal areas
…traffic command / communication

• Mega events require constant monitoring of all transport and security systems
• This is called the “T4C” function for Traffic Command, Control and Communication Centre.
• Two interconnected T4C are needed: one controlling the City networks and the other run by mega event organizers
• Communication shall be centralised to convey “one message” to the public and the media

6. Mega event innovation and legacy

• Mega events like Olympics and World Expos shall be a show case for technological, environmental and sustainable development innovations

• The Sydney Olympic Games have been a show case of environmental protection and a tremendous transport success with 100% spectator by public transport convivial mobility
...transfer of knowledge

- Mega events must take advantage of other very large event experience and management techniques.
- The IOC (International Olympic Committee) invest 10 million US$ to monitor each Olympic Games involving future Games organisers in the learning process
- Technical documentation on mega event transport and mobility problem solving is becoming available at the international level

...and most important: legacy I

- Mega event organization often imply major public investments in transport infrastructures and mobility equipments: compressing 25 years of projects in 5 years
- Mega event “infrastructure” must be planned and designed “in priority” to serve long range community development goals
...legacy or after event use

- “Long term components” are to be cast “in concrete” and “mega event overlays” built as temporary structures.

- Mega event transport infrastructures, especially heavy rail, motorways and tunnel projects must be primarily conceived for long range community benefits and metropolitan sustainable development

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Thank you for your attention