UITP- 54th World Congress- London May 20-25 2001

Exceptional Mobility Management for Large Events: Transport Issues for the Sydney 2000 Olympics

Philippe H. Bovy[1], Professor of transportation, Swiss Federal Institute of Technology at Lausanne, Switzerland

1. INTRODUCTION : LARGE EVENTS TRANSPORT AND MOBILITY MANAGEMENT ISSUES

In a highly mobile society, despite or because of media and information technology developments, very large cultural, musical, commercial and sports events appear to be constantly growing in magnitude, complexity and occurrence.

Because of their ephemeral nature (often of short duration and unique in a given site or region), very large events like the Olympic Games use existing, upgraded or new transport infrastructures that have not been conceived to absorb the intense and highly polarised traffic flows generated by such events. Exceptional transport and mobility management schemes are developed, experimented and applied to cope with these strong temporal and spatial concentrations of spectator traffic flows in addition to usual background traffic. They are “real scale” laboratories of other mobility patterns and travel behaviours whose monitoring is of significant interest to assess measures and policies which could be implemented for day to day transport and traffic operations.

The Sydney 2000 Games are a particularly interesting case of multiple and simultaneous sports events of considerable scale and of worldwide media visibility. Huge human, managerial, technical, technological and financial resources are involved as indicated by Figure 1. By all accounts, these last Summer Games were the most successful, convivial and the best organised ever. It is therefore appropriate to understand, analyse and synthesise the issues, interactions and solutions in the key functional domains such as sports delivery, transport, security and communication among others.

The present communication is focused on Sydney 2000 transportation and mobility management. Transport is generally considered one of the toughest service to get right due to the multiple client groups and stakeholders: athletes, Olympic Family, ticketed spectators, visitors, various categories of workforce, volunteers and logistical functions, all media personals, the general public as well as affected resident and business communities.

The outstanding challenge lies with the fundamental requirement of providing simultaneously different transport systems and services to a variety of constituencies having distinct spatial patterns, schedules, comfort and security standards. In fact, Olympic transport planning leads to the design and operation of a “superposition” of multiple client-oriented transport systems and services operating simultaneously on the same general infrastructure.

[1] Member of IOC Transportation Working Group for Sydney 2000

2. SYDNEY 2000 OLYMPIC GAMES SPATIAL STRUCTURE

The first Olympic Games of the third millennium took place from September 15th to the 1st of October 2000 in Sydney. Most populated metropolitan area of Australia and capital city of New South Wales, Sydney is well known for its Opera House and its superb Harbour and Bay.

The Sydney 2000 Summer Olympic Games have been planned and organised along a 75km East-West axis connecting Bondi Beach on the Pacific Coast to Penrith Lakes at the foot of the Blue Mountains. All Olympic competition venues were located inside a 6 km wide corridor on both sides of the main East-West railroad spine of the Sydney Metropolitan Area as illustrated by Figure 2.

Sydney central area (CBD and Darling Harbour) hosted six of the 28 Olympic sports, including the triathlon as well as most of the Olympic Family accommodation outside the Olympic and Media Villages. Primary transport interchange node of the metropolitan transport system, Sydney CBD is directly linked to Sydney Airport international and domestic terminals by new railway and motorway sections inaugurated only a few months before the Games.

But the key and most outstanding feature of the Sydney Games is Olympic Park at Homebush Bay, 15 kilometres West of Sydney CBD. Clearly inland and close to the “centre of gravity” of the Metropolitan Area, Sydney Olympic Park (SOP) was the first and foremost concentration of Olympic activities.

This new Park was designed and built to host:

- 19 or more than half of all Olympic sport disciplines.
- The brand new 115’000 seat Olympic Stadium of Australia for the Opening and Closing ceremonies and for most athletic competitions.
- Two media centres with more than 20’000 accredited personals: the IBC-International Broadcasting Centre and the MPC-Main Press Centre.

Adjoining to Olympic Park was the Olympic Village with a capacity of 17'000 athletes and team officials.

To cope with the formidable traffic flows generated by such an exceptional concentration of Olympic activities a new underground triple platform rail station named Olympic Park Station has been inaugurated almost 30 months before the Games. The design capacity of the station was 40'000 to 45'000 passengers per direction per hour. A two-kilometre loop line linked the new station to the main East-West Cityrail suburban rail spine. Located about one kilometre South of the Parramata River, main navigable river leading into Sydney Harbour, Olympic Park is also connected to Sydney CBD by river transport using comfortable and rapid “Rivercats” catamarans.

Most other Olympic venue sites were located as close as possible to the Cityrail East-West main track and its major stations. As will be explained later, the proximity of Olympic venues to the rail system was a built-in structural component of the Games, since the Sydney motorway system is not densely developed. Sydney does not have any peripheral motorway and no continuous freeway connecting the CBD to the important M4 Motorway serving most of Western Sydney where a large part of the Olympics took place. Therefore the two primary Olympic traffic generators of the Sydney Games --Sydney Olympic Park and Sydney CBD + Darling Harbour—were in direct and rapid rail connection but in discontinuous motorway linkage. Instead of loading up the already too busy East-West Parramata trunk Road, the Olympic Transport Scheme oriented highway accessibility to Olympic Park on Victoria Road,

a major urban arterial, which was operated with one Olympic reserved traffic lane in each direction during the Games.

The Sydney 2000 concept of concentration of Olympic activities at Homebush Bay had numerous advantages notably those of shortening travel distances for athletes and team officials (more than 16'000) between Olympic Village and Olympic Park. A large part of the Media (more than 20'000) worked at the Main Press Centre (MPC) and at the International Broadcasting Centre (IBC) located inside Olympic Park at walking distances of almost half of all Olympic venues. But this Olympic concentration had the obvious effect of generating extraordinary high spectator traffic demands exceeding 400'000 people per peak day, in addition to more than 80'000 accredited support and logistical staff (workforce, volunteers, media, Olympic Family, etc) active in Olympic Park and an unknown number of non-ticketed visitors.

3. SYDNEY 2000 OLYMPIC GAMES MAIN ORGANISATIONAL AND MANAGERIAL FEATURES

Planning and organising the Olympic Games cover a seven year span – in the case of Sydney -- from the Host city designation on September 23rd 1993 to the Games Opening ceremony on September 15th 2000 (See figure 3).

Contrary to other Games, Sydney organisational and managerial structures were decentralised. In charge of the overall organisation of the Games, was SOCOG (Sydney Organising Committee for the Olympic Games) backed by four other strong organisations:

- OCA (Olympic Co-ordination Authority) created in 1995 to design, built, upgrade and operate all Olympic sports facilities and other infrastructures needed for the Games. OCA was also in charge of all specific legislation related to the Olympic Games and of major interventions on the public domain such as City decoration and Live site planning and operations.
- SOBO (Sydney Olympic Broadcast Organisation) created in 1996 to produce all televised images of the Games.
- ORTA (Olympic Roads and Transport Authority) created in 1997, six months after the Atlanta Games, to plan, test, operate, command and control all transport services during the Games.
- OSCC (Olympic Security Command Centre) created in 1998 to plan, implement and co-ordinate all security functions within all Olympic areas and at citywide level.

All these organisations were in fact New South Wales State agencies specially designed to handle the Olympic tasks at hand. Most key managers were top civil servants in the various State administrations. This specific set-up helped tremendously in assuring solid and effective interactions with public sector functions and multiple co-operations vital for the Games. It is estimated that about 2 billion AUS $ of long term infrastructure investments were spent in conjunction with the Games in addition to SOCOG 2,5 billion AUS $ budget.

Six months after careful monitoring of the Atlanta Olympic Games, a single Olympic transport authority—ORTA—was created to avoid Atlanta's most obvious transport problems. ORTA was conceived and operated as an integrated Transport Authority combining, under a single command, all transport functions such as road traffic, road and rail public transport, ferry services, airport interconnections etc. As will be explained later, ORTA built a large event transport capability by getting actively involved in various "real scale" event testing like the 1998, 1999 and 2000 Royal Easter Shows at Sydney Olympic Park.

The most significant Olympic transport planning phases and milestones were:

- The *Transport Concept of Operations* report prepared by SOCOG and issued in June 1997.
- The consolidated *Sydney Transport Strategic Plan* published by ORTA in January 1998.
- First full scale transport testing during the 1998 Royal Easter Show at Olympic Park, about 29 months before the Games.
- Integration of system wide Olympic transport functions with each Venue operation and management concept (1998 and 1999).
- The *Olympic Transport Plan* approved by IOC in October 1999, one year before the Games.
- A *Contingency Plan* finalised 4 months before the Games.

One particularly interesting characteristic of the Sydney 2000 Games preparation was the move, about one and half year before the Games, from horizontal network system planning and operations by functional domains to vertical integrated studies of venue operations. Called “venue-isation” (figure 4), this move is a refocusing of Games design on the real sports and public interface: the Olympic competition venues. Similarly all non-competition and training venues had to go through the process of checking all functional systems serving them. All venues were fitted with a standard organisation with its own management and staffing to cover all aspects of venue operations before and during the Games. Therefore each venue had a fully structured organisation headed by the Venue manager assisted by all functional units such as security, medical and transport to cite a few.

Also linked to venue management was the critical issue of transport priority to be given to various constituencies. For Olympic Games operations, Sydney 2000 defined the following sequence of decreasing transport priorities:

- Athletes
- Workforce, Technical Officials and Broadcasting rights holders
- Olympic Family and Media
- Sponsors
- Spectators
- Visitors and the General public

4. SYDNEY 2000 TRANSPORT : AN OUTSTANDING MOBILITY MANAGEMENT CONCEPT

Design of an Olympic transport scheme depends on many factors such as the host City urban form and its main transport system layout (motorways, metropolitan railways and subways). Usual travel patterns of residents both for commuting and leisure trips are of considerable importance as well as the general Olympic Games structure in terms of main competition venue spatial location in relation to existing primary transport infrastructures (for example: the Sydney East-West Olympic corridor).

With 4 million inhabitants settled on a very large area, Sydney is a low to very low urban density metropolis. Its high average motorization rates (highest in the world after the US and Canada) lead to predominant automobile dependence. The Sydney metropolitan mobility average modal split is 80-85 % by car, 10-15 % by public transport and 5 % by other means (on foot, bicycle, etc.). Higher public transport ratios are measured within Sydney CBD (70 % public transport during the morning commuting peak) or an event like the Royal Easter Show (50 % public transport), a very popular traditional agricultural fair held yearly near Sydney CBD.

From the start of Olympic transport planning, it was considered obvious that keeping usual travel patterns (50 to 85 % of all traffic by private cars) for the Olympics would lead to utmost congestion and chaos on most of Sydney arterial roads and the few available motorways. But the Sydney candidature bid stressed the will of the Host City to organise environmentally friendly Games in all domains including transportation.

Sydney Olympic transport organisers conducted a full monitoring of transport operations during the Atlanta Games identifying key transport planning, operation and management elements to be integrated into the Sydney Transport Plan to avoid the worst transport “mistakes” which hampered the Atlanta Games. Three of those elements were:

- Integration, in a single “public” Authority, of all road and public transport functions as well as all transport command, control and communication capabilities (this led to the creation of ORTA).
- Strong public transport prioritisation during the Olympics.
- Major emphasis on public communication.

Taking into account the very limited amount of new transport infrastructures (motorway and Cityrail linkage of Sydney CBD to the Airport and a new Olympic Park rail station), the Sydney Olympic Transport Plan called primarily for actions drastically modifying the travel behaviour of visitors/spectators instead of developing transport infrastructures. Given the exceptional magnitude of expected Olympic travel demands, the Olympic transport concept was geared to change the suburban public transport modal share from the usual 15 % to at least 85 %, a full inversion! Thus the Transport scheme evolved towards a “push and pull” plan combining full development of public transport services and restrictive automobile use at Games time.

The Olympic Transport Plan main components were as follows:

- Provision of 100 % Olympic venue accessibility by public transport using rail access, an Olympic network of 13 supplementary bus lines, shuttle services from rail stations or a combination of those.
- All ticketed spectators had free use of Olympic public transport the day of validity of their venue ticket.

- Full private and public traffic control within competition venues doubled with a strict spectator-parking ban inside and around all venue perimeters.
- Availability of more than 25'000 free park-and-ride temporary spaces along the 13 Olympic bus lines and shuttle routes.
- Olympic single or dual reserved bus lanes on crucial Olympic routes, such as the Victoria Road itinerary connecting Sydney CBD to Olympic Park.
- Substantially reduced Games time automobile traffic in Sydney CBD by an array of actions such as complete 24 hour on-street parking ban, downtown street pedestrian priorities, downtown night deliveries only, efficient and frequent downtown free bus loop.
- A large scope Travel Demand Management (TDM) program aimed at inducing motorised travel reductions during the Games through such actions as telework, staggered working hours, reduced business activity during Games, employee holiday incentives and state wide school holiday extension.
- Started with the 1998 Royal Easter Show transport tests, an effective transport and traffic communication strategy was developed to widely diffuse all appropriate Olympic transport and travel advice.

Olympic transport services associated with the Games required the engagement of an exceptionally large fleet of 3850 buses supplemented by a car and van fleet of about 4700 units. Of these, 2700 were operated by ORTA to provide transport services to Olympic client groups. SOCOG and other agencies used the other 2000 vehicles for Games staff functions.

5. EXTENSIVE TRANSPORT AND TRAFFIC TESTING TO VALIDATE OLYMPIC MOBILITY POLICIES

Such a drastic shift of mobility from predominantly automobile to full public transport use had never been experimented in Sydney, in Australia or elsewhere in automobile-oriented societies. The Sydney transport planners--ORTA--decided that the only way to pragmatically assess the feasibility of such a bold scheme was to test it with a very large event in Sydney.

ORTA took advantage of the transfer of the largest, oldest and most prestigious agricultural fair of Australia: the Royal Easter Show. Since 1882, this fair was located in Moore Park at the outskirts of Sydney CBD. The relocation of the Royal Easter Show in new quarters at Sydney Olympic Park—where most of the new Olympic facilities were being built—offered a unique possibility for testing a new suburban transport and traffic scheme.

This two-week Easter Show attracting more than 1 million people with a maximum of 175'000 people or about 40 % of expected Olympic traffic loads provided a convenient “transport and traffic laboratory”. Taking advantage of early completion—30 month before the Games—of the high capacity Olympic Park Rail Station, the 1998 Royal Easter Show was used as the first transport test event.

The aim of this first test was to “boost” public transport accessibility share from the usual 15-25 % for Sydney outlying events to at least 75 % corresponding to Sydney CBD maximum public transport share during working day peak hours. A full array of public transport services were provided:

- Direct and very frequent train services to the new Olympic Park station.
- Eight supplementary express regional bus lines covering Sydney metropolitan areas not served by suburban rail.
- Public transport fare included in Easter Show tickets.

Private car accessibility was limited to 7000 parking spaces with mandatory parking pre-booking at a flat fee of 25 AUS$/car. In addition, a ban on visitor parking was imposed in a 1km deep residential buffer zone around Olympic Park.

Accompanied by an intense and well managed communication campaign, the “1998 Royal Easter Show Transport and Traffic Scheme” was a considerable success in terms of access quality, conviviality and public acceptance. The average public transport share exceeded 88 % (versus 75 % planned) and the peak public transport share of 93 % occurred on the busiest Easter Monday with an attendance of 175’000 people. Easter Show car parks were used at less than 50% capacity.

This extensive test gave assurance to ORTA that a carefully planned, well promoted and advertised “100 % accessibility by public transport “ scheme would be most appropriate, efficient and desirable for all Olympic competition venues. Actually, the second major transport and traffic test, conducted during the 1999 Royal Easter Show, eliminated all parking facilities for spectators to rely entirely on public transport accessibility.

Since the 1992 Barcelona Games, all Olympic competition venues must, in principle, be operationally tested one year prior to the Games. The tests deal primarily with management and delivery of sports event in each given venue. But no one has gone so far in transport and traffic testing as ORTA for the Sydney 2000 Games. The reason behind this huge testing investment lies with the fact that such a bold mobility concept as the “100% spectator by public transport” had to be validated not only in technical and managerial terms but also in political, media and broad public acceptance terms.

Operational testing is not only required for basic transport and traffic policy validation, but entails two other significant advantages which were judged of considerable value in Sydney:

- Management capability build up.
- Transport and traffic scheme revision and optimisation.

For example, the very heavy traffic pressure (from 150'000 to 175'000 arriving passengers per day) on Olympic Park Rail Station, led to the design of a full one-way station operational scheme, with pedestrian overpasses, in view of expected 300'000 to 400'000 arriving passengers per day during the Games.

6. SUCCESSFUL GAMES OPERATIONS : A GOLD MEDAL FOR OLYMPIC TRANSPORT

By all accounts, including the often very critical local media, Sydney 2000 Olympic transport performed extraordinarily well. Traffic was generally smooth in a largely convivial environment despite heavy pressures encountered at key Olympic locations. The three most worrisome transport failures feared by ORTA were:

- Cityrail accident or major breakdown.
- Bus mismanagement, confusion and false routings.
- Traffic congestion around Olympic venue clusters and on major arterial highways leading to Sydney CBD.

Rail transport. Rail transportation luck was with ORTA and Cityrail, since rail accidents occurred just before the Olympic Games and a few days after the closing Ceremony. Although no new rolling stock was available, the current equipment was brought to its best

possible level of maintenance and operating conditions just prior to the Games. Freight traffic was largely eliminated. All efforts were made to provide the most reliable rail services since about 80 % of all Olympic spectators used the system which operated 24 hours a day. A reserved contingency fleet of close to 500 buses was kept ready in case of rail failure, but was not used.

Bus system. Operational risks of the largest ever assembled bus fleet (the Olympic fleet had 3850 units) were not truly perceived until a few days before the Games when a host of problems almost triggered a bus system meltdown. Main problems dealt with untested and weakly managed bus depots, difficulties of pairing drivers and buses, substantial driver walkouts due to accommodation, food and other motives of discontent, lack of knowledge of Sydney road system and of Olympic routes, etc.

These bus problems occurred when most of the Olympic Family was already in town and when a lot of transport services were needed for training, media coverage and technical checks and fittings. The last week before the Games is the real test of organiser's abilities to react efficiently. As it turned out ORTA had the capability, in about 60 hours, to take all corrective measures for the bus system to recover and to work rather well during all the Games.

Heavy traffic congestion. Most feared by large event organisers and by ORTA, heavy traffic congestion just did not happen during the Sydney Games. The vast array of traffic management measures applied in Sydney worked extraordinarily well—even better than ORTA's specialists had hoped—during these weeks of full school vacation. Some estimates suggest a downtown Sydney average traffic decrease of about 20 % during the Games, which is far better than all previous attempts to cope with Sydney CBD traffic.

Sydney 2000 competition schedule and attendance estimates were used by ORTA to draw the 17-day profile of total Olympic ticketed spectator as shown by figure 5. The global travel demand profile is far from optimal since very high and expensive transport capacities must be provided just for the mid-Game peak. But the Sydney experience clearly showed that the gradual, day 1 to day 8, spectator traffic build-up was favourable to allow the transport system to catch-up and adapt itself to rapidly increasing spectator and logistical traffic loads.

7. LARGE EVENT TRANSPORT LESSONS FROM SYDNEY

The most significant and outstanding Sydney 2000 Olympics transport experiences can be developed around the following seven themes: transport managerial structure, public and private transport policies, support and logistics traffic, integrated transport-ticketing, transport and traffic management testing, Games time transport delivery, knowledge transfer and transport legacy.

7.1. Transport managerial structure : need for a strong integrated organisation

One major decision taken after the Atlanta Games was the creation of a special transportation body called the Olympic Road and Transport Authority (ORTA). The Olympic organising committee (SOCOG) delegated the entire Olympic transport task, from planning to Games service delivery, to a single public sector agency in charge of all transport modes (road traffic, bus and rail public transport, ferry, airport interfacing, etc) and all transport functions such as command, control, communications. This decision proved extremely worthwhile.

One strong and dedicated "public" agency integrating all Olympic transport functions for all client groups contributed significantly to the success of the Sydney 2000 Olympic transport operation.

7.2. Large event specific transport policies : strong reliance on public transport and strict control of automobile access

As a rule, successful large events generate high and dense spectator traffic loads in addition to usual urban and metropolitan traffic flows. Only efficiently performing transport facilities can handle these heavily peaked flows. Since urban and metropolitan motorways, expressways and boulevards are generally overloaded everywhere, only high capacity rapid transit systems are available to cope with special "large event" traffic loads. As a matter of fact, most recent large event traffic generators, such as newly built stadium or exhibition centres, are directly tied to one or more rapid transit lines or suburban heavy rail trunk or spur lines.

Connection of large event traffic generators to mass transit is an absolute must and should be a pre-condition for the development of all facilities above 50'000 seats. In Sydney, the creation of Olympic Park at Homebush was conditioned by the construction of a rail loop and a high capacity triple platform Olympic Rail Station. The Olympic Games could never have been organised there without this rail facility providing almost 80 % of total access capacity.

In absence of direct mass transit connection, large event sites of lesser capacity must be able to rely on efficient high capacity bus shuttle services hooked to mass transit interchange stations. In the case of the Sydney Games, both systems were used: direct mass transit service and indirect connection via high performance bus shuttle systems.

But experience shows that "boosting" public transport services is not sufficient to significantly change modal split patterns and public behaviour. Such policies must be accompanied by a simultaneous reduction of automobile accessibility, mainly by well-enforced localised parking restrictions. Operations of large event venues require substantial parking requirements for all support and logistic functions. Often the amount of remaining car parking potentially available for spectators is so small that a full spectator-parking ban is more effective. This was the attitude taken in Sydney where no spectator parking was provided at any Olympic venue.

First Games of the third millennium, the Sydney 2000 Games are also the first to have operated on a very efficient 100 % spectator accessibility by public transport. This successful "Sydney 2000 Olympic transport experiment" of more sustainable urban mobility will certainly show the way for other similar large event transport operations.

7.3. Crucial role of support and logistic transport functions

Large event spectators and visitors are defined as "front door" traffic. All support and logistic functions are considered as "back door" traffic, an essential but often underestimated part of large event operations.

In Sydney more than 150'000 accredited personal of all categories (athletes, media, Olympic officials, workforce, volunteers, etc) were active in Games delivery. Compared to peak daily attendance of about 500'000 ticketed spectators, the support and logistic transport tasks were truly considerable. They amount to about a third of the whole operation in terms of travel demand quantity, but are substantially more in terms of transport resources because of higher reliability, scheduling and punctuality requirements. One thousand late spectators are embarrassing, but late arrival of a single athlete, a competing team or of technical officials

handling the event is unacceptable. Therefore logistic transport is often the largest cost item of the transport-operating budget.

Support and logistic traffic functions (including security, medical, etc) are of critical importance for large event delivery. They tend to increase the complexity and magnitude of the whole transport operation. They require the highest level of traffic priorities to improve their reliability—an essential component of large event success.

7.4. Advantages of Olympic ticketing integrated with public transport

In Sydney, all Olympic ticketed spectators had free use of Olympic public transport services on the day of competition. The same applied to the Olympic family and almost all accredited support and logistic personals.

Linkage of event tickets with public transport access to venues is the strongest possible incentive for public transport use. Moreover this measure makes sense from an operational point of view. Indeed very dense public transport conditions make it almost impractical to control transport tickets on Olympic venue arrivals or departures. Any ticket control would be counterproductive in terms of transport throughput when rapidity and capacity are most needed.

Full inclusion of public transport fares in Olympic venue tickets proved to be a very efficient, attractive and convivial way of handling spectators. This system induces substantial savings in transport operations and ticketing controls. This innovative type of measure might be trend setting for other large events.

7.5. Decisive contribution of pre-Olympic transport testing for Games transport operation success

Complete testing of very large events such as the Olympics is impossible due to the fact that the full organisation is only in place the day of the Opening Ceremony. Large scale testing is also extremely expensive. Sydney 2000 is certainly one of the most “pre-tested” Olympic Games, not only in the sports domain, but also in the transport operation sector.

The basic reasons for the emphasis on transport testing were fivefold:

- Ground validation of innovative mobility policies such as the key “event access by public transport only”.
- Olympic transport managers and operative personal learning and training in command, control and communication processes.
- Public relation and communication developments around the simple message “ Olympic transport will be different but will work well”.
- Building-up and improving transversal integration of functional sub-systems like transport, security, ticketing, accreditation, and human resources management.
- Assembling know how for contingency identification of “what can go wrong?” and “how to cope with it?”.

Drastic changes of usual spectator mobility patterns as required by the Sydney 2000 Olympic transport scheme could only be validated by large popular event testing. Although testing cannot duplicate real Games operational conditions, it remains an

essential tool to consolidate transport management know how and to build up contingency capabilities.

7.6. Main Games time transport delivery features

After solving the bus crisis the week prior to the Games, Olympic transport operations went smoothly throughout the Games. The traffic load pattern grew in magnitude from day 1 to mid-Games (days 8, 9 and 10) when a maximum of approximately 500'000 daily ticketed spectators had to be transported simultaneously to more than 20 venues. The five outstanding features were:

- Smooth arrivals and departures through Sydney Airports (both international and domestic) due to streamlined and well co-ordinated SOCOG-ORTA-SYDNEY AIRPORT operations.
- Overall ”real time” command and control of the transport situation through the Sydney Transport Centre handling jointly the general traffic situation (RTA, Road and Traffic Authority control centre) and all Olympic transport sub-systems (Olympic bus, lines, shuttles, Cityrail, etc) run by ORTA.
- Successful Travel Demand Management (TDM) program which resulted in a sensible Games time decrease of general traffic in Sydney. This was largely obtained through a long, patient and well-oriented pre-Games communication campaign aimed at general citizens, potentially affected residents, local commerce and large businesses.
- The significant contribution of thousands of volunteers in transport operations including spectator and general public guidance.
- Metropolitan media (newspapers, radio and TV) excellent “real time” Games communication efforts. The constantly updated and well-documented ORTA transport information was accurately and particularly well transmitted to the general public.

Sydney 2000 demonstrated that successfully moving half a million Olympic spectators on peak Game days was possible by utilising public transport resources to their limits and by reducing general traffic through an appropriate travel demand management and public communication plan.

7.7. What Olympic Games knowledge transfer and what transport legacy?

Olympic Games are unique by their magnitude and by the complexity of simultaneous operations of 28 sports involving 300 competition events, 11000 athletes, 150'000 accredited personals and about 7'000'000 ticketed spectators. But Olympic Games are also repetitive on different sites every two years as are other large scale multi-sports events.

To take maximum advantage of Sydney’s Olympic experience and to allow the best possible transfer of knowledge, the IOC has acted in two directions:

- Contracting SOCOG and related agencies like ORTA to prepare more than 100 TOK (Transfer of Olympic Knowledge) manuals covering all functional aspects of the Games.
- Sending a 30 person observation team to Sydney to cover all key aspects of Games operations. The assembled material has been grouped with the output of a Sydney 2000 de-briefing Seminar held in Athens one month after the end of the Paralympic Games (see bibliography).

In addition to IOC's work, comprehensive Sydney 2000 monitoring was logically conducted by Athens 2004, the next Summer Olympic Games organisers. Many other organisations, including the 2008 Olympic Games candidate cities, had also their own observation programs.

Development of high quality sports facilities in Sydney will probably be considered as a major metropolitan legacy of the Sydney 2000 Games. From the transport standpoint, the improved capabilities of Cityrail and related public transport to efficiently accommodate very large passenger crowds is a positive legacy. More sustainable mobility patterns for very large cultural, musical or sports events at Olympic Park and elsewhere in Sydney will benefit from the Olympic experience.

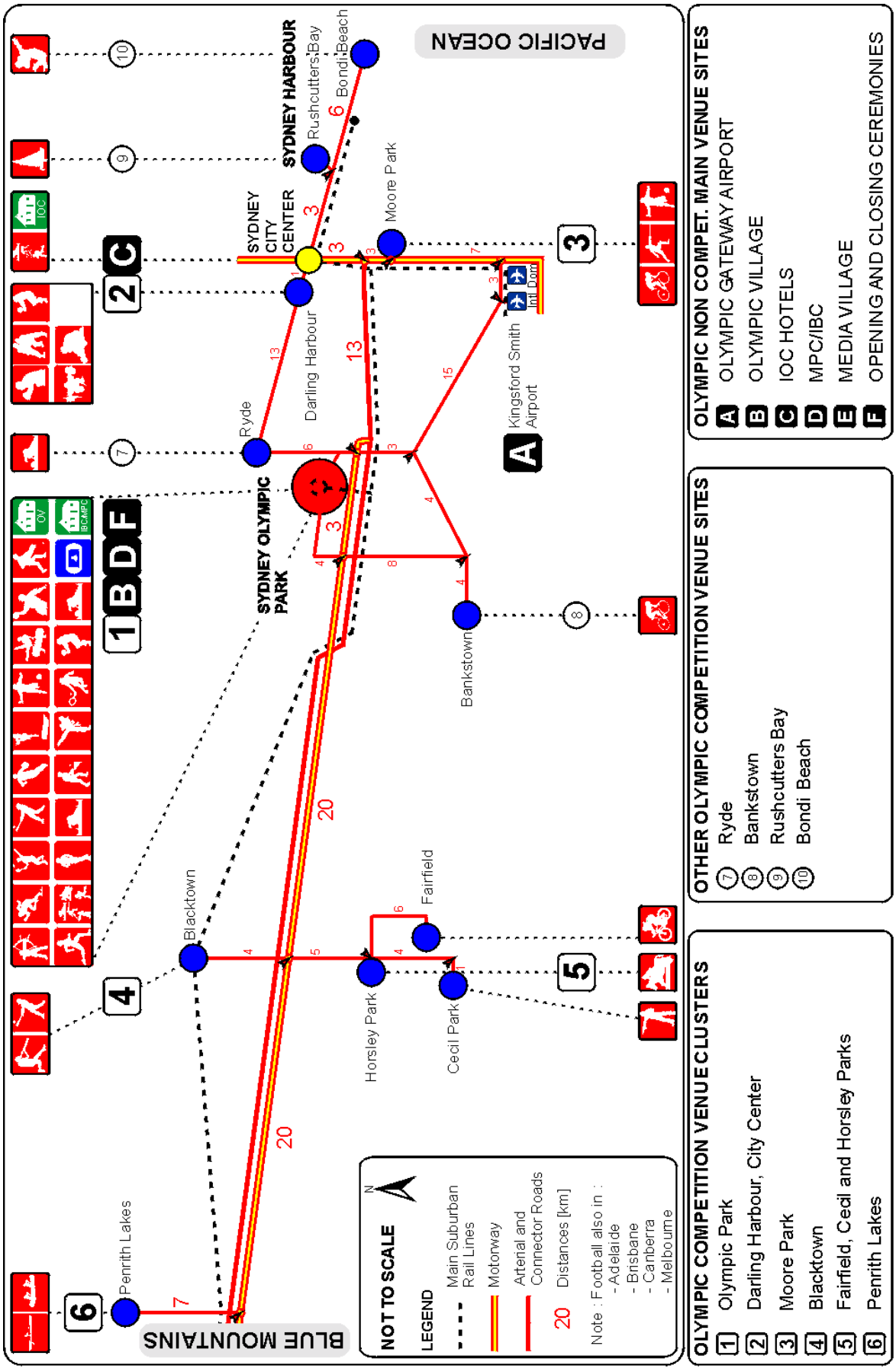
Considered "the best organised Olympic Games ever", the Sydney 2000 Games offered an extremely worthwhile "real scale laboratory" for large sports event organisation as well as for specific domains like transport where innovative and more sustainable mobility management schemes were successfully experimented and applied.

Figure 1: Sydney 2000 Olympic Games in numbers

1. Games duration (DAYS)	**Numbers**	**TOTALS**
Olympics (Opening+16)		17
Paralympics		11
Total Games operational length		60
2. Sports and events		
National delegations (NOC)		199
Number of Olympic sports		28
Olympic Disciplines		39
Competition events-Total		300
*Men's events	168	
*Women's events	120	
*Mixed events	12	
3. Games participants		
Athletes and team officials - Total		18'400
*Athletes- Men	6'700	
*Athletes- Women	4'100	
*Team Officials	7'600	
Technical Officials		2'300
IOC		1'500
Accredited media – Total (approx.)		19'800
*Journalists and photographs	5'300	
*Right holding broadcasters	11'000	
*Host broadcasters	3'500	
Volunteers (approx.)		41'000
Workforce (approx.)		103'000
Ticketed spectators (approx.)		8'000'000
4. Games spatial layout (FIGURE 2)		
Competition venues		32
Competition sites (single and clusters)		13
Non-competition venues		25
Training venues (including 17 inter. Football)		55
5. Security		
People screening- Total		6'900'000
*at Olympic village	900'000	
*at Olympic Park	5'500'000	
*at other Olympic sites	500'000	
Vehicles searches		250'000
6. Olympic Transportation		
Olympic bus fleet		3'850
Olympic car and van fleet		4'700
ORTA staff Pre-Games (permanent in 2000)		230
ORTA Games time staff (incl. volunteers)		12'100
7. Games Attendance (TICKETED SPECTATORS, FIGURE 5)		
Total ticketed spectators (Sydney + interstate)		8'000'000
Peak daily overall attendance (Sydney-tick.sp.)		500'000
Peak attendance at Olympic Park (with visitors, sponsors, support and logistic personals)		600'000
Olympic venue average capacity usage	92 %	
8. Games cost and financing		
Total Games budget (million AUS$)		2'400
Net operating Games budget (million AUS$)		2'000
Approximate revenue share		
*TV rights	47 %	
*Sponsors	28 %	
*Ticket sales	22 %	
*Others	3 %	

Note :
*section 3, all values are rounded off to +/- 100
*sections 5 and 7, all values are rounded off to +/- 50'000

Source :
- SOCOG, ORTA, IOC-Transfer of Knowledge Seminar, Athens November 2000



EPFL/PR/22.1.01

Fig. 2 : Sydney 2000 Olympic Venue Spatial Layout and Metropolitan Transport System

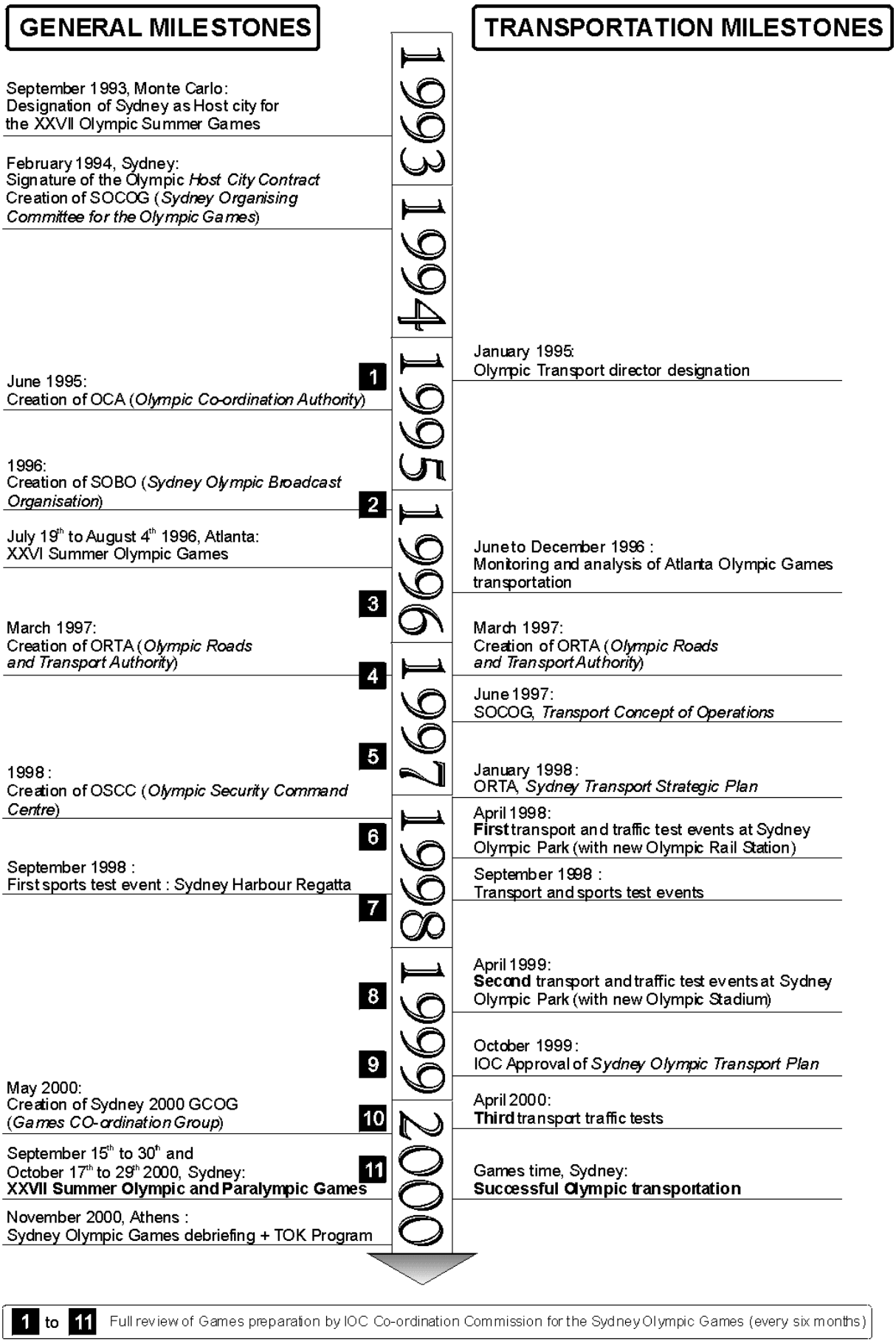


Fig. 3: Sydney Games Organisation Milestones 1993 - 2000

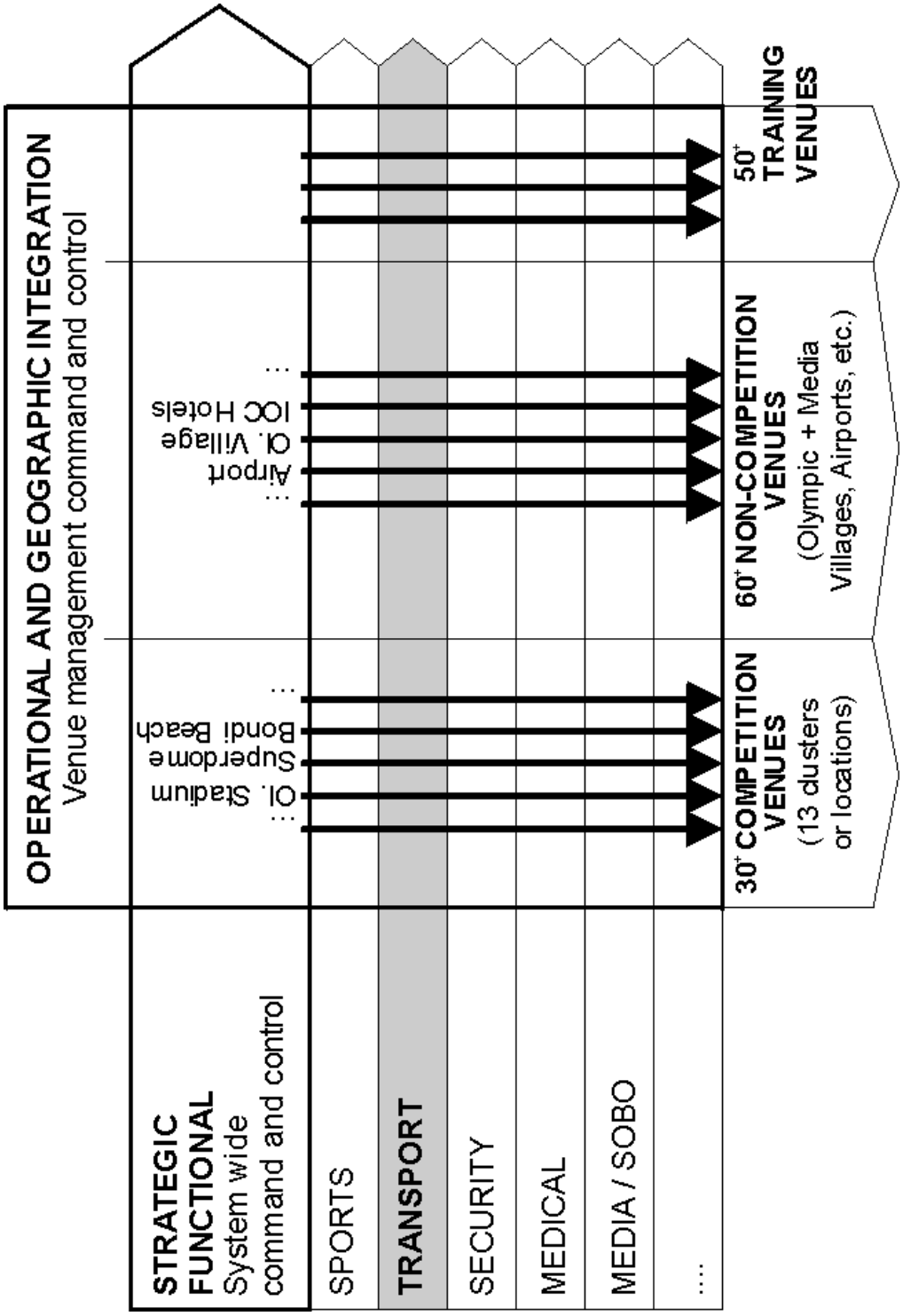


Fig 4 : Integration of Games Functional Systems and Venue Operation and Management

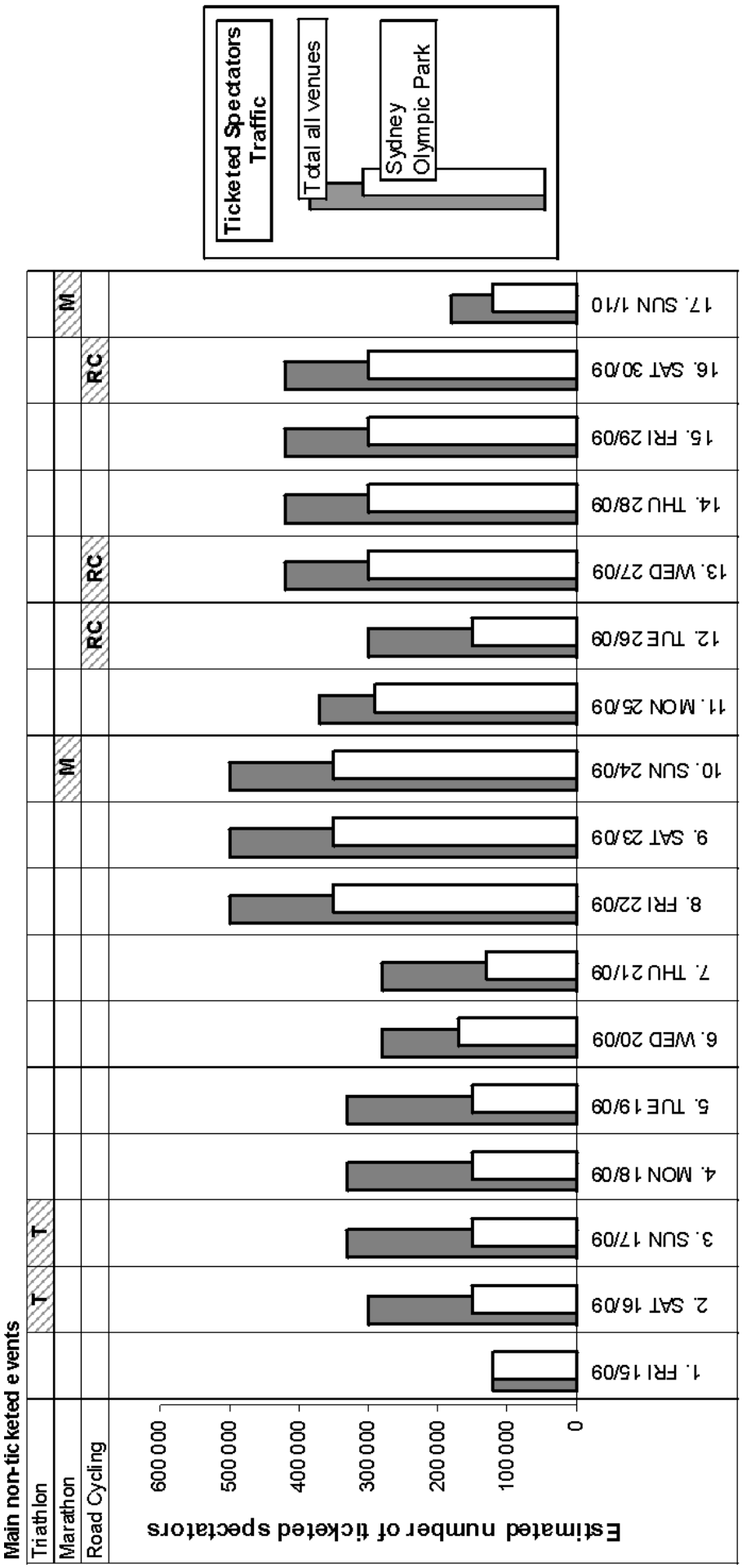


Fig. 5 : Indicative Daily Ticketed Spectator Travel Demands (without sponsor, logistics and non-ticketed visitor traffic)