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TRANSPORT AND EXCEPTIONAL PUBLIC EVENTS

ROUND TABLE

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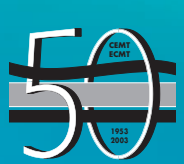


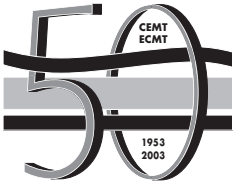
OECD

ECONOMIC RESEARCH CENTRE

REPORT OF THE
HUNDRED AND TWENTY SECOND ROUND TABLE
ON TRANSPORT ECONOMICS

held in Paris on 7-8th March 2002
on the following topic:

TRANSPORT AND EXCEPTIONAL PUBLIC EVENTS



EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT

EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT (ECMT)

The European Conference of Ministers of Transport (ECMT) is an inter-governmental organisation established by a Protocol signed in Brussels on 17 October 1953. It is a forum in which Ministers responsible for transport, and more specifically the inland transport sector, can co-operate on policy. Within this forum, Ministers can openly discuss current problems and agree upon joint approaches aimed at improving the utilisation and at ensuring the rational development of European transport systems of international importance.

At present, the ECMT's role primarily consists of:

– helping to create an integrated transport system throughout the enlarged Europe that is economically and technically efficient, meets the highest possible safety and environmental standards and takes full account of the social dimension;
– helping also to build a bridge between the European Union and the rest of the continent at a political level.

The Council of the Conference comprises the Ministers of Transport of 42 full member countries: Albania, Austria, Azerbaijan, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, FYR Macedonia, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Netherlands, Norway, Poland, Portugal, Romania, the Russian Federation, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine and the United Kingdom. There are six Associate member countries (Australia, Canada, Japan, Korea, New Zealand and the United States) and two Observer countries (Armenia and Morocco).

A Committee of Deputies, composed of senior civil servants representing Ministers, prepares proposals for consideration by the Council of Ministers. The Committee is assisted by working groups, each of which has a specific mandate.

The issues currently being studied – on which policy decisions by Ministers will be required – include the development and implementation of a pan-European transport policy; the integration of Central and Eastern European Countries into the European transport market; specific issues relating to transport by rail, road and waterway; combined transport; transport and the environment; sustainable urban travel; the social costs of transport; trends in international transport and infrastructure needs; transport for people with mobility handicaps; road safety; traffic management; road traffic information and new communications technologies.

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The ECMT's Documentation Service has extensive information available concerning the transport sector. This information is accessible on the ECMT Internet site.

For administrative purposes the ECMT's Secretariat is attached to the Organisation for Economic Co-operation and Development (OECD).

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Further information about the ECMT *is available on Internet at the following address:*
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TRANSPORT AND EXCEPTIONAL PUBLIC EVENTS

SUMMARY

Berlin, November 2001

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Berlin, November 2001

1. WHAT GIVES LIFE TO AN EVENT

Exceptional public events, such as the wrapping of the Reichstag in 1995, the 2000 New Year's Eve Party or the Love Parade, are special occasions providing a source of fascination and of friendships. But for many planners they are a source of amazement. Over a million people get together, most of them in a strange location, celebrate in a confined space and enjoy a sense of community in total anonymity. Music, alcohol, drugs and frenzied activity play an important part in the process. For the most part, the participants are put up for the night and everything goes well. There were 5 million visitors to the wrapping of the Reichstag, 2.5 million to the 2000 New Year's Eve party in Berlin and 1.2 million to the 2000 Love Parade. There was nevertheless only one fatal traffic accident at each of the last two events and in each case - cynical though it may sound - the victim was at fault: one of them got off a train on an open stretch of road and the other was killed "surfing" on the roof of a train.

This kind of harmony between millions of people is the result of countless actions and reactions on the part of the participants, i.e. a constant series of evasive, compensating or rescuing actions. Above all, the context was one of goodwill on the part of all concerned. This is why it is so important to maintain a good atmosphere. Since such an atmosphere cannot be imposed by force, the unifying message is essential, the guiding idea which motivates and arouses a willingness to join together and to remain together.

In this respect an event represents a relatively stable routine, a robust organism or a pattern that prevails for a period of time[1]. An equilibrium of this kind works in the same way as a candle flame, a coalition government or a tropical rain forest. All three owe their stability to the permanence of the essential conditions and to a continuous flow of inputs and outputs. The essential conditions of an event include rules of play, theme, participants, location, time and planning. The inputs to an event are material and immaterial. Material inputs provide for marketing, advanced funding, available infrastructure, food and drink, mobility, alcohol and drugs. Immaterial inputs produce artists, organisation and communication, a good mood, feelings of joy and happiness, co-operation and respect, the pleasure a planner takes in his work or the reassuring certainty that comes with visible power. This mood spreads unconsciously and assumes greater strength as it takes the form of a growing enthusiasm. In the end the event can still only be understood as a whole that is much more than the sum of its participants, stars, planners and organisers. At that point all these people are no longer acting independently but – assuming that the current passes between them – as if they had made arrangements in advance. Creating this sense of "us" is the planners' goal and guarantee of safety.

But with events – as with any equilibrium – some of the parameters lie on the borderline. Planners, managers and organisers must therefore remain wide-awake even when the events are familiar. In such borderline situations, spontaneous fluctuations or minor external influences can cause this equilibrium to operate at a new level or they can produce chaos. Power-cuts or fireworks in the crowd, the tram station with just one staircase, the increasing aggressiveness of tired, drunken ravers without women, the use of unlit paths through parks by great numbers of pedestrians when the

trams have stopped running - any of these factors may destabilize the situation. Identifying these critical areas, keeping them in view and exercising an influence on them requires experience and planning. Above all, an event is a joint achievement on the part of those involved in a practical sense.

2. WHAT DO WE MEAN BY "EVENT" NOWADAYS?

The size of an event is measured in terms of its physical volume (the number of participants or visitors, the space needed), the amount of money involved (capital committed, earnings) and/or its sociological-psychological significance (image, publicity). These aspects are connected in a great many ways (Schneider, 1993: 120). Thus, on the basis of the number of participants, it is possible first of all to distinguish between small-scale, medium-sized and exceptional public events. Small-scale events are recreational functions of local significance, requiring little preparation (such as a street party with 2 000 participants). Medium-sized events are large interregional functions, requiring longer preparation (such as a regional garden festival or a federal league match with 50 000 visitors). Finally, mega-events (special events, hallmark events) are spectacular national and international showcase events with a correspondingly longer preparation time (such as the wrapping of the Reichstag in 1995 with 5 million visitors to Berlin, or the 2000 New Year's Eve Party with 2 million). The 1987 Congress of the International Association of Scientific Experts in Tourism (AIEST) defined major events on the basis of the number of visitors (1 million), the amount of money involved (750 million DM) and its psychological assessment ("must see") (Marris, 1987: 3). Crucial factors here are the theme of the event, the local conditions and the distribution of demand over time.

Central to the following presentation are the mega-events in Berlin and the factors in their success. Since major events first and foremost provide opportunities for the participants, organisers, planners and hosts, it is important to understand and apply their internal logic.

Major events first of all attract great numbers of people and last only a short time (days, weeks, a few months). For this reason, Mecca, Neuschwanstein, Disneyland and leisure parks are not "events" but permanent travel destinations. The Nürburg circuit, on the other hand, only becomes an "event" when motor races are being held.

Major events require the physical presence of the participants. It follows that the moon landing, when millions throughout the world spent the night in front of the television, was not an "event".

Major events draw people from many areas. This makes the long journeys by the public to and from the event an important occasion for anticipation and common experience and, to some extent, an important part of the event.

When events take place, output and consumption coincide and last only a short time. For this reason, the long period of preparation, the extremely short period of the actual "staging" of the event and the short "post mortem" period are among the unusual features of event planning. Since the atmosphere of an event cannot be preserved for the future, it has to have been experienced directly. Demand peaks (and overcapacity) therefore arise in the classic way.

Major events are packages made up of goods and services. The bulk of the demand is for ancillary services, such as accommodation, catering, transport and further attractions and not for the event itself. For this reason, the event is complemented by its environment (and the venue's amenities and capacity).

Access roads are not designed to cater for major events, nor are extensive parking areas available. Huge commercial events are therefore usually held in places designed for the transport of large numbers of people. Thus, the less accustomed the venue is to major events, the more serious is the effect of such events on the flow of traffic.

From the point of view of those affected, major events are mostly welcome and participants come of their own free will. For traffic planners, however, even state-sponsored mass events are, first and foremost, occasions when traffic has to be brought under control and, from a purely technocratic point of view, hardly to be distinguished from holidays.

When major events take place, the total number of visitors is less important than the ratio of visitors to the resident population of the venue. In large cities, therefore, the number of visitors should be seen in relation to the number of inhabitants of the urban district where the event is held.

Major events are goal-orientated, predictable and planned. Since major events represent an essential factor in the marketing strategy of cities, regions, nations or international entities, "catastrophe" tourism, unforeseeable natural events and spontaneous protests involving many people are not "events" of this kind. The characteristics of major events nevertheless lend themselves to miscalculation.

From our transport perspective - geared to the present - non-violent, mass celebrations are the main focus of interest. For this reason we do not regard revolutions, wars or the "days of chaos" in Hanover as "events", even though they might seem to be from the standpoint of those taking part.

Major events have a message. People talk about a remarkable event before it has taken place. The central ideas are promoted and have a transcendental dimension. The object is to arouse emotions and to create something unique, something that cannot be repeated. A characteristic feature is the promotion of the act as the joint creative work of different groups. Symbols are a necessary part of this, as the opening ceremonies of the Olympic Games demonstrate.

The journey to a major event helps prepare participants for the experience: a sense of anticipation about the event and the group, coloured by fantasy and romance, the travel scenario as something out of the ordinary, planning and making the journey as a "group experience", difficulties and strains as an occasion for overcoming crises and for bonding... (Schmidt, *inter alia*, 2000). High expectations of an event in terms of the experience it offers, the combined effects of emotions and physical strain, the enthusiasm, may quite easily be promoted by the additional experience of the journey to and from the event by the vast numbers involved. This applies to a considerable degree to "oldies"‟ and bikers' functions.

Essential to a major event is the enthusiastic crowd, the mass participation and this aspect of the festivities is consciously sought. To a certain extent, it would be true to say "the bigger, the better". Mass enthusiasm and the planning thereof is a key element in major events. Whether "church day", world championship, open air concert or Christopher Street Day, events should motivate, encourage and reinforce the views of participants.

Compelling major events produce a lasting general impression, a memory of something unique, special, a wonderful mood, the sense of having been present at something not to be forgotten in the whole of one's lifetime.

As a result of external effects, major events are the source of economic benefits *par excellence*. "Short-term madness may be long-term sense" (Lynch in Schneider, 1993: 225). Behind this is the combined effect of otherwise disparate actors, places and interests. Since events are still mainly social phenomena, economic parameters are not adequate to the task of describing them.

3. STRUCTURAL TYPOLOGY OF EVENTS FROM THE TRANSPORT PLANNING STANDPOINT

Specialisation by theme is one of the hallmarks of the events scene. Since every event stemming from sport or the youth scene, culture or politics is something special, available remedies must, above all, be adapted to the specific theme, the location and the visitor structure. For the transport planners, however, the spatial and temporal co-ordination between the available transport supply and the expected transport demand is central. From this pragmatic angle, the following ten structural types cover the bulk of the real variants.

The *old-town festival* type mainly takes place within a compact area – such as the marketplace – of the (mostly traffic-free) inner city. Common in both large and small towns, the *Christkindlesmarkt* in Nuremberg is a typical example of such events.

The *procession* type (also the marathon and cycle race) is a mobile event along part of the road network, closed to other traffic. Participants move on foot, on mechanical conveyances (such as cycles, inline skaters) or on motorised floats (as in the Carnival and the Love Parade). In addition to the festivals referred to, Christopher Street Day, the Tour de France, Blade Night or state visits are typical examples.

The *political rally* type consists of a collection of large numbers of people in a public square, usually centrally located. The traffic is directed around a central axis by available urban express trains and bus lines. Many processions also end with an address given in a public square. It is particularly difficult to deal with rallies where demonstrators arrive from different points and are likely to cause a bottleneck at the point of destination. Typical examples are the Mayday rally in Berlin with columns walking through the street to the Reichstag or the spontaneous rally on the John-F.-Kennedy-Platz after the events of 11 September.

The *trade fair (or exhibition)* type is an event on a permanent site provided for the purpose, usually with exhibition halls and located on the outskirts of the city. Such sites are normally only found in large cities and can be reached by public transport or by car, for which there is extensive parking space. They tend to cater for a distinct type of visitor and typical examples are the Expo, as well as various festivals and pop concerts.

The *fairground* type is an event on a permanent site specially provided for the purpose, which is usually located in the outer part of the city, though not on the periphery like the site of a trade fair. It

is therefore mainly accessible by public transport rather than by car, since extensive parking space is lacking. It attracts a wider range of visitors. Typical examples are public and municipal festivals, such as the Munich *Oktoberfest* on the Theresienwiese.

The *stadium* type refers to events held in permanent, purpose-built, securely enclosed sporting centres, with covered facilities and infrastructure, mainly located on the periphery of a city. Accessible by public transport and also by car, for which extensive parking space is provided (though not in Berlin), extreme demand peaks arise as a result of the fixed starting and finishing times. The diverse mix of visitors and their potential for destructive behaviour are further features. Typical examples are football championships.

The *church/catholic day* type covers events held over several days at a number of different points in the city. They consist both of major central functions on large public squares and also of numerous individual functions away from the centre. For events outside the centre, a trade fair site is usually part of the arrangements. The participants are mainly from other localities. This is why there is a marked demand for public transport, geared to available city express trains and scheduled bus services.

The *garden show* type is an event held on hitherto either neglected or agricultural land. It is frequently linked to new public transport lines and urban renewal. For this reason it also takes place in small towns, dormitory towns and residential areas and attracts a wide range of visitors. Typical examples are the *Bundesgartenschau* (BuGa), the *Landesgartenschau* (LGA) and the *Internationale Gartenbau-Ausstellung* (IGA).

The *windjammer parade* type is an event on waterside roads and adjacent spots, used as vantage points for watching ships and boats. The main problem is the parking space needed here. At the same time, a major framework programme, with a particular bearing on traffic, is now underway. Typical examples are Hansa Sail in Rostock, Kiel Week and "The Rhine in Flames".

The *Woodstock* type refers to an event held in green fields in the peripheral zone without permanent facilities. Often associated with camping, access to the events tends to be geared to car drivers or motorcyclists. The main dangers have to do with the overloading of small towns and villages, problems associated with rain-drenched ground and the devastation of the site. Typical examples are bikers' meetings and open air concerts, as in Roskilde.

4. THE CENTRAL, INTERMEDIATE AND OUTER TRANSPORT ZONES OF AN EVENT

At a deeper level, a spatial structuring of the areas surrounding an event into central, intermediate and outer transport zones (*Kern-*, *Mantel- und Fernverkehrszone* – Gottschalk, 2000) seems to make sense from the planning point of view[2]. The extent of these zones may change completely for different events held in the same urban area and for events held at several local venues on different days.

The central zone is the actual site of the event. It would normally be reached on foot, even though – as in the case of the *Karneval* or the Love Parade – floats moving at walking pace are part of

the event. In other words, motorised traffic leaves the way open to the crowds of pedestrians. This applies notably to private cars but cycles, wheelchairs and pushchairs are also frequently forbidden in the central zone. In the case of sporting events, such as road racing, motor racing or Blade Night, as well as football matches, the central zone is further divided into the contestants' zone and the spectators' zone. The demarcation of the central zone of an event does not present a problem for many of the structural types (such as the *Altmarktfest*, the garden show, the stadium event, the church day, the trade fair and the events on the green festival site). If an entrance fee is charged, the perimeter is fenced off. More problematic are the procession, rally, windjammer parade and Woodstock-types of event.

The intermediate zone is bound by the city train and underground stations, from which visitors set off on foot or by bus to the central zone. Buffer zones are essential for the purposes of separating the crowd of visitors from the central zone, selecting or redirecting groups of visitors, providing an escape zone in the event of panic and ensuring that streams of visitors go in the right direction. Above all, when it is all over, the way back from the event is more critical than the way to it. The way to the event leads away from the bus-stops and stations, but the way back produces a blockage. For this reason, participants can and should be driven to the site of the event but they should be provided with a longer footpath for the way back[3].

In the outer transport zone, the incoming traffic is intercepted and brought together. For this reason, this zone would normally encompass all intercity railway stations and airports used by those coming to and leaving the event, as well as the outer rings of the motorway and railway, with extensive park-and-ride facilities and shuttles to the site of the event. If the inner city area is to be freed for public transport and delays are to be avoided through very frequent successions of trains, intercity and regional traffic may run only as far as a ring of suburban stations. The shuttle and distribution functions are then taken over by the city railways and underground. This zone too - depending on the event – is of concern to the police, in that, for example, undesirable participants (such as hooligans or terrorists) may be intercepted there.

5. THE PLANNING PROCEDURE FOR EVENTS IN BERLIN

5.1. Planning from the point of view of the event organisers

Every event has its own history and many models of commercial success began as small protest demonstrations (e.g. the Love Parade, Christopher Street Day, Blade Night). One-off major events (such as the wrapping of the Reichstag) tend to be exceptions. Accordingly, the successful structure of mega-events is chiefly due either to lessons learnt or to preparation over several years. Above all, the planning of events comprises different phases and fields (Freyer, 1998).

The concept, the market and the funding are central to the feasibility-study phase of an event. Since managers of events are ideologically free, modern, profit-orientated technocrats, the decision made in Berlin whether to license an event as a political demonstration or as a commercial function has hitherto been one of the most important matters. Policy orientation also calls for preliminary talks with the Senate (Weiss, 2001).

If the balance of opportunities and risks presented by the event vindicates the organiser and his choice of location, the planning and licensing phase begins. In this phase, the imagined idea becomes the authorised plan. The objectives of the event are defined and a planning organisation is established. This planning group includes a company as sponsor, whose legal status limits liability, facilitates funding and offers fiscal advantages. Contact is made with all those involved: partners in the event, public authorities and officials, safety departments, transport planners, electricity and water authorities, agencies responsible for refuse disposal and the provision of sanitary facilities, insurance companies and other parties. Prognoses, scenarios, basic data and plans for all aspects of the event, reservations and problem areas are presented, co-ordinated and finally authorised.

In the implementation phase, the plans are realised. Management and marketing are central. The "post mortem" phase covers the evaluation of the effects, media policy, control and assessment. After the successful conclusion of the event, the results need to be exploited through media and public relations work. This work serves notably to promote the image of the city and the actors. Assessment of the results should be conducted, *inter alia*, through visitor surveys, evaluation of hotel guests statistics and "expected/actual" comparisons.

One of the peculiarities of the scheduling of an event is the long period of preparation, the extremely short period of the actual "staging" and the moderate period of assessment. In the planning phase, the deadlines for the authorisation process must be observed. The organisation plan aims to promote co-operation between all involved, in order to create a sense of "us". Measures are taken to win customers and gain support for artists. It is customary to establish an organisation committee representing all groups. Since event management is typically also called harmony management (Meyer, 1998: 254), professionalism is emphasized. The basic principle is to confine people to what they are good at and to buy-in additional expertise. For this reason, an early decision in favour of a full-time event management team rather than one made up of voluntary or part-time members is important.

The different phases in the event, with their different demands, call for dynamic personnel planning. Usually, there is a small planning board providing co-ordination and promotional and public relations work is allocated to agencies. Voluntary assistants play an important role and help shape certain events, such as church days, through their involvement. At the same time, they keep costs low.

The financial planning is shaped by the decision of general principle on whether the event in question is a private sector function, whether the public authorities (federal, state, district, municipal) should bear the costs owing to the public importance of the event, or whether the event should be funded from both sources as a public-private partnership. Ticket sales, sponsorship, starting funds, catering, franchising and selling merchandise serve to cover the cost of privately-funded events and to fill funding gaps. This leads on to the authorisation process.

If, on account of the nature of their appeal to tourists, certain mega-events are authorised as political demonstrations (in the sense of the law on assembly), as has been customary in Berlin in recent years, the State takes on considerable responsibilities as a service provider, but also restricts the organiser's opportunities for making profits. The precise significance of this point for the degree of harmony between the organiser and the venue of the event is clear from the conflict between the organisers of the Love Parade and the Berlin Senate in 2001. At this stage, the authorisation process also covers the remaining contractual agreements between sponsors, artists and the GEMA (association for musical performance and mechanical reproduction rights) and extends to personal liability insurance and indemnity bonds.

Since services cannot be stored up for later use, the sales plan adopted before the event takes on particular importance. The entrance ticket automatically entitles the bearer to benefit from the services provided at the event. A package comprising different aspects of the event is on offer and may be reserved in advance (event packaging). Such packages include one or more events, travel to and from the event, local travel, food and lodging. As with the combined ticket, a more modest range of services is also possible.

5.2. Event planning from the transport planner's standpoint

The transport planner tries to estimate traffic flows. Logically, this process involves: (1) goods and passenger transport to and from the site of the event (setting-up and dismantling); (2) visitors' travel to and from the event on intercity and regional transport; (3) visitors' travel by city transport services to and from the main site of the event or other sites located away from the main site; (4) passenger transport at the site of the event; and (5) supply traffic to and from the site of the event. The resulting traffic relationships can be listed in matrices. The traffic flows can then be worked out on the basis of raw data (e.g. participants, visitors) and contributory factors (such as the beginning and end of the event), such information being provided by the organiser and considered in relation to the transport networks (roads, public transport). This process yields initial estimates, from which it is possible to identify problem situations. Reports on experience with earlier or similar events are very helpful. In practice, transport planning for major events in Berlin is the responsibility of the police and is characterised by broad, common-sense rules, procedures and principles.

In the next phase, the planner tries to ascertain the maximum capacity of the available public transport networks (roads, railway lines, stations, stairways, passageways) and lines. Such a review of capacity takes account of approach and escape routes and – depending on the size of the mega-event – of any small alternative events, which may be associated with the main event or may be in competition with it. The planner must then rely on the help of the operators, the police and other planning authorities.

Comparison of the expected transport demand and available supply and capacity reveals insufficient capacity and the prospect of bottlenecks. Closing these gaps with a range of measures and avoiding potential bottlenecks constitutes the creative work of the transport planner. It can only be carried out in co-operation with the police, local representatives, the public transport authorities and transport companies. The main objective is to show that the extra traffic generated (event traffic) will not bring normal traffic to a standstill and that the city will remain operational. For this reason, the transport planner must be concerned to promote a modal split with a high proportion of public transport (Meyer, 2001). At the same time, the transport costs of the participants may be reduced through the availability of combined tickets or special tickets with high discounts. This increases the attractiveness of events, raises the number of participants, relieves the burden on parking space and lowers the amount of traffic seeking parking space. Furthermore, there is a fall in the number of complaints from residents who remain in the town during the event.

The fact that local public transport shoulders the main burden of transport for the event is natural, even in Berlin[4]. Organisers and administrators of stadiums or sites try to ensure that combined tickets are available where there is an entrance charge for the event. There is more of a problem in the case of open mega-events with no entrance charge, whose benefits accrue to the city as a whole. In the case of the latter, the agreement between the Senate and the BVG (Berlin transport operator), given the latter's substantial deficit, is interpreted in such a way that the city must assume the extraordinary demands and the sometimes very high additional costs that arise. The BVG and S-Bahn GmbH not only maintain their own transport management arrangements for major events, but also make their

own plans for the bus, underground and tram services required for the event. These mainly consist in adapting the frequency of the service, extending the operating time, reducing the rest period, closing the nearest overfilled stations, transferring stops and rerouting lines, as well as issuing special day tickets. The public and individual transport planning for the event in question is actually integrated by the event's organiser, the operational planning department of the traffic police division, the co-ordination panels of the licensing authorities and the public transport operators, acting in their own interest.

Central to the transport plan for road traffic is a road-sign plan, which provides the information needed on road closures and gives directions. Since it shows stations, bus-stops and bus routes, including all changes that have been made, it also covers public transport. If this system of planned measures is to be implemented, preparatory measures are necessary. Thus, for example, application must be made for putting up signs and blocking off roads so that measures with particular consequences for the local community may be rejected.

Then the actors (such as the participants, residents, road-users, employees) need to be informed. To this end, circulars are sent to the residents of roads that are to be closed, leaflets are attached to the windscreens of parked vehicles, information is given to shopkeepers about changed delivery times, discussions are held with employees about extended working times and talks are held on the action required for the purpose of training employees and voluntary helpers.

For this broad range of tasks, private transport planning offices are particularly well-suited. The post-war history of Berlin shows how the police were forced to assume the role of transport planners[5]. It also explains why organisers of mega-events in Berlin still show little interest in the way their visitors get to Berlin. Thus plans for long-distance travel are made by the railways and airlines, plans for local travel by the Berlin public transport operators (BVG) and plans for road travel by the police, who also monitor the plausibility of all the other plans[6].

5.3. Event planning from the standpoint of transport management

In Berlin, the implementation of transport planning is in the hands of the transport police at the police headquarters of the urban district concerned. The basis of their work is a traffic guidance plan for the event in question (Schipper, 1994; Bürgin, 2001). This plan comprises six elements: (1) critical examination of the established traffic levels; (2) accommodation of vehicles; (3) routing of event traffic; (4) measures to accelerate traffic; (5) measures to divert traffic; and (6) closing roads to traffic. This results in four sub-plans: the routing, parking, acceleration and road closure plans (comprising diversion and closing off).

The essential point is the testing of the plan. With regard to the time and the persons involved, this testing is part of the authorisation process and begins with a hearing granted to the organiser. The projection values used for the major Berlin events and the associated modal split are derived from events that have become established and have been determined and assessed by experienced police officers in their own area of operation. Theoretically then, the expected number of vehicles (cars, coaches) would either have to be accommodated in the area close to the event, or contained in park-and-ride parks on the periphery of the city. However, when a large, extensive city hosts a major event lasting from one to three days, it is not readily assumed that the vehicles will spread themselves out (or will even use the parking space left by the region's commuters at weekends). Large streams of traffic must then be directed onto roads with a suitable capacity and appropriate signposting. However, Berlin does not yet have an extensive car-park for receiving such traffic, although it does already have road signs at every available point for everyday traffic. For this reason, the idea of a

special system of direction signs[7] for major events in Berlin has been rejected, even for pedestrians, but steps have been taken to ensure that access to existing major roads and by-passes remains unrestricted where possible. Therefore, greater importance is attached to maintaining the speed of traffic by keeping the traffic lights green for a longer time, forbidding traffic to turn off, setting up one-way streets, providing more, narrower lanes and increasing the capacity of roads and junctions. The road closure plan regulates the diversion of traffic, the redirection of traffic to secondary routes and the closing of the event area and neighbouring roads to traffic. Diversions are difficult because Berlin has very few roads that can be adapted for phased or unphased traffic lights; changing the lights at one junction affects the following lights[8]. The mostly parallel streets are not as adaptable as would be required. Where roads are closed, however, they can no longer be used for parking and the cars habitually left there have to be moved. In the end, emergency and escape roads have to be identified.

The road-sign plan covers the necessary road closures and directions and is, above all, checked and standardized by the local police. Assuming that the event will have adverse effects on normal traffic, the police like to know how the organiser intends to react. On the basis of this information and their own experience, the police work out plans of action. Traffic warning signals have to be prepared and a police traffic control centre has to be set up. Escape and emergency roads have to be cleared and kept clear. An intensive traffic information campaign must be conducted in the heart of the area. Necessary measures to regulate and co-ordinate traffic must be applied according to the situation. Traffic authorised to enter the event site must display a badge which cannot be forged; unauthorised private cars should be prevented from entering. Depending on the situation, barriers should be erected around the periphery of the event site. Furthermore, traffic controllers should be on hand.

These measures must be implemented. In exceptional cases, particularly critical parts of the event should be rehearsed[9]. In the course of the theoretical work, the traffic planner proceeds on the basis of agreed projections and loads, which he distributes over the network. But the police are on site during the event and can only hope that demand in particular places at particular times turns out to be as expected. For this reason, they observe traffic loads continuously, so that they will be able to take immediate action. A common control centre is manned by a decisionmaking unit with experience of all types of infrastructure. This unit observes traffic behaviour in the same place and immediately corrects planning mistakes and deals with disturbances.

The prevailing atmosphere is graphically described by the head of the central control centre of the Berlin transport operator (BVG):

"*A major event creates an extraordinary situation. The theoretical values of private and public transport cease to apply and many more people are transported than can be calculated using orthodox methods. Levels of density rise in all areas, outside and inside and capacity is increased. But the elasticity of transport users is decisively influenced by the nature of the event. At a peaceful event, people move closer together; in aggressive demonstrations they tend to keep their distance. Few wheelchairs or pushchairs are to be seen. The course of events follows other rules and chaos theory applies. Limited resources are made available, but then it is a question of 'doing'. 'Planning' comes to an end at some time. We make arrangements on the basis of information and manpower and then it comes down to traffic, traffic and more traffic. This is why figures are not counted. On the contrary, because an event is something unusual in terms of traffic, not even the very few figures available from fixed counters are taken into account. When disruption occurs, we have to act and we have to deal with it. No operator or planner can have reliable data for that eventuality. All we know about the modal split is that, for major events in Berlin, the share of public transport in the area of the event is over 50 per cent*[10]*. But again, even that depends very much on the type and location of the event* (Reupke, 2001)."

Most underestimated are the learning effects. Most learning effects are experienced internally and whenever an event is held everybody learns something about it. But most is learnt when a new event takes place[11].

In the police, co-ordination between the traffic and safety sections, formerly a source of internal conflict, has been more and more finely tuned[12]. The traffic and safety sections are meanwhile being managed in close association with the general operations division. At the same time, officers unfamiliar with the locality are only being deployed in a static surveillance or monitoring role. Discussions on a massive scale have given way to small, efficient working groups comprising police, fire service, BVG, Red Cross, the event's organiser and the public works department in its capacity of owner of the roads. The 1999-2000 New Year's Eve party taught that stages should not be erected on the Pariser Platz for the 2000-2001 celebrations, since the flow of people to the Pariser Platz had to be stemmed as early as 4.00 p.m. The Love Parade taught the need to involve the organiser and his stewards whenever there was any question of extending the enclosed area. Moreover, fixed fences failed to withstand pressure from the outside, so that it was once more necessary to resort to police officers. The main lesson was that traffic should be allowed to flow for as long as possible and that pedestrians should be made to use the pavements. Once pedestrians started walking on the roads, the capacity of the roads would decline. Another lesson was that street-cleaning, even outside the area surrounding the event, should begin early so that the streets could be freed up again quickly. Nevertheless, unexpected incidents are always being reported. One example concerned Coca-Cola lorries in the inner city in 2001. The problem for the local police was not due to the lorries, as had been expected, but to the crowd of onlookers, who had not been expected in such great numbers, given the severe cold.

5.4. Event planning from the political standpoint (licensing authorities)

Since the extra traffic flows and the safety risks associated with major events can adversely affect the city's capacity to function, Berlin's planning practice requires, above all, that an event be licensed, subject to conditions, by authorities with the appropriate knowledge and experience. In this way, the licensing practice reflects Berlin's urban development policy.

If the event in question is to be held on private land, no licence is required from the traffic authorities. If, however, open public land is used, whether an event is licensed as a commercial function or as a political demonstration in the sense of the basic law is of great practical importance[13].

In the case of a political demonstration, the political message is of central importance, as is freedom of assembly for the purpose of influencing informed public opinion. Of relevance here are the basic law and the law on assembly or, more precisely, the way in which they are interpreted. The law on assembly requires the police to be actively involved when political demonstrations take place. Demonstrations must be reported as assemblies to the competent authorities, but they may be made subject to conditions or be banned. In Berlin, the competent authority comes under the state security machinery and is therefore a department of the police. According to Article 8 of the basic law, demonstrations are of greater importance than commercial events and it is therefore more difficult to refuse them. Thus, the organiser of a demonstration can report just 48 hours before it is due to start, whereas this is insufficient notice for commercial functions, according to Article 29, par. 2 of the road traffic ordinance. On the other hand, demonstrations are generally subject to the restrictions needed to allay the concerns of the police and senators. To protect public safety and keep order, the police officer in charge of the operation lays down the requirements. If – as in the case of the overwhelming majority of political demonstrations reported – the demonstration is likely to be peaceful and trouble-free, the reported place of assembly and the route to it are approved without conditions.

The police plan the traffic arrangements and assume technical responsibility for safety. They order the implementation of the road-sign plan by the public works department and see that the "no stopping" signs and barriers are properly set up at the right time. The cost of closing roads, diverting traffic, supplies and land restoration, as well as licensing charges, are met from the public purse (State of Berlin).

A major commercial event (i.e. with special use of open public land and public green spaces) is intended to earn money through activities that enhance the quality of life. The legal basis is the law on road traffic, the law on the roads (Berlin roads law) and trade ordinances. For mobile events, Article 29 of the road traffic ordinance (StVO) applies and for stationary events, Articles 44 ff of the StVO apply. The police are only required to intervene when it is clear that action needs to be taken. In accordance with the "polluter pays" principle, the organiser must meet all the costs incurred from planning, road closure, traffic diversion, supplies, safety arrangements and land restoration. The basic requirement is that conditions prevailing before the event be restored. The advantage of having an event licensed as a commercial function lies in having the plans vetted, having the right to forbid entrance, having to observe essentially minor conditions and in obtaining easy funding from sponsors and unlimited catering. In the case of political demonstrations, there is only a very limited possibility of obtaining these benefits under the law of assembly.

In order to support major events of international repute as symbols of the new Berlin, such as the Love Parade, the Blade Night or the Christopher Street Day, they have been classified as political events by the Berlin Senate and in this way substantial parts of the costs have been externalised. Unfortunately, however, these costs have not been assumed by the competent senate administration, but have been left to the Berlin Tiergarten District (currently Berlin-Mitte) as a service duty. The public displeasure over this injustice has meanwhile forced a change in senate policy. Since then events have had to meet rigorous criteria if they are to be classed as political demonstrations. In other words, demonstrations that have turned into commercial events – like the Love Parade - are once more licensed as major commercial events. For this reason only the licensing procedure for commercial events is described below.

The holding of major commercial events on public spaces is covered by many areas of law and many regulations (Weiß, 2001). Therefore, a great many licences from different authorities are required, for which the organiser must submit highly varied, precisely stipulated documents and must observe certain time limits. Contacts between the organiser and the different offices is mainly co-ordinated by the engineering department of the urban district concerned and the function is included in their calendar of events.

If the site of the event is a street and therefore to be used for other purposes than those for which it was intended, a special use permit is required from the competent district (public works department)[14]. For events in public parks, an application must be made to the district parks and gardens department. Tents and stages must be approved by the district's building supervision section. Trading at the event, exemption from the restrictions imposed by the law governing the hours of trading and the serving of alcoholic drinks are subject to further licensing (district trade department, chamber of commerce and industry).

Since most events produce high noise levels, special authorisation is required from the district environmental office. Finally, where music is played, copyright must be respected (GEMA). For these authorisations, extensive and detailed documentation – spelt out on a checklist – must be submitted by the organiser. The supply of electricity and water, the disposal of waste and the provision of sanitary facilities must be guaranteed and proof given of compliance with this condition.

But because the event disturbs traffic on other public roads, special authorisation is required, in accordance with Article 29 of the StVO. In Berlin, these authorisations are granted by the road traffic authority attached to the chief of police. This authority informs the public safety branch of the police, the authorities that deal with public assembly, the Berlin transport operator (BVG), the public works department of the districts in question and other actors (such as the fire service, medical and ambulance service, the taxi drivers' guild, sightseeing-bus companies and the radio traffic service). Since organisers in Berlin can choose to deal either with the public works department or with the road transport authority in the initial stages, both remain in permanent contact.

Berlin has no central licensing authority for major commercial events and provides for no general authorisation. Rather, the authorisation of an event is a process consisting of several partial authorisations granted in parallel and therefore depends on internal communication between the authorities concerned. The basic approach involves reciprocal information, established groups of experienced professionals, common inspection of the event site with the organiser and statements from those involved. This is why co-operation with the organiser on the basis of trust is so often emphasized.

In accordance with an administrative ruling, however, the urban district office may only grant an application once the assent of the police has been obtained. Since the police cannot be left out of the processes of authorising the special use of the road on which the event is to be held, examining safety issues or co-ordinating the local traffic, they actually dominate the proceedings. This is why the internal interplay between different police divisions (road traffic, public safety, public assembly, headquarters) and the acceptance of the police as a partner by the organiser are of particular importance. The high level of specialisation found in the Berlin police means that it is possible to have each aspect of an event assessed and taken in charge by experienced professionals. Above all, it means that the latter can leave their personal mark on the planning process and the groups concerned. In this respect, Berlin's practice may be described as one of decentralised planning with centralised control of planning.

Traffic planning is, admittedly, only one aspect of the planning of a major event, but it always remains central since the situation and framework conditions constantly change as the event unfolds. In the process, the traffic planning mainly takes the form of a dialogue between the police and the organiser.

Experts regard Berlin's licensing practice as failsafe, in that it combines the wisdom of the legislator, the experience of the authorities and on-site inspection. It is a system of reciprocal interests, help and monitoring. The organisers are out to succeed and want to stay in business. The licensing authorities want to prevent the event from disturbing normal traffic and posing a safety threat to the public at large. This is why the road-sign plan is one of the documents submitted by the organiser with his application: it provides information in advance and provides the local traffic police with detailed knowledge of the traffic planning arrangements. The district's public works and parks and gardens departments know the location and do not want any unpaid bills or damage to the site, litter or injury from broken glass. They therefore help the caterer and drive away unauthorised traders who sell bottles bought at the supermarket. Finally, the licensing procedure reflects a successful approach to planning on the part of a large city, which – financially well-provided for – is under extreme external pressure to pay particular attention to safety matters and has thus assigned the key role to the police, marshalled all the potential for ideas and local knowledge in the district and cultivated a group of experienced planners from the relevant senate offices, local authorities, transport authorities, police, fire service, *inter alia*, who have known each other a long time, have confidence in each other and are used to cutting through the official channels. These actors have no worries about

having the right contacts and - notwithstanding individual interests - have a common goal. The political leaders, for their part, require good public relations from major events for the sake of Berlin and its empty public coffers, but they must maintain their credibility.

6. ACTUAL STRATEGIES AND DESIRABLE MEASURES

6.1. Traffic strategies for major events

Central to an event are activities, experience, physical movement and enthusiastic crowds – but with the proviso that the festivities are safe. At the same time, organisers strike a rather precarious balance between ensuring that the event goes off smoothly, attracting the highest number of visitors and taking account of what the city can bear. Many visitors come from rural areas and wish not only to take part in the event but also to see the city. For reasons of cost they therefore come by car in groups and the journey there and back becomes a part of the event. In a world of mass private car ownership, therefore, no organiser would reckon only on public transport and unmotorised traffic[15]. Since this can only mean increasing the share of public transport, there is actually a wide range of solutions.

For traffic planners, major events are exercises in coping with traffic. At the event, site footpaths provide the solution. For the journey to the site there is the possibility of gathering the participants into groups – packing more people into private cars and/or public transport vehicles. The object is to keep the number of vehicles as low as possible and to achieve fewer vehicle-kilometres for the same number of passenger-kilometres. This applies to the journeys to and from the event, travel around the city and traffic at the event site itself. The planners' way of viewing the journey, from the outside to the inside, will, however, be reversed by those concerned, since it is in their interest to think in terms of a journey from the inside to the outside. A city like Rostock, which is unwilling to turn down any visitors to the Hanse Sail, will first fill the car-parks in the inner city and then redirect the flow of traffic from the inside to the outside[16]. But in other large cities, the police and the planners are only responsible for their own district and many event managers only concern themselves with the periphery in order to see how their guests will get to the event. The promoters of tourism, too, want to impose as few restrictions as possible on the visitor to their city. But for transport operators such as the railways, tourist bus companies and airlines, events represent extraordinary demand peaks, with the corresponding cost of keeping capacity in reserve, together with planning problems and risks (as Expo 2000 demonstrated). If the visitor has his own car, however, he makes his own arrangements and seems to have the least disruptive effect.

For every major event, therefore, a strategic decision is needed on the capacity of the transport infrastructure. This may mean adapting the infrastructure to the event or rather adapting the event to the available infrastructure. This is why three basic forms exist side by side in a major urban region such as Berlin-Brandenburg.

6.1.1 The international supershow

The larger an event is, the longer it lasts and the more time there is for planning, then the more likely it is that measures will be taken to limit traffic, transfer traffic, change the modal split and increase capacity. This is why a different range of measures is to be expected for the Olympic Games, which lasts four weeks and takes eight years to plan, than for the one-day Love Parade. For such top-rank, long-term events, a planning company takes on all the planning, co-ordinates the actors and protects economic interests as a whole. If hosts consciously accept the challenge presented by major, longer-lasting events and establish a new system, an additional dimension is introduced: a new festival site, a new express train system and comprehensive measures to ease traffic in their inner city (as for the Olympic Games in Sydney and, to some extent, for the Expo in Hanover).

6.1.2 Routine events

Events that are organised regularly for a specific group of participants are held on permanent sites. The latter include festival grounds, stadiums, fair pavilions and concert halls. A standard feature is the routine planning, which is partly paid for by the entrance charge. Major events that are particularly prominent are held in the inner city. These include Christmas fairs, carnival processions, New Year's Eve parties and, in Berlin still, the Love Parade. In order to prevent the inner city from becoming overloaded, there is usually a list of priorities for the purpose of matching event profiles and sitings. To keep the city running, the following principle is applied: the less important and the more dangerous an event seems to be, the further away from the city centre it should be sited. The sites of these two groups of routine events (permanent site, inner city) can be reached by the city express train and have areas for parking cars. If they are in the middle of large, extensive cities, like Berlin or Munich, parking spaces for additional traffic are provided all around the city.

6.1.3 Recreational transport

Certain events may be deliberately organised at out-of-the way locations, which means that participants have to make their own way to the site and sufficient parking space has to be provided. The Nuremberg, Hockenheim and Lausitz circuits are situated outside cities, since the latter can hardly accommodate motor racing. Air shows are normally held at military airfields and bikers' meetings call for undisturbed mobility.

6.2. The range of measures

The basic rules include planning an event in advance as comprehensively as possible, ensuring that all authorisations for its implementation are obtained, subject to conditions and concentrating on dealing with any congestion or disruption while it is in progress. Above all, it is important to maintain a good atmosphere, since lively festivals with happy visitors are safe festivals. It is also important that all the important decisions be considered and agreed upon in advance by a group comprising all the leading actors.

Once the basic decision on infrastructure and location has been made, parallel events and disturbances should be kept to a minimum. Where there is a large number of events, they should be rescheduled and relocated. For this purpose, cities – or their public transport operators – have calendars of events and, in Berlin, management of the associated construction work is the responsibility of the local transport police[17].

If a major, long-lasting event is held in or extends as far as the inner city, it is necessary to relieve the inner city of traffic, by staggering school and work times, adapting holidays as required, arranging for goods transport to operate at night, etc.[18] This range of peripheral measures also includes the optimal siting of booths, stands, toilets, sanitary facilities, children's assembly points, areas for handicapped persons, etc., on the event site itself, to keep pedestrian movement fluid and to defuse panic situations.

In dealing with transport, it is necessary to distinguish between traffic for the setting up and dismantling of the facilities required at the event, traffic for travel to and from the town where the event is being held, urban transport to, from and between different event sites, traffic associated with the event and through-traffic (necessary traffic and commercial traffic). Travel to the town calls for strategic decisionmaking. It is therefore necessary to work out an approach to the co-ordination of air traffic, rail traffic and road traffic in the wider sphere and of car traffic, public transport and pedestrian facilities in the immediate sphere. Those driving to the event should be encouraged to take passengers and to pool their vehicles. In principle, traffic of the kind desired (e.g. trains and coaches) should be brought as far as possible into the area of destination and changing should be avoided as much as possible. Where numbers are extremely high and road and rail capacity insufficient, this may mean freeing the inner city for public transport and avoiding delays by offering a more frequent public transport service. In Berlin, the principle of bringing traffic to the outer rim of the event area has been applied to rail traffic and the intercity and regional trains to and from Berlin terminate at a ring of suburban stations. The city and underground railways are then used to take passengers into and around the city.

No parking space should be made available in the centre (except for coaches and taxis). Traffic that is not desired (cars) should be intercepted well outside the area and guided to park+ride lots. From these park-and-ride lots, city trains or buses in dedicated lanes, would take visitors quickly to the event site, undelayed by congestion. With combined tickets covering the parking charge, travel into and out of the city, travel around the city and entrance to the events, public transport should as far as possible be the basic form of travel used by those attending the event. To this end, the organisers must be involved in the financial arrangements. The available city and underground railways should be used, long-distance and city bus lines should be altered as little as possible and shuttles should be introduced. Visitors should receive information on the way in which traffic is to be directed in a leaflet provided with the entrance ticket, by Internet or by post (*Forschungs-und Ingenieurbüro Verkehrslogistik & Regionalplanung*, 2001).

Whatever the approach adopted towards traffic, major events with the associated traffic flows and road closures represent a serious incursion into the living organism that is the "city". This is why people try above all to keep such an incursion as short as possible, to limit the area concerned and to lessen its impact: to this end, through-traffic is diverted around the event site via a wide detour on good, high-capacity roads, roads are closed off for staggered periods and closures and diversions are guaranteed by bans on stopping and parking. This also means finding alternative space for cars habitually parked in particular places. If possible, the more difficult parts of the process are rehearsed beforehand. The object is to ensure that the city is still able to function. This means protecting local residents from very high traffic levels and preventing outsiders from taking their parking spaces.

At the heart of mass events there are people standing and, therefore, pedestrians. This is true even of Formula 1 races, flying shows and motorcycle events. For this reason, the traffic present in various forms for various purposes must be allocated to different zones and at different times in accordance with a clear order of rank. Police vehicles, fire engines, ambulances and authorised trade traffic are placed in the first rank at all times and in all places and take priority over all other vehicles. Within the central zone, pedestrians have priority over cars, lorries and public transport vehicles,

normally excluded from this area. In congested parts of the intermediate zone, public transport (including coaches and taxis) and delivery vehicles have priority over car and goods traffic. Areas where visitors can get on and off public transport and where deliveries can be taken for the catering areas must be provided at the edge of the event zone. At times when stages, catering facilities, etc., are being set up or dismantled, the associated goods traffic is given priority over any other general traffic.

7. FACTORS IN THE SUCCESS OF BERLIN'S EVENTS

Berlin is a city of events. After the fall of the Wall and, as the capital city at a time of new awakening, it must maintain its reputation as a vital megalopolis. Its high proportion of foreign immigrants and its position at the frontier between East and West mean that it is open to the world. The chance of rediscovering the surrounding country - inaccessible for forty years - and the cultural and gastronomic delights of Berlin increase its attractiveness. Not least, Berlin still has no closing time.

In addition to the famous "modicum of luck", there are structural reasons for Berlin's success as a city of events. People come to events to enjoy themselves and co-operation is of prime importance. The people of Berlin are used to major events and either take part or stay at home.

Berlin covers 892 km^2 and extends over about 45 km from east to west and 38 km from north to south. Berlin is not the result of radial planning, but has grown up from several different centres. The many small road networks of Berlin's many "sub-centres", such as Steglitz, Tegel or Spandau, provide suitable by-pass routes when major trunk roads are blocked. Moreover, the population density is relatively low at an average of 38 inhabitants per hectare, there are few very high buildings and the road density of 6 km/km^2 for the whole area is correspondingly high. As a result, a large number of visitors can be spread across the city even if they come by car and park in the neighbourhood. Since the Berlin police do not, on principle, recommend any particular by-pass roads, the roads also remain open.

Berlin not only has suitable event sites and safety areas, it also still has one of the best public transport systems in Europe. This system is composed of different independent sub-systems: long-distance railways, the underground railway, the city railway, the bus network and a few tram lines. With its mass capacity, the city railway alone can fill the Olympic Stadium. At the 1936 Olympics, a train pulled into the stadium station every 90 seconds. Major events are held at tried and tested sites and are organised by experienced planners. It is emphasized on all sides that the preliminary planning must be just right and there must therefore be planning safeguards. The actors know each other and are very much on the same wavelength. Safety and traffic planning for events and gatherings are *de facto* in the hands of one party – the police. The partnership between organisers and police is exemplary, with the police emphasizing the importance of keeping to arrangements. Since the sixties the Berlin police have also become "demo-hardened". Since Berlin has no closing time, activity continues over wide areas and for long hours.

Major events do not represent the same kind of challenge to a megalopolis as, for example, a regional garden show with 450 000 visitors in a small town (such as Luckau) of 6 000 inhabitants. Even the often-mentioned Love Parade is attended by, at the most, 500 000 Berliners out of a total population of 3.4 million. If this major city is to continue to function in spite of the event, the remaining 2.9 million people must be provided with transport services as usual. With its buses, underground and its few trams, the BVG provides for around 3 million individual journeys every working day and the city railway for 1 million. Even when the main parts of a major event take place at the weekend, every line still has to provide for the great many who travel because they have to, not least because their job may depend on it. This is also why the operator is most unwilling to upset his timetable for one or two days and reorganise everything from scratch. A city of this size must first and foremost remain operational, whether or not an event is being held. In this context, it is understandable that the traffic generated by the event must adapt to the city and not the other way round (Schmidt, 2001).

Moreover, events are nothing new for a large city; even in the darkest period before the Wall came down, Berlin had always been the site of major functions. In East Berlin, huge marches took place and in the west, a million people assembled in one place just for open day at the Tempelhof Airport which, at that time – with no south ring to the city railway and with shortened underground trains - was far from being an ideal location. Even in the seventies, there were events such as the "Wannsee in Flames", with 200 000 visitors in an area with narrow roads, where it was only possible to reach the Krumme Lanke underground station by bus (Schmidt, 2001).

At the very least, the great city traditionally has one solution to the transport problems posed by events, this knowledge is shared by police and public transport operators and is grasped instinctively by the residents of Berlin: you should not take your own car to the Love Parade.

8. MEGA-EVENTS IN BERLIN: THE WRAPPING OF THE REICHSTAG, 1995 (5 MILLION VISITORS IN 14 DAYS)

8.1. The event

The wrapping of the Reichstag was an experiment carried out by and for crowds of people. If only for the many statements it prompted, the work of art presented a challenge. Apart from the rational motives given ("wrapping by unwrapping"), the beauty of the white folds falling from an historic building exerted a particular fascination. "*The material moves constantly with the wind....In all our projects the material constitutes the living essence, which the object projects. It is as if it had its own soul* (Christo, interview, 5.9.01)." Above all, the city expected tourists and a higher profile and the political establishment wished to cultivate the image of the new capital in the reunited Germany. The Federal Parliament had given its agreement following impassioned discussion after seventeen years during which Christo had been trying to win support for the project. The event was not dependent on the weather and the work of art was lit up at night.

8.2. Framework conditions

Different framework conditions made planning easier and favoured the success of the project. The event took place in a period of radical change and the Reichstag and its surrounding area were due to be renovated. The event built upon available infrastructure and did not produce ongoing construction work. The sun shone throughout the whole period. There were no fixed opening times. Since the edifice stood on a private site, the realisation of the project was a matter between Christo and the parliamentary administration. The work was authorised as a new building and only the catering on the surrounding street areas required a special licence. All the catering was assigned to a general contractor, who also had to see to the provision of sanitary facilities, supplies and waste disposal. Christo assumed all the costs of the wrapping, amounting to around 16 million DM, but required that a border area without trade activity be established around the structure and that he take over all the logistics in the vicinity. There was no money from sponsors and no entrance fee. Original, striking, popular, the wrapping of the Reichstag ran on its own, without much marketing. When asked, the actors would always emphasize how pleasant the atmosphere had been in discussions with Christo and his team.

8.3. The time frame

The Reichstag was wrapped from 24 June until 6 July 1995. The wrapping and unwrapping, each taking four days, were regarded as part of the event and the periods were used for excursions. The time frame was observed. Christos allowed the event to come to an end while it was at its height and did not extend it.

Because this was a one-off mega-event, there was no on-site experience gained from the past and no learning effect from a previous occasion. Only the Paris experience (wrapping of the Pont Neuf) was of benefit. The German Parliament nevertheless assumed there would be 500 000 visitors when making its decision; the organiser later mentioned a figure of 3 million and 5 million people eventually came. This figure, which surprised all the actors, can only be understood as the effect of media reporting in promoting the event.

Apart from associated events, parallel events were held during the same period and mainly led people to expect that traffic would be disrupted as a result of the football Cup Final on the first weekend.

8.4. The location

The event was held in the centre with special events held away from the centre. The event was stationary and was limited to the area of the building and its forecourt (Platz der Republik). In addition to the small streets that surrounded the Reichstag, marking off the area, there was a sufficiently large area where visitors could stroll. The location was an inner-city area with little traffic, bounded by the extensive Tiergarten Park to the west and by the built-up centre of Berlin to the east. The Tiergarten served as an overspill area. This event accordingly corresponds to the "political rally", "old-town festival" and "fairground" structural types referred to above. Surrounded by a circle of city railway and underground stations which can be reached by foot, the area lacks extensive parking space or spaces where cars can be left for short periods. For this reason, the traffic planners aimed to create a temporary pedestrian zone for the wrapping of the Reichstag. Moreover, as a result

of the separation zone established around the structure by Christo, all commercial activity was transferred to major roads outside the area. Stopping and alighting points for coaches also had to be provided in these traffic areas.

With the area between the relief road, Paul-Löbe-Strasse, the Ebertstrasse and the Strasse des 17 Juni, the central zone covered nearly a third of the border area. Movement within it was on foot. At the edge of the central zone lay the city rail station, Unter den Linden. The intermediate zone stretched as far as the Friedrichstrasse city rail and underground stations, the city rail station Lehrter, the city rail/ underground stations Tiergarten, Zoo and Potsdamer Platz, the underground stations Mohrenstrasse and Französische Strasse and thence as far as the parking spaces in the road network beyond. In the intermediate zone, travel was always by foot or by bus. The direct proximity of the River Spree and the Landwehr Canal meant that passenger boats were another option. The outer transport zone extended to the inter-city transport stations, i.e. Bahnhof Zoo, Friedrichstrasse, Ostbahnhof, Lichtenberg, to the central bus station and to the Tegel, Schönefeld and Tempelhof airports. It would not be too great an exaggeration to describe it as a pedestrian event for city rail and underground passengers. In spite of this, the scheduled buses to and from the Reichstag were full to bursting point and remained stuck in traffic jams. Politicians nevertheless accepted the argument that restricted services on the main arterial roads between east and west and north and south as a result of the (requested) bus lanes might adversely affect Berlin's capacity to function. Apart from the lack of toilet facilities, the lack of bus lanes and signposting were the only complaints made by visitors to the event (Schlinke, 1995: 79-83).

Before and during this mega-event, no additional parking places were made available for cars in the vicinity of the Reichstag. Instead, drivers were constantly requested, through the media and in traffic announcements, either not to come to the event in their own cars or to give the centre of Berlin a wide detour. On weekdays, parking lanes in the Strasse des 17 Juni - between Grosser Stern and the relief roads - and other parking spaces were made available to coaches.

8.5. The planning

Overall planning was carried out by a planning committee ("co-ordination group"), on which all the institutions concerned were represented. The first session of this co-ordination group was held on 28 November 1994. At the meeting, four working groups and a co-ordinating committee were formed. The "transport and safety" working group comprised all the actors and decisionmakers concerned with traffic. The Senate Office co-ordinated the work and cleared all obstacles out of the way.

Owing to the special circumstances of this mega-event (size, international interest, context of radical change, construction, urban development and environmental protection), the key role in the discussion on transport strategy and specific practical implementation fell to the "transport and safety" working group. Admittedly, at the time of its unsuccessful application to host the 2000 Olympics, there had been initial major plans for the traffic generated by such an event; but the wrapping of the Reichstag called for actual implementation and solutions to the many specific details, in the tense situation engendered by the multi-layered administration of different political perspectives in a major coalition.

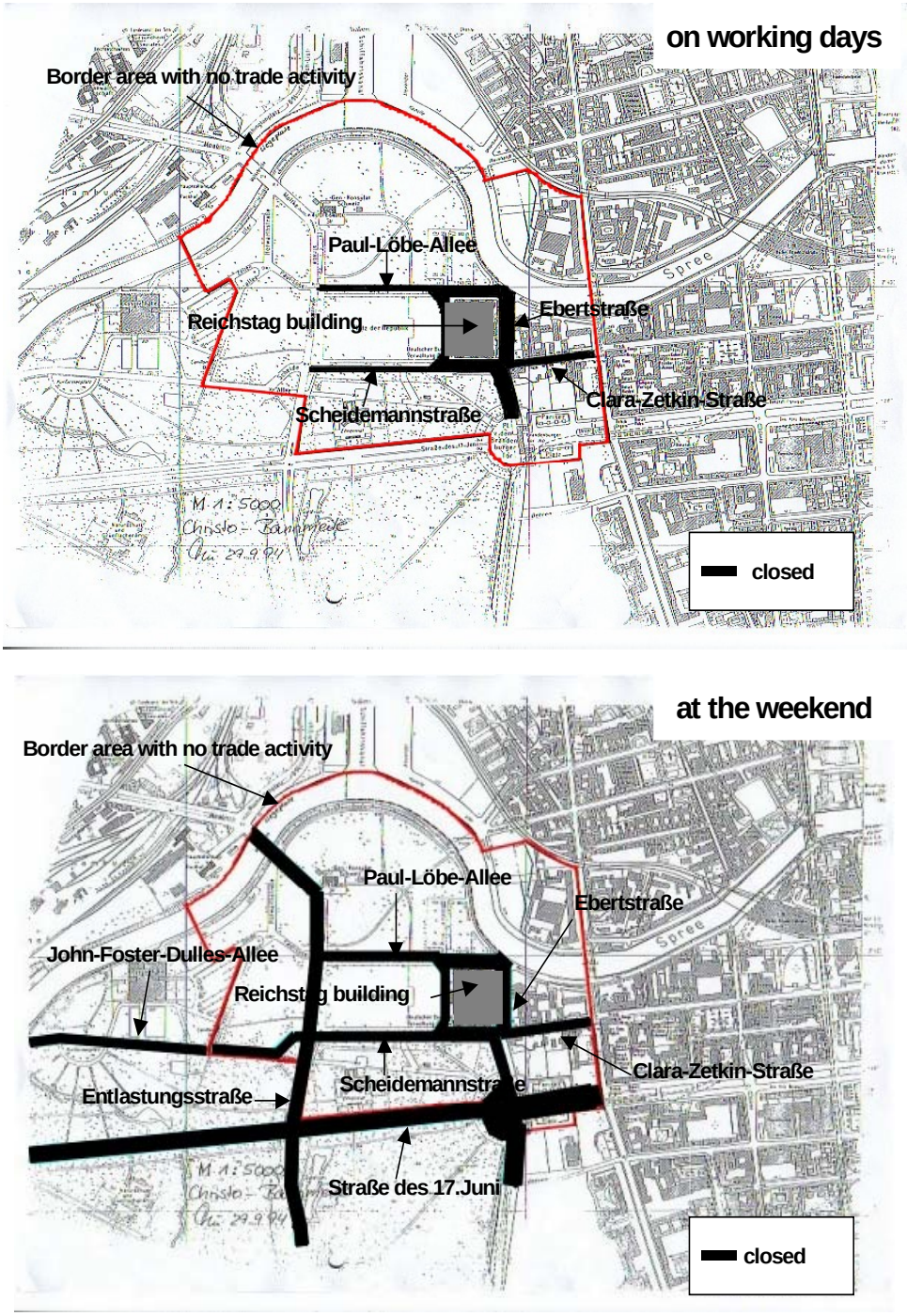
Berlin was experiencing a period of radical change, with much construction work and with other traffic replacing railways. The road network of this city had been separated for forty years. For this reason, there were very few good north-south and west-east links and there was considerable scope for wide diversions. The few good links, however, ran through the centre. Thus, through-traffic from east to west or west to east (Unter den Linden to Strasse des 17 Juni) represented the greatest problem. On

weekdays at least, this through-traffic would be regarded as essential to the functioning of the Berlin economy. At weekends, however, the main stream of visitors to and from the Reichstag had to be contended with The different solutions for working days and weekends represented an initial order of priorities for coping with overall transport demand: on working days priority was given to professional, commercial, school and industrial traffic over leisure and holiday traffic and at the weekend the situation was reversed. The basic principle consisted in giving priority to whichever type of traffic was most used: on working days, private motorised transport and public transport as opposed to pedestrians, at the weekend, pedestrians, cyclists and scheduled bus services as opposed to the private transport. This grading extended the normal ranking for traffic movement to major events.

As a result of this process, Berlin politicians of all complexions became conscious of the narrow leeway for Berlin traffic policy after 40 years of separation. The excessive demand for traffic infrastructure focused on a location where East Berlin and West Berlin had met. It became clear how difficult it was to make the centre of the megalopolis the site of an event attracting 5 million people, even if it was spread over two weeks., with city tour buses, coaches and scheduled buses demanding particular solutions. Therefore, there had to be different solutions to traffic on weekdays and to traffic at the weekend. The Brandenburg Gate was the eye of the needle of the inner city. In order to distract attention from the failings of a future-orientated transport strategy, its opening – like the colour of the new city railway trains – was used in Berlin to improve the Government's image in the eyes of the press and the population. A compromise was finally found, which simply consisted in keeping the Gate open to car traffic on working days during the period from 6.00 to 10.00 a.m. – only from east to west and only the main portal. Traffic from west to east, however, had to turn off to the right before the Gate. Behind this was the idea of allowing visitors to experience the Brandenburg Gate while, at the same time, protecting the Gate from further damage from traffic.

The entire session of this planning group was marked by a dialectical process: again and again, different participants strove to promote major solutions: they were confronted with the realities of traffic and safety matters by the police (Division 3, Chief Commissioner Bojahr) and finally referred the matter to the police, who decided in favour of what was feasible and ultimately successful. The tense relations between the different parties then led to a workable compromise (Figure 1). On weekdays, the police were given confirmation of their small-scale solution in which city traffic had priority. But at weekends, when leisure traffic dominated, the supporters of the Senate office were given a solution that went much farther than the one they had originally fought for. The search for stopping and parking places for coaches proved to be difficult and there was still no solution to the question of signposts, which were intended to show coaches where to leave the motorway, to direct lorries around the event area and to give guidance to public transport users and pedestrians.

Figure 1. **Road closures during the wrapping of the Reichstag, 1995**



8.6. The participants

The participant structure was fairly homogeneous, since it was made up of tourists seeking culture and events. According to estimates by the Berlin Tourismus Marketing GmbH, nearly half of the 5 million visitors came from Berlin and its surrounding areas and 500 000 came from abroad (Tagesspiegel, 7.7.95). Foreign visitors were mainly from the USA. More than a quarter of the visitors came from large cities with more than 500 000 inhabitants. The main characteristics of those attracted to the event were geographical proximity, artistic relations or the size of their town of origin. Nearly half the visitors came to Berlin chiefly because of the wrapping of the Reichstag and the average length of their stay was 2.2 nights (Schlinke, 1995: 50-54).

As far as the flow chart is concerned, the highest numbers of visitors were recorded on the first and last weekends of the event period. Their numbers swollen by fans attending the Cup Final, 350 000 sightseers streamed to the Reichstag as early as the first Saturday, according to estimates by the Culture Department and by 4.25 p.m. the police estimated that the crowd of visitors in front of the Reichstag numbered 250 000. If the average visitor was reckoned to stay 2-3 hours, the police estimate of 200 000 visitors per day must have been substantially exceeded. As far as can be known from the random assessments of the police, the number of visitors at weekends was far higher than the number on weekdays. The daily peak times were found to be in the afternoons to evenings. On the final day, two peak times were identified: 5.00 p.m. with 120 000 visitors and midnight with 100 000 visitors.

8.7. Transport pricing policy

For the wrapping of the Reichstag, the Deutsche Bahn had a "special Christo offer". In addition to the rail ticket, 190 DM + for the journey there and back, there was a voucher for a special bus, city rail and underground ticket in the Berlin-Brandenburg transport area and a voucher for a snack in the area around the Reichstag.

In order to increase the attractiveness of public transport, the Berlin-Brandenburg transport association made a special "wrapping" ticket ("Christo-Ticket") available for 9 DM as from 15 June 1995 for all the buses and trains run by its members. Each ticket was valid from 9.00 a.m. in the morning until 3.00 a.m. on the following morning – i.e. for 18 hours. On the other hand, a normal day-ticket cost 15 DM and was valid for thirty hours but could not be used across the whole region, unlike the Christo tickets. Then again with the "Berlin Welcome Card", an adult could travel for three days for 29 DM, on all stretches run by members of the Berlin-Brandenburg transport association and could be accompanied by three children free of charge. This bonus ticket was available from all Berlin hotels, all BVG ticket offices and from tourist information offices.

8.8. The effect on traffic

When, at the beginning of the event, the traffic network also had to cope with the onslaught of spectators at the DFB Cup Final at the Olympian Stadium, road traffic came to a standstill, both on the motorway and inside the city. In addition, car users were given the opportunity of driving through the Brandenburg Gate; there was thus considerable congestion at first. This once more confirmed the rule that a bottleneck could be avoided as early as the second day as a result of the learning effect on drivers and of media reports.

As to public transport, there were at times twice as many BVG passengers than usual and at certain times during the event the BVG reached the limit of its capacity. At this time it was deploying up to ninety vehicles more than usual. The 100 bus route, which ran through the Brandenburg Gate at weekends, was served by twice as many vehicles, which sometimes ran every two minutes. Unfortunately, the benefits of the very short intervals between buses were cancelled out by the chaotic transport conditions. Owing to the lack of bus lanes, travel time sometimes doubled.

Many of the additional vehicles came from the special traffic bus pool, which had been newly established at that time. Most of the vehicles in the pool were of older construction and were to be used to cope with traffic generated by events and as a replacement for railway trains.

The underground trains also ran in the evening with their full number of carriages. On line U2, twice the usual number of carriages were used. On lines U1 and U9, 375 special trains ran. The frequency of the city railway trains was not increased since, even in normal conditions, trains on the line serving the event ran every 3-5 minutes.

8.9. Long-distance traffic

Only one unverified survey of 150 people exists for information on the modal split for outside visitors (Schlinke, 1995: 70). According to this, around 46 per cent of the visitors travelled by car to Berlin, 37 per cent took the train and only 5-7 per cent came by coach or aeroplane. The bulk of the visitors from the surrounding area used public transport (city railway). Deutsche Bahn reported an increase in the number of passengers to Berlin when the Reichstag was wrapped but, at the same time, pointed out that this new traffic was mixed up with holiday traffic, as the holiday season had begun. The spokesman for a coach company reported a 25 per cent increase in bookings, with a particularly high number of passengers for the services to Paris and London. Lufthansa carried an average of 1 000 passengers a day to Berlin on all lines, and put this down to the "Christo effect".

8.10. Recreational traffic

On the weekends between 17 June and 2 July, the S-Bahn GmbH (city railway operator) offered trips on vintage trains from 1928. The Stern- und Kreisschiffahrt GmbH (boat trips) offered a greater number of one-hour trips around the city, which provided a good view of the wrapped Reichstag. Over the 14-day period in which the Reichstag was wrapped, 3 822 small aircraft and helicopters flew over the structure. On 1st July, a record day, there were as many as seven aircraft over the Reichstag at the same time. Numerous aircraft and helicopter companies offered round trips to tourists from Tempelhof Airport.

8.11. Knock-on effects of the wrapping of the Reichstag

The sheer scale of the wrapping of the Reichstag and the world-wide interest it aroused made it the first mega-event in Berlin after reunification. It accordingly served as a rehearsal for later mega-events, such as the New Year's Eve party and the Love Parade. It was demonstrated that major events could be environmentally friendly; everything depended on licensing, conditions and the people in charge. Contrary to world-wide experience, the nearest city railway and underground station (Unter den Linden) only had to be closed down for a short time.

Major events act as a catalyst in that they impose a temporary but heavy burden on many urban services and institutions. They thus offer an opportunity for experiments, which – if successful – then produce lasting solutions. For the wrapping of the Reichstag, the holiday period for the theatres was postponed and important Berlin museums extended their opening times. This action provided the impetus for the subsequent, highly successful "Long Night of the Berlin Museums" bus event. The Senate had to contend with the law governing trading hours and applied the "hitherto slumbering § 23 Par. 1 of that law" on a large scale. This relaxation of the trading hours law facilitated the general extension of trading hours five years later. For the wrapping of the Reichstag, all activities in Berlin were compiled in the form of an events calendar by the culture department and placed on the Internet. This was how the Berlin events calendar was born. The wrapping of the Reichstag gave a decisive boost to the struggling Berlin tourist industry. The marketing of the industry was taken over by professionals. The need to integrate this mega-event led to the establishment of a planning group, which became a permanent body, even though the institutions and persons involved changed. The regulation of east-west through-traffic through the Brandenburg Gate – born of necessity – was adopted by the coalition government as a permanent solution (and was still in force in 2001 at least). The Berlin-Brandenburg traffic association (Berlin-Brandenburg *Verkehrsgemeinschaft*), whose members co-ordinated their timetables and recognised each others' tariffs during the wrapping of the Reichstag period, was in a sense a forerunner of today's *Verkehrsverbundes* Berlin-Brandenburg (VBB).

8.12. Overall assessment

It was a piece of luck for Berlin, bringing Berlin so much and costing it so little (Schilcher, 2001). If asked to recall the wrapping of the Reichstag, almost anybody who was present would describe the experience as unforgettable. A gleaming white structure against a blue sky, with a great mass of people strolling around it as they exchange impressions; all this is fixed in the memory. The Reichstag, wrapped in white, radiated a friendly atmosphere, filling even hard-nosed taxi-drivers, public transport managers and police officers with astonishment. People sensed the credibility of the artist, who justified a politically inconceivable work of art, financing it himself and insisting, by imposing a no-go area for commercial activity, that it remain uncommercial. The organisers saw that the wrapped Reichstag was guarded around the clock by a private security company working three shifts and aided on each shift by 150 friendly, well-dressed young people, who answered questions and anticipated any vandalism by giving away small samples of the cloth. The outright refusal to market the wrapping material and the solution to the problem of keeping it fit for further use, confirmed the overall impression that this was an untainted, innovative, major event.

Contrary to what politicians had expected, there were no serious disturbances[19]. It is impossible to believe that an event this size would go off without a hitch and yet there were hardly any complaints. The only faults referred to on-site concerned transport, notably – in descending order – public transport, signposting and traffic control (Schlinke, 1995: 79-83). In addition, the 20 toilet cabins were by no means sufficient. Although many people from Berlin and Brandenburg presumably came to the Reichstag by car at the weekend and covered fewer vehicle-kilometres than they would otherwise have covered on a weekend trip, the event as a whole certainly caused a considerable increase in traffic. When the 2001 action artists in the USA were seeking authorisations from the authorities for two new projects, they must have said to themselves: we don't want 5 million enthusiastic spectators in 14 days, like in Berlin (Spiegel, 28/2001: 193).

9. MEGA-EVENTS IN BERLIN: LOVE PARADE 2000 (1.2 MILLION VISITORS IN ONE DAY)

9.1. The event

The Love Parade is regarded as the greatest party in the world. It is a street festival in a public place and therefore with no entrance charge and with a parade of dancers as the core event in an extensive programme. It is an event calling for active participation. The organiser is the firm Planetcom, which works with Love Parade GmbH. Hitherto, the Love Parade has always been held on one of the first three weekends in July.

The parade consists of two processions coming from opposite directions along the festival course between the Ernst-Reuter-Platz and the Brandenburg Gate (Figure 2). Both processions begin at 2.00 p.m. According to the plans, both processions leave the festival course, turn and eventually meet up at 7.00 p.m. at the Victory Column (or one of the roads that converge at the Großer Stern) for the final rally. The subsequent party continues into the night. At the end of the main event, the stream of spectators splits up to attend parties given by the organisers of the Love Parade and to go to various clubs in the urban area.

Each of the two processions consists of around 25 floats. Each float serves as an individual party location, providing the dancers surrounding it with a variety of deafening techno music. Floats and dancers advance at a rate that is half the normal walking speed. There are also dancers on the float. Each of these extravagantly adorned articulated lorries are accompanied by 13 stewards, who protect it from the dancers. Catering facilities are spread out along the course.

The fact that the two processions arrive from opposite directions and the regular distribution of the floats make for a certain spatial organisation and keep the spectators on the parade course. Some elements also facilitate timetabling. Thus, since it begins after 2.00 p.m., it is possible to travel to the event in the morning. Moreover, it is a major event at which people arrive by the hour.

The Love Parade began in 1989 with 150 participants and 3 VW buses, from whose loudspeakers the same music resonated. It took place between the Wittenbergplatz, the Kurfürstendamm and the Adenauerplatz. The limit of the capacity of this location was reached in 1995 with 300 000 participants. As a compromise, the Strasse des 17 Juni was suggested by the Senator responsible for the Interior and this suggestion was welcomed by the police for security reasons (P. Daube in Bublitz, Ballin, 1999: 154). The highest number of participants was reached in 1999 with 1.5 million (according to the organiser) or 1.2 million (police estimate), since when the number has remained much the same at between 800 000 and a million.

9.2. The location

The processions are held on the main east-west road in Berlin, with the readily identifiable Berlin symbols, the Brandenburg Gate and the Victory Column, in view. The core area is the festival route, i.e. the Strasse des 17 Juni and the roads bordering the Grosser Stern. The largely uninhabited Tiergarten, which surrounds it, serves as an overspill area and remains open. The city railway stations on the Unter den Linden and Tiergarten stretch are closed for safety reasons; the Ernst-Reuter-Platz underground station is only kept operational through the lavish deployment of personnel and safety measures. The intermediate zone, extending as far as the circle of accessible city railway and underground stations, is therefore greater than for the wrapping of the Reichstag and covers the whole of the Tiergarten and the roads with barriers (Figure 2). The Love Parade is approached from different directions, with everybody in the crowd making for the same place. The outer area – as for the wrapping of the Reichstag – covers all intercity stations and airports. On the motorways, traffic comes to a standstill early on Saturday morning, as a result of the large number of people coming to the event who take the opportunity to dance, inside or outside their vehicles.

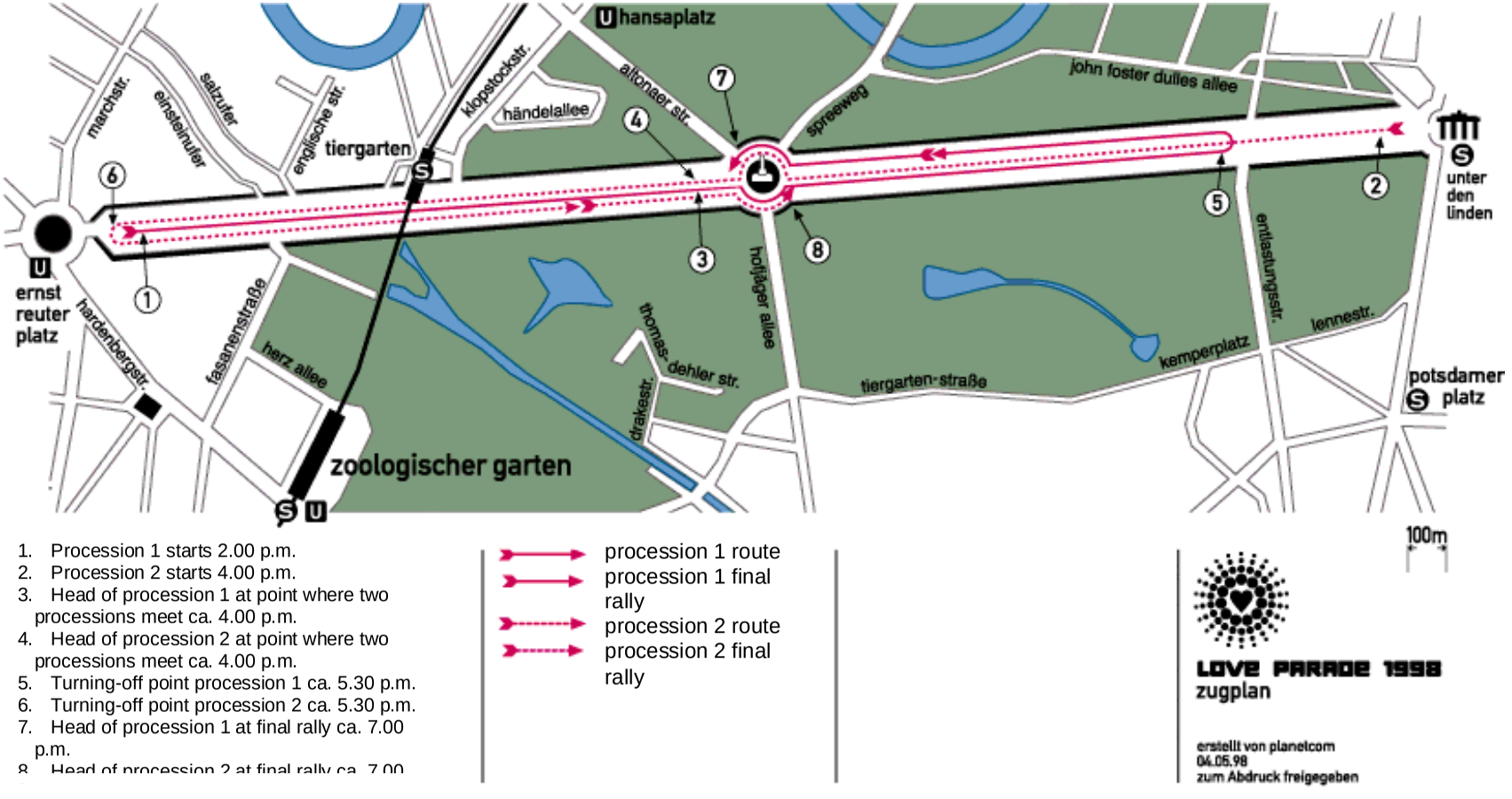
9.3. Crowd congestion

The time when crowd congestion occurs is in the evening, the place is the area around the Grosser Stern and the cause is the toilets. In 1997, there were reckoned to be 1 000 ravers per toilet and the ratio was even more unfavourable in later years. As a result, the Tiergarten is used as a toilet, as well as a camping area. Branches of trees are broken off and shrubs are trampled upon in the process. As an open-air summer event, it causes damage to green spaces and in this respect seems impossible to manage. The stations in the intermediate zone operate to the limit of their capacity. In particular, it is necessary to prevent participants from climbing onto the city railway bridges. The Victory Column is protected and the monuments are surrounded by scaffolding. The 500 or more street lights remain a difficult problem.

9.4. Participants

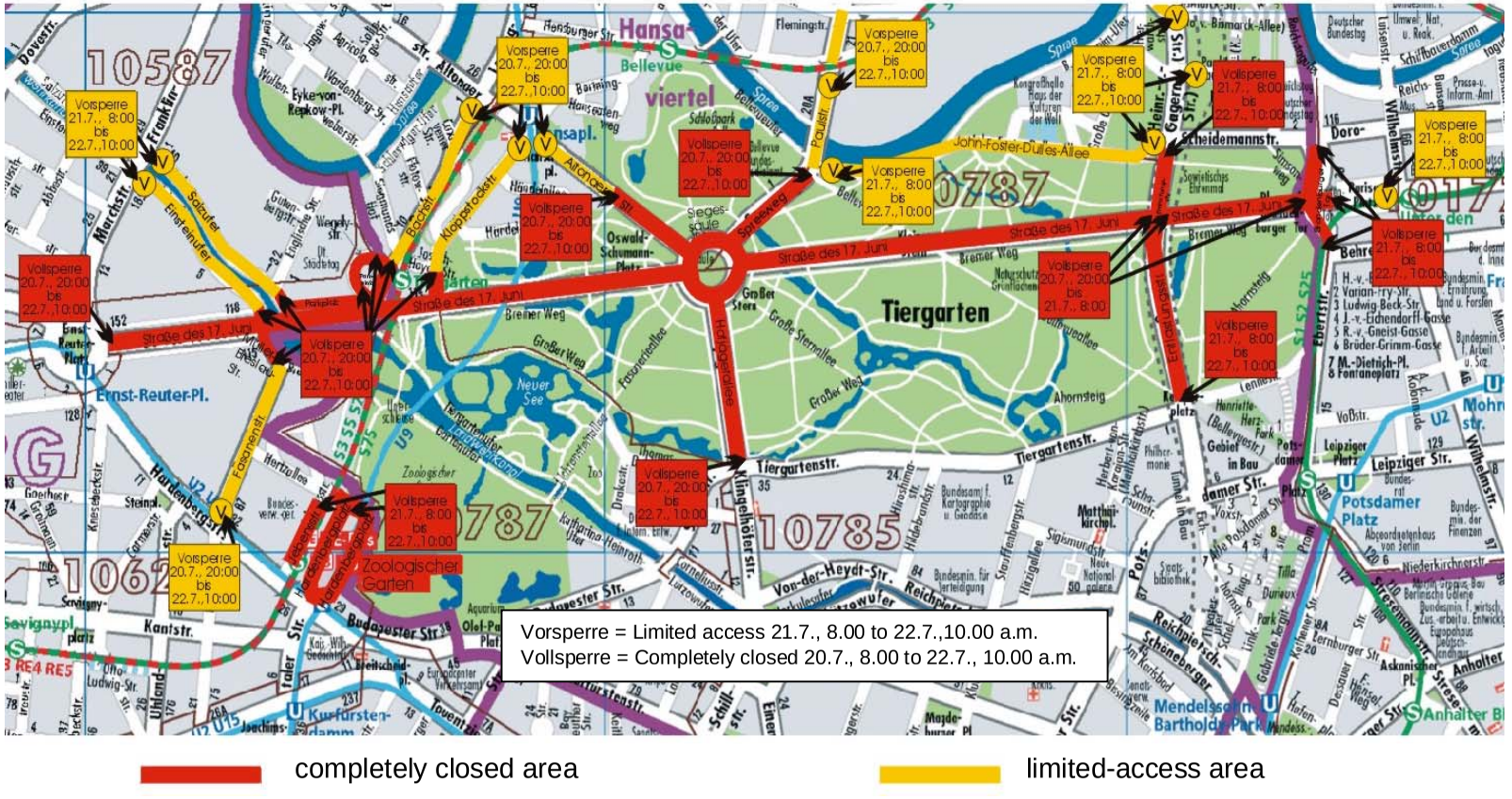
Experience shows that police estimates of the numbers of participants are lower than those of the organisers. Both sets of figures nevertheless show that the maximum number of 1.2 or 1.5 million participants in 1999 has not been achieved since. There is still no known study of the social structure of the participants. The age range has been estimated at 13-30, though there appears to be a trend towards making it a family outing. Around 60 per cent of the participants must be schoolchildren, 30 per cent Berliners and around 7-8 per cent foreigners, mainly from New York *(Forschungsstelle für den Handel,* 1997).

Figure 2. **Love Parade route**



Source: Planetcom, 1998.

Figure 3. **Plan of road closures for 2001 Love Parade**



Source: Berlin Police.

9.5. Safety planning, disruptions and counter demonstrations

The experience of eleven years has led to conditions being imposed on floats and catering. There are updated checklists and recommendations. The situation at any moment is monitored and controlled by the police from the air. Negotiations between organiser, Senate and local authority begin about six months before the event and specific planning arrangements about two months before. In 2001, the nine hundred Love Parade stewards were supported by 1 700 officers from the Federal Border Guard and two thousand police officers. Medical care in 2001 was provided by nine hundred first-aid attendants from the *Malteser Hilfsdienst* and forty doctors. In addition, twenty-one fixed and six mobile medical centres were set up along the route. Experience shows that the main problems are due to exhaustion and alcohol or drug abuse.

The event is regarded as peaceful. According to a description attributed to an experienced police officer: "*The circumstances are chaotic, but with this public we don't need to worry about riots.*" The drug and alcohol abuse is seen as a reflection of our society. In 2000, there were only 110 arrests, half of them for drug abuse.

The commercialisation of the Love Parade is regarded on many sides as grounds for counter-demonstrations. Having once been a protest movement, the Love Parade has now become an event for tourists and members of the establishment. The first consequence since 1996 has been the emergence of a breakaway movement, the so-called "Fuck Parade" which was, however, denied the status of a political demonstration in 2001. In autumn 2000, in order to prevent the 2001 Love Parade, the citizens' initiative, "*Save the Tiergarten from the Love Parade*", blocked all the functions due to be held in the Tiergarten the following July. Thereupon the debate over the status of the licence and the assumption of costs entered its decisive, open stage.

9.6. Funding

As a legally recognised political demonstration, it has been regarded since around 1995 as a commercial undertaking. From the outset the tendency on the part of the organiser to avoid and externalise costs was clear to everybody. Its funding is not transparent and is marked by legal clashes and political horse-trading between the Senate, the organisers and the local authority. It was, therefore, only a matter of time before it was stripped of its status as a demonstration and a clear account of the allocation of costs was required from the organisers.

The main problems were the costs of disposing of waste and restoring the Tiergarten. The waste problem has existed since the event began and singles out the Love Parade as the symbol of the throw-away society. In the meantime, the amounts of waste accumulated have levelled off at 250 tonnes (or 200 grams per participant) since 1997. In the morning after the event, the waste on the Love Parade route lies ankle deep. From midnight until the early evening, eight hundred employees and three hundred vehicles from the Berlin Cleaning Department and the firm Alba, together with police water cannon, are deployed to clear up and dilute the urine in the Tiergarten. In order to free up the roads for traffic as quickly as possible, the major clearing-up work is staggered. As a political demonstration with no rights to catering, the proceeds of an outside caterer are used to offset the costs of waste disposal.

In recent years, the Love Parade has brought around 250-300 million DM per year of extra buying power to Berlin. Of this, around 10 per cent, i.e. 25-30 million DM, represented real additional tax income. In spite of this, it did not seem possible to Berlin politicians to earmark 350 000 DM for the restoration of the Tiergarten, used as an overspill area, a camping site, a toilet and a place for

having sex. Instead, the city authority was reminded of its service obligations, a citizens' initiative was encouraged, a crisis over the very existence of the Love Parade was prompted, uncertainty over planning was aroused and the people of Berlin were exposed to the politics of the absurd. Given the uncertainty over dates and routes, most actors concerned with traffic based their approach on the conditions that had prevailed the previous year.

9.7. Traffic planning

As a political demonstration, the Love Parade had not hitherto had to make any traffic plans itself and had been able to confine its attention to the internal organisation of the processions. The BVG actually made the public transport arrangements, the road closures were planned by the police and the railways, the coach companies and the airlines looked after their long-distance transport interests. Since 2001, a subcontractor has drawn up a draft traffic plan on behalf of the organisers.

9.8. Travel to and from the event, staying overnight

Although many ravers combine the Love Parade with a week's holiday in Berlin, the majority travel to Berlin on Thursday evening and go home on Saturday/Sunday. Most spend the night with friends, are found places by accommodation agencies, stay in hotels, or sleep in tents pitched in parking areas or camping sites.

According to information provided by the DB AG (Kießling, Marketing-Ost) about 75 000 ravers came to the Love Parade on scheduled trains or special trains in 2001. This means 150 000 individual journeys to or from the event. If we assume that there was a total of 1 million participants, of which 300 000 were from Berlin, this gives 1.4 million individual journeys to or from the event on intercity or regional transport and thus a share of 11 per cent in the modal split for the Deutsche Bundesbahn. If half the foreigners came by air, the share of air transport in the modal split is 4 per cent. If all Berliners went to the Love Parade by public transport or on foot, they account for 30 per cent. This leaves a 55 per cent share for motorised road vehicles (cars, coaches, motorcycles). The cars used evidently carried a very high number of passengers. Airlines do not normally lay on extra flights.

In addition to the scheduled trains, the DB AG laid on 76 special trains for the 2001 Love Parade. These special trains came from places more than 200 kilometres from Berlin. The railway operator required more than 1 000 extra employees and 200-300 volunteers from all parts of the DB AG to provide information, dressed in red Love Parade T-shirts. The problem area is the section of the railway that passes through the inner city (the "city railway"), which is the object of intensive surveillance on account of its susceptibility to disruptive activity. The maximum capacity of this section is 452 trains per day. For this reason, scheduled long-distance traffic runs through it, but all the special trains and regional traffic to and from Berlin only run as far as a ring of stations (more or less) in the suburbs (Potsdam, Wannsee, Spandau, Henningsdorf, Lichtenberg, Ahrensfelde, Erkner, Königs-Wusterhausen, Schönefeld). Visitors are asked to travel to the inner city by the city railway (and to come back in the same way at the end of the event). Also, it is forbidden to take bicycles on regional and intercity trains to and from Berlin during the Love Parade weekend. This approach, involving the use of stations at the outer rim of the event, also means that stations with particularly long platforms and wide staircases, as in Schönefeld, are available for use. The special trains were shunted into stations on the periphery and cleaned. The city railway's Zoo station, at which most of the ravers arrive, is supervised by the Federal Border Guard (BGS). The departure of the ravers on Saturday or in the night from Saturday to Sunday is regarded as a critical phase for the BGS and the railway. There is no supervision in the trains. To avoid chaotic conditions at the Zoo station, the

intercity part is closed between 9.00 p.m. on Saturday and 6.00 p.m. on Sunday. But in order to prevent overcrowding on its city railway platforms, on Saturday evening the BGS only allows the ravers from the Love Parade to enter the city railway part of the station in batches. Rail travellers are advised to avoid the Zoo station and to allow themselves more time for their journeys.

9.9. Public transport

At the Love Parade weekend all public transport in the western part of Berlin is affected by the event. The city railway stations located near to the parade route, namely Unter den Linden and Tiergarten, may if necessary be closed. For the Love Parade, not only are extra buses, trams, underground trains and city railway trains laid on but the frequency of the services is increased and night traffic is intensified. The city trains run all night long: on some lines they run every ten minutes and on others every twenty minutes. The central underground lines U2 (Pankow-Ruhleben), U5 (Kaulsdorf Nord-Alexanderplatz), U6 (Tegel-Mariendorf), U7 (Rathaus Spandau-Grenzallee) and U8 (Osloer Strasse–Hermannstrasse) run until 5:00 a.m. Buses have to drive around the closed-off areas and it is therefore necessary to set up new bus-stops. The greater frequency of services changes the duty rosters of employees. Finally, for some years now, visitors have had the use of the "*Bag-Mobil*", a double-decker city bus which serves as a mobile repository for their bags, rucksacks, etc.

9.10. Motorised road traffic

No extra parking space is made available for the Love Parade. The Strasse des 17 Juni, the Grosse Stern, the Hardenbergplatz with the Zoological Garden, the Hofjägerallee, as well as parts of the Altonaer Strasse, the Spreeweg and the relief roads, are closed to all private cars and motorcycles. Apart from the floats, police vehicles, fire engines and ambulances, no vehicles are allowed here and visitors must move around on foot. The Fasanenstrasse, Einsteinufer and Salzufer, Bachstrasse and Klopstockstrasse, Paulstrasse and John-Foster-Dulles-Allee are closed. Here, access by car is limited to residents or persons in urgent need.

9.11. Pricing policy

The DB AG offered a "Raver Ticket" for the 2001 Love Parade. It was valid from 20-22 July for second-class travel in passenger trains (without ICE and motorail facilities), in special Love Parade trains and Berlin city trains. It cost 69 DM for journeys of 600 km or less and 99 DM for journeys of more than 601 km. It was not possible to reserve places and tickets were neither exchanged nor refunded. If the visitor had to use other trains – at least on the journey to Berlin – he/she had to pay extra.

In Berlin, there is a "No-Limit Ticket" for the Love Parade. This takes the form of a plastic armband with the BVG logo, which cannot be removed without serious injury to the wearer. The colour is changed every year. It is valid from 8.00 p.m. on Friday until 12.00 p.m. on Sunday night (i.e. for 54 hours) throughout the whole of Berlin and its immediate environs (tariff zones ABC) for BVG city trains, underground and buses, and in 2001 it cost 15 DM. This ticket is particularly important in that it gives the user insurance cover.

As regards air travel, in 2000 a Love Parade Special to Berlin was offered to ravers aged between 12 and 30. In 2001, it was available up until 27 July from Munich, Düsseldorf, Cologne and Stuttgart as a summer special at a cost of 149 DM , inclusive of tax and charges.

Many coach companies offer trips in co-operation with travel agencies.

9.12. The great trial of strength

The Love Parade represents a classic example of conflict in local government over the objectives of events policy. Experience shows that local influence on the planning process decreases as the scale of the event increases (Hall, 1999: 14). The conflict between the Tiergarten district and the Berlin Senate over the routing of the Love Parade confirms this trend. The debate over the 2001 Love Parade is a text-book demonstration of the critical role of planning. First of all, it clearly shows the extent to which a fascinating location can cause inertia. Just how explosive bottled-up problems can become is particularly apparent from the political fancy-dress adopted by commercial events and from the political failure to grasp the importance of paying appropriate compensation from the regional coffers to the district that has suffered damage. The inability of organisers to adapt to changing framework conditions is shown simply by the speed with which a new movement becomes conservative, if it is successful and consistent with prevailing policy and becomes concerned simply with maintaining power. Finally, an attempt has been made to deduce political priorities from the commercial success of a ten-year-long, highly profitable undertaking. This may have involved taking account of the world-wide publicity provided by a major event with a declining number of participants.

Following a robust confrontation between politicians and organisers, the Love Parade was stripped of its status as a political event but was to assume all future costs, was granted catering rights and would be allowed a smooth transition. In order to ensure that the solution was fully appropriate to the situation, the Senator responsible for Economic Affairs filled the vacuum and took on the role of moderator. Since it concerned the B2/5 (Strasse des 17. Juni) and the B96 (the relief roads), Article 8, par. 6 of the law on trunk roads was invoked and overall responsibility was accordingly given to the State Police Administration Agency (LPVA), who would collaborate with the urban district authorities. This arrangement is to be maintained for the 2002 Love Parade. At the same time, a round table comprising the organisers and all the authorities was convened to work out an approach for the next 4-5 years. Here, a new location was again to be sought, but with a creative consideration of any changes that might be required. To provide for safeguards on planning, scheduling and routing, on 13 November 2001 the Senate decided that the next Love Parade would be a commercial event and could be held on 13 July 2002 on the route used hitherto through the Tiergarten.

10. MEGA-EVENTS IN BERLIN-BRANDENBURG: BIESENTHAL BIKERS' MEETING (30 000 MOTOR-CYCLE ENTHUSIASTS IN A SMALL TOWN)

Events *à la* Woodstock are held out in the green fields and are normally associated with camping. The challenge is posed by the lack of infrastructure, leading to a danger of extreme overcrowding and disruption and a risk to safety from the sodden ground after rain. Travel to and from the event is

normally by individual motorised transport. At a bikers' meeting, the joy of travelling is the central theme and for this reason, the travel to and from the site is part of the event. For the venue, the benefit of this type of event is that its image is enhanced.

10.1. The event

Twenty thousand warrior-like motorcyclists wearing crash helmets and studded jeans arrive at a meadow set between woods, lakes and a small town of five thousand inhabitants, celebrate long into the night for four days, live in tents, and their impact is such that the population look forward to their coming back after they have gone. The special feature of this transport event, therefore, is that there has never been any trouble since it began eleven years ago (Canis, Koch, Krenz, 2001; Jachmann, Tölle, 2001).

The organiser is the biggest and best-known motorcycle club in Germany, "Born to be Wild e.V. (BTBW)" with the Jamboree-Event GmbH. In 1991, the Berlin club was looking for a site for its commercial club festival. The mayor, Thomas Kuther, a motorcycle enthusiast, heard about it, offered his support and brought the festival to Biesenthal. Out of this developed the biggest bikers' meeting in Europe. It is a family outing for a group of people to whom riding a motorcycle means living: "*Anything on two wheels is invited*" (Mayor Kuther, 2001).

The bikers' programme includes several days on the event site and Saturday in the town. On the site, the events not only include music and parties with a lot of beer, but also extend to biker games, bungee jumping[20] and even an "erotic show". The town party on Saturday for bikers and locals includes, amongst other things, an erotic breakfast and a Bikers' religious service. Shopping trips in Biesenthal, excursions in the surrounding country and show-rides complete the programme.

10.2. Framework conditions

Biesenthal is situated outside the urban area and has an unemployment rate of 20 per cent, a moto-cross site that is hardly ever used and a dynamic mayor, who was himself once a district moto-cross champion. The event site and the camping site can be separated off from the locality and the forest deadens the sound. The parking space is just off the road. The necessary separation of the areas is made easier by the patches of woodland and there is room to extend the different areas. The Biesenthal council office (urban/state district), the authorities and club form a team.

10.3. Location and time

The event site is in a delightful setting, thirty kilometres north-east of Berlin, between the motorway, several lakes and the town of Biesenthal. The Lanke turn-off on the A11 is four kilometres away and Biesenthal is on the B2 (federal road) one kilometre away. The event site consists of a festival field with a large stage, a marquee and an arena, a camping site just next to it and a car-park a little farther away. Motorcyclists are supposed to take their bikes with them to their own tents and to the festival area. Most trips made over the four days are by motorcycle. The car-park, where the visitors' cars and caravans are left, can only be reached via rough tracks through the forest and so, because rusticity is the order of the day, two tractors with open trailers provide a shuttle service. This is the central zone, which on Saturday also includes the town. The intermediate zone is the immediate vicinity with lakes and town, the outer area extends to the A11 access roads and to the B2 (Figure 4). All roads are signposted.

The Biesenthal bikers' meeting is held every third weekend of July (thus in 2001 it happened to take place at the same time as the Love Parade in Berlin).

10.4. Transport planning

The organisers have been lucky with the transport situation. The location is accessible from the motorway, without the need to pass through Biesenthal. There is sufficient parking space just off the road. The location is not on the B2, but on the very well-constructed but little-used country road between Biesenthal and Lanke (for the A11). The large numbers of bikers admittedly bring an enormous traffic load, but they do not smother the region. The curious come late on Saturday and stay for a long time, for the live music goes on deep into the night. Even here there is no problem from converging streams of traffic.

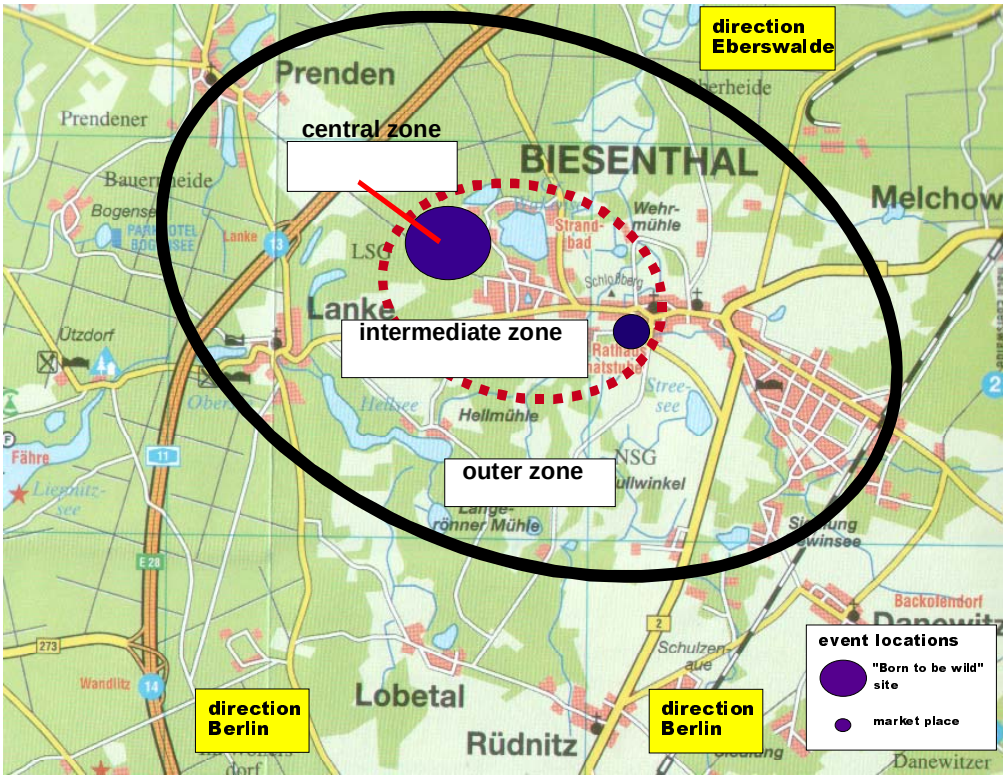
The central transport planning problem at the bikers' meetings has always been to provide for emergency routes in areas that are difficult to negotiate. Because of the narrow forest tracks, only a one-way system can guarantee that traffic can run without hindrance. But these tracks are also used by the large lorries that supply the event and take away garbage and sewage (the toilet facilities are cleared several times a day by sewage-pumping vehicles). Emergency routes are also provided by the one-way route, consisting of the narrow local roads, which serves the festival green and provides access for tradesmen and the press. This route is kept clear with difficulty. Tradesmen have to park their vehicles at the side of the road. If a vehicle is double-parked, it is immediately towed away, since it blocks the emergency route.

10.5. Licensing and planning

The planning rule is: the town does not encroach upon the activities of the event and the event's organisers do not encroach upon those of the town. Advertising in motorcycle magazines and on the Internet begins six to nine months before the event, the main planning is done six months beforehand. The organiser is responsible for everything. The health and safety inspectorate issues the licence and acts as co-ordinator between town and organiser. There is hardly any limitation on traffic. Emergency routes and parking spaces have to be found and the event has to be signposted. Three separate areas are identified, responsibilities are clearly regulated and linked to scheduling and programming requirements: technical arrangements (stage, electrical installations); safety, advertising and marketing; tradesmen, stands and breweries. Since the club has the organiser's role, it takes over the bulk of the planning. The little work that remains for the town/local authority has now been sorted out, so that today only the health and safety department still takes responsibility for official planning and co-ordination. A checklist, the fruit of experience, shows the specialist when the planning is to take place and who is to participate and has to be invited to the session. The most important actors are the police, the fire service, the food hygiene inspectorate, the factory inspectorate and the vehicle recovery service. As organiser, the club is required to make applications and provide information. It gives information on the programme of the event, organisation, safety, supply and waste disposal and traffic regulation. Two weeks before the event, the stage is up, a week before, the fences have been erected, by Monday all the main stands and the marquee are up. On Wednesday the construction work is finished and the site can therefore be inspected by the organiser and the authorities on Thursday. Two hundred and forty toilets are provided, i.e. about one toilet for 125 people. Electricity is supplied by diesel generators; 2 x 45 000 watts are needed just for the stage. On the festival site there is a tent with a special action committee, to which all the actors belong and to which any short-term decisions

fall where necessary. Dismantling takes place on Sunday morning. The motto is: "*For four days every year, we build a little town out in the wilds and lay on everything that goes with it* (Scholz, Jamboree-Event GmbH)."

Figure 4. **Zoning at Biesenthal Bikers' Meeting**



10.6. Size

According to figures from the press and the organisers, there were 50 000 visitors in 1996 and 30 000 in 2001. In the meantime, the numbers given on the Internet have been drastically lowered for all the other past years. This can perhaps be explained by the realisation that the likelihood of getting a good view is important for public relations purposes.

10.7. Participants

There has been no study of the visitor structure. There are said to be 7 000-8 000 motorcycles and 120 tradesmen, about half of them from Berlin. In addition, there are thousands of people who have come to watch. For the working motorcycle enthusiasts, both male and female, this event is a holiday. Many are regular visitors. The organiser is proud of the fact that the unemployed can be heard engaging in shop-talk with bank managers at the event. The conspicuous absence of violence is associated with the high cost of motorcycles. Because of this, the proportion of affluent participants is estimated at 60-70 per cent.

10.8. Travel to and from the event

The camping site starts to fill up on Wednesday evening, but visitors arrive at the event as late as Friday evening. Visitors get in for free on Saturday. Although Biesenthal can be reached from Berlin-Lichtenberg, travel to the event is exclusively by motorcycle or car. Normally, there are groups of fifty or sixty bikers and about half of them are from Berlin. The departure from Biesenthal begins on Sunday at midday and on Monday morning the camping site is empty. In spite of the traffic to and from Berlin, commuter traffic on working days and leisure traffic at the weekend, there is hardly any disruption due to traffic build-up. This will presumably not be the case at the next bikers' meeting, to be held from Friday 17 May to Monday 20 May 2002, since this period includes Whitsuntide.

10.9. Security

The whole site is fenced in and there is an entrance charge. Visitors are normally checked and their pockets inspected at the crossing point between the camping site and the festival area. Two uniformed police officers are on hand, but they stay outside the site. Even the traffic police stay in the town. Only plain-clothes officers are allowed onto the site. An atmosphere of mutual trust prevails between police and participants. The basic principles include no provocation and no heavy-handed control of traffic. On the site, many bikers ride without helmets, having drunk a lot of alcohol, but there have never been any incidents. The police are there, regulating the situation, fulfilling their supervisory function, but seldom carrying out checks. On the festival site, the BTBW club sees to security with two hundred of its own stewards ("*Bikers look after bikers*"). All stewards are members of the club, they know their public and "have arms like other people's thighs". Rainy weather is not seen as a problem as the stage is roofed over. There have only been 4 or 5 matters reported to the police at each event. Two health and emergency vehicles stand ready.

10.10. Funding and pricing policy

The three-day ticket costs 80 DM. In earlier years there had been cheaper tickets for those who could show they were from Biesenthal. When the number of local residents on the event site doubled, the ticket was done away with. And there are no one-day tickets. The participant therefore buys a combined ticket, which gives access to the marquee and all the other events on the site. The organising club pays all the costs and restores the site to the condition it had been in before the event. Even the Biesenthal voluntary fire service is paid, being on hand from Wednesday to Saturday. According to internal estimates, the participant pays out around 500-800 DM over these four days. Of this amount, 20-25 per cent stays in the town. Sponsors have no say in the organisation and may only say how they wish to be presented. Even though 40 per cent of those present ride a Harley-Davidson, the meeting is not sponsored by that company.

10.11. Advantages for the town

The town pays nothing, but gains additional tax income and a considerably higher profile. The bikers' meeting is a strong element in the town's tourist strategy and Biesenthal's businesses are full of enthusiasm for the bikers' meetings and demand more activities. The hotels are completely booked up, the shops are open longer and their turnovers are higher. The initial fear of the "rockers" has given way to a wave of sympathy. Not only have the mayor's private discussions contributed to this, but also the Saturday festival programme in and for the town. The *Wukenseefest*, organised in August, is seen to demonstrate the learning effect of the bikers' meeting.

11. LESSONS LEARNT FROM PLANNING OF EVENTS IN BERLIN-BRANDENBURG

In a megalopolis like Berlin, nearly everything that has to be planned, set up and learnt in a small town already exists. It can therefore be stated - without any arrogance - that for the experienced traffic planner from the Berlin police, there are no difficult events, there is simply the question of how many police officers there are for planning and supervision.

As Berlin's practice shows, mega-events can be successful without measures to deter traffic, parking space to absorb it or signposting and with rule-of-thumb planning by experienced practitioners.

The centre of a large city is a much-coveted but particularly difficult location. These bottleneck situations led to a ranking of locations in Berlin and the conditions of their use.

The planning role of the Berlin police came about as a result of particular factors: these included the vulnerability of West Berlin up until reunification, the "demo scene" from the sixties to the eighties and, not least, the recognition of major commercial events as political demonstrations.

The restless years bred the model of the experienced police officer who knows his limits and, for this very reason, seeks open, integrating solutions to problems involving the local area. Precisely because he knows how alone he is in the event of failure, he self-consciously defends his specialised position in the face of state bureaucrats, as in the case of the wrapping of the Reichstag[21].

Berlin's way of planning events fulfils central requirements of modern planning for complex systems. The decisionmaking processes are transparent. The planning group is an interdisciplinary team. With the inclusion of the district, the potential for local ideas is exploited. The minorities affected are brought into the process. Inasmuch as lessons can be learnt from an earlier period, the system is conducive to learning. For planners, organisers and participants, variety, creativity and spontaneity are possible.

In Berlin there is no co-ordinating authority for events. What is needed is a single office that co-ordinates everything and is also available for smaller events. It must not seek to do everything itself but, in its capacity as a service agency with its own competences, must demand, collect and bring together inputs and grant authorisation, knowing that it will be supported.

Since freedom of assembly is part of a democratic society, demonstrations must remain serious expressions of political will. Following the crisis of the 2001 Love Parade, the prerequisites for the authorisation of a political demonstration were therefore made more precise and more rigorous.

It is clear from Berlin's mega-events that environmental considerations and the interests of residents can easily be pushed into the background by economic factors. But above all it has been demonstrated – by Christo with the wrapping of the Reichstag and by Willy E. Kausch with the 2000 New Year's Eve party – that environmentally friendly and financially attractive events are possible.

12. CHANGES IN FRAMEWORK CONDITIONS, DEFICIENCIES AND NEW CHALLENGES

The exceptional experience gained with demonstrations in Berlin was applied to the planning of events representing the central product of the growth in the leisure and recreation society. In this respect, it was a model for success in the decade between the fall of the Wall and the normal operation of the capital.

Berlin is in the process of establishing an uncompromising event culture. It is setting the limits for event managers and deciding what can reasonably be expected of Berlin and its traffic system[22].

In the planning for traffic at Berlin's events, a harder distinction will be made in future between priority and non-priority traffic and the two categories will be dealt with differently. If all transport users were treated in the same way, in the end nobody would be able to move[23].

After forty years as an island, Berlin has a lot of catching up to do in a number of areas. These include the provision of park-and-ride lots with accommodation facilities at the gates of the city and shuttle links to the city railway, coupled with package offers for a particular event and local transport[24]. In addition, there are no facilities for giving directions, even for pedestrians[25].

A growing challenge is the co-ordination of several events taking place near each other at the same time. These are held at different places, they have different ties to the city and they attract different types of visitor, who accordingly use different forms of transport. How is the problem of converging traffic flows to be solved?

How can organisers be made more flexible, so that they include the journey to and from the event in their planning arrangements and do not leave the visitors to their own devices? A punctual arrival increases the pleasure derived from an event; or at least it does if there is a clear starting time.

A central problem is the future role of the police. If the State wishes to remain strong, its police must be able to concentrate on their most important duties and on the rules governing the planning of events. This applies particularly when peaceful events and violent demonstrations occur near each other. The number of events is rising by leaps and bounds (Table 1) and is increasingly overtaxing the police. State visits require a particularly high number of officers, parliament and government buildings are the targets of demonstrations and the right of access to embassies must be guaranteed. After the 11 September massacres, particular attention is being paid to questions of security[26].

With the requirement for organisers to submit a draft traffic plan with their application, the police are admittedly given a very good idea of the overall concept behind traffic planning, but they have to rely on the figures provided by the traffic planning office who, consciously or unconsciously, do the calculations on behalf of the organisers and are bound to proceed in the interests of the event. In any case, the dependence of the police on the assumptions and arithmetical ingenuity of traffic planners, which they can only counter with their years of experience, is a strong argument in favour of a new orientation in transport management.

Table 1. **Disruption of traffic area in the Berlin-Mitte district by events (processions and rallies in open street areas and in closed areas, as well as state visits)**

Type of licence	1998	1999	2000
Assemblies	303	652	1 005
Events	748	1 284	1 819

Source: Der Polizeipräsident in Berlin (2001): Landesschutzpolizeiamt, Direktion 3 (Verkehrsdienst).

Several specialised fields should be called upon in future in order to optimise traffic movement: the Senate's urban development and interior departments should establish strategic targets; the traffic management centre (VMZ) should gather, evaluate and provide information; the police's state regulation centre (VKRZ) should collect information and take charge of its dissemination on the Internet and traffic warning radio and should also take over traffic management. From this traffic management centre, Berlin hopes to integrate all the different traffic systems and thus establish a single overall system. Mass events, because they present traffic problems, are a particularly important field of operation.

13. NEW EVENTS THRIVE ON CHANGES IN FRAMEWORK CONDITIONS

There have always been events, but they were called something else. Events will exist as long as mankind exists, since celebration is an essential part of human existence: an expression of community and fellowship, of contrast and relief, it is also a way of cultivating transcendency and manifesting success. Celebrations are social phenomena and stem from a time when tourism was still unknown. For this reason, the easy argument that events in open fields (like Woodstock 1969) or in gigantic enclosed spaces (like the 2000 New Year's Eve in Berlin) only became the norm when modern transport techniques broke down spatial barriers, is only half the truth. Mega-events do not merely depend on accessibility, for there were already mass events in the era of horses, carriages and sailing ships. Even though the attendance levels claimed for major events still prompt us to caution, coronation ceremonies and royal weddings, markets and fairs, pilgrimages, parliamentary meetings and councils have been associated with peak transport levels since the earliest times.

The Industrial Revolution admittedly pushed technical products into the centre stage and encouraged the rise of world exhibitions, but there was still severe want in the societies of that time. Even though they were liberal and had relations with countries across the world, they were still hierarchically structured, with geographical awareness restricted to the local and regional area and there was a national policy. As these conditions were reflected specifically in the relative transport prices[27], in the limited desire by people to come together in crowds and, above all, in public opinion on the subject, major events were limited to large-scale religious, political and sports meetings.

These restrictions were first broken down by the militant ideologies, which systematically exploited the seductive power of major events to create a sense of common purpose. The intimate relationship with the media (radio and mass marches), the perfect organisation, the military discipline and the aesthetic extravagance set lasting standards (the 1936 Olympic Games or the Nuremberg rallies). In comparison, the major events and marches of the GDR (the World Youth Festival of 1951 or the 1st May celebrations) seemed provincial. Because of the uneasy memories stirred by these events, major functions – in east and west – were for many years confined to sports stadiums, the vicinity of churches (as on catholic and church days), arenas (such as the Nürburg circuit) or marquees on local sites (e.g. the Munich *Oktoberfest*).

Events involving vast numbers in the open country (like the flower-power Woodstock festival in 1969) and on stretches of roads or in city centres (like the techno generation's Love-Parade) have only become conceivable in democracies since the hitherto very effective social barriers to car ownership have lost their force. This is as a result of mass prosperity, growing freedom, individual car ownership, the model provided by American mass culture, possession of one's own TV and record player, ease of foreign travel, convertible currency, the sexual revolution resulting from the widespread use of the pill and the legalisation of homosexuality, the student revolt against an apparently meaningless war and pop culture. Behind all this was the fact that the society of want with its restrictive canon of values was being replaced with an individualistic society, in which there were fewer and fewer common values and these were now sought during leisure time. According to the logic of this situation, the three legendary days of Woodstock represented something totally new[28]. As early as the fifties, the new rock'n roll music of the time was associated by the older generation with "*noise, chaos, black music and sexual freedom* (Focus 18/1999: 133)." Today, it is precisely these features that draw people to the Love Parade and techno.

The wave of mega-events in the nineties may be interpreted as a continuation of the longing for self-fulfilment of the 1968 generation, as a movement seeking freedom from the *angst* of the eighties or as the purchase of fun, aesthetic delight and companionship for a short time[29].

In recent years, inflationary tendencies in the events scene have been a sign of limited growth and of wear and tear in well-known events. As a result, event planners have increasingly tried to free themselves from having to cater for the crowd, to put their money on variety, to place the emphasiz on the particular and not merely seek salvation in "size". Top commercial events and the systematic discovery of counter-movements have been thrust into the foreground. As the history of mass events shows, counter-movements are always a good source of opportunities. In addition, there are the international super-events, such as Germany's hosting of the Football World Cup in 2006 and perhaps the Olympic Games in 2012.

The events of 11 September 2001 now confront the "me", "fun", "leisure" and "recreation" society with a contrasting agenda: the power of a fundamentalist value system, the demonstration of total self-abnegation, the targeted mass destruction of symbols of Western civilisation and, above all, fear. The safety of events, however, depends on joy, rules, common interests, openness, communication and effective sanctions. For this reason, these four counter elements hit the functional mechanism of an event at its most sensitive point. Major commercial events are now directly threatened by terrorism, war and political demonstrations. But their indirect effects could encourage the return of those social factors that once made mass commercial meetings difficult: renewed scarcity as a result of economic crises; intolerance and exclusion on the grounds of colour, nationality or religion; impediments to travel due to the refusal to allow entry into a country; border controls and security checks.

The current situation will favour the rebirth of local and regional identity as a reaction to globalisation in tourism. Delightful leisure options will thus be available without the need to travel, or to travel very far. This idea of "renewed neighbourhood activity" could be favourable to local events (cf. Heinze, Kill, 1997; Heinze, 2000)[30]. These would include non-commercial events, such as catholic and church days and (genuine) political demonstrations.

However long this hiatus lasts and however far-reaching it may be, history teaches us to look forward to joyful festivals in subsequent periods. Some of them might even be new "long-standing" events - such as the Oberammergau Passion plays, marking the end of the plague (1633), Guy Fawkes Day in England following the failed attempt to blow up Parliament (5 November 1605) or the 14 July celebrations in Paris - and will represent a new departure for a more humane society. Whatever form these festivals may take, they will still be exercises in coping with traffic and will require solid transport and safety planning. Lastly, even the fall of the Berlin Wall did not bring traffic to a standstill.

NOTES

1. At the same time an event is astonishingly adaptable, for it changes throughout its duration and, whether at the same place or elsewhere, it becomes something different whenever it is repeated, if only because the initial conditions are different.

2. With respect to safety aspects, the police distinguish -- by analogy with an onion (cf. K. Daube) -- between the immediate site of the event and the wider area. Closer examination shows that the latter is very like the central zone and the intermediate zone. The underground and city rail stations represent appropriate limits to the intermediate zone precisely because they are the object of intensive policing.

3. The bus and coach termini also belong in the intermediate area (since very few major events allow internal bus traffic).

4. According to reports by the road transport authorities, in practice, no organisers ask how many visitors the BVG can cope with or how many places its vehicles can provide.

5. For the wrapping of the Reichstag in 1995, the road sign plan was again provided by the Berlin Police (Division 3, Road Transport), for the Love Parade up until 2000 it was provided jointly by Police Division 3 and the Local Authority and for the 1999-2001 New Year's Eve parties and the 2001 Love Parade by a private planning office. Insofar as the road sign plan had to do with traffic issues, the planners were guided by the earlier police plans.

6. To a very great extent, these activities are the result of many years' prompting and advice from the police.

7. In view of the overfilled stations, the travel to the event qualifies as an additional aspect of the event and experience shows that it is keenly accepted. Pedestrians simply follow others who know where the Reichstag (for example) is situated. With this "vortex" effect, the sense of anticipation inspired by the mega-event drives the distance to be travelled by foot into the background.

8. The few exceptions include the major radial routes, such as the route to the Olympic Stadium via Bismarckstrasse-Kaiserdamm-Heerstrasse.

9. An example is the annual rehearsal of the New Year's Eve party on 30 December from 4:00 to 9:00 pm.

10. For travel to and from Berlin, the Berlin Tourismus Marketing GmbH currently estimates the modal split as follows: cars 55 per cent, railway 25 per cent, air traffic 10 per cent and coaches 9 per cent (A. Weecks, 2.10.01)

11. For the BVG, the Pope's visit in 1994-95 and his address at the Olympic Stadium was one such event. *"We only knew in advance that 150 000-200 000 people would be coming, most of them not by car and a particularly large number from Poland. At that time, the city railway link with the Olympic Stadium had not yet been recommissioned. We then set up a working group at the BVG and estimated how many were coming and from which directions and established sectors. It was also assumed that the visitors would be mainly older people, unfamiliar with the Berlin transport system. Information policy thus became a matter of central importance. The challenge consisted in distributing this extra traffic over several transport routes. In practical terms, this meant linking the traffic flows from the south-east from the underground to the south ring of the city railway and at the western intersection to bus shuttles to the Olympic Stadium. This meant changing several times. We had no figures, either beforehand or afterwards, but just rough corridors. Information was passed on by word of mouth in trains and stations, the key injunction being "Don't remain sitting, change!". The south ring was newly built and so people were not generally aware of its existence. Consequently, many traditional BVG planners would have much preferred running bus shuttles from the Zoo station. But it was a peaceful public and the whole event was a success* (Reupke 25.09.01). "

12. A good example is the Berlin Marathon. The first time this event was held there was an enormous deployment of police. Today just a few police officers are needed. In the meantime, the runners have got to know the way, the spectators along the way provide the best protection and the police are now only needed to deal with pickpockets. An event of this kind now "runs itself"! Always the same occasion, the same route, continuity and acceptance on the part of the population. It is also a "fun" event, for the spectators themselves celebrate and show their good humour; they do not stand where the course runs uphill - as it does at the Hohenzollerndamm and the runners have to struggle - but at the am Wilden Eber Square, where the Brazilian band plays and the pretty girls dance. This professional composure is one feature that distinguishes the current situation from the one that prevailed in the GDR, where attempts by class enemies to disturb proceedings had to be reckoned with at every event.

13. In practice, however, there are mixed types. For all aspects of an event that are recognised by the authority responsible for assembly as relating to "assembly", no further authorisation is required. For certain aspects of the event that do not fall under "assembly", all the required authorisations must be obtained. Thus the "*Sternfahrt der Grünen Radler*" (green cyclists rally) is licensed as a political demonstration, but the "*Ökomarkt als Fahrtziel*" (destination: ecomarket) is regarded as a commercial event.

14. But if the road is part of a federal trunk road running through the district, no special use permit is required (Article 8, par. 6 of the law on federal trunk roads). In that case, however, the district does not receive the special use charges and its right to intervene in the matter is weakened. But because the central area of the event - Strasse des 17. Juni to Unter den Linden - is made up of the trunk road B2/5 and the relief road B96, this legal provision is ignored in Berlin and only applied if – as in the case of the 2001 and 2002 Love Parades – the complexities of planning responsibilty and the pressure of time mean that a makeshift solution is inevitable. In that case, the road traffic authority of the police as the authorising/licensing authority becomes the main actor.

15. This is true even for the Berlin cycle rally, to which many spectators travel by car, judging by the number of parked cars in the vicinity of the Grosser Stern.

16. Cf. the report "Konzept zur Verkehrsführung bei Grossveranstaltungen in der Hansestadt Rostock" by the Forschungs- und Ingenieurbüros Verkehrslogistik & Regionalplanung GmbH, Rostock 2001.

17. Nevertheless, the Berlin police may not oblige the organiser to hold the projected event at the weekend.

18. In Berlin some such consideration applied to the 1989 Church Day and the bid to host the 2000 Olympics. Thought was given to the idea of holding gymnastics and sports events at a time when there was no school, as sports halls would be needed.

19. The high security conditions governing the issue of a construction permit had led the organisers to select highly flame-resistant materials. For this reason, the burning arrow shot at the Reichstag by a person unknown on the morning of 24 June 1995 was not followed by similar incidents. It caused just a small burn-hole at a height of about seven metres. After the incident, safety precautions were increased and the building was watched at all times by private security guards, 150 stewards and the local police.

20. If you jump in the nude you pay nothing.

21. Just how experienced the Berlin traffic police are was last shown at the time of the Lorry Rally to Berlin on 26 September 2000. It was expected to bring Berlin to a standstill, but went off in a well-ordered way owing to skilful traffic direction.

22. Bringing the interests of the organiser into line with those of the public is regarded as particularly difficult. For example, at the Berlin Marathon on a Sunday, the organiser wanted to let the Japanese Olympic champion set a new world record. To this end, the route was altered and the much-visited department store on the course was concealed at an early stage by constructions, etc., so much so that it feared a decline in turnover as early as Saturday. In the interests of promoting Berlin's image, there was a demand that the finishing straight be located where television viewers would see the Gedächtniskirche in the background at all times. For the BVG, however, the change in the route meant that there could only be limited use of their Wittenbergplatz underground station.

23. In this connection it is worth bearing in mind the fact that BVG bus trips to the events are not individual journeys with a waiting period at the terminus but round trips, the reduction of which represents a saving on vehicles.

24. In face of this historically understandable deficiency, the Berlin approach to traffic in planning for events makes a virtue of a necessity. Thus for decades thought has been given to park-and-ride lots and systems of road signs as the logical consequence of events and it has long been appreciated that this is a political dispute between the City of Berlin and the surrounding State of Brandenburg. It is nevertheless still argued that, given the extension of the city, parking areas outside its gates to accommodate visitors would not be accepted. Consequently, the city needs no road signs either. Coach drivers are assumed to be professionals who already know their way around. For an innovative view, cf. BMW Group, Research Division (2000): *Park and Ride im Verkehrsraum Berlin*, Gutachten, Berlin.

25. Even on the museum island there is still no plan of the museums, although they are a prime attraction for foreign visitors.

26. Safety at an event is based above all on the many years' experience of the planners and their intimate knowledge of locations. With the move towards a slimmed-down Berlin authority, these 60-year-olds are now taking early retirement. This loss of a highly experienced generation of "doers" could cause the system to break down.

27. Relative transport prices are derived from the relationship between the price of transport and that of other goods or services.

28. Today Woodstock, with its unexpected 300 000–500 000 participants out in the open countryside in the rain, is regarded as "*the largest, the most peaceful and the last common symbol of a mass movement of rebellion ..., which believed in the possibility of a transnational change in social relationships* (Schmitt, 1988).

29. The change in material circumstances and its influence should not be underestimated: the proportion of single households had drastically increased, the quantum leap in the development of media techniques had been made, deregulation and large-capacity aircraft had made cheap air travel possible, communications systems were available for booking and reservations and, not least, the PC, the mobile and the Internet were now taken for granted.

30. This also includes travelling in a group as part of the event. This can extend the location, period and objectives of an event and improve it in terms of social content and security.

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TRAFFIC PLANNING AND MANAGEMENT CONCEPT FOR THE HANOVER EXPO 2000 - IMPLEMENTATION AND CONCLUSIONS FOR SIMILAR EVENTS

SUMMARY

Hanover, January 2002

OVERVIEW

For the region of Hanover, the EXPO 2000 World Exhibition was one of its one-off or at least rare major events, in respect of which a demand-based approach to traffic planning is not possible. Instead, what is needed on such occasions is a result-oriented concept that includes measures to control demand. Through a combination of building, operating and organisational measures, the aim is to cope with a dynamic demand for transport by dynamic means.

The tools needed for "dynamic road transport systems" were developed and successfully put to the test in the region of Hanover in connection with the EXPO 2000 World Exhibition [1]. Subsequent developments – e.g. for the 2001 BAUMA fair held in Munich [2] [3] - have perfected the measures implemented in Hanover and have led to the inclusion of several new features: ramp-metering equipment in on-ramps, dynamic filling of car parks near the fairground via several different motorway junctions and routing of traffic using visual and sound signals mounted on mobile service vehicles [2].

Insofar as result-oriented planning limits the amount of extra building work, it is also possible to ensure that good use will be made of all infrastructure measures even after the exceptional event is over.

On the basis of the extensive studies carried out and subsequent developments in the German motorway network, it is possible to affirm, albeit somewhat cautiously, that the concept of result-oriented traffic planning and dynamic road transport systems could also be used for other major European events.

1. WORLD EXHIBITION EXPO 2000: FACTS AND CONDITIONS

The Federal Republic of Germany was host to a World Exhibition for the first time from 1 June to 31 October 2000. The 160-hectare exhibition site lies south-east of Hanover and includes the area used for the Hanover City Fair. Because the World Exhibition was spread over a total period of 153 days, however, the traffic planning and control measures required during the event were very different to the traffic control system implemented by the police during other major fairs in Hanover. In a referendum that followed a heated public debate, the citizens of Hanover had agreed to the hosting of the EXPO 2000 World Exhibition by only a small margin (52 per cent) and they expected any disruptions caused to the city and residential areas near the exhibition site, by vehicles travelling to and from the exhibition, to be kept to a strict minimum.

Forty million visitors were expected during the five months of the exhibition, in other words, a daily average of 261 000 visitors, peaking at 400 000 on Saturdays. Advance sale of tickets through travel agencies offering a central booking service, based on a sophisticated ticketing concept, began world-wide in October 1998, the aim being to sell 90 per cent of all tickets in advance.

Part of the reason why Germany's application to host the world exhibition was successful was undoubtedly due to the catchy motto chosen for the event, "Humankind – Nature – Technology", which was full of promise for the future. It suggested that the world exhibition, taking place as it did on the eve of the new millennium, had its own contribution to make towards a new, balanced approach to global living and development standards, as well as towards ensuring that the actions approved by the signatory states to the HABITAT II Agenda and the Istanbul Declaration were coherently implemented, in the context of sustainable development of settlements and mobility.

When planning preparations for the world exhibition, the organisers identified a series of objectives as part of the overall result-oriented strategy. These objectives were as follows:

- Building work should only be planned and carried out if there were convincing arguments to show that there would be a use for it after 2000;

- Because the world exhibition was scheduled to be open for such a long time (153 days), the residential areas near the fairground needed to have adequate protection from all the motorised traffic associated with the event;

- Traffic control should be by means of innovative technical measures rather than being left, as in the past, to transport police.

2. TRAFFIC PLANNING CONCEPT FOR EXPO 2000

The strategy, based on result-oriented traffic and mobility planning, was tried out as a system for the first time during preparations for EXPO 2000. The strategic framework conditions were as follows:

- High priority in respect of any infrastructure measures was given to public transport (75 per cent of visitors);

- The basis for calculating the potential demand for transport (cf. Table 1) was the capacity of the infrastructure which would be needed after EXPO 2000 to cope with the volume of regional traffic, including traffic travelling to and from the major fairs held in Hanover;

- Routing of traffic connected with the world exhibition onto selected major routes could only be achieved by including operating and information measures in the planning process.

Table 1. **Result-oriented matrix for visitors travelling to and from EXPO 2000 (visitors/day)** [1]

Main journey by:	Arrival at EXPO 2000 by:					
	Long-distance rail	**S-Bahn station**	**S-Bahn**	**Bus**	**Car**	**Total**
Aeroplane	-	8 000	-	-	-	8 000
Train (long-distance)	25 000	6 000	4 000	-	-	35 000
Coach	-	-	-	80 000	-	80 000
Car	-	8 000	5 000	4 000	70 000	87 000
Local transport means (Hanover and Greater Hanover)	11 000	23 000	46 000	5 000	5 000	90 000
TOTAL:	36 000	45 000	55 000	89 000	75 000	300 000

The main components of the traffic planning concept for EXPO 2000 itself were as follows:

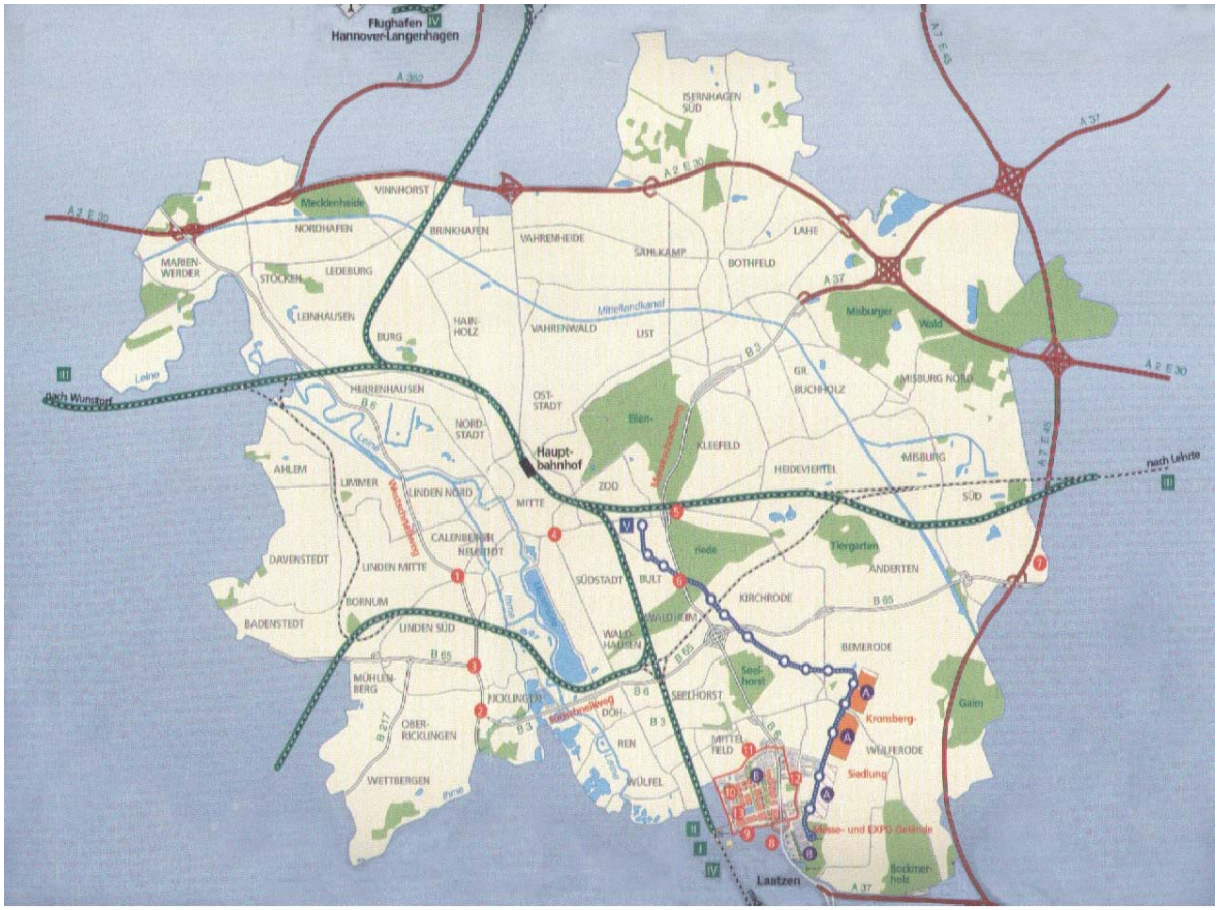
- High priority given to environment-friendly modes of transport for visitors travelling to and from the exhibition (75 per cent of daily visitors: cf. Table 1);

- New building work only when it could be shown that there would be a use for it after 2000, with preference given to extension of existing networks and including the following individual measures:
  - New S-Bahn system (suburban trains) for the region of Hanover (cf. Figure 1);
  - Upgrading of the Hanover-Messe-Laatzen railway station as a stopping station for the high-speed ICE train (cf. Figure 1);
  - New S-Bahn station, Hanover-Messe-Laatzen, in the regional S-Bahn network (cf. Figure 1);
  - New S-Bahn station, Hanover-Flughafen (airport), in the regional S-Bahn network to link up with a new, third terminal for the airport;
  - Construction of a new S-Bahn line, D-Süd (cf. Figure 1);
  - Construction of a four-lane ring road round the site of the world exhibition (cf. Figure 2) which, owing to its poor capacity, was moreover to be seen as the weak spot in the overall system and therefore meant that traffic needed to be guided and directed as well as possible to prevent motorists from stopping at random to look for somewhere to park;
  - Upgrading of the A2 (east/west) and A7 (north/south) motorways to six lanes on the basis of extra traffic forecasts in relation to EXPO 2000 and in conformity with national plans for developing the country's long-distance routes;
  - Provision of car parks to accommodate 25 000 cars and 1 400 buses and coaches around the exhibition site (cf. Figure 2);
  - Provision of 25 000 park-and-ride spaces in the Hanover region.

- Development of a comprehensive traffic management system (cf. Chapter 3) with:
  - traffic control systems on the motorways and expressways;
  - state-of-the-art information and traffic services;
  - a mobility/traffic management centre for the Hanover region (for all transport modes), known by the name of "MOVE"; and

- short-term management strategies based on actual advance ticket sales via the global ticketing network (Ticketing System).

Figure 1. **Hanover transport projects for EXPO 2000**



Schienenprojekte
Rail projects

I Fernbahnhof Hannover Messe/Laatzen
Hannover (Messe/Laatzen) station for ICE trains

II S-Bahnhof Laatzen
Laatzen S-Bahn station

S-Bahnlinien
S-Bahn lines

III Wunstorf - Lehrte

IV Flughafen - Laatzen
Airport - Laatzen

Stadtbahn
LRT

V Linie D-S
D-south line

Straßenbau
Road works

Kreisel
Roundabouts

1 Deisterplatz
2 Landwehrkreisel
3 Ricklinger Kreisel

Weitere Projekte
Other projects

4 Aegidientorplatz
5 Pferdeturmkreuzung
Pferdeturm intersection
6 D-Brücke: Bischofshol
D-south bridge: Bischofshol
7 Sechsspurige Befahrbarkeit der A2 und A7
Six-lane traffic on A2 and A7 motorways

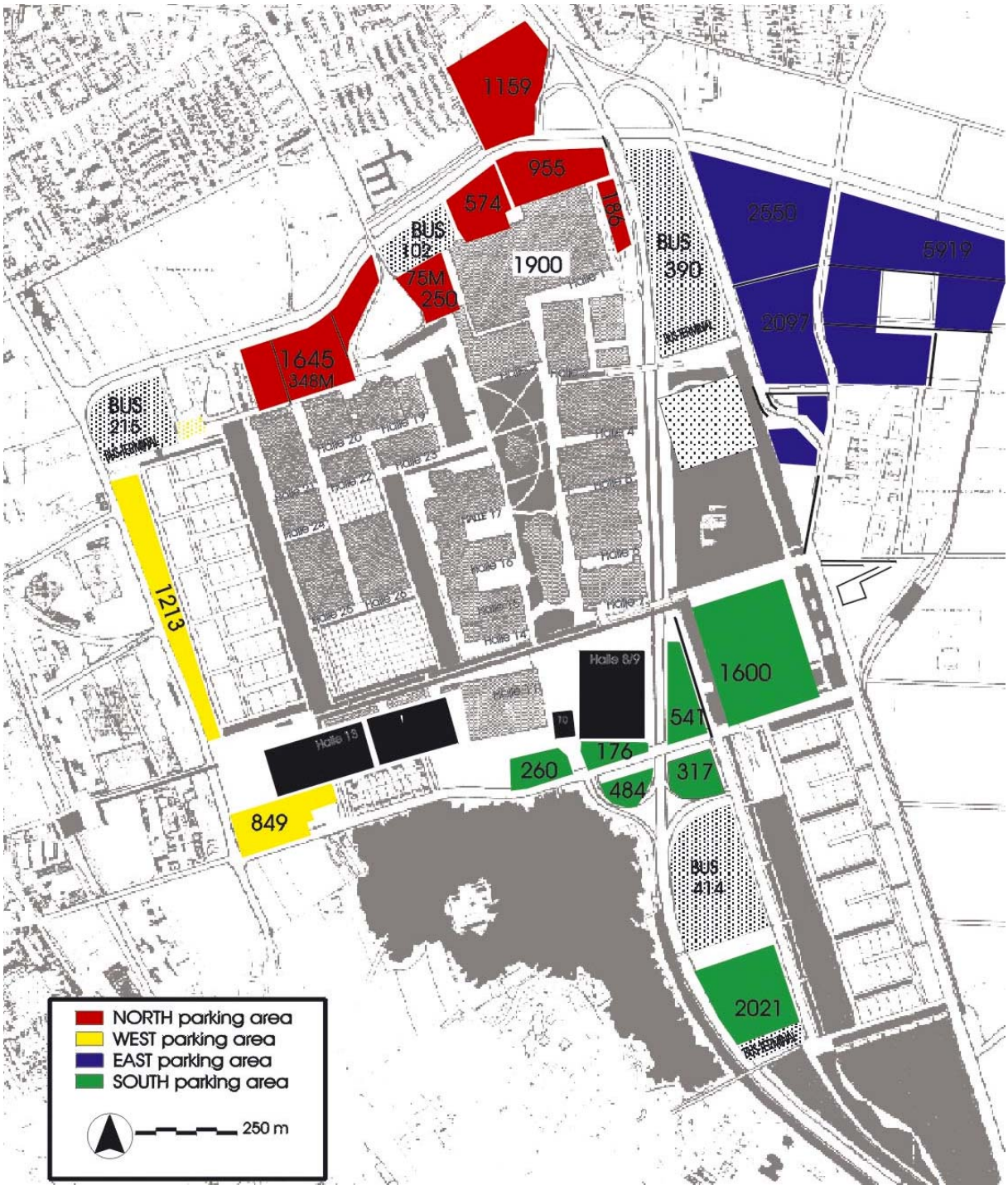
EXPO-RING
EXPO ring road

8 Kronsbergkreuzung
Kronsberg junktion
9 Kronsbergstra
10 Karlsruherstra
11 Nordspange
North Link
12 Neue Laatzenerstra
13 Münchenerstra

EXPO 2000

A EXPO-Siedlung Kronsberg
EXPO village (Kronsberg)
B EXPO-Gelände
EXPO Site

Figure 2. **Position and number of colour-coded parking spaces near the EXPO 2000 site (RED: NORTH parking area; YELLOW: WEST parking area; BLUE: EAST parking area; GREEN: SOUTH parking area)** [1].



3. TRAFFIC CONTROL AND MANAGEMENT SYSTEM FOR EXPO 2000 [1]

3.1. Overview

The traffic control and management system for EXPO 2000 was based on the assumption that:

- most of the visitors would not be familiar with the region of Hanover;

- it is much easier to control these visitors than those attending the large fairs, who return to the region every year and want to head for their usual parking spaces;

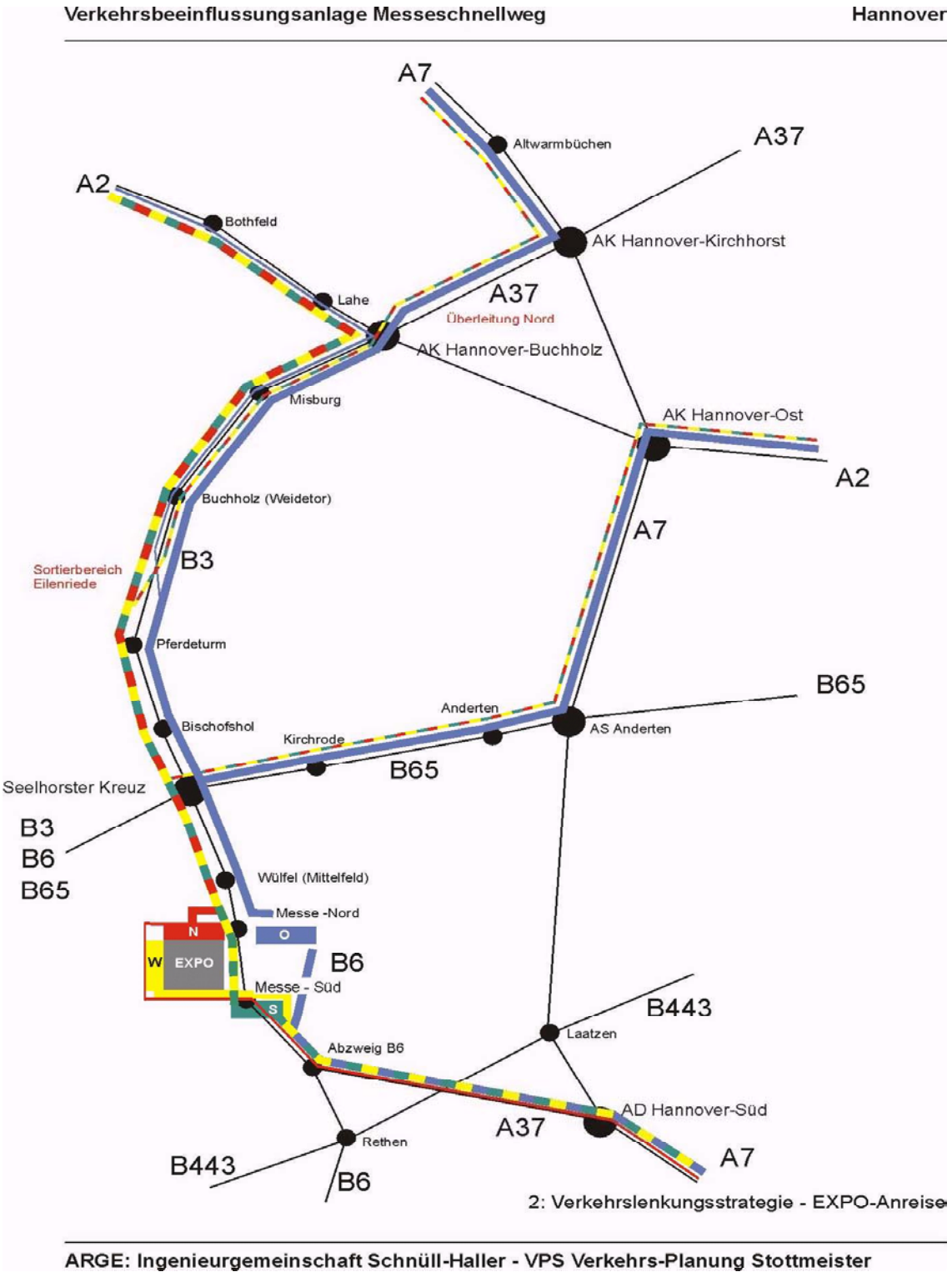
- in addition to the traditional traffic control equipment, a series of new telematics information and traffic services would be available in 2000 and would facilitate the task of controlling dense flows of visitors.

On this basis, the main elements of the traffic control and management concept were:

- Result-oriented control of visitors' choice of transport mode and the day they visited the exhibition, by means of advance ticket sales via the global ticketing network, given that:
  - the objectives (cf. Table 1) for the choice of transport mode of people travelling to and from the exhibition were predetermined by the capacity of the transport infrastructure;
  - the means of transport used to travel to EXPO 2000 was to be booked in advance at the same time as the entrance ticket to the exhibition:
    a) car parking could only be reserved by motorists purchasing three entrance tickets at once;
    b) priority use of public transport in accordance with the result-oriented matrix (cf. Table 1) was promoted by means of a combined ticket which entitled people to free use of local public transport anywhere in the region on the day they visited the exhibition;
  - a maximum of 400 000 entrance tickets were to be sold each day, for a total capacity at the world exhibition site of approximately 300 000 visitors;
  - the programme for EXPO 2000 was designed in such a way as to ensure visitors were spread more evenly over the entire duration of the event than would otherwise have been the case.

- As far as possible, motorists were expected to reserve a parking space in advance and, to ensure optimum traffic conditions, vehicles travelling to the exhibition were to be directed to different colour-coded car parks depending on the direction they were coming from [Red (north), Blue (east), Yellow (west), Green (south)], by means of a colour-coded regional advance sales system (cf. Figure 3);

Figure 3. **Colour-coded system for directing vehicles travelling to and from the exhibition to ensure optimum traffic conditions**

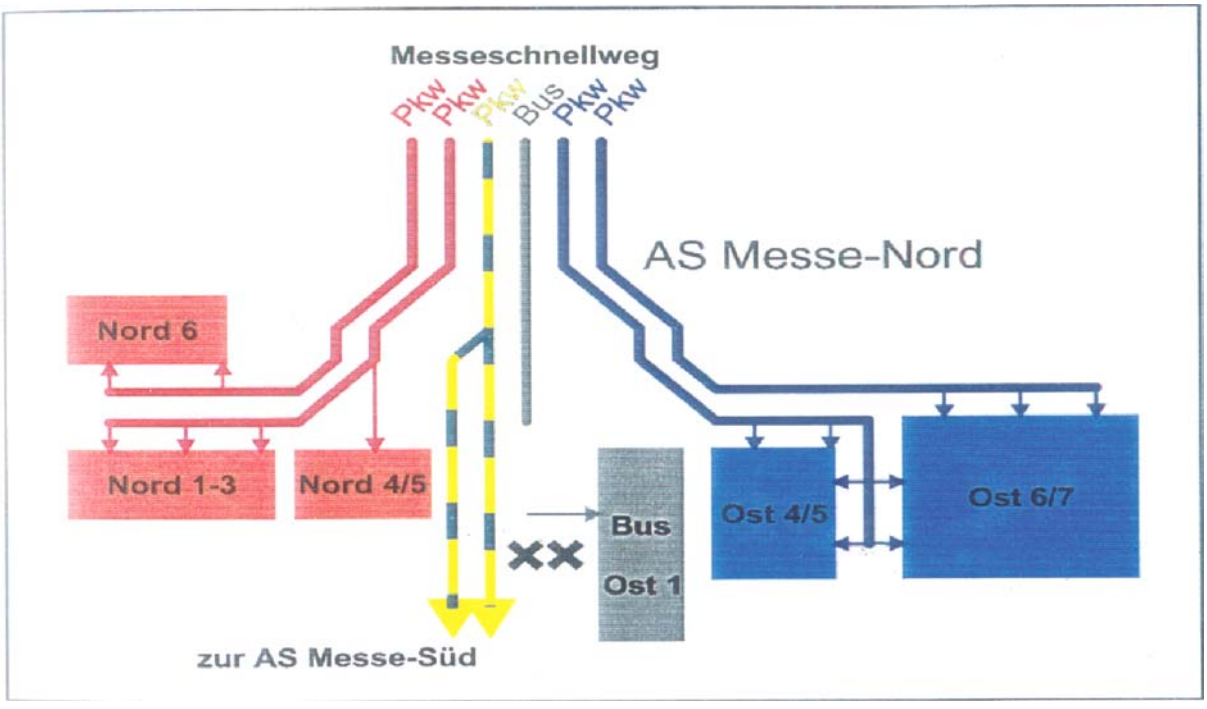


- Priority given for the sale of any parking spaces still available on the day, either at the exhibition site or in the park-and-ride car parks, to decentralised ticket offices that could be set up in conjunction with information desks at motorway service stations on the outskirts of the region;

- Whenever possible, routing of cars travelling to and from the exhibition site onto the motorways and city expressways by means of the following part-systems:
  - Traffic control on the A2 motorway;
  - Traffic control on the Messeschnellweg (fairground expressway) with the possibility of switching to six-lane, one-way traffic (cf. Chapter 4);
  - Traffic lane signals at motorway intersections to enable vehicles to turn off in two lanes (cf. Chapter 4);
- Limited and highly defensive activation of alternative routes in the secondary road network (westbound B65, eastbound B65, southbound B6), given that these roads, which pass through many small towns and villages, were not to be used as a way of avoiding motorway hold-ups. Experience had shown that they would themselves also quickly become saturated.

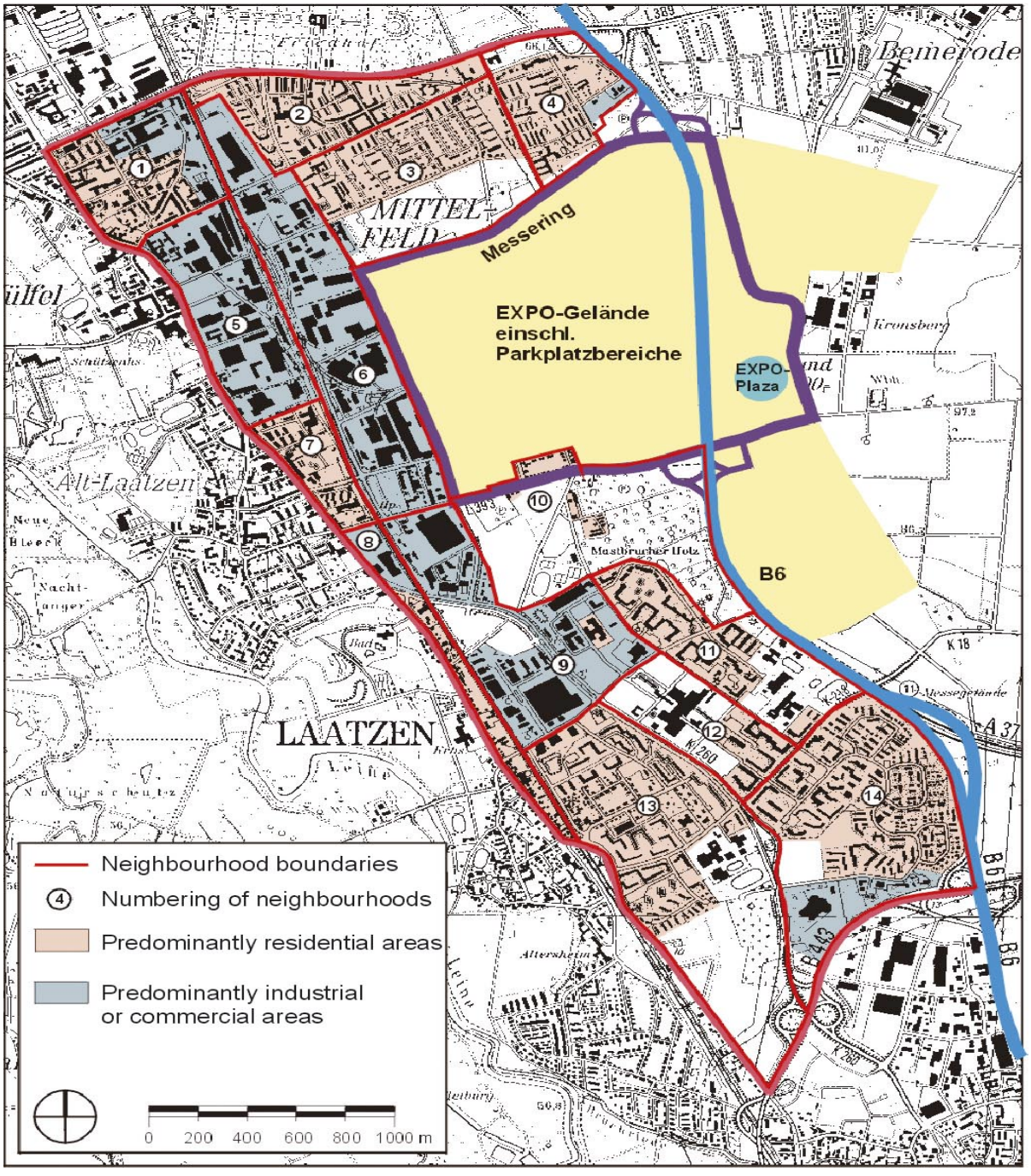
- Increased capacity on the four-lane ring road around the EXPO 2000 exhibition site thanks to traffic lane signals (cf. Figure 11 and section 4.2.) and the biggest known parking guidance system (25 000 places), the aim being to direct vehicles to all parking spaces in a steady flow without causing tail-backs on the Messeschnellweg (Figure 4).

Figure 4. **Traffic control in the area of the junction AS Messe-Nord (Messeschnellweg-Messering)**



– Protection of residential areas near the exhibition site from parking by non-residents, by means of an extensive range of measures taking in a total of approximately 16 500 parking spaces to ensure that local residents had priority (cf. Figures 5 and 6).

Figure 5. **Neighbourhoods where measures were taken to prevent parking by non-residents**



All the infrastructure measures needed, according to the plans described above, were in place by the beginning of 2000.

Figure 6. **List of proposed measures for preventing parking by non-residents, according to district**

Measures proposed in the different neighbourhoods

Quartier	Parking reserved for residents	Parking metres	Paid parking	Traffic rules sign 267	Traffic rules sign 250	Blocked road	Dead end	No stopping
● = Measure implemented								
1 - Loccumer Str.		●		●				●
2 - Garkenburgstr.		●		●				
3 - Am Mittelfelde	●	●		●				
4 - Spittastr.	●	●		●	●		●	●
5 - Am Eisenwerk		●						●
6 - Karlsruher Str.					●			●
7 - Birkenstr.	●	●			●			●
8 - Hildesheimer Str.	●	●	●					●
9 - Hauptstr.		●						●
10 - Kronsbergstr.	●	●				●	●	●
11 - Würzburger Str.	●	●						
12 - Leine-Einkaufszentrum		●						
13 - Wülferoder Str.		●						
14 - Lange Weihe		●						

3.2. Use of simulation models to test the overall concept

In order to reach a consensus between politicians and citizens of the region of Hanover affected by EXPO 2000, the overall concept was fed into computers so that the impact on the relevant trunk network of the extra traffic induced by EXPO 2000 could be properly assessed. The scenarios grouped together in Figure 7 were studied in relation to a series of different models reflecting variations in transport demand and changes in the modal split. The simulation models showed that:

- the only way of providing the capacity needed to cope with all vehicles travelling to the exhibition grounds was to open the whole of the Messeschnellweg to one-way traffic (Measure A) (Plan 2.3 in Figure 7);

- for traffic leaving the grounds in the late evening (during EXPO 2000 the pavilions shut at 10 p.m.), there was no need to open the whole of the Messeschnellweg to one-way traffic;

- most of the south-north traffic displaced as a result of the one-way operating arrangements on the Messeschnellweg tended to transfer to the A7 motorway;

- the extra traffic on the parallel secondary road network remained within acceptable limits;

- it was possible to provide sufficient overall capacity to be able to offer 25 000 parking spaces near the exhibition site; and

- during the big fairs that would take place after EXPO 2000 (when the total number of available parking spaces would be 40 000), the whole of the Messeschnellweg would have to be opened to one-way traffic for vehicles travelling both to and from the fairs (Measures A and R).

Figure 7. **Scenarios and plans for simulation models in the relevant trunk network in the Hanover region**

Scenario 2	**EXPO 2000**
Routing of extra traffic induced by EXPO 2000 over the motorways and Messeschnellweg. Parking capacity of 25 000 places at the World Exhibition site.	
	• No operating measures on the Messeschnellweg Plan 2.1 ARRIVALS Plan 2.4 DEPARTURES
	• Measure A from the Hanover-Buchholz intersection Plan 2.2 ARRIVALS Plan 2.5 DEPARTURES
	• Measure A from the Hanover-Buchholz intersection and concentration of exhibition traffic on the Messeschnellweg Plan 2.3 ARRIVALS Plan 2.6 DEPARTURES
Scenario 3	**Major fairs**
Routing of extra traffic induced by major fairs over the motorways and Messeschnellweg. Parking capacity of 40 000 places at the fairground.	
	• No operating measures on the Messeschnellweg Plan 3.1 ARRIVALS Plan 3.4 DEPARTURES
	• Measure A from the Hanover-Buchholz intersection Plan 3.2 ARRIVALS Plan 3.5 DEPARTURES
	• Measure A from the Hanover-Buchholz intersection und concentration of fair traffic on the Messeschnellweg Plan 3.3 ARRIVALS Plan 3.6 DEPARTURES

4. TRAFFIC CONTROL SYSTEM FOR THE MESSESCHNELLWEG

4.1. Requirements

The traffic routing concept for major events taking place at the Hanover fairground is an essential component of the result-oriented traffic and mobility plans devised for coping with traffic connected with events taking place in Hanover.

The concentration of road traffic on an efficient network of motorways and expressways leads to high traffic densities, particularly on the Messeschnellweg, which can only be handled successfully with the help of many different measures to control traffic.

In future, events can basically be divided into two categories, depending on their frequency and how long they last, the expected number of visitors and the different advance sales and management strategies:

- Major fairs:
  - Annual events lasting a week (three to four major fairs per year);
  - Essentially business visitors;
  - Approximately 90 000 visitors per day;
  - Approximately 40 000 to 45 000 cars and 250 coaches in the way of extra daily traffic in and around Hanover;
  - Opening times: 9 a.m. to 6 p.m.;
  - No control of choice of transport mode via advance ticket sales.

- EXPO 2000 World Exhibition:
  - One-off major event from 1 June to 31 October 2000;
  - Major event designed to appeal to the whole family;
  - Approximately 300 000 visitors per day;
  - Over 25 000 cars and 1 900 coaches in the way of extra daily traffic in and around Hanover;
  - Opening times: 9 a.m. to 10 p.m. (national pavilions).

During the big fairs held at the fairgrounds each year (CeBIT, Hanover Fair), Hanover and its surrounding area have to put up with considerable surplus traffic. Since the Messeschnellweg was built in the early 1950s as part of the Hanover tangent system, the Messeschnellweg has been at the centre of all traffic control plans.

Because of the large numbers of visitors and the desire to fill the 40 000 or so parking spaces as quickly as possible, a variety of different traffic control measures are needed. Without them, it would be impossible to cope with all the traffic on its way to and from the fairground. In the past, in addition

to the many members of staff from the Deutsche Messe AG, more than 300 members of the police have been brought in during each major fair to manage the traffic control measures on the Messeschnellweg and additional measures in the neighbouring residential areas.

Because the EXPO 2000 World Exhibition took place over a long period and because of the otherwise unacceptable disturbances it caused for the people of Hanover and the environment, it was recommended, as part of the routing concept for controlling traffic associated with the Hanover EXPO 2000, that the main access routes and alternative routes should be limited to the region's motorways and expressways. So that capacity could be maintained on the Messeschnellweg at peak times (vehicles travelling to and from the major fairs), all traffic on the Messeschnellweg was to operate in one direction only between junction AS Buchholz and the fairground (cf. Figure 3), namely in the southbound direction for traffic travelling to the fair (Measure A) and in the northbound direction for traffic leaving the fair (Measure R). Vehicles would therefore have the use of all four lanes or even six if traffic was allowed to use the hard shoulders. In addition, traffic travelling to and from the fairground was to be directed by means of a new, dynamic and colour-coded route indicator system (cf. Figure 2) which guided visitors leaving the motorways to the fairground parking facilities. In order to limit traffic flow disruptions as far as possible from the outset, traffic approaching Hanover from the different directions was to be guided onto pre-defined arrival routes (cf. Figure 3). The aim, when coupled with the ticketing system, was to direct traffic in such a way that disruptions were spread out more or less evenly throughout the affected area. Maintaining capacity along these routes was at the forefront of traffic control measures during major events at the fairground. In addition, all the various components along the route and in the intersections had to be accurately synchronised so that the capacity of the system as a whole could be maintained.

4.2. Design of a traffic control system for the Messeschnellweg

The system for controlling traffic on the Messeschnellweg combines route control and intersection control. It was designed to control the stretch of road between the intersections AK Hanover-Buchholz and AD Hanover-Süd (cf. Figure 8), but has also been integrated into traffic control systems on the A2 and A7 motorways and into the additive re-routing system for Hanover and the surrounding area. The main features set out below concern the traffic control system for the Messeschnellweg.

The stretch control system offers the possibility of operating traffic on the Messeschnellweg in one direction only at certain times, so that vehicles have access to four or, if the hard shoulders are used as well, as many as six lanes (contraflow operations). Depending on the type and scale of the event taking place at the fairground, the system can also be switched to either a short variant (between the Seelhorster intersection and the fairground) or a long variant (between the intersection AK Hanover-Buchholz and the fairground). The stretch of road controlled by the system totals approximately 18 km, including nine intersection points that are not part of the plan (cf. Figure 8). The changing travel destinations are displayed to motorists via overhead gantries supporting substitutive re-routing signs composed of rotatable prisms (cf. Figure 9). Speed restrictions are controlled manually in groups. Depending on the traffic situation, maximum speed limits are lowered throughout the control section to 100, 80 or 60 km/h by means of fiberoptic signs. There are also signs warning drivers of congestion.

Figure 8. **Basic components of the traffic control system for the Messeschnellweg** [2]

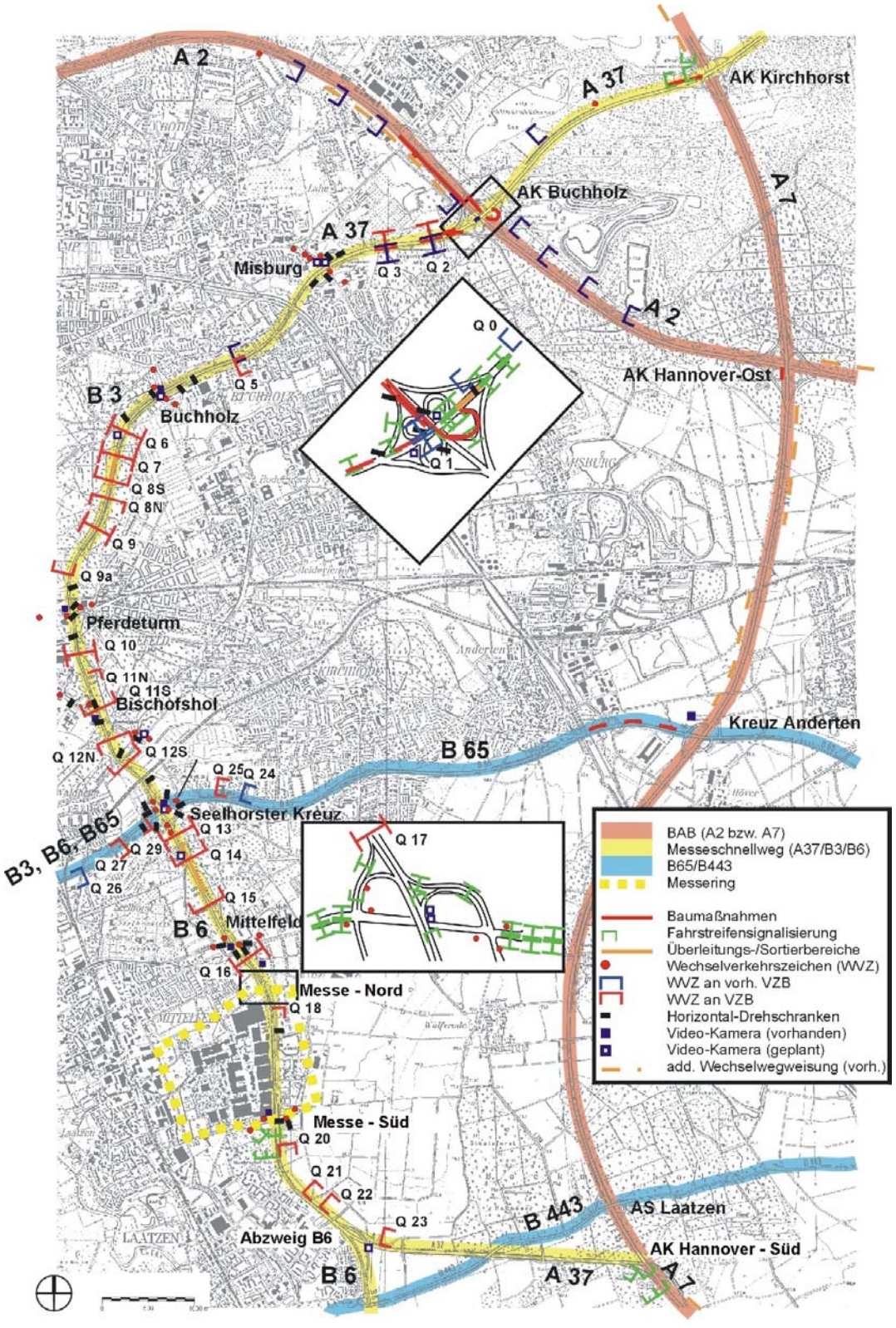
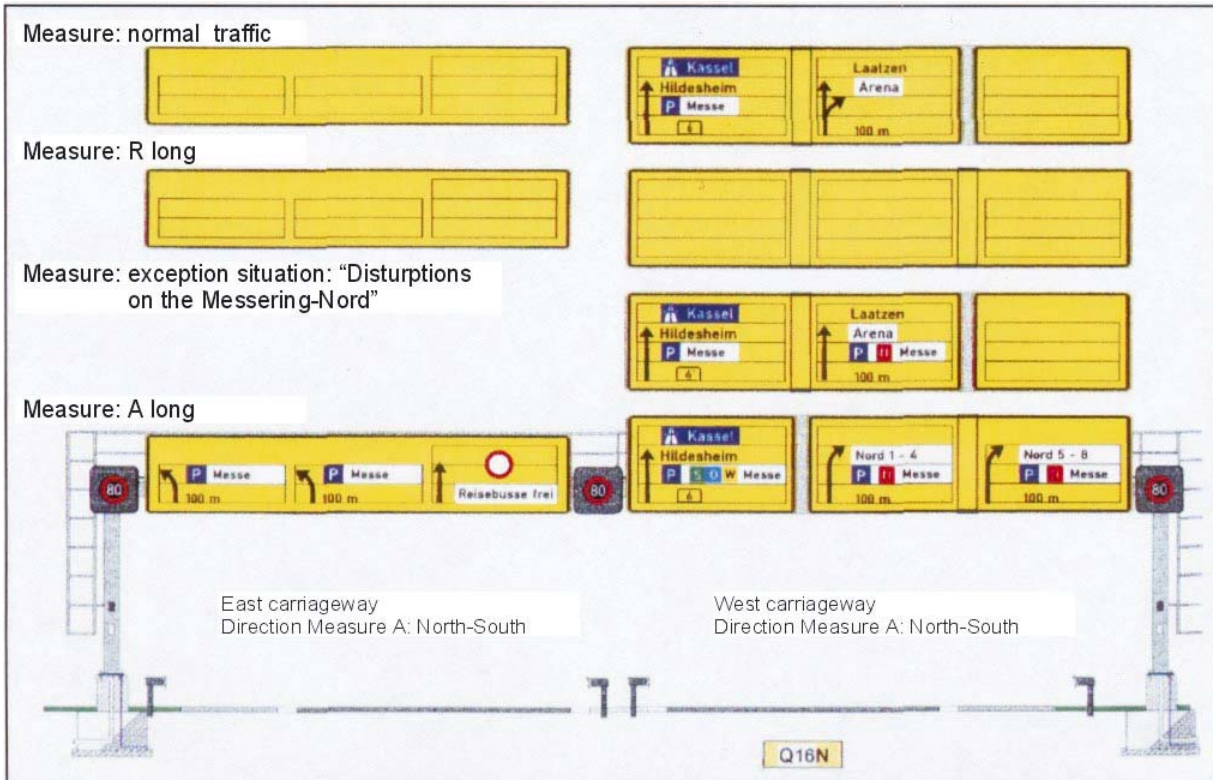


Figure 9. **Example of substitutive alternative route signs with rotating prisms (Q16: southbound)**



The stretch control system has provision for five main operating modes:

- In the **zero mode** (no major event at the fairground), the traffic control system remains out of action and only standard roadsigns are displayed. The dynamic speed limit signs display the optimum speed for the particular traffic conditions. In the zero mode, the whole of the Messeschnellweg operates as two-way traffic;

- In the **normal mode** (during major events), excluding Measures A and R, the system switches to a mode which is largely the same as the zero mode. At the sorting and crossover sections, however, the guard-rails in the central reservation are temporarily removed so that these sections can be made more secure by means of lights embedded in the road surface ("cat's-eyes") in addition to the collapsible traffic beacons (cf. Figure 13) and lane signals. The guard-rails are replaced once the major events are over.

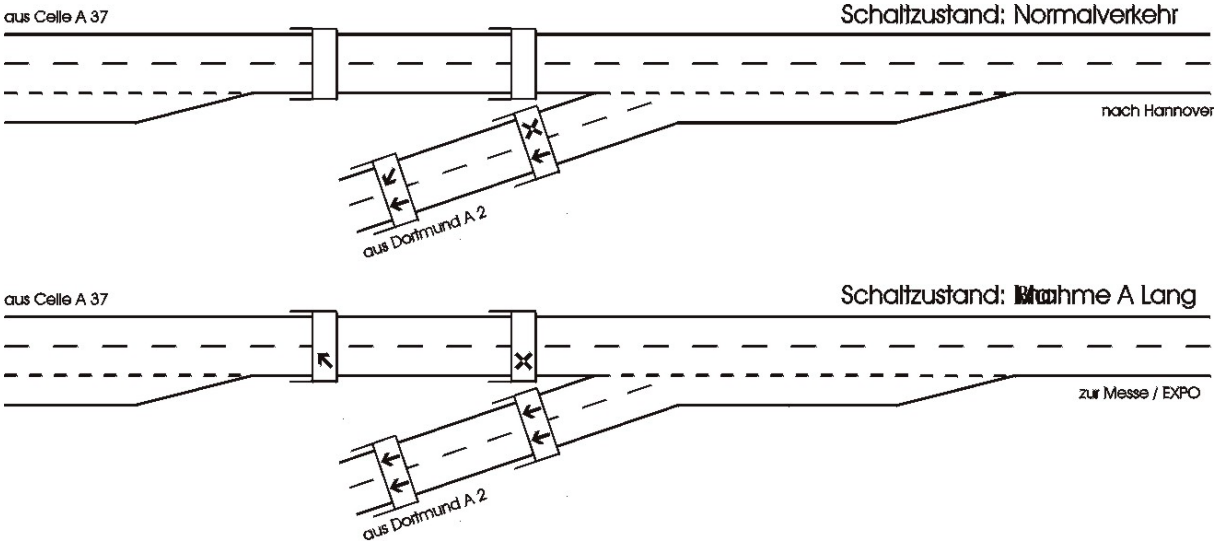
- In **mode $\mathbf{A_{long,}}$** the Messeschnellweg operates as one-way, southbound traffic between the intersection AK Hanover-Buchholz and the junction AS Messe-Süd. If the hard shoulders are also opened to vehicles, southbound traffic operates over either four lanes (from the intersection AK Hanover-Buchholz) or even six lanes (from the Seelhorster Kreuz intersection). Mode A_{long} is meant for use during peak hours to handle traffic on its way to the major fairs in Hanover, including EXPO 2000.

- In **mode A_{short}**, the Messeschnellweg operates as one-way traffic only between the Seelhorster Kreuz intersection and the junction AS Messe-Süd. Southbound traffic then has access to six lanes from the Seelhorster Kreuz intersection. In the northbound direction the Messeschnellweg operates as two-way traffic as usual between the intersections Seelhorster Kreuz and AK Hanover-Buchholz. Position A_{short} is meant for use during smaller fairs or major evening events taking place at the fairground.

- In **mode R**, which is similar to position A_{long}, northbound traffic has access to either six lanes (between the junction AS Messe-Nord and Seelhorster Kreuz intersection) or four lanes (between the intersections Seelhorster Kreuz and AK Hanover-Buchholz). The Messeschnellweg then operates as one-way, northbound traffic between the junction Messe-Nord and the intersection Hanover-Buchholz. Position R is meant for vehicles leaving major fairs held at the fairgrounds.

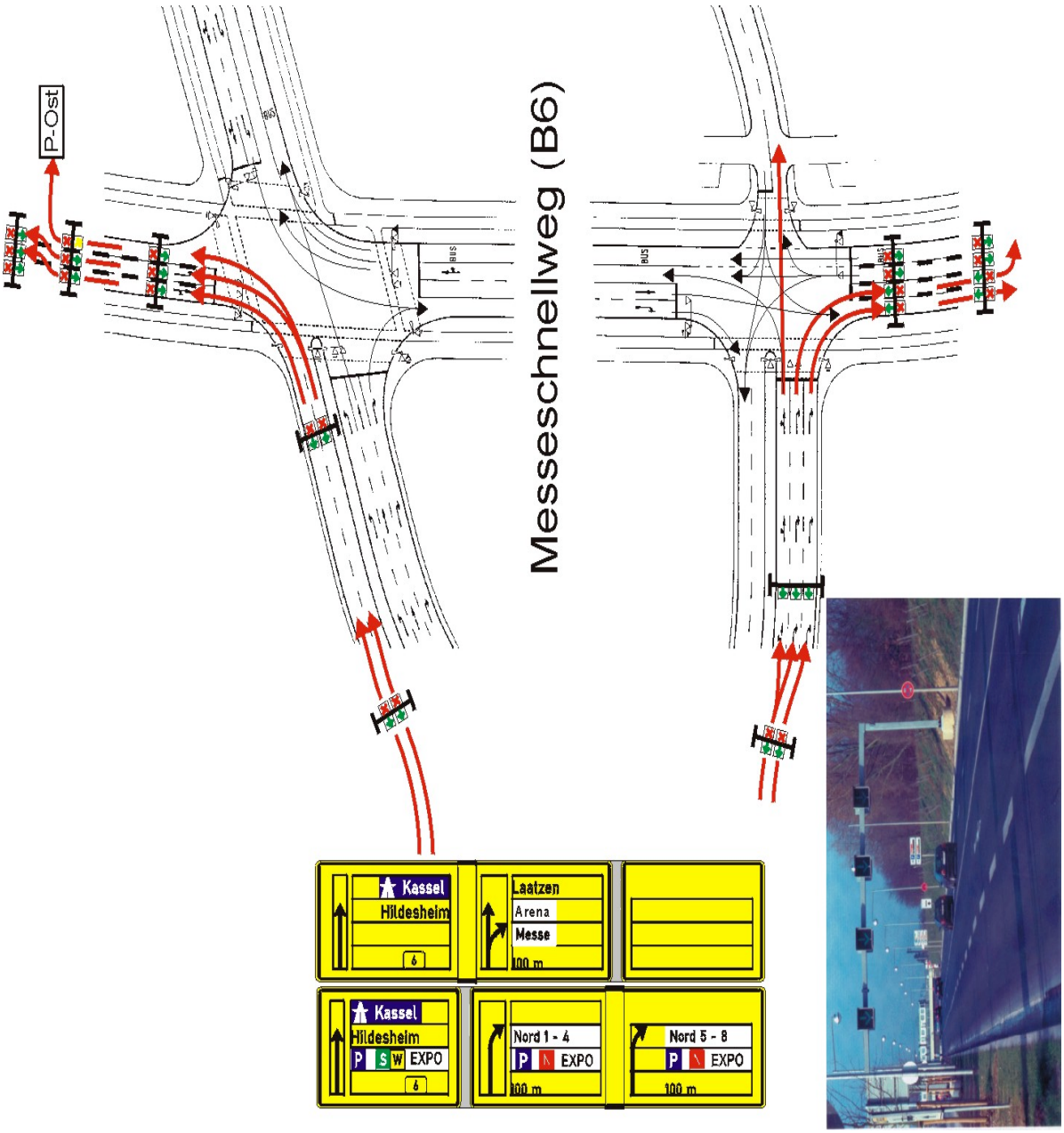
There is provision for intersection control at crucial intersection points between the Messeschnellweg and the federal motorway network. Thanks to traffic lane signs in the form of permanent light signals, vehicles heading for the fairground at peak times are able to join the Messeschnellweg in two lanes. The system switches the relevant sliproads that join the Messeschnellweg to two-lane traffic control while, on the Messeschnellweg itself, the righthand lane is closed and traffic is confined to the lefthand lane (Figure 10). The result is a significant increase in capacity for traffic joining the Messeschnellweg from the side. It is the only way, for example, of coping with the estimated 3 500 or so southbound vehicles per hour joining the A2 from the A37 at the intersection AK Hanover-Buchholz. Intersection control equipment was installed at the intersections AK Hanover-Kirchhorst, AK Hanover-Buchholz, AS Messe-Nord, AS Messe-Süd and the AD Hanover-Süd (cf. Figure 3).

Figure 10. **Figure showing intersection control with traffic lane signs at the AK Hanover-Buchholz intersection**



The Messering (ringroad) (Figure 11) is used to take traffic from the Messeschnellweg to the parking areas. The northerly section of the ringroad is the Nordspange. Here several lanes of vehicles are able to exit the Messeschnellweg at once via the east and west sliproads thanks to alternative route signs and cat's-eyes sunk into the road.

Figure 11. **Management of traffic travelling to EXPO 2000 at the intersections AS Messe-Nord/west sliproad and AS Messe-Nord/east sliproad**



In the exits from the junction AS Messe-Nord itself, two-lane traffic management is backed up by lane signals. The Nordspange section is equipped with two stretch control systems, each with two or three gantries over a distance of approximately 700 metres (cf. Figures 4 and 11), so that extra turning lanes of vehicles heading for the parking areas can be operated with a degree of flexibility in the very dense intersection areas. In addition, at the junction AS Messe-Nord, the east and west sliproads are operated as one-way traffic on an alternating basis, so that traffic on its way to the exhibition (Measure A) can be fed quickly into the parking spaces and vehicles leaving the exhibition (Measure R) have the use of several lanes to join the Messeschnellweg.

The impact of the control concept on traffic was tested using computer models and by superimposing the extra traffic induced by the fairs and EXPO 2000 onto normal traffic (NT). The results, in terms of the high traffic densities at peak times (arrivals and departures traffic) and the lanes needed to cope with such dense traffic (Figure 12), show that the introduction of one-way traffic on the four-lane Messeschnellweg is unavoidable during major events such as EXPO 2000, when the extra traffic is estimated at up to 6 600 vehicles per hour. It is also clear that:

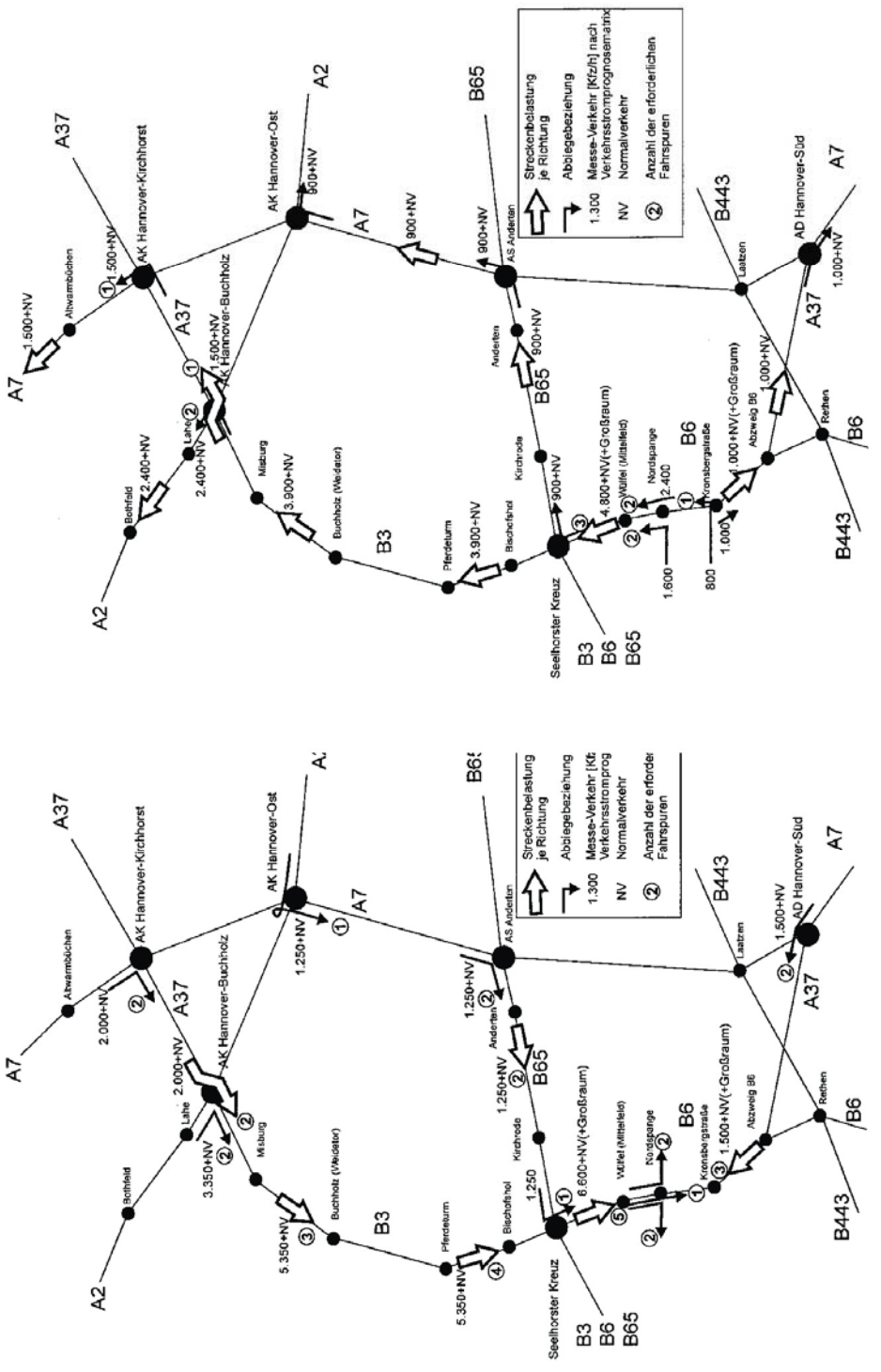
- on the way to the exhibition, the high density of traffic coming in from the side expected at intersections means that two lanes of traffic in the tangential sliproads and lane signals at the entrance to the Messeschnellweg (cf. Figure 10) are unavoidable;

- at the intersection AK Hanover-Buchholz on the way to the exhibition, all the traffic on the opposite carriageway must be re-routed; and

- at the junction AS Messe-Nord (Nordspange), traffic heading for the exhibition must be able to exit to the west and to the east in two lanes (cf. Figure 11).

The need for these measures arose as a result of the concentration of extra traffic on the motorways and expressways, as foreseen in the traffic control concept, and the transfer of exhibition traffic away from the secondary road network and residential areas.

Figure 12. **Traffic density of morning and evening rush hours in the Hanover region during large fairs**



4.3. Verification of the efficiency of specific sections [5]

4.3.1. Procedure

All infrastructure measures needed in accordance with the planning process described above were in place by the beginning of 2000. It was therefore possible to test and, where necessary, improve the traffic control and traffic management measures for the Messeschnellweg and the parking guidance system during the four large fairs held in 1999 and 2000 (March and April) before EXPO 2000 opened. The trials conducted during the CeBIT Fair and Hanover Fair in 1999 were backed up by empirical studies which focused in particular on traffic flow quality and safety. They were carried out with the help of video-assisted analyses of different traffic conditions taken into account by the system operating on the Messeschnellweg. The tests covered the following areas (cf. Figures 3 and 12):

- The north crossover section in the intersection Hanover-Buchholz;
- The Eilenriede sorting area on the Messeschnellweg;
- Two-lane exits at the following junctions and intersections: AS Lahe, Messe-Nord (Nordspange), Anderten and Messe-Süd (Kronsbergstraβe) and AD Hanover-Süd;
- The crossover section in the intersection Seelhorster Kreuz;
- The use of both hard shoulders between the intersection Seelhorster Kreuz and the junction AS Messe-Nord.

4.3.2 North crossover area

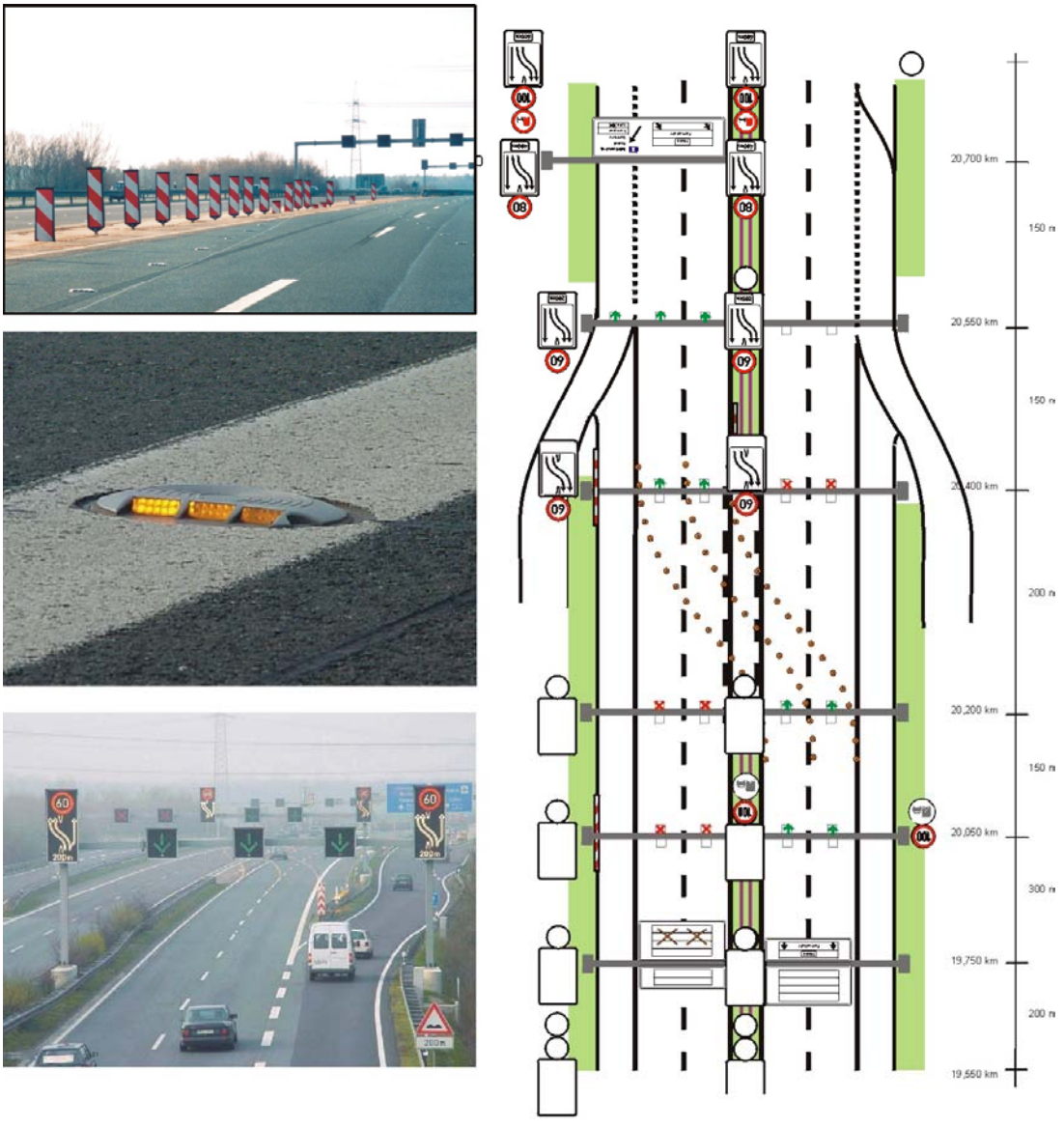
In the case of traffic travelling southbound to the exhibition site, Measure A starts to the north of the intersection AK Hanover-Buchholz. The north crossover section comprises the following elements (Figure 13):

- Signs announcing a change of lane at distance intervals of 600 m/400 m/200 m/0 m (similar to a roadworks site, where the traffic crosses over the central reservation) together with a speed funnel;
- Crossover confirmed by substitutive alternative route indicators directing traffic to the exhibition grounds;
- Assignment of available traffic lanes by means of lane signals;
- Traffic management in the crossover section backed up by means of dynamic “cat’s eyes” (LEDs) that simulate a continuous line similar to yellow roadworks markings;
- Collapsible traffic beacons that secure the openings in the central reservation, from which the guard-rails have been removed, when Measures A and R are not in operation.

In the case of Measure R, the north crossover marks the end of one-way operations. In the northbound direction, vehicles are also brought back from the opposite carriageway across the crossover area to the normal carriageway.

The massive doubts expressed before the trial phase, about whether motorists would be able to cope with the north crossover section and whether it was safe, were not confirmed during the trials. There were only a few isolated cases of wrong vehicle manoeuvres, none of which was caused by either poor signs or poor markings near the crossover section. Traffic safety and the efficiency of the north crossover section during Measures A and R were achieved by controlling and directing the traffic with the help of overhead signs in conjunction with lane signals and cat's-eyes (cf. Figure 13). This was borne out by the video recordings and unanimous opinions of traffic experts.

Figure 13. **North crossover area at the AK Hanover-Buchholz intersection on the Messeschnellweg (southbound direction)**



4.3.3 Eilenriede sorting section

The Eilenriede sorting section (Figures 3 and 14) can be used both during peak hours for traffic on its way to the exhibition site (Measure A) and during peak hours for traffic leaving the site (Measure R) to change the direction of the carriageway. In the case of vehicles travelling to the fairground (Measure A), there are also substitutive alternative route guidance signs with colour-coded parking signs to encourage motorists to sort themselves over the open central reservation, so that they take the lefthand (east) carriageway if their destination is the blue east parking area and the righthand (west) carriageway if they are aiming for one of the other parking areas (red, yellow, green). This makes sense for reasons of capacity, since each of the parking areas has approximately 9 500 spaces and the Nordspange cannot cope with such dense flows of weaving vehicles.

As a result of massive misgivings on the part of the police and general doubts about the efficiency of such a "weave section" in the central reservation, a number of extensive empirical studies were carried out during the trial phase on traffic flow and traffic safety.

♦ *Empirical traffic flow studies*

The design of the Eilenriede sorting section corresponds to that of a V2 "weave section" (*Verflechtungsbereichstyp* V 2 - German draft guidelines) (cf. Figure 14).

Figure 14. **V2 "weave section" and the Eilenriede sorting section**

During the planning stage to develop the traffic control system for the Messeschnellweg, the capacity of the sorting section was estimated at a density of vehicles weaving between lanes of approximately 2 200 vehicles/hour, where total traffic averaged approximately 7 000 vehicles/hour.

In the context of the empirical studies, video recordings were used to calculate traffic density in the weave section and to assess, subjectively, the quality of the traffic flow. In order to calculate capacity, for each observation period the busiest five-minute interval was recorded and converted into an hourly value. The video recordings were then used to assess whether maximum capacity was attained during the five-minute interval or whether there were any unused capacity reserves.

Figure 15. **Total traffic per lane and weave manoeuvres during Measure A (22.3.1999, 8.23–8.28 a.m.) (vehicles/hour)**

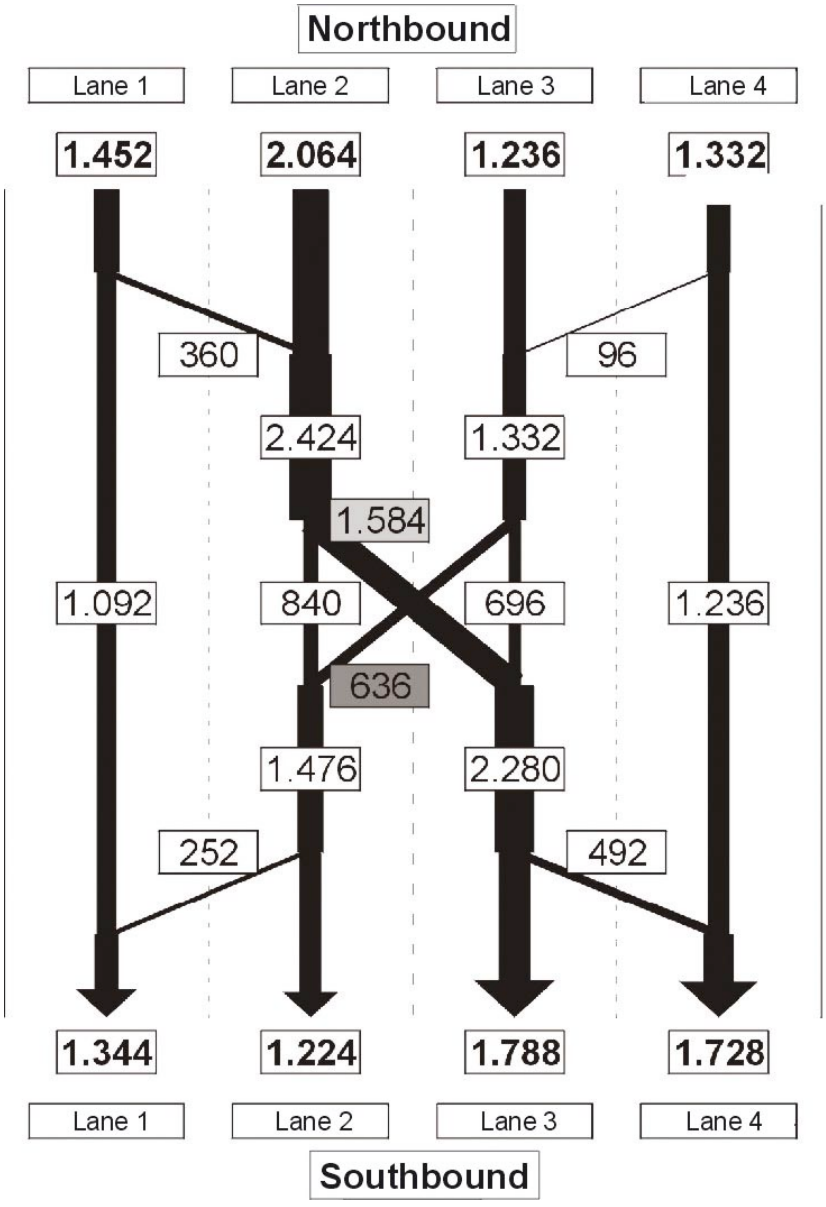


Figure 15 shows the traffic densities (vehicles/hour) for each lane before and after the weave section during the busiest five minutes for vehicles travelling to the exhibition site. The lane changes and number of vehicles that kept to the same lane are also shown.

The density of weaving traffic was calculated at 2 220 vehicles/hour, i.e. 36.5 per cent of total traffic (average 6 064 vehicles/hour). The estimated density of weaving traffic, used as input for the plans for the traffic control system on the Messeschnellweg of 2 200 vehicles/hour, was therefore attained with slightly lower total traffic figures. This traffic density corresponds to the capacity specified in the German draft guidelines for intersections not included in the plans for V2 weave sections (*Verflechtungsbereichstyp* 2). In other words, in spite of the fact that traffic had to cross the central reservation, capacity was the same as that achieved in intersections not included in the plans. On the whole, traffic flow was stable and its overall quality may be classed as satisfactory [2].

The video recordings also showed that capacity utilisation on both through-carriageways could have been much higher. On the two outer lanes, in particular, time intervals between vehicles were sufficiently large to have allowed for additional vehicles. Only lane 2, with its density of over 2 000 vehicles/hour, was already operating at maximum capacity. It is estimated that each of the other lanes had an additional potential capacity of 15 to 20 per cent, bringing the potential maximum capacity of one carriageway to 3 700 vehicles/hour.

♦ *Empirical traffic safety studies*

Only one traffic situation analysis was carried out in the context of the empirical traffic safety studies, because no accidents occurred while the control system was being tested in the Eilenriede sorting section. It quickly became clear from the video recordings that, in order to analyse the spread of total average traffic over the two carriageways (symmetrically/asymmetrically), it was necessary to distinguish between different traffic conditions. During peak hours in the morning (between 8 a.m. and 9 a.m.) there was an additional problem insofar as traffic kept coming to a brief standstill, during which time no safety assessments were possible. Six different sets of traffic conditions were identified in all (four for Measure A and two for Measure R), based mainly on a comparison of traffic volumes and driving speeds on the west and east carriageways.

In order to be able to compare the results for all six traffic conditions in terms of safety, approximately 100 interactions between two vehicles were analysed for each set of conditions. Unimpeded lane changes (i.e. no interaction) were left out of the analysis. So that the different sets of traffic conditions could be compared in terms of the risk of dangerous or conflictual situations arising, three levels of interaction were defined:

Interaction Level 1: A non-critical weave manoeuvre (no conflict);

Interaction Level 2: Minor obstruction, characterised by moderate braking or slight swerving (minor conflict);

Interaction Level 3: Major obstruction, characterised by sharp braking and swerving (major conflict).

Traffic conditions were divided subjectively between the three interaction levels on the basis of the video recordings. The traffic situation analysis was conducted over several different days and at several different times.

Table 2 shows the overall result of the traffic situation analysis during Measure A. It shows that most weave manoeuvres could be classed under Interaction Level 1 and that braking and swerving occurred in only 1 to 2 per cent of cases.

2. **Results of the traffic situation analysis for the Eilenriede sorting section – Measure A (%)**

Traffic conditions	**A1**	**A2**	**A3**	**A4**
Interaction Level 1 No conflict	66	77	61	81
Interaction Level 2 Minor conflict	33	23	37	19
Interaction Level 3 Major conflict	1	0	2	0

- *Summary and assessment*

The results of the empirical traffic flow studies in respect of Measure A showed that, with approximately 2 200 lane changes per hour, the Eilenriede sorting section (V2 weave section - *Verflechtungsbereichstyp* V2) was operating at nearly maximum capacity. On the whole, traffic flow remained stable despite this high density of weaving traffic and traffic flow quality could be classed as satisfactory.

The traffic situation analysis also showed that, during the busiest five-minute interval (conditions A 2), the safety level was acceptable on the whole. The observed lane changes and the conflicts that arose were basically no different to the interactions that occur in the weave sections of intersections not included in the plans. For, in the weave sections found at every motorway intersection there are isolated critical interactions which, however, have no adverse effect on the safety of such sections. High proportions of critical interactions occur where there are significant differences in the traffic densities and speeds of the two adjacent lanes.

The video recordings also showed that some of the capacity of both carriageways before and after the sorting section is still unused and that it is possible to handle the density of traffic expected during EXPO 2000 and other major fairs.

The traffic situation analysis also showed that the concerns about safety were not unfounded in the case of traffic conditions A 3 and R 1, where there were significant speed differences between the east and west carriageways. It is therefore necessary to make sure motorists comply with the selected maximum speed limits.

4.3.4 Two-lane exits off carriageways [6]

An essential part of the traffic control concept for EXPO 2000 consists in two-lane exits off carriageways and lane signals at the two-lane entries from tangential sliproads onto through-carriageways (Figure 3). In this way, it should be possible to handle crosswise traffic densities of between 2 000 vehicles/hour (junction AS Messe-Nord) and 3 000 vehicles/hour (intersection AK Hanover-Buchholz) (Figure 12).

Research [6], based on empirical studies conducted during the major fairs held in 2000 and including fair data for Bavaria and Frankfurt-am-Main (A9), showed that:

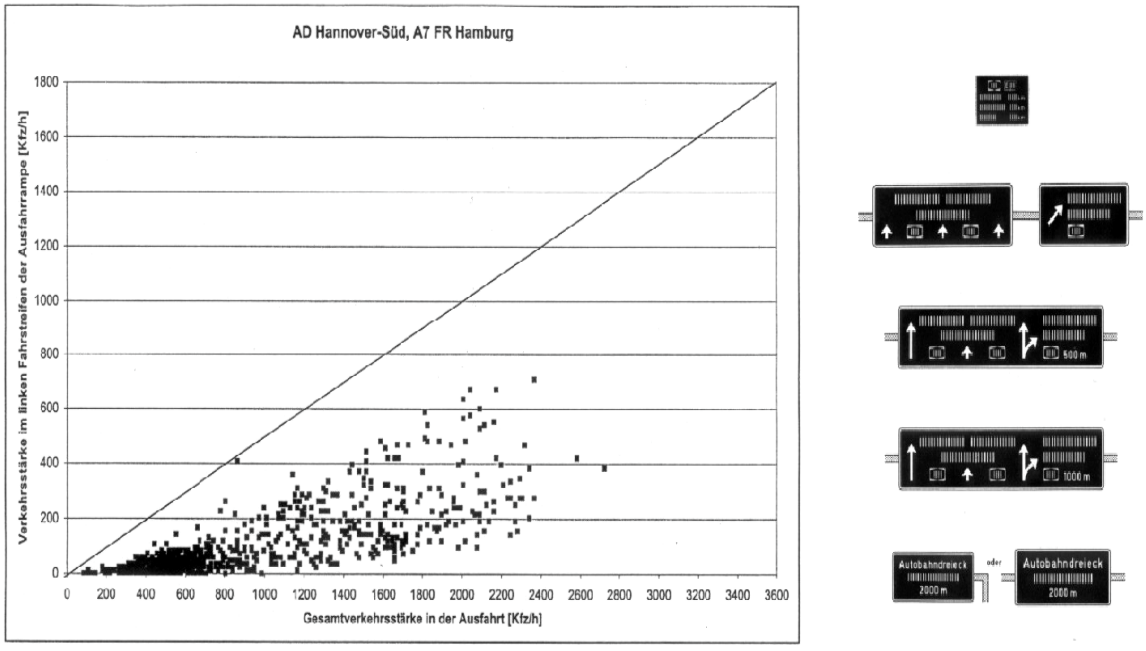
- the capacity of 3 000 vehicles/hour indicated in the German draft guidelines for two-lane exits can only be achieved in conjunction with good route indicator signs (Figures 16 and 17);

- the tangential sliproads equipped with traffic lane signals at the motorway intersections also have to handle this traffic density; and

- clear alternative route signs on gantries, showing two sets of exit arrows that can be dynamically activated, significantly improve the chances of even capacity-utilisation on both exit lanes (Figure 17).

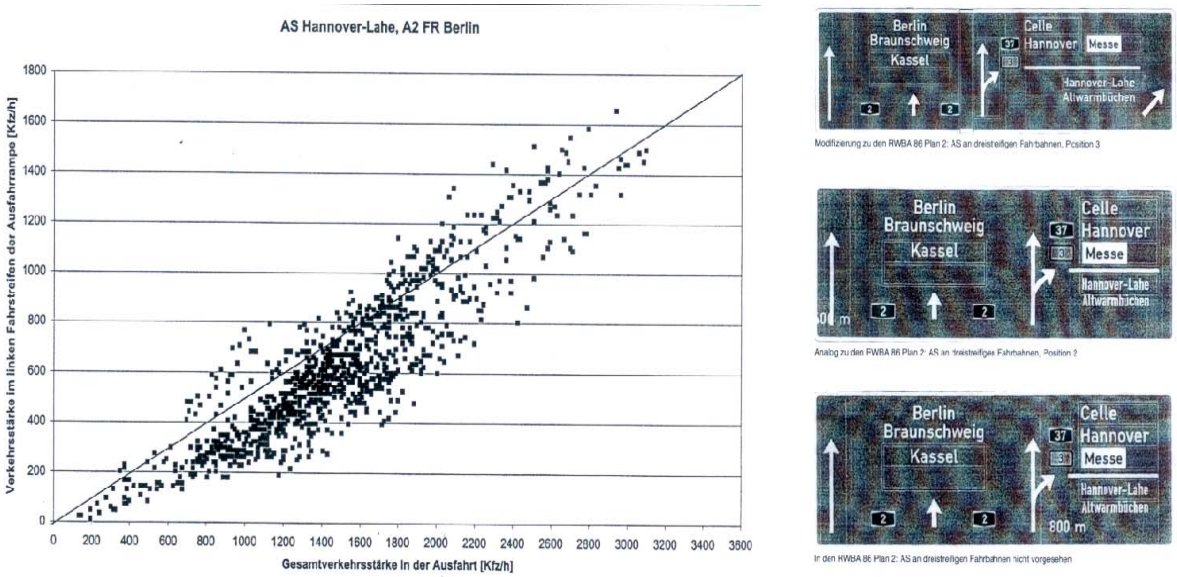
During EXPO 2000, satisfactory use was therefore made of two-lane exits at intersections not included in the plan that were equipped with dynamically activated route indicators and, in future, such two-lane exits will be a valuable part of any dynamic traffic management system for coping with major events.

Figure 16. **Total traffic density in a two-lane exit with standard signposting**



X-axis: Traffic density in the left-hand lane of the exit sliproad (vehicles/hour)
Y-axis: Total traffic density in the exit (vehicles/hour)

Figure 17. **Total traffic density in a two-lane exit with substitutive alternative route indicators and dynamically activated exit arrows** [6]



X-axis: Traffic density in the left-hand lane of the exit ramp (vehicles/hour).
Y-axis: Total traffic density in the exit (vehicles/hour).

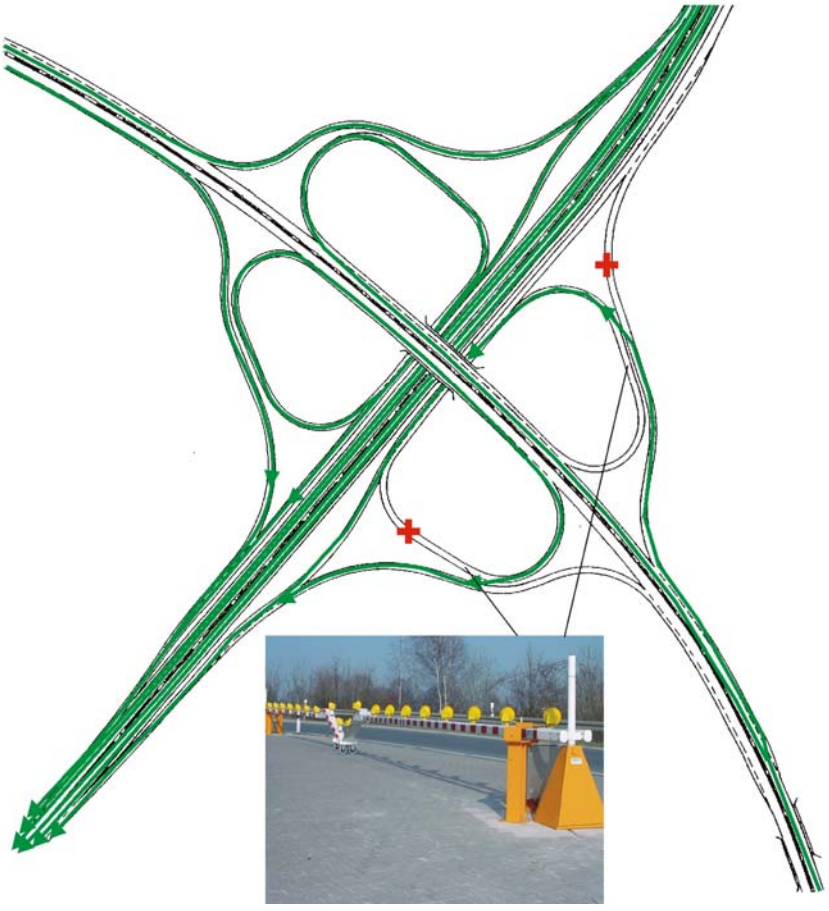
4.3.5 Crossover sections in the intersection Seelhorster Kreuz

The crossover sections in the intersection Seelhorster Kreuz (cf. Figure 3) are located at the outer edges of the loops. They enable traffic to cross over between the tangential sliproad and loops, in the case of six-lane traffic on its way to the fairground (Measure A), including use of the dynamically activated hard shoulders, between the intersection Seelhorster Kreuz and the junction AS Messe-Nord (cf. Figure 18).

In normal operating conditions, the crossover section is closed off by barriers. When Measures A or R are activated, the barriers are swung round into the link roads by remote control and under video surveillance so that they block off the parts closed to traffic.

During the test phase, there were a number of minor disruptions caused by the high density of traffic and rather unusual manoeuvres required of vehicles (exits to the left, crossing of sliproads). The operating measures were sufficient, however, to cope with all the traffic travelling to and from the different major events and the resulting traffic flow quality was reasonable for this area.

Figure 18. **Crossover sections with barriers in the connecting ramps at the intersection Seelhorster Kreuz**



4.3.6 Dynamic activation of hard shoulders

The permanent or temporary activation of hard shoulders, opening them to traffic as implemented on the Messeschnellweg between the intersection Seelhorster Kreuz and the junction AS Messe-Nord, has since been the subject of further tests carried out on a series of test stretches of road and backed up by systematic research. Results to date have been predominately positive:

- Traffic density is spread between several traffic lanes;
- The likelihood of congestion is therefore reduced;
- As a result of maximum speed limits (usually 80 km/h), collisions are no more frequent despite the absence of a hard shoulder.

On the test stretches of road, opening of the hard shoulders to traffic resulted in an increase in capacity, from 3 700 vehicles/hour to approximately 5 500 vehicles/hour on each carriageway [7].

Whether the filter-in and filter-out lanes need to be widened in parts, or completely rebuilt when the hard shoulders are activated, is open to question.

In future, the dynamic activation of hard shoulders, which is a measure shortly to be incorporated in the German road traffic regulations (StVO), will be a reliable part of dynamic traffic management systems for major events and is generally preferable to the permanent use of hard shoulders.

5. HANDLING OF TRAFFIC DURING EXPO 2000

5.1. Modified framework conditions in private motorised traffic

Because the advance sale of tickets was so sluggish and because of visitors' intelligent choice of traffic mode in the first few weeks of EXPO 2000 (car traffic share: 13 per cent), officials at EXPO GmbH came under considerable political pressure and those who supported a car-oriented traffic policy were obviously also uneasy. To encourage visitors to travel to the exhibition by car, the framework conditions were gradually altered. Pre-booking of parking spaces in specific car parks was abandoned and later, in spite of EXPO 2000's financial troubles, parking fees were also dropped. Therefore, the result-oriented approach subsequently became a rather arbitrary demand-oriented approach, but with no control of demand.

The share of private motorised traffic rose gradually, as a result, to approximately 25 per cent (policy objective: 25 per cent). For a long time, the total number of daily visitors to EXPO 2000 was under 150 000 and therefore caused no traffic problems, since the infrastructure had been designed to cope with 300 000 visitors.

As a result of low traffic density, there was generally no need for "MOVE" to switch operations on the Messeschnellweg to six-lane traffic, since this measure was not designed to come into operation until the number of daily visitors exceeded 200 000.

5.2. Policing

The role of the police in controlling traffic connected with EXPO 2000 remained controversial throughout the exhibition. When the density of traffic increased, the police controlled the light signals manually (as they generally like to do anyway) and they scarcely ever activated the traffic lane signals on the ring-road round the exhibition site (Messering).

During the preparations for EXPO 2000, it soon became clear that there was little support at the operating level for doing away with the age-old tradition of directing traffic on the spot. However, the planners hoped that it might at least be possible to control the extremely costly infrastructure manually if by the time EXPO 2000 opened, there was still no situation-oriented operating software in place to control the system.

The fears were, for the most part, confirmed during the World Exhibition. At the operational level, the traditional approach was maintained in the secondary road network, under decentralised orders from the police and the costly infrastructure for directing the traffic was hardly ever activated. There was still clearly a certain amount of scepticism about the technical systems and how they worked. Instead of working in the background to support the technical infrastructure, the police insisted on operating alongside it. In addition, because of the high volume of traffic that had been

expected at the exhibition, the police were overstaffed and naturally also wanted their share of the action.

5.3. At full capacity the concept comes into its own

In October, the number of EXPO 2000 visitors rose to approximately 200 000 per day, peaking at 300 000 on Sundays and bank holidays. On those peak days, all 50 000 parking spaces (including park-and-ride) were full. Nevertheless, when taken together, rail (25 per cent), local public transport (17 per cent) and coach traffic (20 per cent) still accounted for approximately 62 per cent of total traffic. If park-and-ride users who arrived at the exhibition by local public transport were included (11 per cent), the share was as high as 75 per cent (forecast 75 per cent).

At the same time, the roads attained their capacity limit on those days and with it the limits of demand-oriented traffic management that has no control over transport behaviour. The daily visitor figures of 300 000 and at times 400 000, which were regarded as possible during the planning phase, would most certainly have resulted in disaster since, by the last month of the World Exhibition, it would no longer have been possible to revert to the original management concept. The changes made would also have meant it was impossible to predict the number of visitors on the basis of ticket sales, to develop foresighted control strategies or to keep potential visitors, who would have travelled to the exhibition by car, away on certain days. The original traffic management concept was therefore belatedly endorsed – if only indirectly and as an inverted conclusion – as being the right one for extremely large numbers of visitors.

Certain improvements are sometimes needed to the traffic control system for its subsequent use during the large annual fairs in Hanover. Mobile displays mounted on vehicles at the two-lane exits to convey special motoring announcements have proved particularly useful, as have certain improvements to the route indicator signs.

In full-capacity situations, policing work needs to make more room for technology. A basic precondition for this, however, is the availability of an appropriate operating software to ensure that, once clear limits have been attained, “MOVE” can activate the traffic routing system.

5.4 Conclusions

EXPO 2000 was a major event. It will be remembered for its positive, uniting influence which will quickly silence all the talk about losses in the autumn of 2000. Most national contributions were intended neither as a display of industrial prowess nor as a technological demonstration. People and nature had a special place in all countries’ contributions.

EXPO 2000 has blessed the region of Hanover with enviable infrastructure, which was developed with the firm intention that it should also be put to good use after the World Exhibition, with EXPO 2000 as its baptism of fire. The fact that the number of people who visited the exhibition was less than predicted is therefore not a disaster and does not mean the public were right to see the event as a bad investment.

On peak days, long-distance rail, the suburban railway (S-bahn), city bus services and coach traffic accounted for an extremely high proportion (75 per cent) of all traffic. On days when there was not much traffic, coach traffic alone accounted for up to 30 per cent.

On most days during EXPO 2000, the routing and management system, designed with future use in mind, did not have to be activated. When there was a need for it, however, because of an increase in the number of visitors, it was no longer possible to use it properly because by then the framework conditions had been deliberately altered at the operational level.

On the other hand, it has to be said that it is difficult to convince visitors to a major event of the utility of a result-oriented concept when there is not much traffic. It is certainly not easy, when car parks are empty, to turn motorists away for technical reasons or to insist that they park in the spaces they reserved in advance.

On the whole, EXPO 2000 showed that, when the number of daily visitors exceeds around 200 000, uncontrolled demand-oriented traffic management is no longer feasible and needs to be replaced by a traffic management system that is able to control behaviour.

6. TRANSFERABILITY OF THE TRAFFIC PLANNING AND MANAGEMENT CONCEPT

On the basis of experience acquired during preparations for EXPO 2000, in the course of subsequent use during the major fairs held in Hanover and, as a result of further research studies or applications, it is possible to draw the following conclusions regarding whether or not the concept can be transferred to other major European events:

- Result-oriented rather than demand-oriented traffic planning is always essential when, in the case of a major one-off event, an approach based on the estimated demand for traffic would lead to the development of traffic systems that are too big for future use.

- Providing there is a convincing alternative, and providing there is a good marketing strategy, it seems possible to persuade the majority of visitors to major events to keep their cars off the roads.

- "Dynamic road transport systems" that combine construction and operating measures are also essential for adapting intelligently and cost-effectively to significant changes in transport demand.

- The following measures have proved themselves to be valuable components of dynamic road transport systems:
  - One-way operations on urban motorways with weave sections in the central reservation;
  - One-way operations on secondary roads;
  - Dynamic activation of hard shoulders at peak times;
  - Traffic lane signs in the access areas of intersections not included in the plan;
  - Efficient two-lane exits with substitutive alternative routing signs, dynamically activated routing boards, cat's-eyes and mobile displays mounted on vehicles;
  - Ramp-metering in on-ramps at intersections not included in the plan; and
  - One-way operations with crossover sections in the link roads of intersections not included in the plan.

In addition to the suggested reading list below, the experts in the Federal Republic of Germany would be more than willing to share their experience with anyone preparing for a major event similar to the EXPO 2000 World Exhibition.

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EXPERIENCES AND CONCLUSIONS DERIVED FROM THE AUSTRIAN PILOT PROJECT - "EXCEPTIONAL EVENTS – ENVIRONMENTALLY FRIENDLY AND CONGESTION FREE"

SUMMARY

Vienna, January 2002

INTRODUCTION

Major events are always associated with high traffic levels, congestion, considerable strain on local inhabitants and serious damage to the environment. As part of its work on the development of sustainable, environmentally friendly traffic, the Austrian Ministry of the Environment launched an initiative seeking to make transport at major events as environmentally friendly as possible.

This initiative was implemented in three stages:

- **1st stage:** wide dissemination of information on environmentally friendly solutions to traffic at major events (events handbook);

- **2nd stage:** announcement of a competition and implementation of three selected pilot projects in different categories of event;

- **3rd stage:** evaluation, recommendations and measures to encourage wide implementation.

1. PROVISION OF INFORMATION – DISTRIBUTION OF EVENTS HANDBOOK

First of all, a handbook, "Major events – environmentally friendly and congestion free", was drafted and distributed to the main target groups, i.e. organisers and licensing authorities.

The handbook was mainly intended to show how it was possible to ensure that visitors' traffic did not harm the environment and, in particular, how the proportion of visitors travelling to the event in their own cars could be kept low. It put forward sets of measures and sound models drawn from a wide-ranging analysis. Among the principal measures recommended were the provision of attractive transport options and shuttle services by train and bus, incentives to ensure that cars were used to full capacity and efficient management of parking space. There was also advice on funding the measures and successful marketing. An appendix on establishing information networks rounds off this very practical handbook, which was widely distributed to all organisers of events and all relevant authorities in Austria.

2. COMPETITION AND IMPLEMENTATION OF PILOT PROJECT: "MAJOR EVENTS – ENVIRONMENTALLY FRIENDLY AND CONGESTION FREE"

2.1. Implementation and objectives

When the above-mentioned handbook was sent out, all the organisers of major events in Austria were invited to take part in a pilot project on making the traffic generated by events environmentally friendly. At the same time, the general principles were to be tested in a wide-ranging field trial and the subject was to be given a higher profile. The Ministry of the Environment provided financial support for the work on the transport scheme and the implementation of transport-related marketing measures in the three pilot events.

Three major events were chosen from the many candidates; these events were thought to cover the broadest possible spectrum:

1. The Wieselburg an der Erlauf Fair (July 1998): an agricultural fair held annually in a small town in a rural setting, as an example of a trade fair;

2. The Nordic Ski World Championship in Ramsau (February 1999): as an example of a sports event held in winter conditions in the vulnerable Alpine area;

3. The Graz International Garden Show (Summer 2000): as an example of a leisure event held over a longer period in the vicinity of a large city.

These pilot projects would provide models, which would be used to make traffic at events as safe and as environmentally friendly as possible. The most important objectives were to:

- Reduce damage to the environment and lower the number of accidents;

- Reduce stress on local residents;

- Ensure that traffic ran as efficiently as possible, provide optimal accessibility and attractive public transport, pedestrian and cycle traffic facilities, in order to make the proportion of visitors travelling to the event by car as low as possible;

- Improve the image of organisers and visitors, presenting them as “positive models”;

- Improve awareness of the practicalities of promoting sustainable transport and involving all the actors (organiser, advertising agency, transport operator, local authority, police, etc.) in an interactive planning process;

- Provide a model for other events.

The pilot project was implemented in the period from 1998-2000. The Ministry of the Environment made external consultants responsible for the co-ordination of the project, the expert supervision of the event and the evaluation of the results (surveys). The consultants were charged with:

- Devising schemes to deal with traffic at events in a way that met environmental needs, was consistent with the recommendations of the planning handbook and took account of all participants; ensuring that the approaches devised were in line with the objectives of the pilot project;

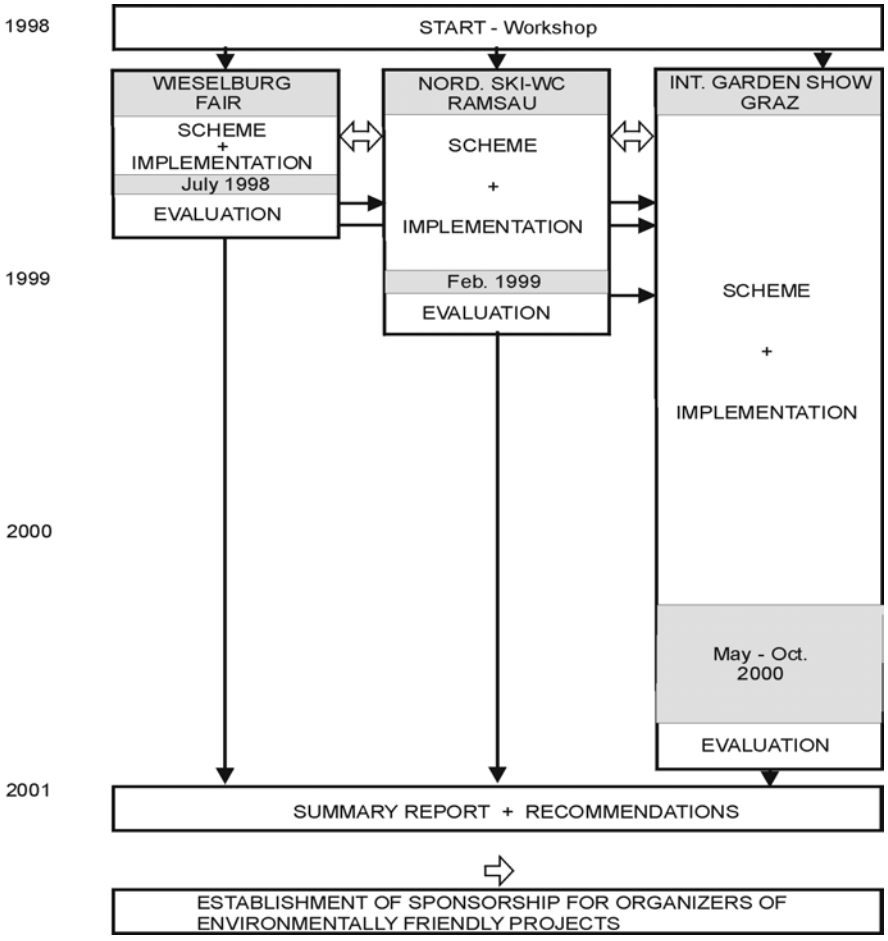
- Evaluating measures at the three events with the aid of visitor surveys;

- Providing specialist help in public relations and marketing work and correlating the content of the three events so that common lessons might be learnt from the experiences;

- Drawing up comprehensive reports on the results with recommendations that could be broadly implemented.

The visitor surveys played an essential part in the assessment; they were used to ascertain how people travelled to the event, whether they were satisfied with the transport organisation and what made them choose a particular mode of transport.

Figure 1. Stages in pilot project



2.2. Pilot project "The Wieselburg Fair 1998"

2.2.1. Starting point and objective

Wieselburg, a small town of around 5 000 inhabitants in a rural area in the west of Lower Austria, has established itself as an important trade fair location in the past ten years. Four fairs are held every year. Its most important event is the "Lower Austrian Trade Fair and Wieselburg Public Festival", held in Wieselburg at the end of June/beginning of July. With around 250 000 visitors, the fair is the most important annual trade show in Lower Austria. The number of visitors is made up of those visiting the festival as well as those visiting the fair. Most of them are from the surrounding rural regions and districts, the Wald and Most areas and from neighbouring Upper Austria (as far as Linz). The structure of the catchment area is predominantly rural.

Owing to the poor public transport connections – during the evening and at night in particular there is almost no way of travelling home by bus or by train – visitors have always had to travel to the event by car. According to the fair organisers' estimates, the number of people travelling to the event by public transport amounted to a mere five hundred, most of whom travelled by coach.

For parked vehicles, four reception areas at the entrance of the town were available for parking, in addition to the parking facilities in the vicinity.

An important factor in the organisation of transport was the distribution of the visitors' arrival and departure times over the period. Since the Wieselburg agricultural fair was held at the same time as the public festival, the measures were aimed at two groups – visitors to the fair and visitors to the festival – each travelling to and from the event in different ways. The majority of visitors to the fair arrived in the morning between 9.00 and 11.00 a.m. and remained until around 5.00 to 6.00 p.m. But in the case of visitors to the festival, the peak time for arrival was in the evening between 8.00 and 10.00 p.m. Generally speaking, the homeward-bound transport was most intense during the night or in the early hours of the morning (2.00-4.00 a.m.) after each festival had ended.

According to estimates by the transport planners, the potential for a shift to other means of transport was such that 20 per cent of visitors might have come without their cars. This proportion was at first considered unrealistic by the regional project group, given the rural structure of the catchment area; however, the results showed that this estimate had been very much along the right lines.

2.2.2. Measures implemented

The review of measures to be adopted mainly focused on "guaranteeing" a return journey from the fair or the festival. The Wieselburg Fair could be reached from all parts of the region almost around the clock. It thus became possible, in keeping with requirements for the public festival, to return home by various bus and train services even in the early hours of the morning. All the services provided were offered at very favourable rates. There were also many special offers for users of these environmentally friendly modes of transport.

a) Alternatives to car travel – offers available through local transport operators

- "*Seidel- und Krügerlbusse*": Crucial to the transport strategy were the "Seidl" and "Krügerl" buses, which offered completely new scheduled transport services providing access to the immediate and more remote parts of the Wieselburg area. The following points were of considerable importance in devising the bus lines:

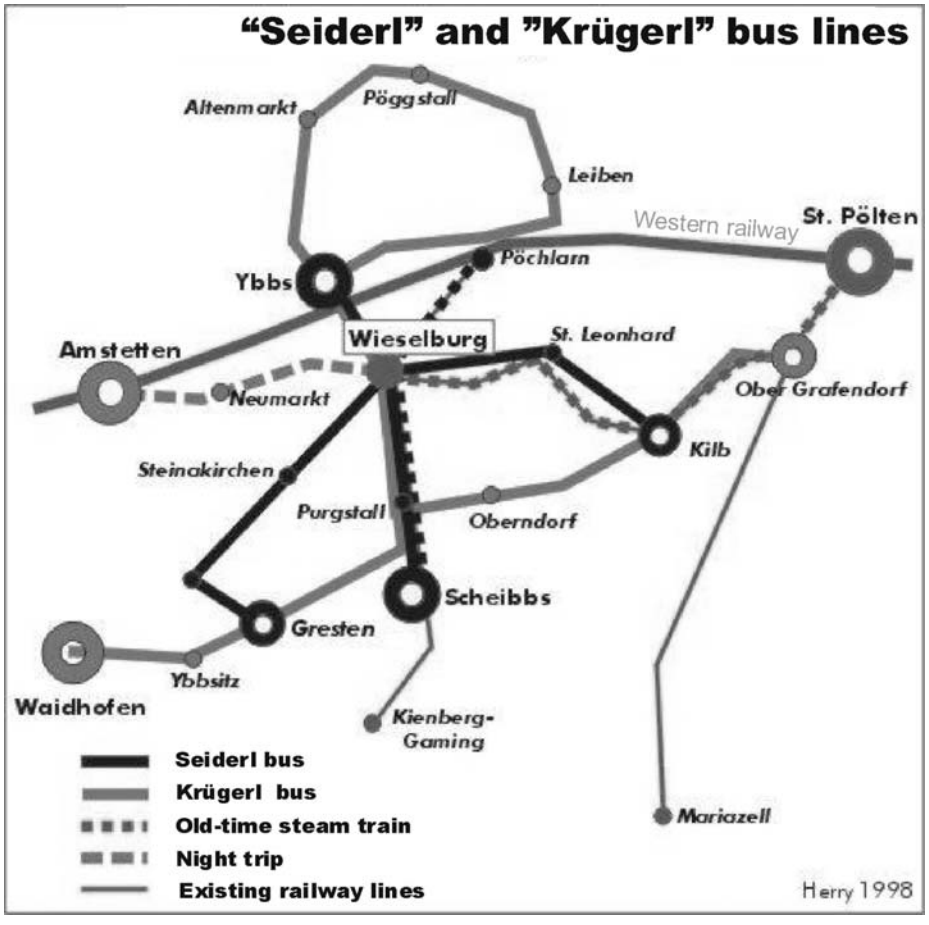
- **Scheduled buses** in the evening and at night, so that visitors were able to plan their visit accordingly;
- **Long operating periods** and thus the certainty of a "guaranteed journey home"; and
- **Safety** owing to the 50-millilitre alcohol limit.

The visitors to the public festival were the main target group for this new service. Buses ran until late in the night or the early morning, providing a night service to ensure that visitors could travel home. Since Wieselburg is home to one of Austria's largest breweries and closely associated in the public mind with a quality beer, this new "quality service" for travelling to the fair – the shuttle bus service – also became associated with the brand of beer. The names of the bus services were applied to the different measures of beer normally used in Austria (*Krügerl*: half a litre, *Seidel*: third of a litre) and it was made clear to visitors that, even without a car, it was possible to have one more beer and be sure of having transport home from the event;

- Cost-free shuttle service between the main railway line (about 10 kilometres away) and the fair and between park-and-ride facilities and the fair;

- Special trains from the State capital, St. Pölten, to the fair (old-time steam train provided by the ÖBB).

Figure 2. Optimal travel to the fair and guaranteed travel back by bus shuttle



b) Management of parking space

- Parking arrangements for visitors' cars had been newly regulated since the last fair. In addition to the larger parking facilities situated as far as one kilometre from the fair, a ban on parking or stopping in the vicinity – above all on the Krügerl, Seidel and shuttle-bus routes – was introduced. These measures were also expected to alleviate the parking problems of local residents. In principle, a charge was payable for a parking space. It was forbidden to park outside authorised parking places.

- Parking space charge. The charge for parking was raised from 1.82 to 2.54 .

c) Marketing and public relations work

Marketing alternatives to car travel were an integral part of the general marketing plan. The elements of the transport scheme, particularly the shuttle buses for "car-free" transport, were promoted in all the advertising media used.

- Devising a proper logo to draw attention to the new "*Ruck-Zug*" (return train) offer and promoting the Krügerl/Seidel buses as a new quality product;

- Incorporation of travel information (timetable) in the trade fairs journal. The detailed information filled eight(!) of its 64 pages. The logo and a reference to the pilot project were included on the title page. A total of 120 000 copies were printed;

- Publication of an individual timetable with detailed information on travel and specific information on bus stops and buses. The timetable was distributed throughout the region and it was possible to meet the cost of it by including advertisements;

- Setting up of an information hotline for information about available bus and train services.

Figure 3. **Bus and train information hotline**

d) Financial incentives

A wide range of financial incentives and tangible benefits was offered. As a result, visitors without cars enjoyed a clear advantage in terms of prices and a better image.

- Favourable package rates for users of the Seidel and Krügerl buses: The cost of travelling in these buses was 2.18 (Seidel buses) or 2.90 (Krügerl buses). Included in the offer was a voucher, which the visitor could use at various eating-places.

- ÖBB's "sweeteners": 30 per cent reduction on travel to the event on scheduled ÖBB trains. In addition, train users paid less for entry and received a free gift (glass of beer). In the evening, entry to the public festival was free.

- The shuttle service between station and event site was free for train users;

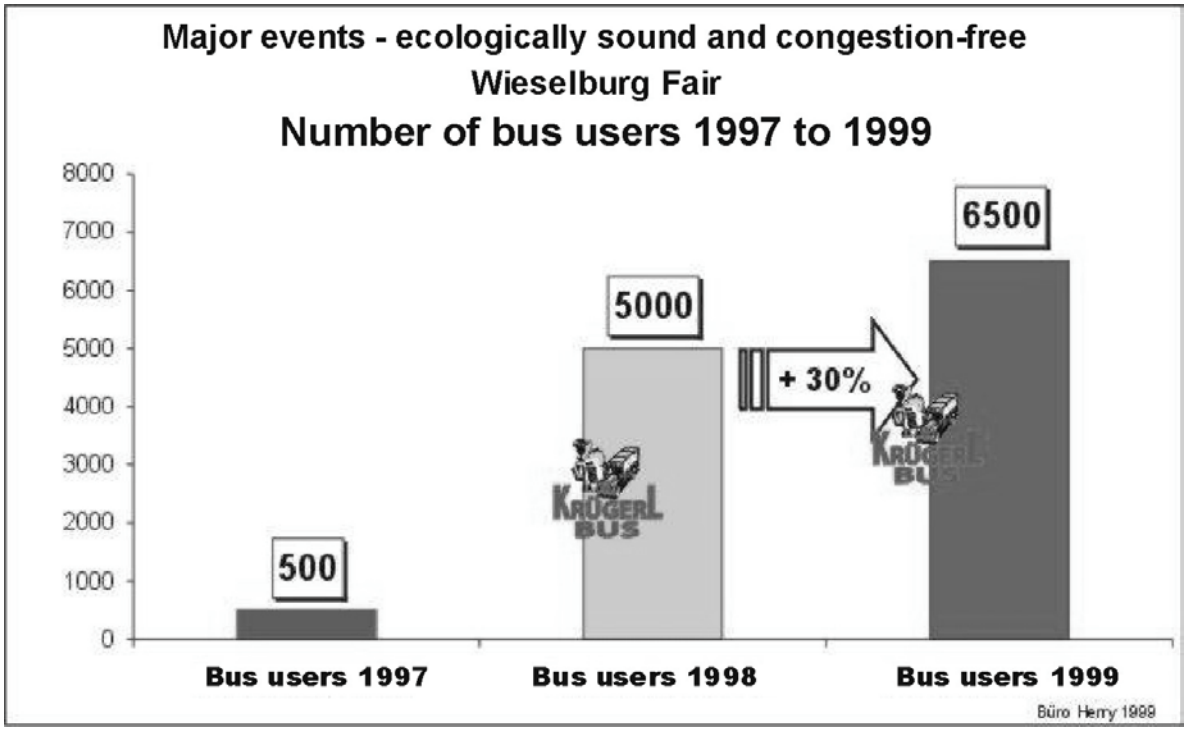
- Lower entry charges for groups travelling by coach;

- Visitors without cars were taken closer to the event site, since the Krügerl/Seidel bus terminus and the Wieselburg station were in its immediate vicinity. This benefit, together with the reduced entry charges, sent out a signal to the effect that preferential treatment was given to visitors without cars.

2.2.3. Main findings

It was possible to achieve a tenfold increase in bus users on the previous year. A total of 5 000 people used the new Krügerl and Seidel buses alone.

Figure 4. **The number of bus users has multiplied**



Of the (around) 250 000 visitors:

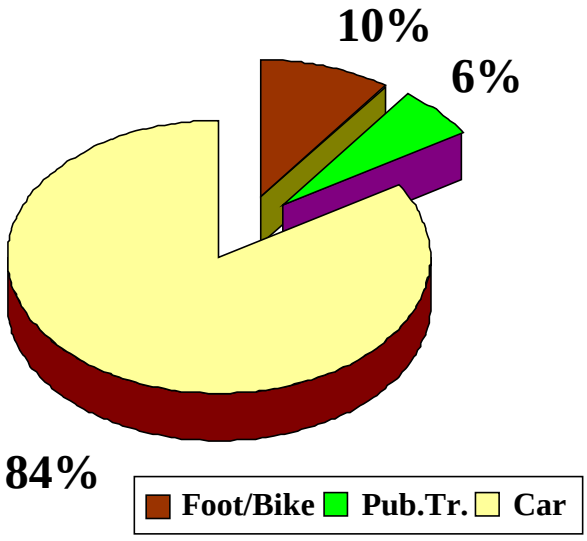
- 84 per cent came in cars. Of these, 63 per cent drove themselves, the average level of occupancy (persons per car) being 1.6;

- 10 per cent, chiefly from Wieselburg itself, came on foot or by bicycle;

- 6 per cent came by public transport. The breakdown of different means of transport used was as follows:

  - 46% Krügerl and Seidel buses;
  - 25% train;
  - 19% scheduled buses;
  - 7% train + bus shuttle;
  - 2% coach;
  - 2% old-time steam train.

Figure 5. **Choice of mode of transport by visitors to the Wieselburg Fair**



In view of the initial estimate that more than 90 per cent of the visitors would come by car, the result could be seen as satisfactory, given the regional structure (rural area) and the poor general image of public transport in this country district.

The attractive alternatives offered by public transport and the management of parking space to keep car occupancy at a certain level resulted in fewer car journeys and a reduction in the level of CO_2 emissions of between 5-7 per cent.

In short, the visitors were very satisfied with the transport scheme measures, motorists as well as public transport users. The Krügerl/Seidel buses especially were judged to be excellent and were very well received by young people in particular. Visitors did not regard the (higher) cost of parking the car or taking the bus as a problem.

The visitor survey, however, clearly showed that it was very difficult to win over habitual drivers with rational arguments (prices, services). In order to make them more willing to accept change, the journey would have to be presented as an "experience" closely associated with the event. Marketing and good package deals acquired considerable importance in this connection.

Following the very favourable assessment of the transport arrangements by the users and the positive experience of the organisers (a model for other fairs), the new services were optimised and developed for fairs held in the meantime and they have now become an essential feature of these major events and of the image they project.

2.3. The Nordic Ski World Championship 1999 in Ramsau

2.3.1. Starting point and objectives

The District of Ramsau has around 2 300 inhabitants and lies on a terrace at the foot of the Dachstein Massif. Its only links to the nearest federal road and to Schladming station in Ennstal were the steep, winding lanes used by the bus service. It was therefore necessary to ensure that the site of the Nordic Ski World Championship remained accessible during the event, particularly to buses and in the event of a sudden snowfall.

It was also necessary to bear in mind that the number of visitors at such events depended upon many unpredictable factors, such as weather and the success of a home sportsman. Moreover, a means of transport other than the car had to be available to competitors, officials and journalists for travel between sites where the events were staged.

Between 18 and 28 February 1999, the world's best nordic skiers competed for medals. At the beginning there were nearly four hundred athletes from more than thirty countries. About 250 000 spectators were expected, or an average of 25 000 spectators for each day of the event. With the sale of 231 000 one-day tickets, this target was almost reached.

Figure 6. **The motto of the pilot project "Nordic Ski World Championship" was *"Weiter Sprünge – kurze Wege"* (Long jumps – short journeys)**

The transport scheme was worked out over a longer period. The initial groundwork had been done even before the model event competition. Plans to make the world skiing championship a model environmental event (environmentally friendly transport, biomass as a source of energy, organic agricultural produce) had been drawn up early on by an "environment" working group set up by the organisation committee. The main emphasis was on specific proposals for transport arrangements that protected the environment: keeping the area free of normal motor traffic during the event, providing special trains and bus shuttles, laying out the facilities, notably the sports facilities, in such a way that attractions such as the ski-jump and the finishing points of the slopes were within easy walking distance of each other. There was a conscious decision not to build new, large-scale infrastructure. The slogan "*Weite Sprünge – Kurze Wege*" (long jumps – short journeys) was chosen as the motto for the environmentally friendly transport scheme. It had been possible to try out many of the measures at an earlier world championship in 1998.

In order to level out the expected traffic peaks caused by arrivals and departures and to encourage visitors to prolong their stay, an extensive cultural programme was also offered.

The objective and hence the basis of the transport scheme was that:

- only about 30 per cent of the visitors should travel to the event by car and
- the health spa air-quality levels should be maintained during the event.

With the centre of the locality kept free of traffic and the main event areas made easily accessible to walkers and skiers, ideal conditions were created for visitors and local residents, as could be seen from the high proportion of visitors who came to the event without motorised transport (walkers and cross-country skiers in particular).

2.3.2. Measures implemented

a) Alternatives to car travel – offers available through local transport operators

- Travel by train: for travel to the event, the number of trains provided by the ÖBB (Austrian Federal Railway) was substantially increased;

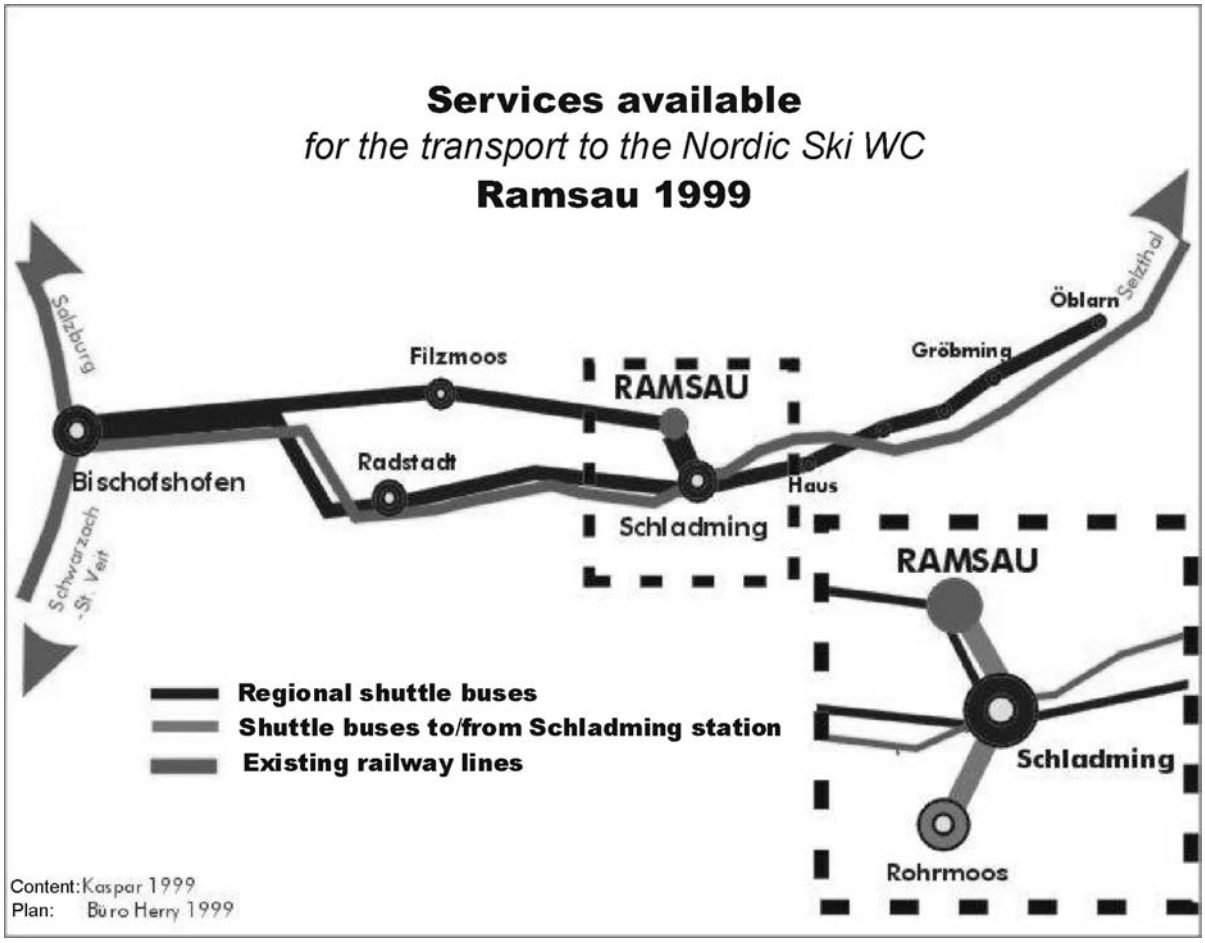
- Bus shuttles: Bus shuttles were laid on between the ÖBB trains stopping at Schladming station and Ramsau (free to train users);

- Regional bus shuttles: four bus-shuttle lines, adapted to particular stages in the event, were laid on in the surrounding districts. These were intended to give local residents, above all the many visitors from the region, an attractive transport option;

- Flexible bus and taxi services in the district, especially for transporting those actively involved (athletes, officials, reporters, etc.).

In all, 55 ÖBB "world-championship" trains with extra carriages, 40 local or regional bus shuttles and 100 minibuses for VIPs and press were deployed.

Figure 7. **Transport scheme**



b) Management of parking space

Visitors could only park their cars outside the confined space of the event locality. The 7 000 parking spaces originally provided for were reduced to around 2 800 as a result of the increased use of buses and trains as alternatives to car travel. Furthermore, visitors had to pay 3.63 a day to park their cars. In the locality as a whole, parking was banned or was authorised only for very short periods. Only those with special accreditation were allowed to enter and park in the event zone.

c) Marketing and public relations work

The main target area for marketing was the surrounding Dachstein-Tauern region, where many visitors stayed when the world championship was held in this area. The following measures, *inter alia*, were implemented:

- Travel folder with programme and all travel information, ÖBB information posters displayed in all stations and distributed to households;

- The general secretariat of the organisation committee tried to promote the travel as part of its co-operation with the media. In practice this initiative enjoyed only limited success, owing

to a lack of interest in many parts of the media, who were only interested in reporting the sporting events;

- Co-operation with transport editors of the major radio broadcasters, who provided regular information on the rail travel option;

- Setting up of a world championship hotline and homepage, on which the alternatives to car transport were spelt out;

- Ministry for the Environment video on the subject of "Climate protection, transport and major events", which was frequently broadcast on television.

d) Financial incentives and benefits

The wide range of financial incentives meant that visitors without cars had a clear advantage:

- Combined train and world championship ticket: Visitors who came by train were offered a package-deal with a reduction of around 30 per cent. Entry tickets could thus be bought at the station and visitors coming by train were spared the inconvenience of having to queue up at the cash desk;

- Attractive prices for the regional bus shuttles, the cost of the journey to the event being between 1.45 and 2.91 .

Visitors without cars were (normally) able to travel closer to the event site by bus.

2.3.3. The results

The arrangements for the "car-free world-championship village" and the "short-journey championship" enabled a very high proportion of visitors to reach the event site without motorised transport.

Of the visitors:

- only 29 per cent came by car, of whom 16 per cent drove themselves and 13 per cent were passengers. The average occupancy level (persons per car) was 1.8;

- 26 per cent came by scheduled buses, as well as the bus shuttles in the area;

- 21 per cent came on foot or by bicycle, or came by cross-country skiing. The pedestrians formed the largest part of this group;

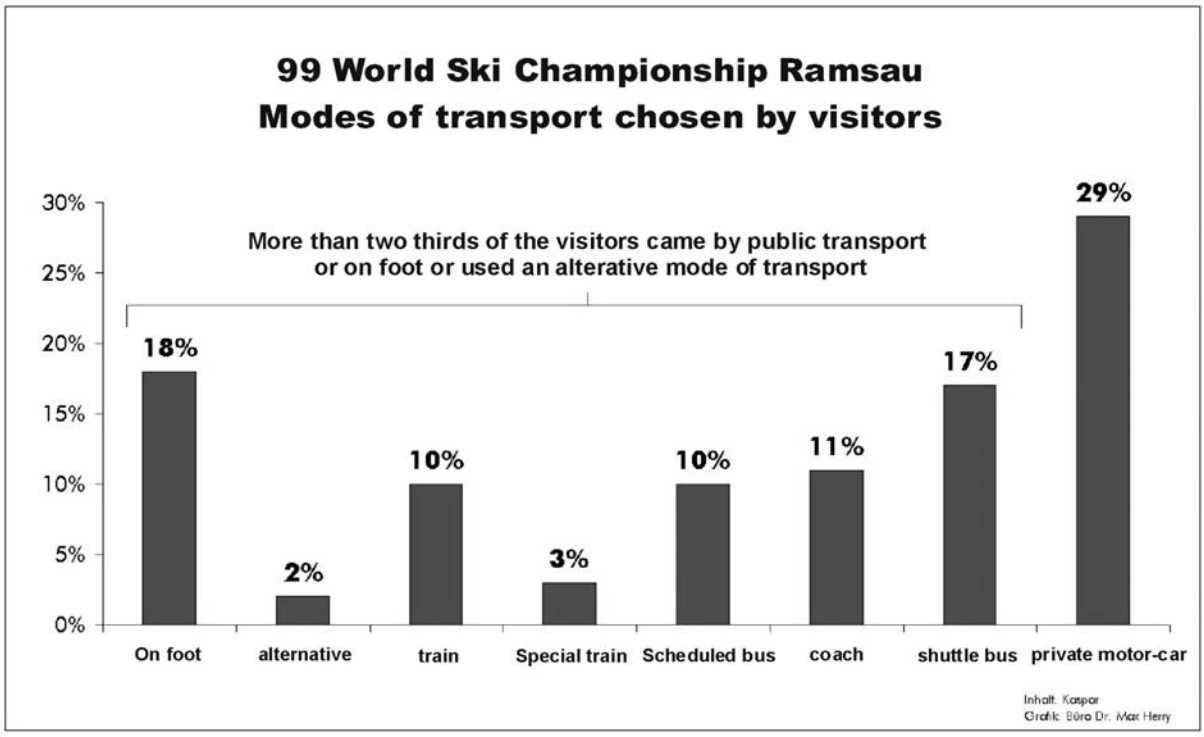
- 13 per cent came by a combination of train + bus shuttle. This group comprised users of scheduled trains and special trains;

- 11 per cent came by coach and were therefore on the special excursions organised by various operators.

The proportion of visitors travelling by environmentally friendly modes (including coaches) was therefore 71 per cent! Compared with other major events, such as the Alpine Ski World Championship in Vail and in Sierra Nevada, the high proportion of visitors without cars was

sensational. Only in Norway (1994 Olympics in Lillehammer and 1997 Nordic World Championship in Trondheim) were comparably good levels achieved.

Figure 8. **Choice of transport by visitors to** Nordic Ski World Championship in Ramsau 1999



It was evident from the visitor survey that those living in the surrounding region knew of the transport services on offer and the services had consequently been taken up by a great many.

The overwhelming majority of visitors accepted the cost of public transport or did not regard it as a problem. They also accepted the charges for parking space, which had originally been criticised by the organisers.

As a result of the above-average take-up on the bus shuttles between Schladming station and the event site, it was sometimes necessary to accept longer waiting times and overcrowded buses. These problems could, to some extent, be ascribed to the unco-ordinated methods of the *gendarmerie*, who at times opened roads reserved for shuttle traffic to car traffic with the result that the bus shuttles could not keep to their timetables. In addition, many coaches were parked in the valley because of the weather and so their occupants also used the ÖBB bus shuttles.

In short, 70 per cent of the visitors were very satisfied with the transport scheme measures. These were mainly pedestrians, drivers, coach users and regional bus users.

The environmental goals were also achieved. Thus, in spite of this event, the health spa air-quality levels were still maintained.

The Nordic Ski World Championship in Raumsau was therefore a successful model for other major sporting events.

2.4. The 2000 International Garden Show in Graz

2.4.1. Starting point and objectives

The 2000 International Garden Show (IGS 2000) was held from13 April to 15 October 2000 in a former gravel-pit district, converted into a holiday area, to the south of the town of Graz. The event site was almost on the "green belt" at the edge of the city outskirts and right next to the motorway, though with no proper links to the public transport services. This presented a great challenge, for despite being unfavourably situated for means of transport other than the car, it was supposed to be accessible to modes appropriate to the pilot project. In addition to the IGS visitors, the visitors to the leisure centre and the traffic involved in the redevelopment work also had to be taken into consideration. Work on the transport scheme was carried out as part of a more general plan for the highly concentrated area of Graz Süd. It was thus also possible to solve a series of traffic problems not directly associated with the 2000 IGS (heavy goods traffic, closure of the leisure area). A regional working group was set up, representing all the districts in the area, the Styrian Transport Association, the Styrian State Government Office, the planners and the Ministry of the Environment.

In drawing up the transport plan, the following goals were established:

- Visitors' transport arrangements should be adapted to environmental requirements – as many journeys as possible should be made by public transport;

- The lack of transport connections should not be considered a hindrance to visitors to the show – good accessibility was an essential requirement if this mega-event was to attract the public;

- Integrated planning – taking account of the implications and effects of the measures in the context of the overall planning sphere;

- Redevelopment – integrated and sustainable conception of transport development in the Graz-Süd/Ost industrial zone, in keeping with its growing importance.

The specific goal was to encourage at least 30 per cent of the visitors to the IGS to travel by public transport.

2.4.2. Measures implemented

a) Alternatives to travelling by car and integrated transport

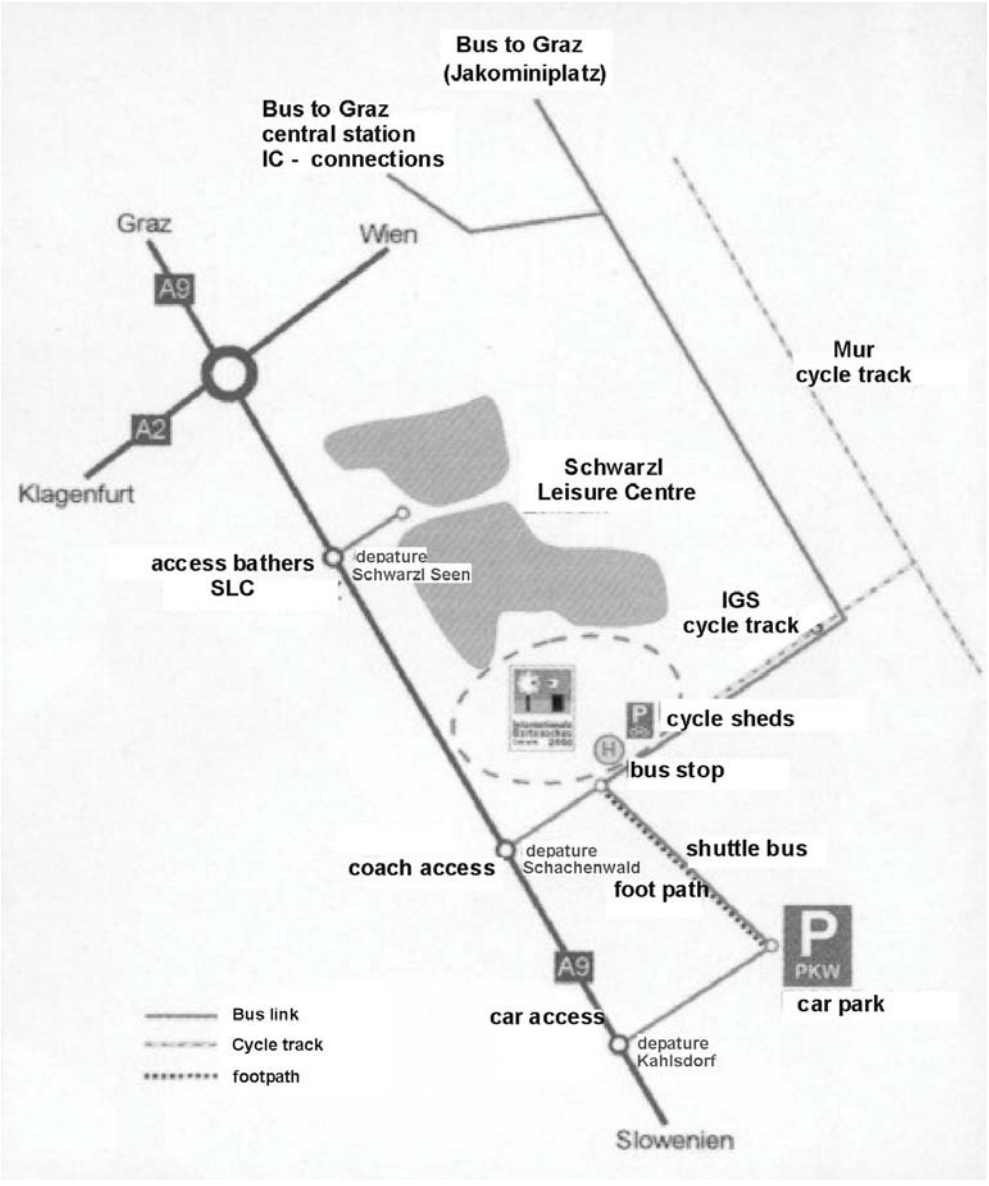
- Establishment of an attractive shuttle-bus service ("Oskar-Express") with direct connections with the main railway station in Graz and the airport (every 60 minutes) and Jakominiplatz in the centre of Graz (every 15–30 minutes);

- Improved conditions for cyclists, with a link-up to a regional cycle track network;

- A signposting system provided for the harmonious routing of traffic flows. Clear routing of motorised transport with a view to ensuring that most traffic came and went directly by the motorway, in order to keep the locality largely free from visitor traffic and allow the bus shuttles to run without hindrance;

- The high potential of coaches as a means of transport to the event was to be realised through co-operation with transport operators.

Figure 9. Overall transport scheme for travel to the International Garden Show



b) Management of parking space

Clear regulation of **parked vehicles**. Whereas the "Oskar-Express" terminus, the cycle sheds (with room for 300 cycles) and the point where coaches put down or picked up their passengers were situated right at the main entrance to the event, the car park with 4 000 spaces was around one and a half kilometres away, transport to the main entrance being provided by a special shuttle bus. Drivers had to pay 3.63 per day to park their cars.

This charge, together with other financial incentives, was part of a deliberate policy of giving preferential treatment to visitors who had not come by car.

c) Marketing and public relations work

The marketing targeted two main groups: visitors from the immediate area and visitors from more distant areas. The marketing plan emphasized the four main advantages of coming without a car: speed (fast shuttle buses, optimal connections with the ÖBB intercity trains), comfort (air-conditioned, low-floor buses, bus stop right in front of the entrance), pecuniary benefits (free shuttle-bus service, no parking charge, entrance ticket useable as travel card for the town of Graz) and safety.

More precisely, the following specific measures were put in place:

- The provision of information on transport was made an integral part of the overall marketing approach to the event (advertisements, info-folders, homepage);

- Production of an individual travel folder with specific information on transport (timetables), the distribution of the folder to tourism offices, transport operators, schools, clubs, the "mobility centre" in Graz (MobilZentral) and the display of a standard poster throughout Austria;

- Enlisting of the MobilZentral to provide specific, individual travel information;

- Co-operation with travel agencies, which would provide information. This co-operation was begun two years before the event and agreements were entered into with a total of 355 agencies in 23 countries.

d) Financial incentives and benefits

- For visitors travelling with the ÖBB, a cut-price package was offered, obtainable from all Austrian stations and covering train journey, shuttle bus and entrance;

- Free shuttle buses ("Oskar-Express"): The "Oskar-Express" buses could be used free of charge;

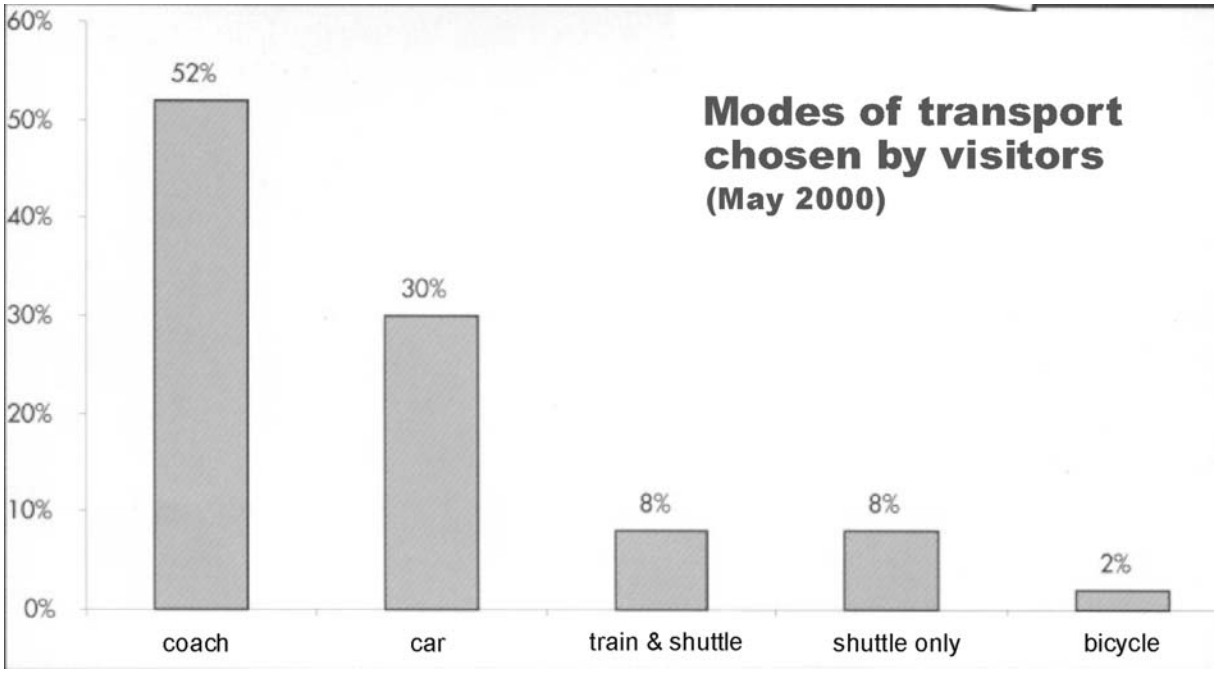
- Free travel card for Graz: Visitors to the IGS could use their entrance card for free travel on the Graz public transport network. This meant, amongst other things, that many of those attending the IGS also took the opportunity of visiting the town of Graz.

Figure 10. **The "Oskar-Express" – Free shuttle-bus service to the International Garden Show**

2.4.3. Findings (assessment)

The proportion of visitors who came by coach was surprisingly high. This can be seen as a great success for the strategy of co-operation with travel agencies. Take-up for public transport services was good; around 90 000 visitors used the "Oskar-Express". Of those who came by public transport, 41 per cent at any rate used the Graz travel card included in the entrance price and went for a walk around the town.

Figure 11. Means of transport chosen by visitors to the Garden Show



Of the visitors surveyed on two sample days in May:

- 52 per cent came by coach. It emerged that the proportion was high for visitors from all regions as well as for visitors from the town of Graz and the surrounding area;

- About 30 per cent came by car. This is a very low proportion, especially considering the location of the IGS, with direct access to the motorway. The proportion of cars was higher for visitors from the surrounding districts (35 per cent) and from the more distant Austrian states (37 per cent);

- Eight per cent of the visitors came from the region by a combination of train + shuttle bus;

- A further eight per cent used the shuttle buses from the town of Graz;

- Two per cent came to the IGS by bicycle. Of course, visitors from the surrounding area (12 per cent) and from the town of Graz (7 per cent) make up the highest proportions in this group.

In short, the overall proportion of environmentally friendly modes, including coaches, was 70 per cent!

The visitors were very satisfied with the transport scheme measures. On the question of the organisation of transport, favourable responses ("very" and "fairly" satisfied) accounted for nearly 100 per cent(!)

3. CONCLUSIONS AND FOLLOW-UP WITH A VIEW TO WIDER IMPLEMENTATION

3.1. Summary and conclusions

The three pilot events show that it is possible to influence visitors' travel choices by applying wide-ranging sets of measures. This is essentially true for all types of event calling for a combined approach to transport and marketing, specially tailored to the situation.

The transport scheme must be adapted to the particular event and should take account of the following principles:

- *Choice of location for the event*:

  The position of the event site and its situation in relation to existing transport networks have a very important influence on the modes of transport chosen by the visitors. The location of fair centres, for example, must be such that a direct connection to an efficient public transport service is guaranteed and the local town can be easily reached by train, tram or bus, on foot or by bike.

- *Attractive public transport services as an alternative to car travel*:

  The availability of alternative transport facilities geared to visitors' requirements is a prerequisite of environmentally friendly travel. The services should be planned in such a way that the users gain an additional benefit: the journey by train / bus should become a part of the event. Overcrowding in the shuttles should be avoided as far as possible. To this end the peak periods for travelling to and from the event should be levelled out, through the adoption of framework programmes, for example.
  In principle, every stage in the journey, from leaving the house to arriving at the event site, should be taken into account in the planning. Taxi vouchers for travel from home to the local station or park + ride facilities at the home station might be used as the final link in the transport chain.
  Transport services should be available as part of a complete package. Ideally, the package should cover the journey, the bus shuttle, entry to the event at a reduced rate and other benefits ("all-inclusive ticket"). It should be possible to book such a package at home.
  If public transport is to run smoothly and profitably, its approach roads must be kept free of normal transport. It is therefore recommended that the approach roads for cars be separated from those for shuttle buses.

- *Co-operation with travel agencies*:

  Group travel by coach is a very profitable and environmentally friendly option for major events. It calls for the earliest possible co-operation between planners and travel agencies.

- *Management of parking space and parking charges*:

  It is recommended that planners concentrate on a small number of locations and that clear guidance be given to car drivers by signposts. Whereas the bus stops and cycle stands should be located in the immediate vicinity of the event site, car parks may be situated further away. Footpaths of around 1 000 metres or shuttle buses to and from the car parks are possible and indeed quite normal.
  Today, parking charges are normally taken for granted by car users, particularly at major events and they should therefore be introduced as a matter of course. Moreover, they provide an incentive for leaving the car at home or at least increasing car occupancy levels. The parking charges can also be used to part-finance the shuttle traffic.

- *Taking the offensive in marketing and public relations work on new alternatives to car travel*:

  Marketing plays a key role. The visitor must be informed of the alternatives to car travel before he decides how he will travel to the event. The incorporation of travel information into the overall marketing plan has proved to be particularly effective. It follows that information on transport (by means other than the car) should be included in all advertising media and presented in a convincing way.
  The travel should be included in the package and, if possible, visitors should be made to feel that it is part of the event. For example, relevant information may be provided on the bus and games and other activities may be organised.
  It is very difficult to obtain the detailed information needed when making a journey by public transport. In this connection, the links with transport centres and the hotlines for specific events have demonstrated their worth in providing visitors with personalised travel information.

Of particular value in supplying information to visitors from the more remote parts of the catchment area is the co-operation with transregional transport operators (train and bus companies), transport associations, travel agencies, clubs and the media.

- *Preferential treatment for visitors without cars ("no car = VIP")*:

  Travelling without a car should be clearly advantageous to visitors. Possible measures here are the provision of shorter footpaths for bus/train/cycle users, arrangements to reduce or eliminate waiting time at the entrance ("VIP" treatment) and financial benefits. Other measures include allowing shuttle buses priority access and giving free gifts to visitors without cars. These advantages must be clearly spelt out wherever information about transport options is provided.

- *Financial incentives*:

  Financial incentives should be applied in accordance with the "carrot and stick" principle. Whereas drivers are required to pay parking charges, visitors without cars should be offered good package deals with a reduced charge for entry. All-inclusive packages, covering train and bus travel, cut-price entry and various other additional benefits and services (e.g. vouchers for drinks and meals, city travel cards, entry to other events), are very much to be recommended and should be standard practice at major events.

- *Levelling out peak travel to and from the event*:

  As far as possible, peak periods should be prevented from arising so that overcrowding and long waiting periods might be avoided. Framework programmes for the actual event provide one possible solution. It would then be possible to achieve a considerable reduction in shuttle traffic.

- *Co-ordinated implementation and enforcement of traffic regulations*:

  The implementation of the transport measures calls for the professional management of transport and a co-ordinator with overall responsibility. In particular, the appropriate regulations must be effectively implemented and enforced by the executive. This is why the competent authorities need to be included in the planning process. The executive's staff need to be given clear guidelines on the priorities of traffic regulation (e.g. bus before car).
  Granting exceptions to the appropriate regulations often proves to be problematic. In the case of particularly large groups of people, exceptions to rules limiting access and parking should be avoided at all costs.

- *Informing and motivating organisers and transport operators*:

  Transport operators and organisers are often helpless in the face of transport problems. They need to co-operate with representatives of the parties affected for the purpose of gaining information and raising their level of motivation. It is of the utmost importance that transport operators and organisers be encouraged to use their entrepreneurial initiative and offer attractive packages and transport services at their own risk.
  In any event, the actors concerned (organisers, transport operators, executive, etc.) should be given more information and regular briefing.

- *Involving all the actors concerned in the planning process*:

  The transport scheme must be the result of a planning process focusing on practicalities, in which all those concerned with its implementation are brought in at an early stage and are able to co-operate. In addition to the organisers and the transport planners, the actors involved from the outset should include, at the very least, those responsible for marketing and public relations work, as well as local authorities, licensing authorities and executives, transport enterprises and media representatives.

- *Funding transport arrangements*:

  Shuttle transport is expensive and many organisers are reluctant to pay for it. The service can, however, be jointly funded. The parking proceeds may be used for this purpose, as well as graded entry prices.

- *Legal framework conditions*:

  At present, the problem of traffic generated by visitors to events is hardly addressed in the laws on public events or by the competent authorities. Clear legal prescriptions would be an advantage here; in particular, conditions governing the drawing up and implementation of ecologically sound transport arrangements would be of help in the official licensing process.

3.2. Encouraging broad implementation

In view of the great success of the pilot projects, the Federal Ministry of Agriculture, Forestry, the Environment and Water Management (BMLFUW) is supporting ecologically sound transport arrangements at major events through initiatives at three levels:

- *Broad range of possibilities for sponsorship*:

  As a result of a change in the UFG (federal law for the promotion of environmentally friendly projects), the organisers of major events will be entitled to grants under a special environmental scheme (*betriebliche Umweltförderung*). These grants will be available to organisers as from 2002 if they implement environmentally friendly transport plans that lead to a reduction in pollution, more especially CO_2 emissions. A motivation and information campaign is to be launched in co-operation with the Austrian Chamber of Commerce with the object of encouraging the organisers of major events to implement environmentally friendly transport schemes by offering them new opportunities for sponsorship.

- *Faster preparation of information and know-how*:

  Short fact sheets have accordingly been drawn up on each pilot project, setting out the main findings and these have been sent out to all the organisers of major events and relevant authorities. The pilot project conclusions are to be published with a checklist on a short fact-sheet and made available to organisers, together with a guide on applying for grants.

- *Establishment of good practice networks*:

  An information network (*Netzwerk Mobilitätsmanagement Österreich*) is being built up with the co-operation of the Austrian Ministry of Transport and the Association of Local Authorities. The network will focus on leisure transport and major events and will also make the experience derived from models of good practice more widely available.

Owing to the federal structure of Austria, the responsibility for licensing events lies with the states, regions and districts (*Länder, Bezirken and Gemeinden)*. The Federal Ministry can do no more than issue the recommendation that the licensing of a major event should be subject to the condition that the organiser draws up and implements an environmentally friendly transport scheme for the event.

The promotion of environmentally friendly development in leisure traffic, in this instance the traffic associated with major events, together with the wider promotion of staff mobility management, is an important environmental component of a sustainable transport strategy of the kind being pursued by the Austrian Ministry of the Environment.

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MOBILITY AND THE EURO 2000 FOOTBALL CHAMPIONSHIP

SUMMARY

Brussels, November 2001

1. INTRODUCTION

From 10 June to 2 July 2000, Belgium and the Netherlands were host to the third largest sporting event in the world, after the Olympics and the World Cup, in terms of the amount of travel involved over a short period of time. The European Football Championship brought together 16 European national teams, mainly from neighbouring countries, as can be appreciated from the map in Annex 1.

Given Belgium's central location at the economic and social crossroads of Europe, its wealth of transportation networks of all kinds and its ready accessibility to most participating countries, it was logical that our country should be called upon to play the key role in assuring mobility for fans during such an event.

The fact that the co-host country was next door and attracted fans to matches played on its soil not only generated an enormous amount of traffic in Belgium but also meant that the teams had to commute between the host cities, in accordance with the schedule of matches during the four preliminary rounds.

From the beginning of the event to its end, 15 matches were played on Belgian soil in the four host cities of Bruges, Brussels, Charleroi and Liège.

Given the expected influx of fans (who numbered more than 1.2 million) the Belgian Government of the time tasked the Minister of the Interior with taking the lead in managing preparations.

This task included mobility and transportation arrangements, devolved to the former *Gendarmerie*, now the Federal Police.

It quickly became apparent that mobility for this event, given its multiple aspects, was a highly complex issue, particularly in terms of co-ordinating the various transport sectors and ensuring their complementarity.

One year before the event, the Ministry of Communications and Infrastructure was asked to draw up a National Mobility Plan to accommodate this increased flow which, while limited in terms of space and time, would add to the existing daily traffic that already causes great congestion in our major urban centres.

2. LEAD-UP TO THE EVENT

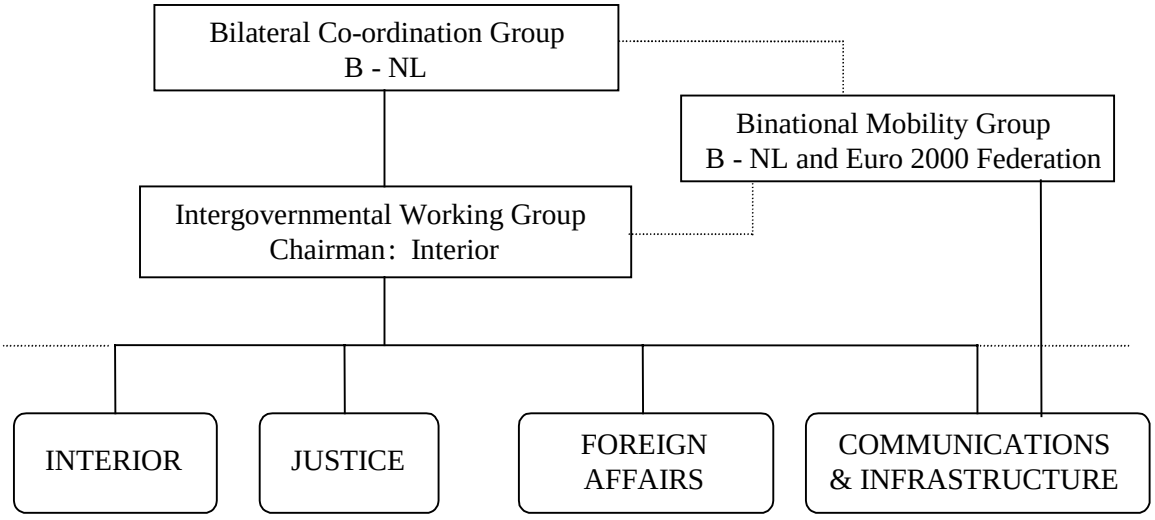
Given the particular features of our country, with a federal government and regional governments each with their own ministers of transport, the Federal Project Manager needed responsible regional co-ordinators to work with.

At the Federal Government's request, three co-ordinators were appointed to represent their regions (Flanders, Wallonia and the Brussels-Capital region).

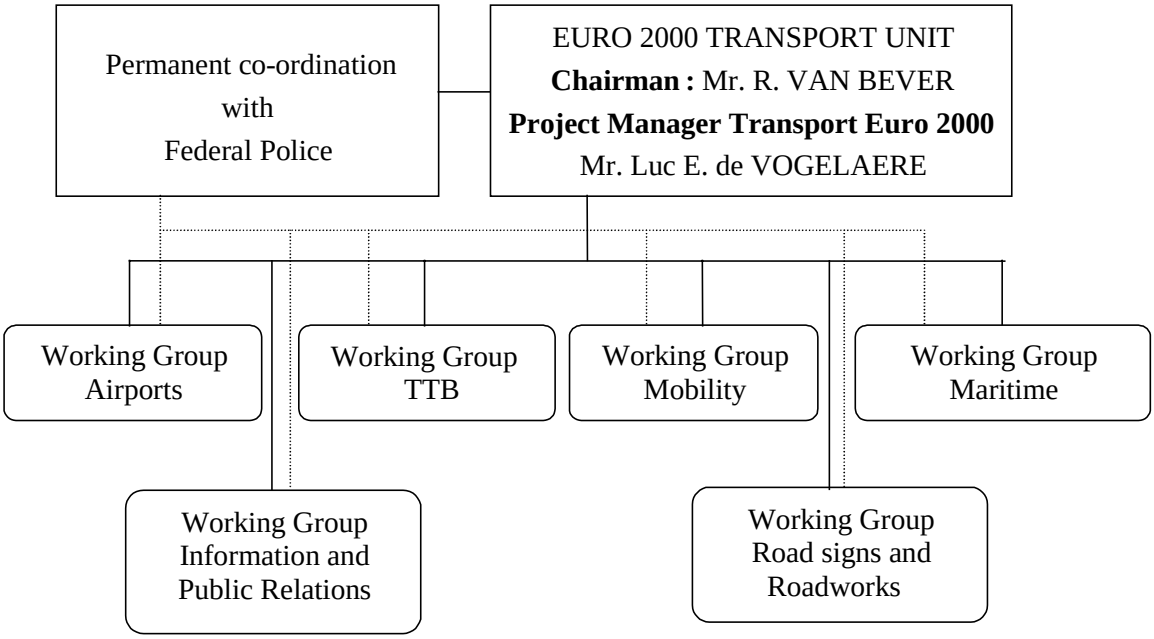
The logistics of readying Belgium for the event thus consisted of an organisation at the national level, working in close bilateral co-operation with the Netherlands.

The organisation chart for the bilateral and national levels is shown in Figure 1 below:

Figure 1. **Euro 2000 Football Championship**
Organisation chart for the bilateral and national levels



Our department set up the following structure:



In addition, because the security aspect played a very important role in mobility, a representative of the *Gendarmerie* participated in all meetings and assisted the Project Manager Transport Euro 2000 in all activities and tasks.

As to the regional mobility co-ordinators, they participated in all meetings of the working groups and were also to form a brainstorming group which would meet if there were problems to sort out between the co-ordinators. Fortunately, such a situation never arose.

Because arrangements involved two countries and one foundation, we planned for:

- Regular co-ordination with our Dutch transport colleagues;
- Co-ordination with the transport officials of the Euro 2000 Foundation.

Once these organisational logistics were in place, the next step was to lay the overall plans for the event, taking particular account of the following aspects:

- The security aspect was essential for all movements. This meant avoiding any chance encounter between fans from opposing camps. We decided to try wherever possible to separate and channel the flow of fans at source, i.e. from the train stations and terminals to the parking lots, consistent with the separation system planned for the stadiums, at the request of the security services.

- In addition to this separation, we drew up plans for meeting fans at stations, ports and airports and transporting them directly to meeting and dispatch points, except where the organiser or tour operator was responsible for taking fans from their point of arrival in Belgium to the stadium and back (e.g. for arrivals and departures of Euro 2000 charter flights at designated Belgian airports). This aspect of mobility was thoroughly covered by the mobility plans prepared by the four host cities.

- For fans arriving by car or bus, it was felt that existing signage on the roads leading to the host cities should be sufficient until the city outskirts were reached. Upon approaching the city, fans were then guided by specific temporary signage installed along streets leading to the stadiums.

- For information purposes, in addition to a mail-order channel for purchasers of Euro 2000 stadium tickets, information supports were planned in the form of flyers for each host city, pointing out the best routes for reaching the events. The official logo was used to mark assembly points wherever large concentrations of fans were expected. Together, we would try to provide as much useful information as possible through the mass media and radio announcements to promote mobility, especially on the roads. The Minister of Mobility and his regional colleagues had targeted a national information campaign at the Belgian public, associations and businesses and similar efforts were made at the local level by the host city authorities, especially for local citizens and neighbours of the stadiums.

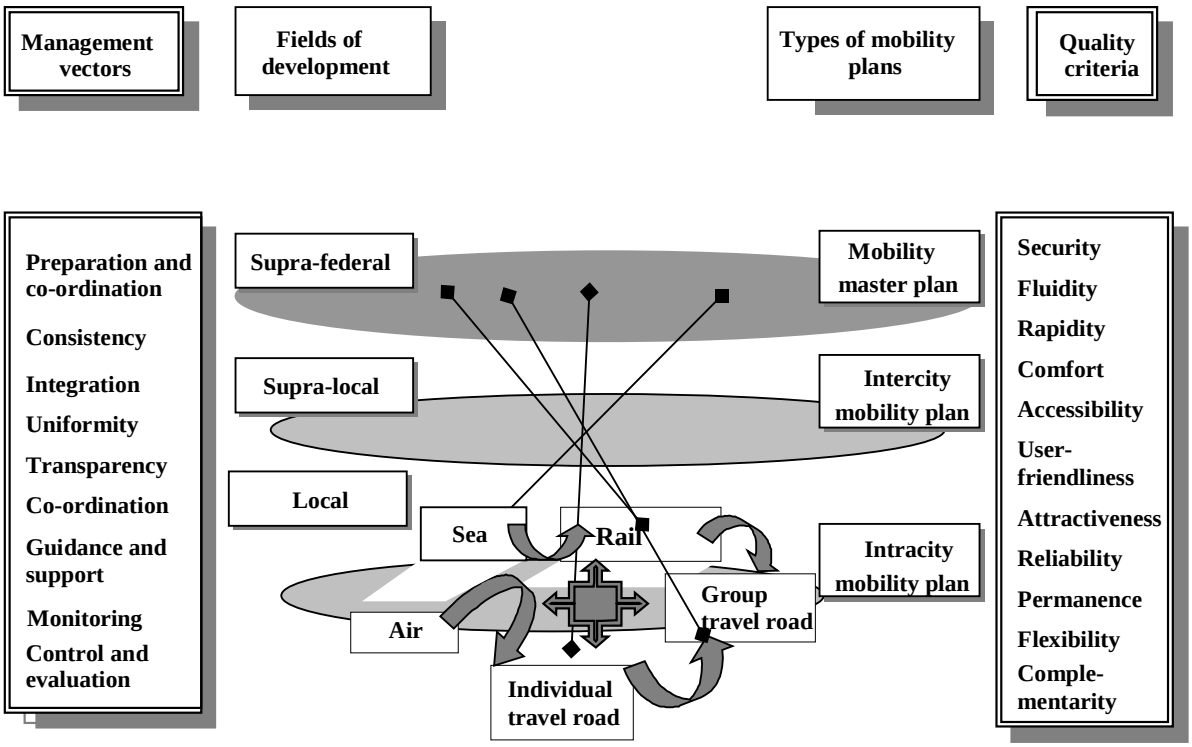
- For those travelling by train and public transport, it was planned to promote our public transport networks through an attractive system of special fares, inspired by the Train-Tram-Bus formula.

In this planning, we respected a fundamental rule: look after the fan from the time he arrives until the time he leaves, wherever possible.

Before going into the details of the National Mobility Plan, it would be useful to provide an organisation chart to illustrate the working method we followed in our planning.

The procedure covered, as we saw it, all aspects that should be taken into account in any mobility plan, not just one for this particular event.

Figure 3



Source : Federal Police

3. THE FLOW OF SUPPORTERS

Of the 31 matches played during Euro 2000, 15 took place in Belgium. Aware of stadium capacity and the fact that all available places would be occupied, thanks to the pre-sales programme, we were expecting the following numbers of fans:

- **First round, 10-21 June 2000**

Brussels	50 000 x 3 =	150 000
Bruges	30 000 x 3 =	90 000
Charleroi	30 000 x 3 =	90 000
Liège	30 000 x 3 =	90 000

- **Quarter-finals, 24-25 June 2000**

  Brussels 50 000
  Bruges 30 000

- **Semi-finals, 28 June 2000**

  Brussels 50 000

This represented a total of 550 000 people.

This figure was based on the number of available seats. It should be noted that VIPs, journalists, special guests and suppliers, together with the Euro 2000 Foundation directors, were also included.

People in these latter groups were expected to participate at all matches and thus to stay in Belgium or the Netherlands throughout the entire event. This meant that they would constantly be travelling between the host cities. At the approach to the stadiums, they would have to join the flow of fans and respect the routing laid out for them.

Given our country's central location, it was felt best to follow a similar procedure in quantifying the number of fans expected at the 16 matches that would take place in the Netherlands (where there were four host cities). They represented a total of **680 000 people**.

It became apparent from this method that the Euro 2000 event would mean the presence in the two host countries of 1 230 000 people during the event, generating the following flows:

- Those staying within our territory;
- Those travelling to the Netherlands;
- Those making return trips between the two host countries, since most of the qualifying teams would have to play in both.

Using these data, a profile of the various types of fan was prepared in order to identify their habits in terms of where and how long they would stay and where they would travel during the event. From the outset, we limited ourselves to football, since a fan at the Olympic Games uses other criteria for participating in events. The only study of fans available to us at that time was one prepared by the University of Liège. Unfortunately, it did not deal with "extreme" fans.

Based on the author's familiarity with European countries and the fact that he had followed all the qualifying matches for more than six months, and using information about these matches gleaned from the press, he derived a more targeted profile of fans from participating countries, which allowed him to draw the following conclusions for Euro 2000:

- Choice of transport mode by Euro 2000 fans:

  Air 7 per cent
  Train 23.5 per cent
  Bus 40 per cent
  Private car 29.5 per cent

– Length of stay:

50 per cent one day (match day), i.e. maximum 24 hours;
20 per cent one to two days;
15 per cent one week;
10 per cent two weeks;
5 per cent longer than two weeks.

In terms of length of stay, the data still had to be adjusted, since the groups gravitating around Euro 2000 were expected to remain throughout the event. Moreover, the commuting of teams between Belgium and the Netherlands and the fact that some fans would be following their teams to different places had a great impact on both the length and the locale of their stay.

This led us to assume that 60 per cent of fans and a portion of the general public would stay for between one day and one week at most. For the remaining 40 per cent, essentially clients gravitating around Euro 2000, they would stay for two weeks or even more.

The latter expectation was confirmed. The same is true for the distribution among modes of transport.

There is no general rule applicable to all countries on this point. In fact, the geographic location of the host country and the proximity of participating countries plays a great role.

In terms of travel, it should be noted that transit to and from the Netherlands was broken down as follows:

Train	27 per cent
Bus	40 per cent
Private car	33 per cent

The reason these projections are limited to three modes of transport has to do with the proximity of the two countries and the existence of highly developed, complementary and interconnected rail and road links.

4. ELEMENTS TAKEN INTO CONSIDERATION IN PREPARING THE PLAN

In preparing the National Mobility Plan, we had first of all to consider the following elements:

4.1. Geography

Because of its central geographic location, Belgium is a country of transit *par excellence*. Its compact size, moreover, is such that its population is heavily concentrated and this is further accentuated by the large number of cities that are separated by only short distances. Furthermore, if we look at our immediate neighbours, we find that all of them qualified for the Euro 2000

championships: the United Kingdom to the West, Germany to the East, France to the South and the Netherlands to the North.

We therefore found ourselves at the very heart of the event. This led us to expect that the flow of visitors generated by the event would come from all points of the compass and must be integrated as smoothly as possible into our already heavy daily flow of traffic.

4.2. Transportation

Our country is famous for its dense transportation networks of all kinds. This is no doubt a major asset in drawing up a mobility plan.

Looking at the four host cities alone, we found that they were serviced by motorways from most of the expected points of entry for fans. They are also linked to each other by motorways. The stadiums, moreover, are readily accessible via the highway network. In general, they can be reached without passing through the city.

When it comes to rail, the four cities concerned had major stations that were well served by both national and international lines.

The same is true for air service, since each host city had an international airport that could accommodate intercontinental flights. Bruges is less well served in this regard, since it had to rely on the Ostende Airport for Euro 2000 arrivals and departures. However, these two cities are only 20 kilometres apart by motorway and the city of Ostende itself can be bypassed.

A shuttle bus service was provided between the airport and the stadium, scaled to expected air traffic.

The density of road and rail services thus made it possible, on the one hand, to offer alternative routes, along the lines of *"bison futé"* ("Wily Bison", a series of roadsigns recommending less crowded or more convenient itineraries for travellers) and, on the other hand, to separate fans by using different stations in the same host city.

Here again, Bruges was an exception since it has only one railway station. In terms of sea travel (bearing in mind England's participation), Ostende would be the most important port, while the port of Zeebrugge would also be of some service. Since England was playing two matches at Charleroi, provisions were also made to facilitate sea-rail connections in order to ensure optimum mobility, taking advantage of the single arrival and departure point represented by the rail-sea terminal at Ostende. For Zeebrugge, where traffic is primarily by passenger car, there was a useful connection to the motorway network.

The other asset enjoyed by the host cities was that they all had an urban transit network that was well connected to the railway stations.

This urban network played an essential role from the time fans arrived in the host cities and extra service and shuttles were laid on.

4.3. Urban

In addition to the density of its transportation networks, our country is also typified by dense urban settlement in a number of major cities. In fact, the four host cities are very close to each other. Starting out from Brussels, the other three cities can easily be reached within ninety minutes. This proximity also extended to two of the host cities in the Netherlands, Rotterdam and Eindhoven.

Given this density of population, trips tended to be frequent and shorter. Depending on their length of stay, fans could be expected to travel not only between the host cities but also to other points of attraction (the seacoast, for example), particularly when the weather was good.

4.4. Social

The density of our population and its travel habits meant that we had to take this element into consideration as well. Generally speaking, Belgians are very mobile and travel a great deal. During the week, they commute between home and work or home and school and at the weekend, depending on the weather, they flock to the seacoast or the mountains of the Ardennes.

During the week, this traffic is inevitable and it generates long lineups and bottlenecks into and out of the major cities. We therefore decided to try to encourage collective transport for fans, by offering special fares during Euro 2000. In this way, it was hoped, some of the supporters who would otherwise travel by car might be induced to use public transit, depending on their length of stay, recognizing that those who were here for only a match or two would be difficult to persuade.

4.5. Timing

Euro 2000 took place from 10 June to 2 July 2000, a period that corresponds to the beginning of the annual summer vacation, school examinations and the onslaught of tourists. It was this latter aspect, in particular, that posed the real problem, since a number of major cultural events were also scheduled at this time, particularly in Brussels.

Using the above working hypotheses, we were able to draw up a National Mobility Plan based on the following four principles:

- Organised transportation;
- Traffic management;
- Safety for travellers;
- External communications.

These four principles were at the basis of every initiative, measure and decision taken in preparing the various components of the national plan.

Having identified these components, we were then able to spell out a number of provisions and measures to ensure mobility for fans during the event, by sector.

5. ROAD TRANSPORTATION

Since each host city had established its own mobility plan, we began from the principle that national road transportation planning should cover all travel by fans from the moment they arrived in Belgium, i.e. from the time they passed the frontier and entered into our territory, whether:

- at the borders of adjacent countries;
- at airports;
- at seaports;
- at major Belgian railway stations receiving trains from abroad.

Our task, then, was to bring fans to the outskirts of the host city (the "orientation perimeter"), where the city's mobility plan would then take over responsibility for guiding them, through measures of deterrence, control and organisation, towards their reserved seats in the stadium, as identified by the colour of their tickets. In order to avoid any mistakes on the part of those responsible for enforcing the road transport directives, we had already defined the various itineraries, making clear the objective of each in terms of ensuring mobility.

5.1. Bypass or transit routes

- ***Description***

  These were routes designed and recommended for travellers in transit, in order to avoid the scene of the event (e.g. intracity and intercity detours).

- ***Objective***

  - To avoid clogging the major roads leading to the event;
  - To allow transiting travellers to select routes where traffic was flowing more freely.

5.2. Convergence routes

- ***Description***

  These were routes designed to bring people to the scene of the event from all directions.

- ***Objective***

  - To offer different routings to the city's orientation perimeter, taking into account the most likely place of origin of the target group.
  - To avoid saturation of routes leading to the event area.

5.3. Approach itineraries

- ***Description***

  These were routes leading directly to the scene of the event and to the service areas [e.g. nearby parking lots ("deterrent" lots), intermodal loading and unloading points].

- ***Objective***

  - To offer different routes between the outskirts of town and the reception sites for the event;
  - To recognise that target groups would eventually split up (e.g. supporters of one team or the other, spectators, participants).

5.4. Alternate routes

- ***Description***

  These were additional routes planned around the main convergence and approach routes.

- ***Objective***

  - To reduce traffic congestion on the convergence and approach routes;
  - To recommend their use in case of need.

5.5. Detour routes

- ***Description***

  These represented additional routes to be used in case a major artery (convergence or approach routes) had to be closed. Depending on local circumstances, the alternative routes could be used as detours.

- ***Objective***

  To reroute traffic at a certain point (for example an interchange or intersection) from an obstructed route to one that was free.

5.6. Service routes

- ***Description***

  These routes were reserved for exclusive or preferential use by certain services such as:

  - rescue vehicles;
  - police;
  - organisational services (administration, logistics authorities, partners);

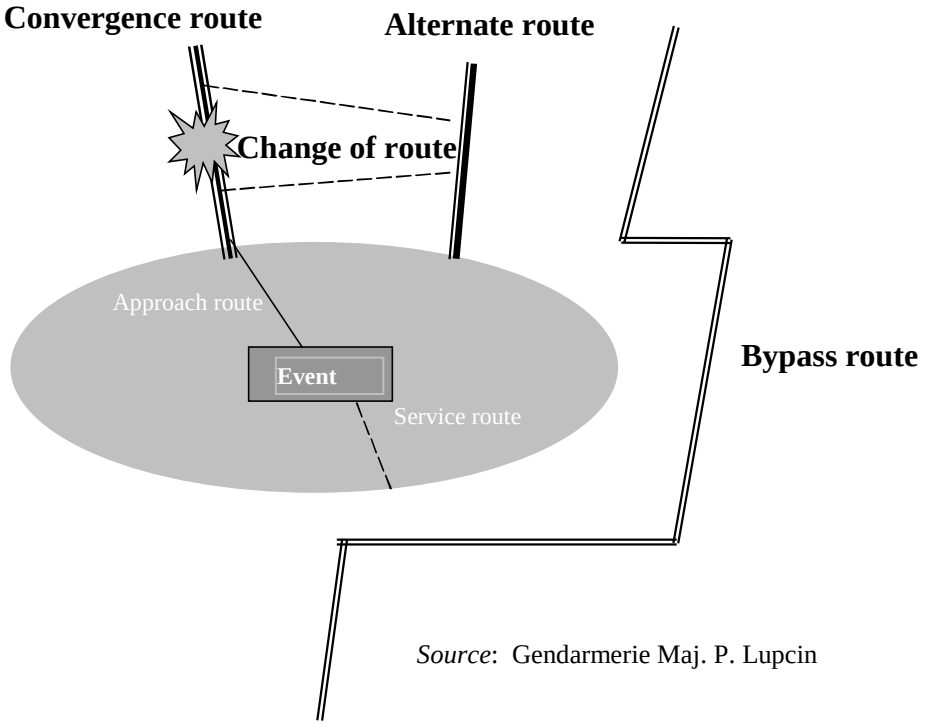
- certain other persons, e.g. VIPs;
- local residents;
- shuttle services.

– ***Objective***

To facilitate movement by members of these groups.

The following diagram will assist in visualising these itineraries:

Figure 4



Source: Gendarmerie Maj. P. Lupcin

In terms of signage, we adopted the principle that signage on our motorway and highway network did not need any specific adaptations, since signs in the host cities were clear enough and readily perceptible by anyone using these networks.

Moreover, anyone coming to Belgium for the event would have already used highway maps to lay out a travel plan for reaching the host city of his choice. As far as we were concerned, it was with the approach to this host city that our troubles began, given the various approach perimeters in the host cities' own mobility plans. At this point, we had to take responsibility for leading the "individual" fan or busload of fans, to the right destination.

We therefore decided to set up temporary roadsigns specific to the Euro 2000 event, which would be the same for the approaches to all four host cities and which would be placed within the different perimeters called for in their mobility plans.

A. General principles

Drivers were to follow existing highway indications (destination by name of city, conventional roadsigns with white on blue or white on green).

At the outskirts of the cities in question, depending on the nature of the road (regular or motorway), they would then follow the specific "Euro 2000" signage.

Initially, the intent was to indicate a common direction to all drivers. It was only at the approach to the stadium that a distinction was to be made between:

- Ticketholders, by colour of ticket;
- Type of vehicle (automobile or bus).

At the exit from parking areas, signs were installed to guide pedestrians to the stadium.

B. Signage

The signs shown below were adapted as needed to the dimensions and the roads concerned.

B1. Distance signage

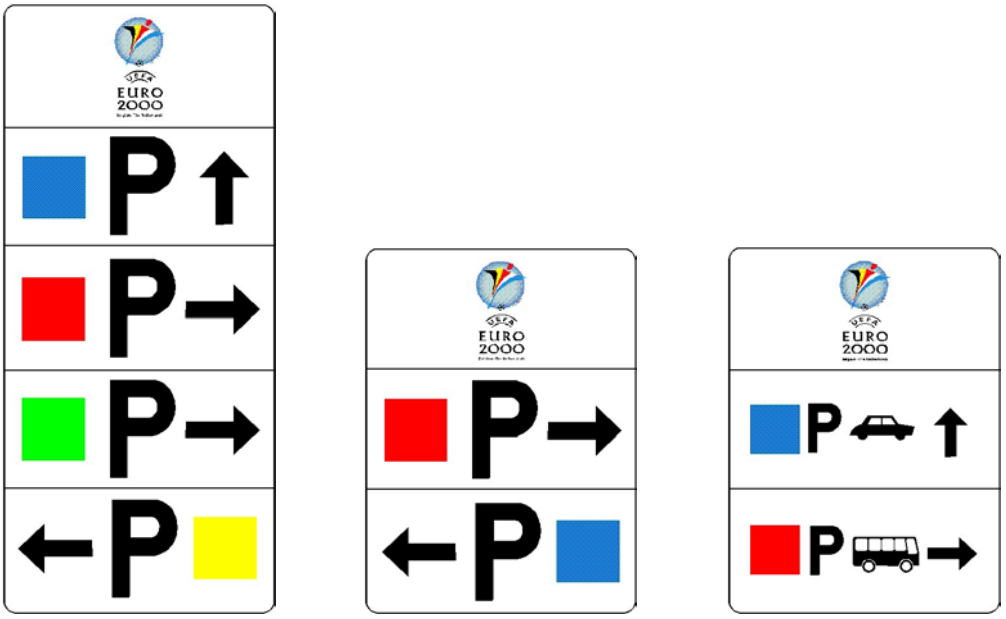
OR

Common itinerary

B2.

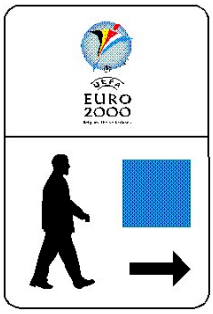
Parking: common itinerary

B3. Signs at the approach to the stadium



Indication of parking areas, by colour of ticket or by category of vehicle

B4

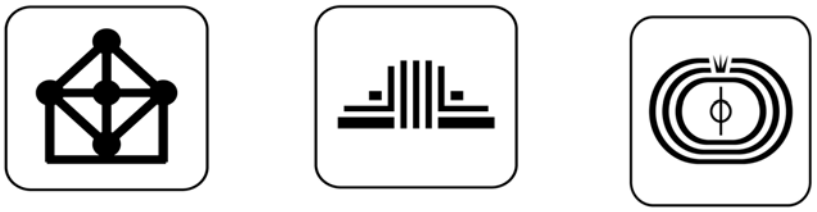


Pedestrian route

To the extent possible and where feasible (e.g. along motorways leading to the stadiums), we used electronic panels with changing messages about the matches, as well as mobile signs. The latter were used primarily in the case of bottlenecks and traffic jams on the access roads, as well as at the approach to the perimeters established in the host cities' mobility plans.

With respect to signage, the Flemish Region replaced all references to the Heysel Exhibition Park on and around the Brussels ringroad, with a system of pictograms showing the Atomium, the Palais des Expositions and the King Baudouin Stadium. Although the signs had been designed earlier, they were in fact set up permanently on the occasion of Euro 2000.

The three pictograms are:



EXPO

To avoid any complications caused by road construction, the regional authorities agreed on the following restrictions for the period from 1 June to 9 July 2000:

- On the motorway network and on the major arteries to, from and between the host cities, there would be no startup or completion-phase construction work;
- On the bypass, convergence, approach, alternate, detour and service routes, there would be no startup or completion-phase construction work;
- At the approaches to the host cities, beginning at the orientation perimeters, all construction would be prohibited in order to allow traffic to flow smoothly;
- For works that had been underway for several months and were expected to be completed long after the end of the Euro 2000 event, e.g. works for upgrading the TGV between Brussels and Liège in the direction of Liège, it was suggested that, on match days, the reserved service lane should be temporarily opened to increase traffic capacity on the motorway (one lane represents 2 000 vehicles an hour). Similar examples applied elsewhere in the country.

To achieve these objectives, the regions agreed on the following with respect to these works:

- The specifications for all works scheduled to be performed during the Euro 2000 period were to prohibit work during that time or else ensure that the routes concerned could be cleared temporarily by stopping work or shutting down the worksite temporarily so as to allow traffic to flow as smoothly as possible;
- For work already underway, the portions of roadways that were not actually being worked on but were used to service the site would be opened on match days, whenever possible, by appealing to the goodwill of the construction companies;
- The prohibition of any new work on access routes into the host cities.

These traffic flows within the country and especially towards the Netherlands, as co-host country, led us to consider compulsory points of passage, i.e. key cities and regions where traffic to the host cities divides.

For the "key" places (Antwerp, Ghent, Namur) we asked the regions, in the case of construction work planned during the event, to adopt policies equivalent to those taken for the national routes to and from the host cities. Realising that the ideal decision was to avoid any work that could be

postponed anywhere in the country during the event, we felt constrained to take decisions in this sense for the routes that seemed to us indispensable for ensuring optimal mobility, by eliminating any obstacle that would slow down travel.

6. PUBLIC TRANSPORT

Belgian public transport companies at the national, regional and local level, namely, the Société Nationale des Chemins de Fer Belges (SNCB, the Belgian railways), the public transit companies for the Flemish region (De Lijn) and for the Walloon region (TEC) and the Société des Transports Intercommunaux de Bruxelles (STIB), were all directly involved with the Euro 2000 event.

Their task was to provide service on intercity routes as well as to and from the perimeters established around the stadiums and within the "orientation" and "deterrence" perimeters up to the assembly points called for in the host city mobility plans.

According to our estimates, 25 per cent of fans took the train and 40 per cent took buses to reach the host cities. Moreover, 60 per cent of these fans spent only one or two days in Belgium.

If the 25 per cent of fans travelling by train were joined by the 30 per cent of those who came by car in trying to reach the stadium and visit the host cities, we can readily see how important public transport was going to be, especially on match days, i.e. the 15 days during the period from June 10 to July 2, 2000. This pointed to the need for a campaign to promote public transport, targeted specifically at fans, through initiatives by the federal, regional and local authorities.

Since the remaining 40 per cent of fans stayed more than 48 hours in Belgium, intercity traffic and that between the host cities was significant, but its impact was less because there was no mass travel and trips between matches were spread out, as fans followed their respective teams.

Moreover, we had to take account of the accommodation possibilities in the host cities. The fact is that many fans were obliged to spend the night in towns at some distance from the matches (at a radius of at least 20 kilometres, according to our estimations). This produced what we called "temporary shuttle" travel on match days. Given the volume of travel generated by the Euro 2000 event, the public transport companies (SNCB, STIB, De Lijn and TEC), in an effort to promote urban transit and reduce congestion on the road system, had agreed to offer a special fixed-fare formula for the duration of the event, based on the Train-Tram-Bus system and known as “BEFOOT” (België, Belgique, Belgium…Football), represented by the following logo:

[

Based on our initial estimates, we considered a number of formulas with respect to the length of time that fans would stay in Belgium. People with special accreditation, sponsors' and suppliers' guests, Euro 2000 Foundation personnel and the media corps were expected to stay for the duration of the event, for obvious reasons and to travel between the four host cities, as well as to the Netherlands.

Wherever possible, the cost of the shuttles (part of the host cities' mobility plans) was included in a special fare as part of a rail, air or ferry package. This applied to special trains from neighbouring countries with teams in the competition and to charter flights from more distant countries with competing teams. A country's distance from Belgium determined the choice of transport.

Based on the above criteria, the BEFOOT product menu looked like this:

- BEFOOT CITY 1/30 and 2/30
- BEFOOT MATCH 1/30
- BEFOOT 5/30 – 10/30 and 30/30
- BEFOOT 30/30 MASS MEDIA

A table showing details of the different tickets is reproduced in Annex 2.

In addition to existing public transport services, special shuttles were provided from rail stations and airports to the stadiums and between the outer parking lots and the stadiums. The host cities of Bruges, Charleroi and Liège made the shuttle services free. Brussels, on the other hand, decided for its own reasons to adopt the Befoot 2/30 formula.

In fact, since our capital city is popular with visitors throughout the year (as the centre of Europe), it can hardly afford to offer free services, since this would upset its regular clientele.

In contrast to the Netherlands, this was the only concession in terms of free services offered in Belgium. Our neighbours to the north in fact decided to offer totally free services on match days.

This difference in approaches was never an obstacle, since under our system the BEFOOT pass was good even for days when there were no matches and it could easily be combined with the Dutch system. In addition, it was available to all, including accompanying persons.

This situation could have been avoided, however, if a flat "public transport" fare had been built into the stadium seat price. The Euro 2000 Foundation consistently refused this option.

In terms of how the public transport companies as a whole (including the Belgian railways) organised mobility, this was based on the following criteria:

- Separating supporters from countries A and B, both at arrival and at departure (e.g. putting them on different trains);
- A common reception centre in train stations -- "Mobility -- Euro 2000 Foundation";
- Setting up signs with our logo.

For rail services, we tried wherever possible to provide two stations, one for arrivals and one for departures, so we could separate fans of any two teams from the outset.

To show how effective was this system of traffic separation and management, Annex 3 presents a summary of the local mobility plan for Liège, prepared under the aegis of its mayor.

In order to prove that we were ready for any eventuality, in the case of Brussels for example, the STIB had a standby system of articulated buses that could be used to carry stranded supporters in case of an incident in the metro. This alternative was inspired by an incident that occurred during the World Cup in France. Furthermore, the fact that the matches ended late in evening led the SNCB to put on night trains to take fans back to the city centres of Belgium and, in co-operation with the Netherlands Railways (Nederlandse Spoorwegen, NS), to the major Dutch cities.

7. AIR TRANSPORT

Taking into account the four host cities and starting from the assumption that about seven per cent of fans would be flying into Belgium during the Euro 2000 event, we selected the international airports closest to the cities, namely:

- Brussels National for Brussels;
- Charleroi-Gosselies for Charleroi;
- Liège-Bierset for Liège;
- Ostende for Bruges.

Moreover, since the city of Antwerp represented a hub between two of the Dutch host cities (Rotterdam and Eindhoven) and two host cities in Belgium (Brussels and Bruges), we also included the Antwerp-Deurne Airport in our mobility plan.

In terms of traffic expected during the event, it was agreed to make a distinction between supporters using regular scheduled flights and those arriving by charter flight.

For regular flights, our room for manoeuvre was limited, since fans were mingled with other passengers taking the same flight - the impact on fans aboard charter flights was likely to be more

important, therefore. We recognised that these charter flights would be coming in from a country participating in the final tournament, with a clearly targeted destination in Belgium and yet they would not necessarily choose the airport closest to the host city for the match their passengers would be attending.

We took this aspect into account in preparing a reception strategy for charter flights.

This distinction between regular and charter flights led to the following provisions:

- **For regular flights**: we set up information stands in all terminals of the five airports located in Belgium. At these stands, fans could get information and advice on how to reach the host city and on the public transport available through the BEFOOT ticket office.
- **For charter flights**: since the passenger volume was predictable, we looked for ways to control it and steer it towards the appropriate airport.

For this purpose, we took the following initiatives.

For unscheduled and charter flights, we made contact with the European Civil Aviation Conference (ECAC) to obtain information on flights to Belgium during the event, for purposes of security, safety, mobility and optimal traffic flow between airports and the four host cities.

Under existing European provisions and regulations governing air service, airline companies of most countries likely to be participating in the final tournament were under no obligation to seek permission from the Belgian Aviation Administration for charter flights. We asked the ECAC to help us and to request its member countries, whether or not their team was participating in the tournament, to intercede with their airline companies and to provide us on a voluntary basis, in a spirit of co-operation, with all the information we needed.

A printed form was prepared covering all information necessary to ensure proper reception and service and a pleasant return for supporters visiting our country during Euro 2000.

The form (shown in Annex 4) was designed to gather the following information:

- **Aircraft**

  - Complete co-ordinates of the airline company;
  - Nationality of the aircraft;
  - Type of aircraft used for the flight;
  - Noise certificate, passenger capacity.

- **Flights** (by flight)

  - Flight number;
  - Airport of departure;
  - Airport of destination;
  - Expected time of arrival;
  - Expected time of departure;
  - Route and flight plan;
  - Number of passengers aboard and their nationality.

- **Other information**

  - Flight organisation: complete co-ordinates; or
  - Tour operator: complete co-ordinates.

Having thus adopted a strategy to obtain maximum information on nonscheduled flights generated by the European championships, we had to organise the reception of these flights, starting from the following principle: flights carrying supporters should land at the airport closest to the stadium their passengers would be attending.

Starting with this principle, we drew up a "gentleman's agreement" (Annex 5) among all parties concerned, as the legal basis for the co-operation we sought in order to steer charter flights to the right airport.

Moreover, co-ordination and distribution of flight requests was done by the slot co-ordinator at Brussels National Airport, in close co-operation with all Belgian airports involved and also with the slot co-ordinator at Schiphol in the Netherlands. This standing contact was consistent with the mobility co-operation policy between the two host countries for the event.

To expedite requests, airline companies were asked to:

- Organise ground transportation for their passengers between the airport and the stadium;
- Provide information on passenger intentions in terms of their travel and stay in Belgium.

With respect to ground transport, if the trip organiser had not provided for this, we were ready to help by providing a shuttle service between the airport and the stadium, at a cost of 5 Euros (about 200 Belgian francs) per head. The charter flight organisers did not take up this offer, however.

For Euro 2000 charter flights, we also promoted the system of complete separation between supporters of countries A and B, as was done at Brussels National:

- **Arrival**

  - Passengers from a Schengen country. Buses or shuttles from De Lijn picked up passengers right at the aircraft. Escorted by airport inspection service officers, these buses left the airport via Avenue Leopold III in the direction of King Baudouin Stadium;

  - Passengers from non-Schengen countries. Passengers taking airport buses to building 114 were subjected to identity control (*Gendarmerie*) and baggage control (Customs) and were then put on De Lijn buses to King Baudouin Stadium, following an agreed route;

  - Passengers travelling to Brussels for several matches and who therefore had baggage, joined up with Schengen/non-Schengen supporters at the terminal and were taken to the bus parking lot.

- **Departure**

  - Here the reverse system was used and the supporters were separated as of their exit from the stadium until they were at the airport.

Thus, while supporters arriving by charter flight were under our control, we still faced a number of unknowns, particularly with respect to people who had taken regular flights.

Since we were dealing with a category of people who could not be easily traced, we relied on the long-standing formula for any congress: a reception centre at the airport arrivals hall. The reception centre, staffed by mobility representatives and the Foundation, provided practical information on transportation to the stadium (by BEFOOT, for example).

8. SEA TRANSPORT

We addressed this sector only at the last moment, since England was very late to qualify for the tournament.

In this case, there was only one possible connection point to Belgium: Ostende. This port had a major handicap, moreover, in that it did not operate between 11 p.m. and 7 a.m., exactly the time when we could expect supporters to show up after the end of the match.

We got around this problem in the following way:

- An information campaign in England to make English fans aware that there was no night service back from Ostende;
- Alternatives via Calais, using special trains, as requested by the security authorities.

In the end, none of the "special night returns" worked out. English supporters, aware of the problem, simply extended their stay.

9. PUBLIC RELATIONS

From the outset, we were aware of the need to publicise information on any initiative, provision and decision taken under the mobility plan.

Consequently, we:

- arranged for mobility agents to be present at all press and information centres for the duration of the event;
- advised a similar presence in Dutch information centres;
- informed fans of our initiatives, via the Euro 2000 Foundation;

- prepared a flyer for each host city, with all practical information relating to security, roadsigns, public transport (BEFOOT) and city access (maps);
- set up a radio guidance system.

This highway radio guidance system was based on co-operation with neighbouring countries. We felt it essential to provide a regular information system for users during the event, focused in particular on match days and the host city concerned.

It was clear that the greatest volumes of traffic would be generated on the day preceding the match, the day of the match itself and the following day. It was therefore important to keep users informed, to steer them in the right direction and to monitor their movements.

We therefore requested our regional radio guidance services to co-operate in setting up a system that would be as effective as possible, so as to avoid bottlenecks and keep traffic flowing smoothly.

Furthermore, given the central geographic location of our country and the presence of many national teams, most of them from neighbouring countries, we recognised that cross-border radio guidance co-operation was also essential. We therefore made contact with the Netherlands (co-host of the tournament), France (which was qualified for the tournament and also provided transit from Spain and Portugal to other participating countries), Germany (qualified and a country of transit for Czechoslovakia, Slovenia, Denmark, Sweden, Italy, etc.) and England, to seek their co-operation in this initiative. It was essential to ensure that travellers should be aware in advance of any major obstacle before they crossed the Belgian border.

In Belgium, we also made sure that any information published in the local language was also available in an international language (e.g. English). We used the following channels to reach foreigners:

- Installation and optimal use of all information channels available to us in railway stations, trains, airports, aircraft, ships etc., to guide supporters to their destination;
- The mass media, through press conferences with the federal, regional and local authorities.

In addition to these information channels, we encouraged bilateral contact between railway companies and we requested the Belgian Federation of Bus Operators to contact their counterparts in participating countries and inform them about the mobility plan. We, in fact, enjoyed the full support of the Belgian associations and their foreign counterparts.

This broad information plan was supplemented by the targeted briefing of Belgian businesses and social sectors that might suffer disruption through the additional influx of traffic.

When it came to information, we always proceeded consistently and targeted our actions, since too much information is misinformation.

10. CONCLUSIONS

The experience gained during preparation of the mobility plan and during its application is difficult to quantify. We can now say, after the fact, that it was an enriching experience and even today, when it comes to events that are less significant in terms both of time and space, the plan constitutes a solid foundation and reference point for dealing with important but more specific events. When Belgium holds the presidency of the European Union, for example, the Brussels mobility plan will be used for the Laeken Summit to manage the great influx of European trade unionists.

Moreover, the security and mobility provisions that were set up around the host city stadiums proved their worth. They can serve as a model for Belgian competitions and for organising mobility before and after European and international matches. The same is true for other, more targeted events such as mega-concerts and athletic meets.

What lessons stand out?

- Create and use special signs with different colours for separating people traffic and keeping it flowing smoothly for stadium arrivals and departures. Signs of this kind are recommended by mobility experts and applied in particular in the Brussels capital region;
- Establish different approach itineraries to the city centre: this allows for better preparation and understanding of mobility plans. Standardizing this approach would facilitate access to urban sites;
- Set up a "sky dispatch system" for charter flights coming to an international event, in order to avoid saturation of the principal airport;
- Ensure co-operation with highway radio guidance centres in neighbouring countries to avoid bottlenecks at regular congestion points.

These are just a few initiatives that, we hope, will not remain a “dead letter” and can survive for the future.

Now that the event is over, we can congratulate the entire transportation sector on the way the National Mobility Plan worked out. This success is due partly to the way it was presented. It provided everyone with all the directions and general provisions needed for their area of activity or their sector, without worrying about others. At the same time, everyone had to apply the directives and adapt them to local circumstances.

If we have one regret, it is that our special BEFOOT ticket initiative was not very successful. This reflected, to some extent, a lack of enthusiasm on the part of the companies involved, which were slow off the mark with their publicity campaigns, as well as the supporters, who tended to buy normal tickets. We are not in a position to evaluate this segment of the plan objectively.

Be that as it may, on the basis of information received we can say that, in terms of the security budget, the mobility plan was less costly than expected.

Finally, we must note that in organising any event it is essential to have a mobility and security plan ready in advance.

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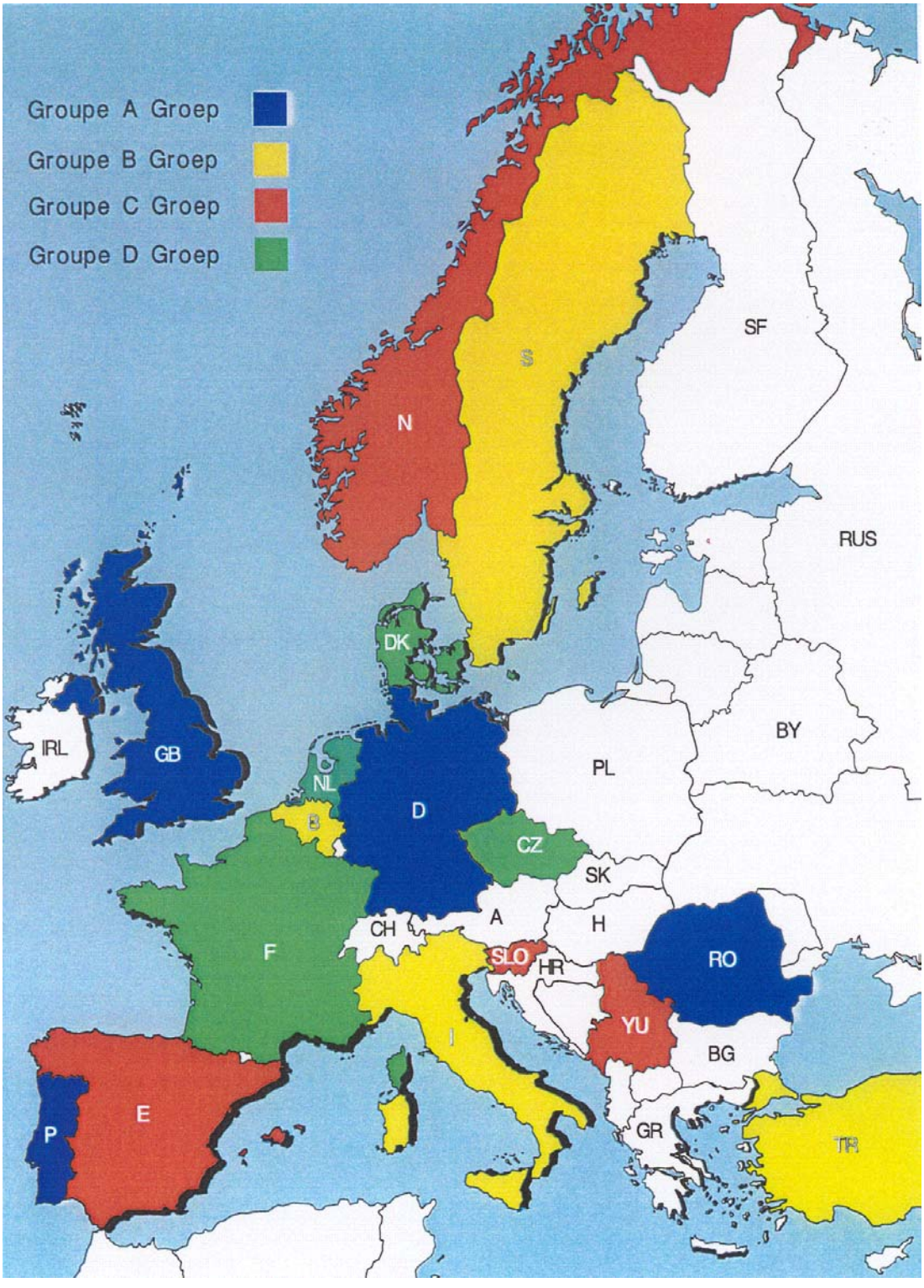
ANNEXES

Annex 1



Annexe 2

Validity	Price		Networks	Details
	BF	EURO		
1 / 30 CITY	70	1.74	De Lijn, TEC, STIB	Valid only in host cities on match day for stadium ticketholders. Next-day return possible before 2 p.m.
2 / 30 CITY	140	3.47	STIB	Valid only for Brussels on match day + 1 day, for stadium ticketholders. Third-day return possible before 2 p.m.
1 / 30 MATCH	500	12.39	SNCB + STIB SNCB + De Lijn SNCB + TEC	Valid only for stadium ticketholders. SNCB second-class. Valid for round-trip by train, from departure station to host city + transport terminal depending on host city (STIB, De Lijn or TEC). Next-day return possible before 2 PM.
5 / 30	3 100	76.85	All	Unlimited number of trips over all networks for any five days, from 06/06 to 05/07/2000. SNCB second-class. For everyone.
5 / 30	4 300	106.59	All	Same as above but SNCB first-class. For everyone.
10 / 30	6 000	148.74	All	Unlimited number of trips on all networks for any ten days, from 06/06 to 05/07/2000. SNCB second-class. For everyone.
10 / 30	8 500	210.71	All	Same as above but SNCB first-class. For everyone.
30 / 30	10 850	268.96	All	Unlimited number of trips on all networks for 1 month, from 06/06 to 05/07/2000. SNCB second-class. For everyone.
30 / 30	15 000	371.84	All	Same as above but SNCB first-class. For everyone.
30 / 30 Mass media	10 850	268.96	All	Only for journalists accredited by Euro 2000 Foundation. SNCB first-class.

Annex 3

EURO 2000 LIÈGE
LOCAL MOBILITY PLAN

1. Stadium and surrounding area

Here we find:

1.1. A free zone extending from Val Benoît to the Seraing Bridge and the Meuse at the foot of the Cointe Hill (with an extension embracing route N63 to the “Bol d’Air”). The perimeter of this free zone coincides with the "deterrence perimeter" where strict access conditions will apply.

In this free zone, we find:

- Neutral zones, reserved for residents and their visitors, suppliers, regular clients, doctors, etc.;
- Transit zones, reserved for security services and fans travelling to the stadium;
- Parking zones, for buses and automobiles;
- A controlled zone (C. 1.2);
- An organisation zone, including the stadium and adjacent areas.

1.2. The controlled zone includes the various components of the free zone located in the immediate vicinity of the stadium as well as the stadium itself, where stricter access conditions will apply; this control zone will extend from Rue Berloz to Rue de la Barge (excluded) and from the railway line to the Meuse.

1.3. The organisational zone, managed exclusively by the organisation: to include the stadium, the VIP and press parking lots and the Hospitality Village located in the Terril parking lot.

1.4. Finally, beyond the free zone, we find:

- "Deterrence" parking lots at Sart Tilman (university precinct and possibly parking lots for the Boncelles shopping centre);
- A route reserved for TEC shuttles from Sart Tilman (Tilman shuttle);
- A route reserved for TEC shuttles between the city centre and Val Benoît (city shuttle)

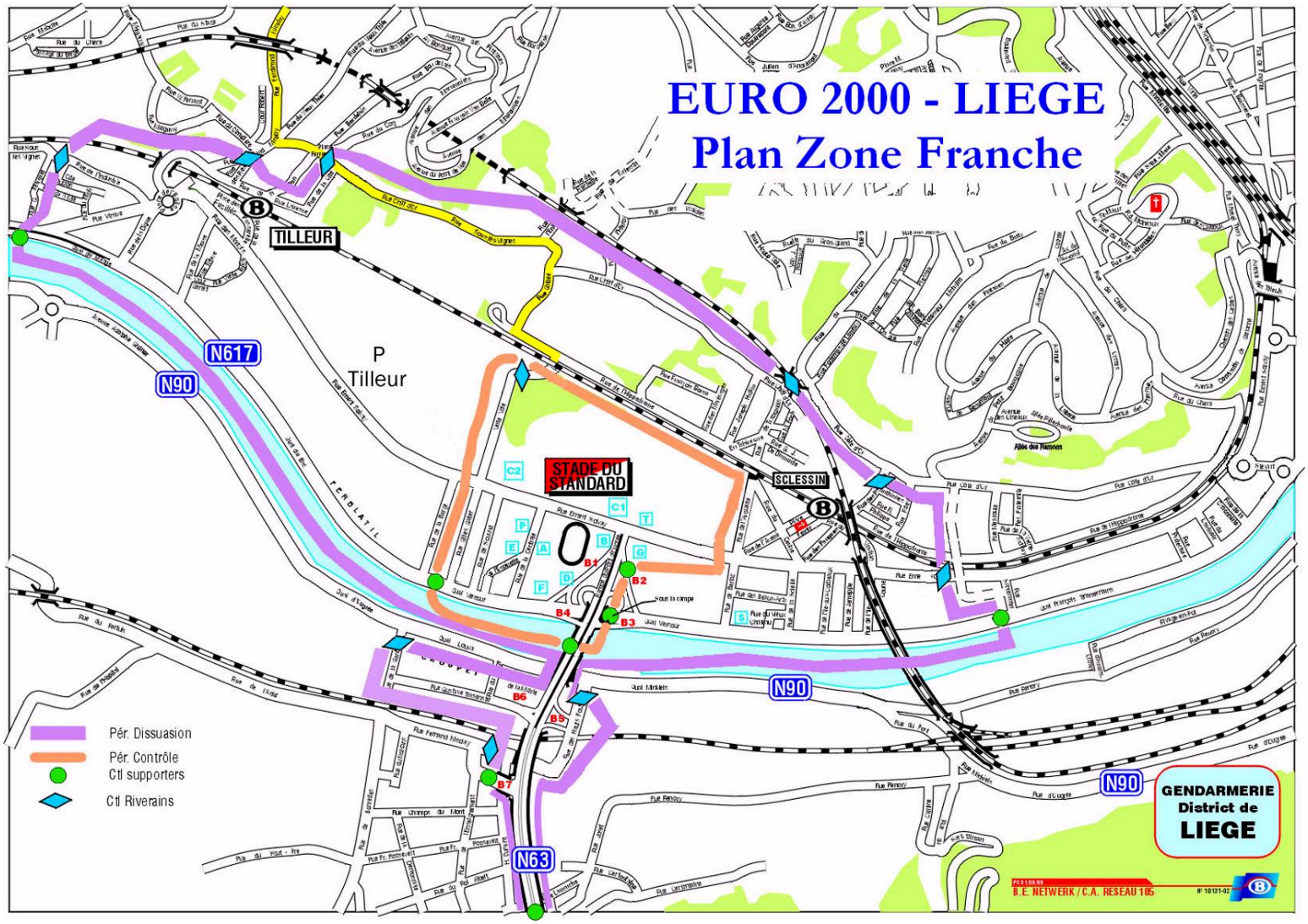
2. Information for supporters and other participants

	Parking lots		Access routes		Shuttles (TEC shuttles and taxis)		Trains	Aircraft
	Cars	**Buses**	**Cars**	**Buses**	**City centre - stadium**	**Tilman parking lot – stadium**		
Fans A Red and Yellow Stands	"Tilleur" (Rue des Martyrs)	Quai du Halage	E42/A604/Quai des Carmes	E42/A604/Quai des Carmes/ Quai du Halage	City shuttle + taxis	NA	Tilleur Station	Bierset (shuttles provided by tour operators)
Fans B Green and Blue Stands	"Tilman" (University precinct of Sart Tilman)	N63 (foot of hill)	E25/Exit 40 (Embourg)/N633 (Rue de Tilff)/Bd du Rectorat	E25/Exit 40 (Embourg)/N633 (Rue de Tilff)/ Bd du Rectorat/ CHU circle/ Boncelles shopping centre/ Rue d'Ougée/ Rue de Boncelles	City shuttle + taxis	Tilman shuttle (shuttles between stadium and parking lots)	Sclessin Station	Bierset (shuttles provided by tour operators)
Handicapped	Souvret		A602/Exit 33 (Burenville)/ Rue Gilbart/Bd Ste-Beuve/ Rue St-Gilles/Rue F. Nicolay/ Rue Chiff d'Or/Rue Sous-les-Vignes/Rue Galilée/Rue Verte-Noire		City shuttle + taxis			
VIP	Burenville and C2 (Rue E. Solvay)		A602/Exit 33 (Burenville)/ Rue Gilbart/Bd Ste-Beuve/ Rue St-Gilles/Rue F. Nicolay/ Rue Chiff d'Or/Rue Sous-les-Vignes/Rue Galilée/Rue Verte-Noire/Rue Solvay		City shuttle + taxis			
Press (If not accredited: city pass required)	E (Rue Souvret)		A602/Exit 33 (Burenville)/ Rue Gilbart/Bd Ste-Beuve/ Rue St-Gilles/Rue F. Nicolay/ Rue Chiff d'Or/Rue Sous-les-Vignes/Rue Galilée/Rue Verte-Noire/Rue Souvret					

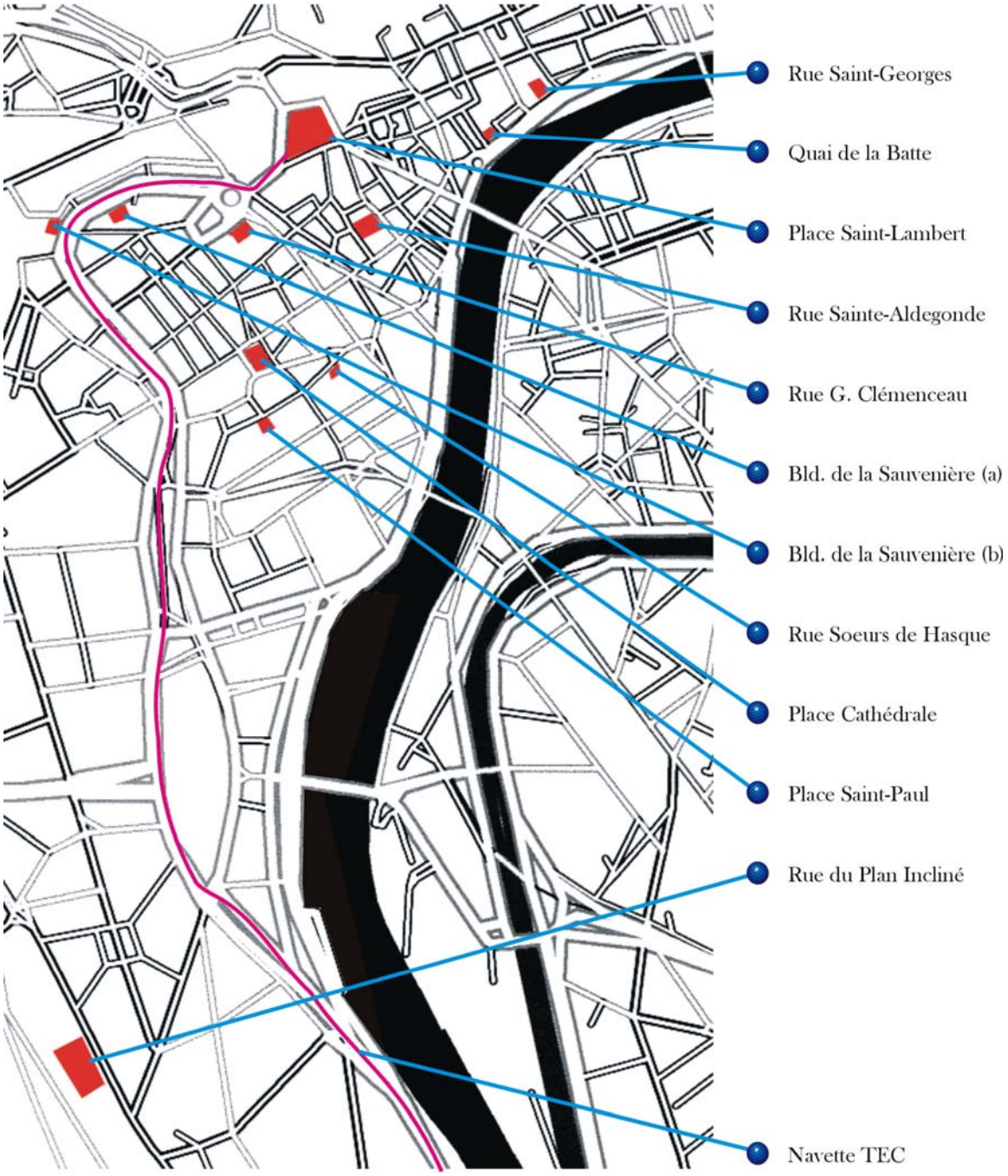
3. Information for non-supporters

TRANSIT CIRCULATION			
Vehicles	Liege – Seraing		N90 (via Angleur/Campagne de Renory/right bank of Meuse)
	North- South (Liege – Huy)		A602/E42 to Ivoz-Ramet Bridge via N677 (Av. Gonda); or N680/N63 (Route du Condroz)
		West side (Left bank of Meuse)	Ivoz-Ramet Bridge/N677/E42/A602
	East-West (Sart Tilman – Cointe)	East side (Right bank of Meuse)	Leave Nandrin/Neupre: Ivoz-Ramet Bridge/N677/E42/A602; or Leave Boncelles via Tilff /E25
	Flemalle - Herstal		Depending on place of origin or destination: Via Ivoz-Ramet Bridge Via E/24/E40 (Tilleuls exit prohibited at Quai Banning) E40 (Loncin/Cheratte)
Trains (REL)			Via following stations: Palais/Jonfosse/Guillemins/Sclessin/Tilleur

Plan Agglomération
Grands axes
Annexe n°1
E40
N3
Bruxelles
E42
Namur
A604
A602
E313
Antwerpen
E25
Maastricht
Liège
Meuse
P
"TILLEUR"
"STADE"
N63
"SART TILMAN"
40
E25
A26
Ardennes
N3
Aachen
E40


EURO 2000 - LIEGE
Plan Zone Franche
TILLEUR
N617
N90
P
Tilleur
STADE DU STANDARD
SCLESSIN
N90
N90
N90
N63
Pér. Dissuasion
Pér. Contrôle
Ctl supporters
Ctl Riverains
GENDARMERIE
District de
LIEGE
B.E. NETWERK / C.A. RESEAU 105

PARKINGS - TEC



03.03.2000/C.G.

Annex 4

Gentlemen's Agreement

The parties to this Gentlemen's Agreement:

- Mrs. Isabelle Durant, Deputy Prime Minister and Minister for Mobility and Transport; Aviation Administration and Euro 2000 Unit, within the General Services of the Ministry of Communications and Infrastructure;
- Mr. R. Daems, Minister for Telecommunications and Public Undertakings;
- Mr. Steve Stevaert, Vice Minister-President of the Flemish Government and Flemish Minister for Mobility, Public Works and Energy; Highways and Traffic Administration of the Flemish Regional Ministry;
- Mr. Serge Kubla, Minister for Economic Affairs, SMEs, Research and New Technologies; General Director of Transport of the Ministry of Infrastructure and Transport (DG3);
- Mr. Jean-Claude Tintin, Managing Director of Belgocontrol;
- Mr. Pierre Klees, Chief Executive Officer, Brussels International Airport Company (BIAC)
- Mrs. Marie Dessaux, Managing Director of Brussels South Charleroi Airport (BSCA)
- Mr. Luc Partoune, Managing Director of the Liège-Bierset Airport Development Corp. (SAB).

Have agreed as follows:

Article 1

During the Euro 2000 event, i.e. from 10 June to 2 July 2000, the parties concerned and the international airports that they represent undertake, for reasons of:

- security
- optimal mobility
- and fluidity of travel

that, for all nonscheduled passenger flights coming from countries participating in the final phase of the European championship and for all nonscheduled flights coming from non-participating countries but providing service to this event, the following provisions will apply on the basis of reciprocity:

a) All requests for nonscheduled passenger flights relating to Euro 2000 must concern flights made by aircraft belonging to Chapter III and higher, respecting the noise standards set forth in Annex 16, Volume I, second part, Chapters 2 and 3 of the International Civil Aviation Convention, 3rd edition (July 1993). Aircraft belonging to Chapters I and II will not be considered.

b) All requests for nonscheduled passenger flights relating to Euro 2000 submitted by airline companies to the airport authorities and/or announced on the basis of the information form prepared by the Euro 2000 Unit, created within the General Services of the Ministry of Communications and Infrastructure, as well as those collected by the Aviation Administration, will be communicated to all airport authorities.

c) All requests from foreign and Belgian airline companies seeking to obtain "airport slots" during this period must be examined and processed by a co-ordination committee including a representative of each airport involved and Belgocontrol, under the joint direction of the Euro 2000 Transport Unit and the Aviation Administration, so as to direct the flights concerned towards the airport nearest to the host city to which passengers are heading, on the basis of the following rationale.

d) Airline companies providing unscheduled passenger flights to carry supporters to a match taking place in one of the four host cities will be invited, on the basis of information obtained under paragraph b) and in accordance with the provisions of paragraph c), to use the airport nearest to the host city where the national team of these supporters is to play:

- For Charleroi, Charleroi-Brussels South Airport;
- For Liège, Liège-Bierset Airport;
- For Brussels, Brussels National Airport; and
- For Bruges, Ostende Airport.

e) In order to ensure that foreign and Belgian airlines making unscheduled passenger flights to Euro 2000 will be properly received in the airport designated to receive them, those companies are asked to arrange round-trip ground transport for their supporter-passengers, between the airport and the stadium.

f) Any decision taken in accordance with paragraphs c) and d) will be officially communicated to the airport authorities and to the airline companies concerned, by the Euro 2000 Transport Unit.

g) The airport authorities will send to the Euro 2000 Transport Unit, created within the General Services of the Ministry of Communications and Infrastructure, all information concerning requests for unscheduled flights relating to the event, so that shuttle services can be organised from the airports, with priority to the public transport company or companies serving the airport in question.

h) The airport authorities undertake to co-operate closely with the Euro 2000 Transport Unit in organising the arrival and departure of supporters and providing information on the event, in collaboration with the host city authorities, with all official bodies and public transport companies involved, as well as with the Euro 2000 Foundation.

Article 2

This gentlemen's agreement does not concern scheduled passenger flights serving international airports in Belgium. With respect to these scheduled flights, any information about the presence on board of participants in the Euro 2000 event should if possible be reported to the Euro 2000 Transport Unit so that transportation can be arranged for them to the host cities.

Article 3

This gentlemen's agreement does not include air taxi flights under the terms of the European Civil Aviation Conference (ECAC) organised for and by the teams or other guests at the Euro 2000 event.

Article 4

Since the Euro 2000 event will take place between 10 June and 2 July 2000 and since people may arrive and depart before or after the event, this gentlemen's agreement will be valid from 1 June until 9 July 2000, inclusive.

Article 5

No derogation from this gentlemen's agreement will be made, unless for reasons of air security or public safety.

Article 6

In signing this gentlemen's agreement, the representatives of the concessionaire companies and the parties concerned undertake, for the period established in Article 4, to ensure that their contracts with the airline companies respect the provisions set forth in Article 1, for any request relating to the Euro 2000 event.

Annex 5

BELGIUM - EURO 2000

INFORMATION TO BE FORWARDED FOR EACH NON-REGULAR PASSENGER FLIGHT TO BELGIUM DURING THE EUROPEAN FOOTBALL CHAMPIONSHIP EURO 2000 FROM 1 JUNE TO 9 JULY 2000

For security, safety, mobility and organisational reasons, the Belgian Euro 2000 Transport cell of the Ministry of Communications and Infrastructure would like to obtain, in order to offer an optimal and efficient handling and transport of the passengers from the Airport to the stadia and return, the following information about each non-regular Euro 2000 flight :

CO-ORDINATES OF THE AIRLINE:

Commercial Name: .....
Address:

Person to contact: .....
Phone: Fax: ..... E-Mail: .....

CO-ORDINATES AIRPLANE:

Nationality: ..... Aircraft type:
Noise Certificate: ..... Capacity: .....
Chapter:

CO-ORDINATES FLIGHT:

Flight Number: ..... Origin Airport: .....
Belgian Destination Airport:
• Antwerp • Brussels ..... • Charleroi • Liège • Ostend
Scheduled arrival time: ..... Scheduled departure time: .....
Flight route: .....
Number of Pax on Board ..... Pax list Nationality (1) .....
Nationality Pax: • EU • Schengen • Non Schengen
If non EU: .....

OTHER INFORMATION:

• Flight Organiser or • Tour Operator
• Final transport to stadium organised by Tour Operator
If not: 5 Euro per pax for Belgian Urban Transport to stadium

Co-ordinates

Commercial Name: .....
Address: .....

Person to contact: .....
Phone: .... Fax: .....
E-Mail: .....

Date:
Signature Responsible Person:

Françoise POTIER
Institut National de Recherche sur les Transports et leur Sécurité
INRETS
Arcueil
France

TRANSPORT AND MEGA-EVENTS: TRENDS, DEVELOPMENTAL IMPACTS AND TYPOLOGICAL ANALYSIS

SUMMARY

Arcueil, February 2002

INTRODUCTION

The growing interest in mega-events is clearly illustrated by a number of well-known phenomena: the ever greater numbers of soccer fans at championship matches, the waiting lines for major exhibitions, the crush of visitors to trade fairs and exhibitions and the monster traffic jams that surround major historical and sporting events.

To take only this latter category, consider how the following events have shaken up transportation systems: the World Cup, the solar eclipse, the great Armada at Rouen, the World Youth Days, the *Fête de la Musique*, the Olympic Games in Sydney, the Hanover World's Fair, all of which attracted hundreds of thousands and even millions of tourists, spectators or visitors.

Whether recurrent or one-off phenomena, mega-events have a pronounced impact on the local, regional and even national economy and in particular on local employment and development planning. They constitute an additional boost to economic activities and services.

Mega-events were, until recently, fairly rare or exceptional and yet now they are becoming ever more frequent. In fact, they have taken on such a scope that they can no longer be staged without having an impact on the environment. They generate enormous flows of tourists which are much harder to predict than everyday flows and which require exceptional measures and special forms of organisation and logistics in order to manage them properly.

Mega-events pose a number of special problems in terms of transport logistics and traffic management. There are three essential reasons for this:

- The convergence of heavy flows of spectators, players and logistical personnel at one or several sites;

- A temporary concentration of flows causing hyper-points of congestion for automobile traffic, public transportation and pedestrians;

- A high proportion of unusual and non-repetitive trips, giving rise to problems of orientation, information and communication, signalling and ticketing.

Because of their one-time, exceptional nature, special events also pose unique problems in forecasting attendance and flows of tourists: how much traffic will there be and how will it be distributed among transport modes? Where will it come from? How dense will it be at points of convergence?

While it may be easy enough to manage spectator events where seats are reserved (and where the admission ticket may include transportation), "open" events such as fairs, processions and exhibitions give rise to more unpredictable logistical problems. It is obvious that public events can have very different characteristics and so it is essential to develop a typology for them.

Because they will take place for only a short time, mega-events must generally be organised on the basis of existing infrastructure and transportation facilities. Because infrastructure is likely to be already overloaded, particularly in urban areas, special measures must be taken to organise transportation and manage traffic flows.

These measures can range from reducing "regular" circulation to stopping traffic completely at the perimeters of the event, for specific periods of time, so as to make room for the "exceptional" traffic generated by the event.

Even though they are temporary, such changes cannot be introduced without making provision to allow people to go about their normal business in areas directly affected by the event. These events disrupt the normal routine and often give rise to innovative schemes for organising transport and managing and controlling traffic flows. They represent veritable testing laboratories for new approaches to moving people and they may persist, at least in part, long after the event is over.

While these events and their impact may be thoroughly covered in the media, there has been little effort to analyse them or to draw lessons from them.

What trends and what conclusions can we establish in terms of this rapidly growing phenomenon?

This paper attempts to quantify the phenomenon of mega-events, to access its evolution, to establish an overall typology for it and to indicate some reference points for measuring its economic, social and developmental impact.

1. LEISURE MOBILITY, THE MAIN CAUSE OF THE SHARP GROWTH IN MOBILITY

The mobility of Europeans is constantly growing. This is hardly a revelation. On the other hand, the sharp growth in non-work mobility, which contributes greatly to the overall growth of mobility, is much less recognised and discussed.

In France:

- Statistics from transportation surveys conducted in 1982 and 1994 show that the French are travelling more frequently and further from their homes: the number of weekly trips per person rose from 15.4 to 16.6 (up 8 per cent) and the length of those trips increased from 29.1 km to 35.3 km (an increase of 21 per cent). More recent household surveys (Lille, Grenoble, Ile de France) confirm these findings;

- Over the same period, the number of passenger-kilometres (an index linking the number of people sharing a trip and the distance covered) has risen even more sharply (by 45 per cent). This growth is primarily due to the rise in long-distance mobility (representing trips of more than 100 km from home, 85 per cent of which are tourism trips), which surged by 56 per cent

between 1982 and 1994 and which represented 41 per cent of total mobility in the latter year, as compared to 38 per cent in the former year (Table 1);

- In terms of local mobility (representing trips shorter than 100 km from home), the relative share of "leisure" mobility[1] is now greater than that for work-related mobility: leisure accounted for 33 per cent of trips in 1982 and 40 per cent in 1994, while the proportion of work- and study-related trips declined over the same period from 37 per cent to 33 per cent (Table 2). When it comes to length of trip, the results are similar. Finally, the traveller-km pattern shows sharp growth in leisure mobility (53 per cent), while the work-related portion rose by only 28 per cent and the overall average increase was 38 per cent.

Comparable results have been obtained in several European countries (by the European Consortium ARTIST and by Switzerland):

- In Great Britain, the number of domestic trips rose by 22 per cent between 1989 and 1997, to a total of 134 million trips. During the same period, leisure and tourism mobility rose from 35 per cent to 40 per cent of total mobility, in terms of trips and from 42 per cent to 48 per cent in terms of distance covered;

- In Italy, the number of tourist trips is estimated to have increased by 15 per cent from 1993 to 1999, while tourism travel accounted in 1999 for some 30 per cent of total traveller-km;

- In Switzerland, total mobility rose by 16 per cent between 1984 and 1994, in terms of distance travelled per person per week, while leisure mobility rose by 41 per cent. In 1994, leisure accounted for about 50 per cent of kilometres travelled by the Swiss per week. This growth in leisure mobility is one of the principal concerns identified by the National Research Program 41 (PNR41).

Increasing numbers of Europeans are now travelling for leisure purposes to places ever more distant from their homes, whether for daily or weekend outings or on longer vacation trips and this phenomenon shows no signs of reversing itself.

The growth in leisure mobility can be explained by several factors, including greater worktime flexibility, more frequent social contacts, greater numbers of cultural, sporting and recreational activities and the growing number and diversity of public events.

In France, changes in working patterns have been evident for several years and have now been amplified by the move to the 35-hour week. Moreover, the reduction in working hours has occurred in parallel with increased life expectancy. Yet leisure time had increased sharply even before the 35-hour week arrived. Worktime reduction legislation will accelerate existing trends, but it will not lead to any sharp break in the evolving pattern.

Leisure and tourism are increasing mobility sharply. Mobility is becoming more complex, varied and unpredictable. The principal reasons for travel have changed and mobility models have shifted from a bipolar to a multi-polar pattern (which the Italians call "zigzagging").

Table 1. **French mobility trends**

	1982	1994	Change
Travellers x km, short-distance			38%
Travellers x km, long-distance			56%
Travellers x km, total travel			45%
Long-distance/total travel	38%	41%	

Source: INSEE-INEST Transport Survey 1981-1982 and 1993-1994.

Table 2. **French local and long-distance mobility trends, 1982-94**

	Share of total trips		Share of distance travelled		Change in traveller-km
	1982	1994	1982	1984	1982-94
A. Local mobility					
Pleasure	33%	40%	36%	42%	+53%
Work	37%	33%	39%	37%	+28%
B. Long-distance tourist trips:	+3% since 1985				

Source: INSEE-INRETS Transport Survey.

Table 3. **Distribution of average distance travelled per person, calculated over one week, by purpose, in Switzerland and France, 1994 (%)**

	Switzerland	France
Professional journeys	**12.3**	**12.6**
Work	**21.1**	**19.6**
Training	**3.6**	**5.9**
Shopping	**13.0**	**12.4**
Leisure	**50.0**	**49.4**
Km per person per day during one week	**33.2 km**	**35.3 km**

Source: Switzerland, Office fédéral de la Statistique; France, INSEE-INRETS transport surveys; author's calculations.

Table 4. A**verage distance travelled per person, calculated over one week, by purpose, in Switzerland and France**

	Switzerland			France		
	1982 km	**1994 km**	**Change 1982-94**	**1982 km**	**1994 km**	**Change 1982-94**
Total	28.7	33.2	16%	29.1	35.3	21%
Commuting	8.7	8.4	-3%	8.1	8.6	6%
Business	4.7	4.1	-13%	4.8	4.5	-6%
Shopping	3.4	4.0	18%	3.8	4.4	16%
Leisure	11.9	16.8	41%	12.3	17.7	44%

Source: Switzerland, Federal Statistics Office; France, INSEE-INRETS Transport Surveys, author's calculations.

1.1. Events-related mobility

In France, leisure mobility is expected to represent 55 per cent of kms travelled per week in 2000, of which public events of all kinds will account for only 10 per cent. In Switzerland, leisure represents 50 per cent of kms travelled and about one-third of this is for sporting events and nine per cent for other events.

This event-related mobility is a form of very short-term tourism. In France, 40 per cent of event-related trips are day trips. For the 60 per cent of trips involving overnight stays, the average length is still only three or four days.

While institutional constraints are being relaxed and the religious calendar is losing its importance, leisure time is making itself felt with new periodicities (weekends, long weekends, minivacations, regular vacations) and major public events, usually with much media hyping, are establishing new collective rites in response to individual and social aspirations. These varied events are the occasion for new forms of social gatherings and celebrations. The "rave" phenomenon, involving thousands of partying youngsters, is a recent example of this trend.

The growing frequency of events of different kinds reveals a tendency towards the generalisation of collective behaviour. They are revolutionising mobility practices by enhancing the share of leisure travel and, more broadly, they are promoting mixed time use between "*the city that works, the city that sleeps and the city that plays*", in the words of F. Ascher.

Large public events of all kinds are helping to break down the distinctions between generations and social classes. An internationally popular sporting event, for example, allows different groups of people to share the same moment of excitement. *"We thought it especially important that this event should involve the entire population*" said P. Braouzec, Mayor of St. Denis, in 1995, referring to an international athletics meeting hosted by his town. A prescient statement indeed, when we think of the gigantic fraternal celebration that broke out following France's victory in the 1998 World Cup.

2. A TENTATIVE QUANTIFICATION OF THE "EVENTS" PHENOMENON

There has been little systematic monitoring of public events from the transport viewpoint. The lack of cumulative data on attendance at events is a major obstacle in attempting to quantify trends.

Accumulating data is difficult enough, but estimating attendance is even more problematic. While it is easy to measure attendance at events held within a confined space, with an admission ticketing system, this is not the case with a parade or an open, unrestricted event such as the *Tour de France* or the *Fête de la Musique*. The organisers themselves have trouble providing accurate estimates. Moreover, in a context where commercial and image competition is strong organisers may be reluctant to offer estimates.

What is the typical trend and scope of events? Is their number increasing? Are there more spectators per event? Is event size growing? Is it the number of participants or the number of performances per event that is growing?

The only possibility for determining these trends at present is to look at a few significant cases involving different kinds of events:

- Two congress centres in Paris simultaneously hosting several events (exhibitions, trade shows, conferences);
- The Avignon festival, a cultural event consisting of performances at many sites, open and restricted, with the In and Off festivals taking place each year at the same site;
- Sporting events in Paris, at repeat intervals, generally at the same site;
- Parades, free-admission events;
- The Salon de l'Automobile in Geneva, regularly held at the same site;
- Mega-events that move their site each time.

2.1. Paris-Nord Villepinte and Paris Expo

In operation since 1982, the Paris-Nord Villepinte Exhibition Park is served by Autoroutes A1 and A3, line B of the RER (20 minutes from Paris) and the TGV (the Thalys since 1999) through the station at Charles de Gaulle Airport, which is five minutes from the site by car or RER.

The Paris-Expo Park, located at the Porte de Versailles, is near the southern *Périphérique*, the Paris ring road, which connects with the Autoroute A6 at Porte d'Orléans and with Autoroute A13 at Porte de Saint Cloud and is close to the heliport. The park is served by two metro lines (Nos. 8 and 12) and by three bus routes on weekdays (two on Sundays and holidays). Parking lots

with 6 450 spaces are located at the park's gates. Although there are other nearby parking lots available, parking spaces as a whole are inadequate, particularly during the larger fairs, when traffic becomes congested in the entire vicinity of the event.

During the 1990s, the trend of events at these two Parisian sites was as follows:

- The total number of national and international fairs in Paris rose by 75 per cent, while the number of visitors by 70 per cent and for the large public fairs by 150 per cent;

- The number of visitors per fair remained stable, at around 33 000 for all fairs taken together and 70 000 for the major public fairs;

- The average exhibition space occupied declined sharply, by 25 per cent.

As a result, the number of exhibitors and visitors per square metre increased by 31 per cent. The number of small fairs (covering less than 20 000 square metres) increased much more sharply than the number of larger fairs. Profit considerations were, no doubt, a factor behind this trend.

Can some fairs be considered permanent fixtures? Those most likely to endure seem to be the large commercial fairs such as the automobile and agriculture shows, as well as the more innovative events which surprise or astonish and make people wonder and which feature new technologies.

At the same time, we increasingly find several fairs cohabiting at the same site, particularly in the case of shows that occupy a relatively small exhibition space. When it comes to transportation, this situation poses the same kind of problems as a single, larger fair, something that must be taken into account in managing traffic flows.

2.2. Festivals: cultural festivals are proliferating

2.2.1 The Avignon Festival

The international fame of Avignon, in the south of France, is due in large part to its "In" Theatre Festival. Between 1990 and 2000, the In Festival saw its attendance numbers increase only slowly, stabilizing at around 130 000. By contrast, the Off Festival, which has been grafted onto the In, recorded regular attendance increases, rising from 350 000 in 1995 to 500 000 in 2000. Yet this increase is more a function of the growing number of performances than of the number of spectators per performance. This example shows a clear pattern for cultural events: for those held in enclosed spaces, with limited capacity, the flow of participants increases when the number of performances rises, since the potential demand is high.

At the same time, new cultural festivals are constantly appearing: the cartoon festival at Angoulême, the jazz festival at Marziac, the puppet festival at Charlesville, the music festivals at Roque d'Anthéron and Montpellier, the *Folles Nuits* at Nantes, etc.

2.3. Parades and celebrations

Virtually any pretext can give rise to a celebration or a parade and it will be difficult to predict attendance numbers accurately: the arrival of the new millennium, carnival time, historic commemorations, etc.

Gay Pride Day, involving long parades of festive coloured floats passing through the streets of many capitals (Berlin, Amsterdam, etc.), is one among many examples. At its Parisian debut, in 1977, this parade drew no more than 500 marchers, but by 1991 it already had 5 000 and today it attracts more than 300 000 from France and abroad, including many from outside the homosexual community.

The Technoparade and Gay Pride, two events that are now well established, drew some 300 000 participants each on a single day in Paris in 2000, offering perfect examples of the growth in the drawing power of street festivals, where the individual can reappropriate a bit of public space for the duration of the event.

2.4. Sporting events

In the world of sports and particularly in soccer, where the impact of the World Cup endures, events attract sustained numbers of fans. Attendance records for the Parc des Princes and for the Grand Stade, since its opening in January 1998, show that these sporting events are increasingly popular and are attracting increasing numbers of women.

National and international soccer events and international rugby matches held in France have filled 40 000 seats in the Parc des Princes and 70 000 seats in the Stade de France at St. Denis since 1998: this town now experiences a constant stream of major events taking place in the Stade de France.

2.5. Mega-events

Mega- sporting events immediately jump to mind, no doubt because of their overwhelming media impact. They may involve major international competitions (World Cups for soccer or rugby, tennis tournaments, automobile, motorcycle or bicycle races) that are held each year or every few years, such as the Olympic Games.

The Summer Olympics have grown sharply since 1980, when they attracted teams from 145 countries to Moscow to compete in 21 different sports and 203 separate events involving 8 300 athletes and officials, 8 000 journalists, 5.3 million ticket buyers and US$90 million in television rights. By the time of the Sydney Games in 2000, there were 199 countries, 28 different sports, 300 events, 18 400 athletes and officials, 19 800 journalists, 8 million tickets sold and US$1.3 billion in television rights.

The major international exhibitions have a similar worldwide attraction and they focus on themes that may be at the same time technical, cultural, commercial and recreational. Their statistics also involve superlatives: they may involve 120 countries and draw millions of visitors (40 million in Seville, 10 million in Lisbon and 18 million in Hanover) over a period of five or six months, during which time thousands of artistic and cultural performances will take place. While the number of countries represented has remained more or less stable, the presence of international organisations and large corporations has tended to grow, as has the number of performances and exhibits.

We must not overlook the great historic festivals, among which the most popular have included the Winemakers' Fair at Vevey, the end-of-century celebrations at Nantes and the Armada at Rouen.

In conclusion, the events phenomenon is evolving in different ways, depending on whether it involves closed or open events, fairs or sports gatherings:

- Commercial fairs, except for the largest ones, have tended to shrink in terms of exhibition space while involving increasing numbers of participants (exhibitors and visitors). As far as transportation is concerned, the problem lies in the increasing trend of having several fairs cohabiting at the same site;

- Cultural festivals are increasingly numerous and the number of performances at each has been growing, especially for the Off festivals. Performances at the In festivals take place in enclosed spaces and the number of spectators per performance has remained stable. The growth in total attendance at each cultural event has more to do with the proliferation of performances than with the number of spectators per performance.

In both of these cases, the events that endure are the most innovative and the most spectacular ones.

- Sporting events are the subject of increasing media attention and their attendance numbers are growing;

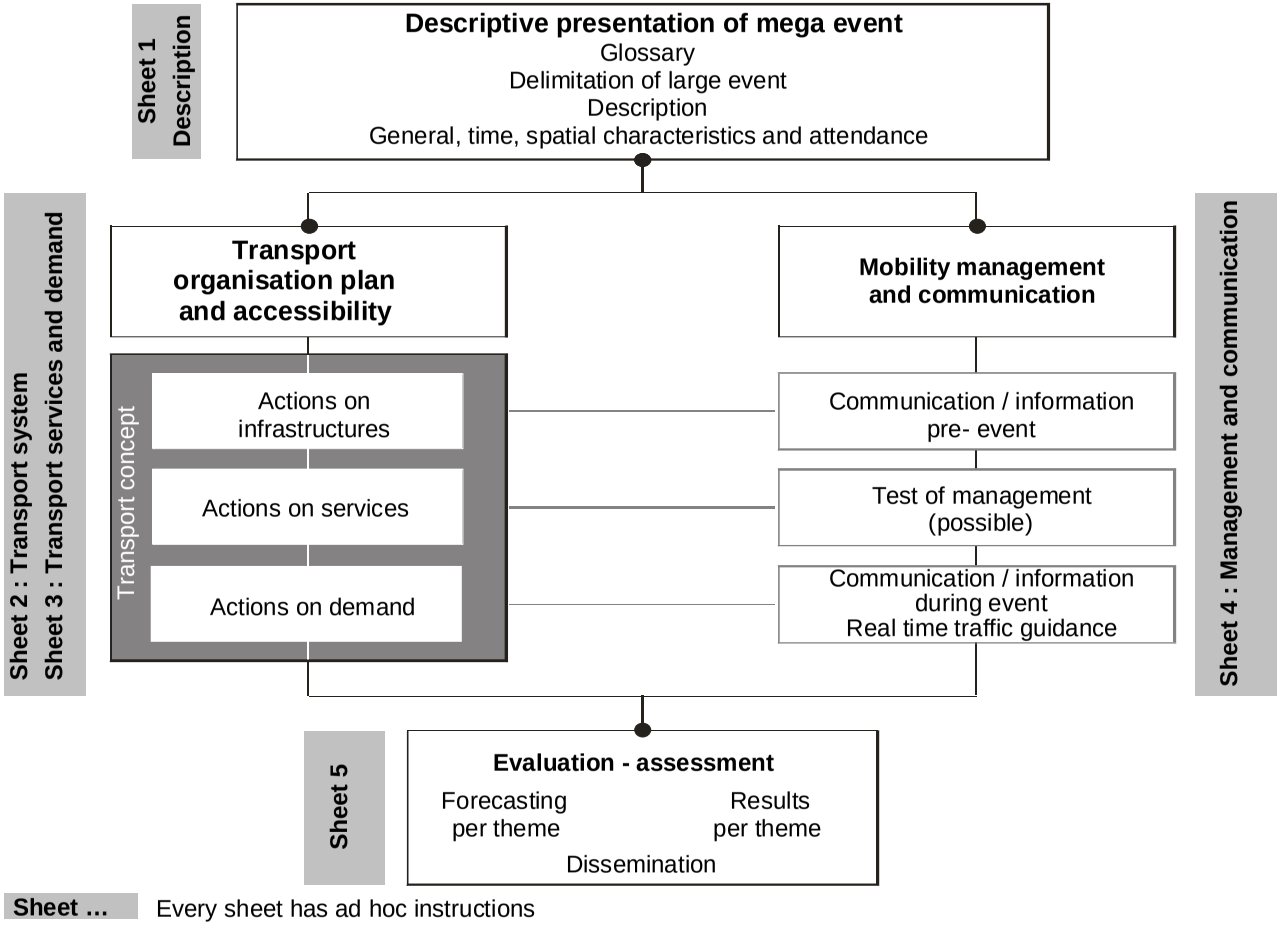
- Mega-events are growing in number, in attendance and in the variety of their component offerings.

3. AN OVERALL TYPOLOGY[2]

How are we to manage the transport and security aspects of an event that takes place in a closed, covered space or one that is held in the open? How do we deal with events in a small village, versus those in a major city? We cannot treat all events as a homogeneous lot, nor can transportation planning for these events be the same from one case to the next. The diversity of events implies an equally diversified approach to transport management.

Given the great variety of major public events, a general typology is essential, one that takes into consideration a complex set of criteria, including the setting of the event, its scale, whether the event occurs on a regular or exceptional basis, its nature and orientation, its programme, the degree of local involvement, etc. In this way we can analyse the structural elements that make up an event in order to optimise its management by taking effective action. Every group in this typology must be related to an organisational plan for transportation and accessibility and for the management of travel and communication, the success of which can be subsequently evaluated. By comparing different events against the same parameters, we can draw some lessons which may be used in transferring know-how (see Figure 1).

Figure 1. **Typological sheets**



How do we determine whether an event can or should be considered as "mega" or “major” rather than normal? The definition of a major event depends on the standpoint from which it is analysed. The indicators that allow us to define an event and its importance will differ greatly, depending on whether we are interested in economic, social, cultural, tourism or logistics and transport considerations.

This paper, which is focused primarily on attendance capacity and accessibility, looks at the structural and organisational aspects of transportation for public events.

3.1. A short but useful glossary

a) An ***event*** is composed of one or a series of sporting competitions, cultural or artistic presentations or commercial exhibits, held for the public at a specific time and place by one or several organisers.

b) An event may consist of an ***In event*** and an ***Off event***. The In event will usually be the first to be created, it will be official and it will be more famous. The Off event is grafted onto the In event, with a supplementary purpose – it will often be free and will attract additional numbers of people.

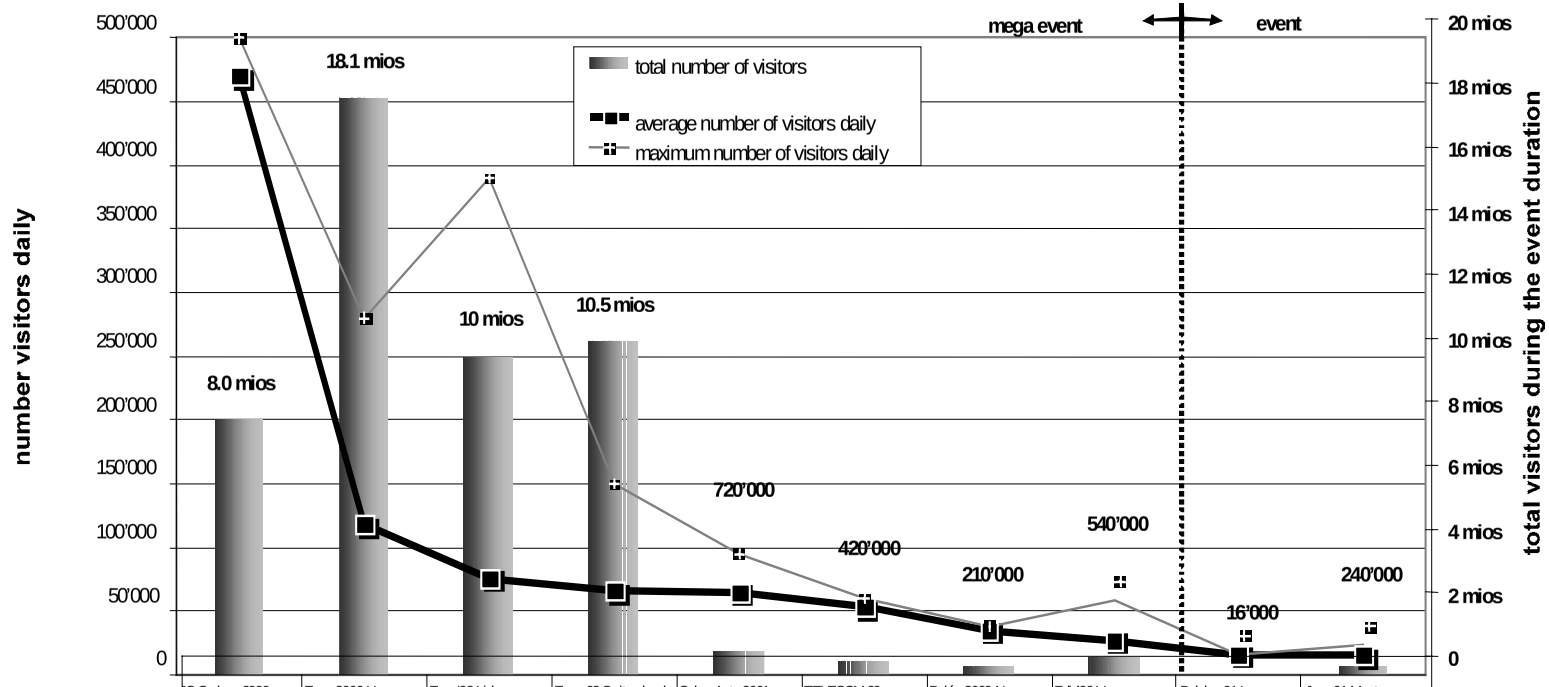
It is important to identify the various components of an event, since each will have its own programme, timetable, audience, etc.

c) A ***mega-event*** is an event that, because it generates major attendance numbers, requires special facilities in terms of transportation, security and logistics.

The distinction between "event" and "mega-event" is relative and depends heavily on the locale in which it is to take place. In a major city, the threshold for a "mega-event" may be considered to start at 60 000 to 100 000 spectators. In contrast, the convergence of 25 000 spectators in a town of 15 000 inhabitants, as with the Jazz Festival at Marziac, is significant enough that this event should be considered "mega" as well (Figure 2).

d) ***Attendance*** at an event or one of its components is measured by the number of spectators or the number of admissions over a unit of time: this is generally one day, but can also be a week or the duration of the event (which may be a few hours, as in the Cannes Festival). This notion is distinct from the number of tickets sold, since some classes of tickets can authorise admission to several performances or to the entire event. Transportation problems arise when there is heavy attendance. In many cases, problems are limited to a short period of mass attendance at mega-events of various kinds (pilgrimages, festivals and carnivals, sporting competitions, fairs, exhibitions, special congresses) or they can extend over several days at the site of an event. Between 1997 and 2000, for example, only two events, the *Salon de l’Automobile* and the *Salon des Telecoms*, at the Palexpo in Geneva, posed transportation difficulties because of their heavy attendance.

Figure 2. **Attendance and delimitation of mega-event**



	JO Sydney 2000	Expo 2000 Hanover	Expo'98 Lisbon	Expo.02 Switzerland	Salon Auto 2001	TELECOM 99	Paléo 2000 Nyon	FdV'99 Vevey	Balelec 01 Lausanne	Jazz 01 Montreux
	OLYMPIC GAMES	MAJOR EXPO	MAJOR EXPO	MAJOR EXPO	COMMERCIAL EVENT	COMMERCIAL EVENT	FETE AND FESTIVAL	FETE AND FESTIVAL	FETE AND FESTIVAL	FETE AND FESTIVAL
total number of visitors	8.0 mios	18.1 mios	10 mios	10.5 mios	720'000	420'000	210'000	540'000	16'000	240'000
duration	17 days	5 months	4.5 months	5 months	11 days	8 days	6 days	20 days	1 day	16 days
average number of visitors daily	470'000	118'000	76'000	66'000	65'000	53'000	35'000	27'000	16'000	15'000
maximum number of visitors daily	500'000	280'000	390'000	150'000	95'000	60'000	38'000	59'000	16'000	23'000

e) Transportation needs are deemed ***special*** when mobility demands occasioned by an event are such that they cannot be met by existing transport facilities and require substantial temporary modifications in the organisation and management of the transportation system.

This special organisation has to do with managing traffic generated by the event, as well as handling normal transportation and traffic within the perimeter of influence of the event.

f) ***Traffic*.** Traffic generated by an event is additional to the normal daily traffic base. There will be three types of traffic:

- Spectator traffic covers all movements of spectators arriving at the event or leaving it;
- Logistical or accredited traffic means all flows related to the organisation, functioning, provisioning, maintenance, security and media coverage of the event, as well as participants in the event;
- Base traffic is the traffic that exists without the event and that will be maintained or subjected to special temporary modifications within the event's perimeter of influence.

One major problem has to do with sharing local space (which is limited and often densely settled) between residents and visitors and managing the social and spatial conflicts that can result. The severity of these conflicts over appropriation and use of space will depend on the size (in terms of population, land area, road network, other infrastructure, services) of the host city. Security and traffic management problems become priorities. We often find, however, that city governments, which were long content to witness the spontaneous growth of tourism activities and events, will concern themselves only late in the day with issues of route planning.

g) ***Perimeters***

Organising a major public event requires establishing management perimeters, generally of three types, to delimit responsibilities for transportation and security:

- A perimeter of influence encircles the entire area where base traffic will have to be modified. Within this perimeter, special and supplementary transport services can be programmed, commanded and controlled;
- A perimeter of controlled access outlines the space under the control and responsibility of the event's organisers. In principle, the interior of this perimeter is restricted to participants and to vehicles bearing an accreditation card;
- An internal perimeter delineates one or several functional zones within the controlled access perimeter, which will be accessible only to participants holding certain classes of tickets or accreditation.

In France, for example, since the Pasqua Law of 16 December 1993, the organisers of a sporting event are responsible for security within the stadium and they now provide for and train stadium marshals to enforce internal security (within the controlled access perimeter) during such events.

If a sporting event involves a risky match (three levels of risk are identified) because of its popularity and the expected number of fans, the police will provide traffic management and security

services around the stadium at entry points and at the parking lots (perimeter of influence). These services will be billed to the organisers.

h) ***Partnerships***

Putting together a comprehensive "transport-accessibility-security" organisation for a major event involves establishing partnerships between the organisers of the event, transport companies, public services and local authorities, each of which will have different responsibilities within the area of the event, involving decisions at various levels as needed to ensure security and manage the flow of people and goods. In France, very large-scale events require the appointment of a prefect or establishment of a special unit, including the event organisers, the police, the CRS, the fire brigades, transport authorities and carriers and the local or regional authorities.

In terms of security and traffic management, specific provisions are put in place during working meetings that may be held several weeks or even months before the event. The prefect as well as local government representatives, carriers and organisers attend these preparatory meetings. The provisions adopted may vary widely, depending on the nature and scale of the event.

i) ***Logistics***

This covers all means and methods for organising an event and may include administration and services such as security, medical and health services, reception, accommodation, rental and technical assistance, the assembly and removal of structures, transport of people and supplies and the media.

From the logistics viewpoint, major events involve three successive time periods, with distinct features and organisational constraints:

- Pre-event: installation of facilities and technical systems for the event and testing of subsystems;
- The event itself;
- Post-event, involving disassembly and restoration of premises.

j) ***Categories of participants***

Depending on the scale and nature of events, we may distinguish six categories of participants: spectators, players, logistical personnel, volunteers, VIPs and the media. Each of these groups will have specific mobility needs for which separate plans will have to be devised.

1) *Spectators* are the people visiting or attending a single event (spectator-visitors, day spectators) or several events over a number of days (festival-goers) and visitor-tourists who, while present at the site of the event, do not attend it (visitors without tickets);

2) *Players* are those directly involved in producing the event and who, depending on the type of event, will be referred to by different names:
   - For sports events: athletes, trainers, team technicians;
   - For cultural events: actors, artists, musicians, extras, directors;
   - For commercial events: exhibitors, vendors, hostesses, etc.;

3) *Logistics personnel* covers people responsible for various organisational activities, services and support for the event. Their numbers and responsibilities will depend directly on the

type, nature, scale, territorial configuration and technical and security aspects of the event. We may distinguish two types of logistics personnel:

- *The organisers*, responsible for direction, control and provisions relating to the event.
- *Service providers, including security services* (police, fire-fighters, doctors, veterinarians, crowd marshals, etc., responsible for the security of people and installations, public safety, health safety, etc.); reception services (guides, hostesses); general services relating to operations, maintenance, repairs and cleaning; specific services (technical and regulatory functions depending on the nature of the event, such as referees or masseurs); goods transport (delivery services supplying the event) and personal transport (chauffeurs assigned to officials or VIPs, private transport personnel hired by the organisers), food and accommodation services and sales of products associated with the event;

4) *Volunteers;*

5) *VIPs;*

6) *The media.*

These different categories of participants will also have different types of access to the event: spectators will use public access (the main entrances); players and logistics personnel will use service entrances.

3.2. **Typology of events** (Sheet 1 in annex)

In constructing a typology of events, we must take into account several characteristics:

- The description of the event itself and of its various components (date, series number, site and size, type, importance and organisers);
- General characteristics;
- Time-related characteristics;
- Space-related characteristics;
- Expected attendance.

The principal parameters and indicators characterising major events and their organisation are identified with the help of typological fact sheets. On the basis of experience and the monitoring of several major European and world events, this paper assesses the relative importance of the various indicators.

3.2.1 Principal characteristics

Three principal characteristics are used to define the typology of a major event:

- The type of activities that compose it: restricted capacity or open;
- The spatial structure of the event: mono- or multi-site;
- Its scale.

3.2.1.1 The most important characteristic of any event is its capacity type: limited or open, corresponding to two types of quite distinct events:

- "Predetermined capacity" event, where the maximum number of spectators is fixed and known;
- "Open event", such as parades, processions, street festivals, where the maximum number of spectators cannot be determined.

Planning for "predetermined capacity" events is based on a known scenario, where attendance is limited by advance ticket sales. An open event is obviously much more difficult to plan. Several attendance scenarios must be prepared to take account of unpredictable factors, which may be internal to the organisation of the event (marketing, advertising, communication) or external to it (weather, competition with other events).

In many cases, events will include components of both types: this is the case with music festivals, where there will be concerts in conventional music halls, together with open-air performances or the Olympic Games, where some sports take place indoors, while others, such as cycling and the marathon, are held outdoors. Another example is the 1999 Winemakers' Festival (which involved 16 500 spectators and a number of processions).

3.2.1.2 It is also useful to distinguish events according to their spatial structure:

- "Mono-site" events are those that take place at a single site and are the most frequent;
- "Multi-site" events will usually have a main site and secondary sites, as with the Olympic Games or they may consist of several sites, as with the Soccer World Cup.

By cross-referencing these two variables, attendance capacity and spatial structure, we obtain a first indication of the class to which the event belongs.

3.2.1.3 In addition to the classes defined above, the scale of the event, measured by the number of spectators per day, represents the third essential characteristic of any event.

3.2.2 Time-related characteristics

The description of an event involves three temporal characteristics: its duration, its periodicity in general and its periodicity at a single site and finally its schedule (daily or nightly).

3.2.2.1 Duration

The duration of an event conditions the main operational parameters. We may distinguish three families:

- "Short" events, of one or a few days;
- "Medium-run" events, of two to three weeks (the Olympic Games);
- "Long" events, lasting several months, primarily major exhibitions.

Long-lasting events, such as world fairs and expositions and national exhibitions, are generally used to promote the development of permanent infrastructure facilities (see Chapter 4).

3.2.2.2 Periodicity

The periodicity of the event is also one of its basic characteristics. It may be annual (Avignon or Cannes Festival) or it may take place every two or four years (Olympic Games, Soccer World Cup) or, more rarely, events may be very widely spaced (every 20 to 25 years for the Winemakers' Festival at Vevey). The fact that an event takes place repeatedly at the same site has significant implications in terms of organisation, acceptability and the potential for change (as with the Cannes Festival or the *Nuits Folles* at Nantes).

A repeat event with relatively high attendance at the same site is bound to have an impact on the host city. The acceptability of measures that place constraints on residents and local activities is always a sensitive issue and above all a political one. As well, experience gleaned from previous versions of the event can help to improve transportation and accessibility planning and to reduce negative fallout, such as for example during the Cannes Film Festival. A repeat event can often be used to test new transport schemes (see below) and to adapt them in light of operating results, surveys and on-site participant polls.

At sites equipped to accommodate events, such as exhibition or congress centres, experience will be of a different nature. A single site can accommodate small, medium and large events. Generally speaking, only a minority of events at such sites will require much in the way of special organisation. At Geneva's Palexpo, for example, the *Salon de l'Auto* is the only annual event that attracts large crowds, as noted earlier.

3.2.2.3 Event scheduling

Transportation implications will be different depending on whether the event takes place during the day or during the night: in the latter case, since normal service is usually reduced during the evening hours, substantial reinforcement and extension of service will be required. Moreover, operating conditions are different at night, particularly in terms of additional lighting needs.

3.2.3 Spatial characteristics

The environmental setting and the local situation must be known in order to describe a major event.

The environmental setting of an event and its location with respect to the city centre are closely related to existing transport facilities and traffic in the host town.

The environmental context situates the event site in terms of local population density: large, medium-sized or small centres. But the event site can also involve an itinerary passing through several different types of urban centres (as with the *Tour de France*).

Location concerns the position of the site or sites of the event with respect to the host city (city centre, outskirts or rural area).

For climatic reasons, it is important to determine whether the event will be held indoors or out. For "outdoors" events, the weather will be a factor in predicting attendance. The schedule of such events must include provisions for cancellation or "rain checks".

3.2.4 Attendance

Attendance at an event can be evaluated using different ratios. There are, however, four ratios which are particularly important and which must be known or at least estimated in calibrating forecasting models:

- Total number of spectators;
- Average number of spectators per day;
- Number of spectators at peak hours;
- Number of players and logistical personnel per day (which may be significant, for example, during a marathon, where there are thousands of runners).

In terms of the number of participants, it is important to differentiate between total average daily attendance and peak attendance (see Figure 2). Average and peak estimates define normal and exceptional values.

The maximum theoretical attendance defined by promoters of the 1992 Seville World's Fair, which was set at 250 000 visits per day, was exceeded on 65 of the 176 days of the event. Attendance was particularly high on Saturdays and during the weeks immediately before closing date: the attendance record was set on 3 October 1992, with more than 630 000 visits or 2.5 times the officially determined saturation threshold.

It is sometimes difficult to pin down a single classification for an event, when it consists of highly varied components: each of these will have to be examined separately.

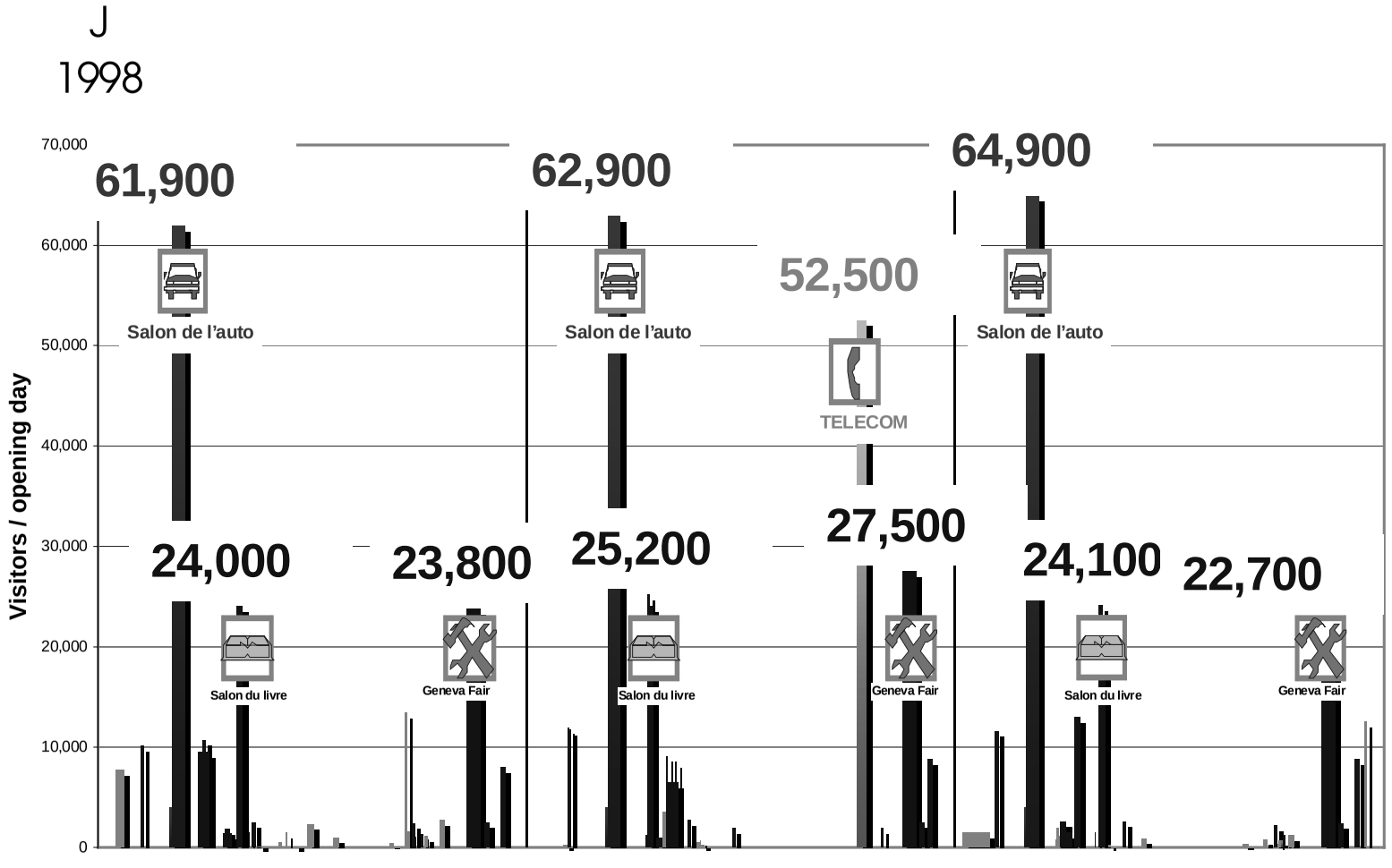
The above typology of events is independent of the transport organisation in place. Organisational actions affecting supply and demand (see Sheets 2 and 3 in annex) and traffic and communications are an integral part of the overall typological analysis, which should be included in a set of "recommended specifications for organising mega-events".

3.3. **Organising transportation and accessibility** (Sheets 2 and 3 in annex**)**

3.3.1 Actions

Actions represent strategic choices that must be planned and adopted. They relate to the supply of transport, infrastructure and services, as well as to the demand for them (Figure 3).

Figure 3. **Palexpo events 1998-2000 ; Average number of visitors daily**



3.3.1.1 Actions relating to infrastructure involve the permanent or temporary upgrading of public transport and road infrastructure, temporary facilities (extra parking lots) or the creation of new infrastructure. Following are two of many examples:

- During the Monaco Grand Prix, which involves automobile racing through city streets, the local authorities and the SNCF constructed a special underground station to cope with expected rail traffic. It had two separate exits, one leading towards Italy;

- Creation of new highway infrastructure: a new freeway was built for the Olympic Games in Sydney to link the northern and southern portions of the city.

3.3.1.2 Actions relating to services. These actions concern primarily public transport. Generally, they involve increasing the supply, extending hours of night service and adding new lines (shuttle connections with peripheral parking lots).

In terms of private transport, action generally focuses on protecting the event perimeter and adjacent areas by limiting private vehicle parking and traffic. Examples:

- In Monaco in 2001, the SNCF increased the frequency of regular runs by adding 30 trains during the three qualification days and 50 extra trains on the Sunday on which the Monaco Grand Prix was to be held.

- For the Avignon Festival, the Inter-Municipal Syndicate of Urban Transport for the Avignon Region (SITURA) worked with the organisers to provide special bus service (the "Bustival") that included four separate lines serving all festival sites in the city and its surroundings. At night, festival-goers at all sites were assured transport back to their place of accommodation.

- Extending regular service hours: in Marseilles, during the 1998 World Cup, the RTM extended metro service from 9 p.m. to 1 a.m. every evening for the duration of the event and until 2 a.m. on match days.

- Introducing new transport routes. For the 1998 World Cup, at the request of the organisers and the city of Marseilles, the RTM offered "reserved buses" that followed a different route from the regular lines, taking fans directly to and from the match sites.

- Temporary solutions for dealing with parking problems. These may be nothing more than fields marked off with posts and plastic tape, as for the 1999 Winemakers' Festival at Vevey. Temporary parking lots are also a solution for handling traffic flows, since they allow users of private transportation to leave their vehicle and travel to the site of the event by public transport or shuttle.

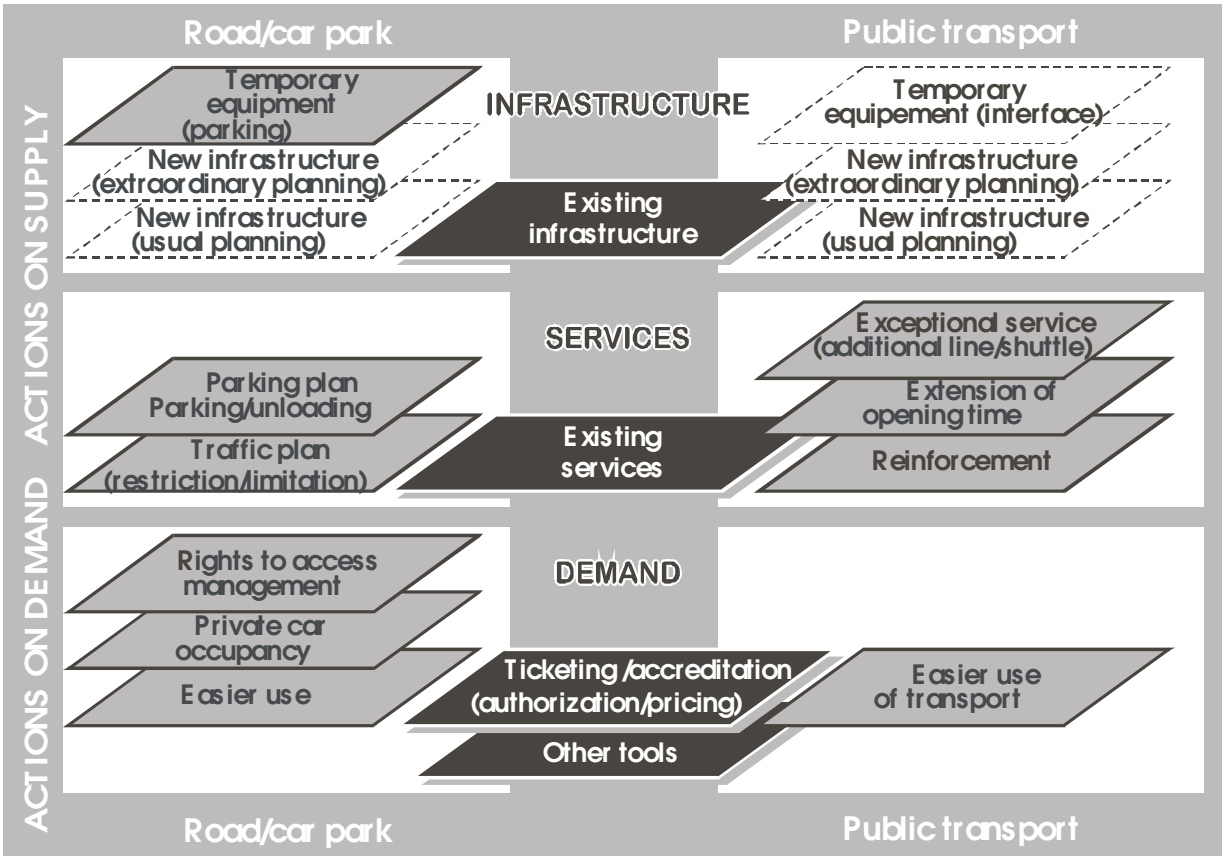
3.3.1.3 Demand-related actions

Actions affecting demand involve:

- Managing access, through accreditation and ticketing;
- Facilitating the use of a particular means or mode of transport;
- Increasing the occupancy ratio of private vehicles.

Accreditation and ticketing are essential tools for influencing demand.

Figure 4. **Actions on supply (infrastructure and services) and on demand**



For events with a controlled access perimeter, accreditation involves a pass permitting access at specific perimeters, generally through the service entrance ("back of house"). Apart from spectators whose "accreditation" is their admission ticket, all other participants in an event (players, logistics personnel, media, volunteers, VIPs) must be accredited. Vehicles entering controlled sectors or crossing internal perimeters must bear an accreditation, as must all their occupants.

The type of accreditation depends on the kind of event and in particular on its security aspects. Following the example of the Sydney Olympic Games, the organisers of mega-events are resorting to increasingly sophisticated forms of accreditation.

Ticketing covers all systems in place for reservation, sale, distribution and control of access permits to one or several events. It includes single tickets, multiple-entry tickets and permanent passes. The event organisers can choose from three types of ticketing:

- Single ticket: this allows admission to the event only;
- Combined ticket: a package including admission to the event plus transportation service, which may be offered at a discount;

– Integrated ticket: admission to the event, plus the right to use public transport or parking facilities.

Combined and integrated tickets are often designed to encourage participants to use public transport. For example:

– During the opening match of the 1998 World Cup, a special pass issued by the *Syndicat des Transports Parisiens*, "Transport '98", could be purchased upon presentation of an admission ticket at the two stadiums, the *Stade de France* and the *Parc des Princes* and could be used on the entire transportation network. Similarly, for the 1998 World Cup, the "Mobifoot" fare pass was sold at a discount and was valid for an unlimited number of trips in all cities involved in the competition;

– For the Winemakers' Festival at Vevey in Switzerland, the public transport authorities offered free transportation on procession days.

3.4. Managing mobility and communication

The management of travel and communication makes it possible to apply specific actions (communication/information), to test them (management testing) and to adapt them if necessary (monitoring).

3.4.1 Communication and information

Communication/information is involved at two points in time: a preliminary information strategy, conducted several months before the event and information which may be changed up to and during the event itself. It is either general or targeted and makes use of several media (event-specific press, local and national press, radio, TV, signage, etc.). The success of the transport plan will depend heavily on the coherence and quality of the communication strategy.

Signage is a particular form of information and communication, covering all types of signs, directional indicators and noticeboards, with changing or permanent messages, indicating clearly marked itineraries for:

– easy and smooth access to the event (access to vehicle parking, bus parking, public transport, taxis, pedestrian indications) and problem-free exits;

– indications of detours, allowing people not involved in the event to avoid the locality (dynamic tools).

3.4.2 Management testing

In the case of mega-events, "nearly full-scale" testing at the site is recommended in order to calibrate the device, especially if it is new or innovative. Successful experiments of this kind were undertaken for the Sydney Olympic Games: two traffic tests were conducted in April 1998, and a final test was run in April 2000. The 14th of July parade in 2000 in Paris was subjected to two night-time tests. In the case of a repeat event at the same site, such as the Cannes Festival, the debriefing from the previous year can be used as a test for the coming year.

3.4.3 Monitoring

Real-time monitoring of an event is intended to gather transport data (modal distribution, passenger numbers) for analysis, so as to be able to respond quickly in case of problems.

The command centre responsible for operational management of an event generally consists of the organiser, general security, health security, transport and weather services.

For example, the planning of open-air events, subject to the vagaries of the weather, must provide for cancellation or the issuance of rain checks for individual performances. This can lead to the stacking or overlapping of performances that will require an emergency transportation plan.

3.5. Final evaluation

3.5.1 Forecast and real attendance

Underestimating attendance can jeopardise a transportation scheme and lead to severe disruptions in local transport systems, as well as security problems. Over-dimensioning the transport scheme, on the other hand, can imply a heavy financial burden.

Open events are more difficult to model. Many events suffer from an overly optimistic estimate of attendance, as happened with Expo '98 in Lisbon, where only 10 million visitors showed up instead of the expected 15.6 million (35 per cent shortfall) and Expo 2000 at Hanover (where attendance fell short of forecasts by 55 per cent, see Figure 5).

3.5.2 Forecasting demand

Forecast modelling is primarily the responsibility of the organiser, who must determine the scale of the event, its attractiveness, its target audience, etc. Event-related trips are classified in accordance with the usual three variables: time, space and mode of transport. These parameters must be modelled in order to quantify the additional traffic that will be generated.

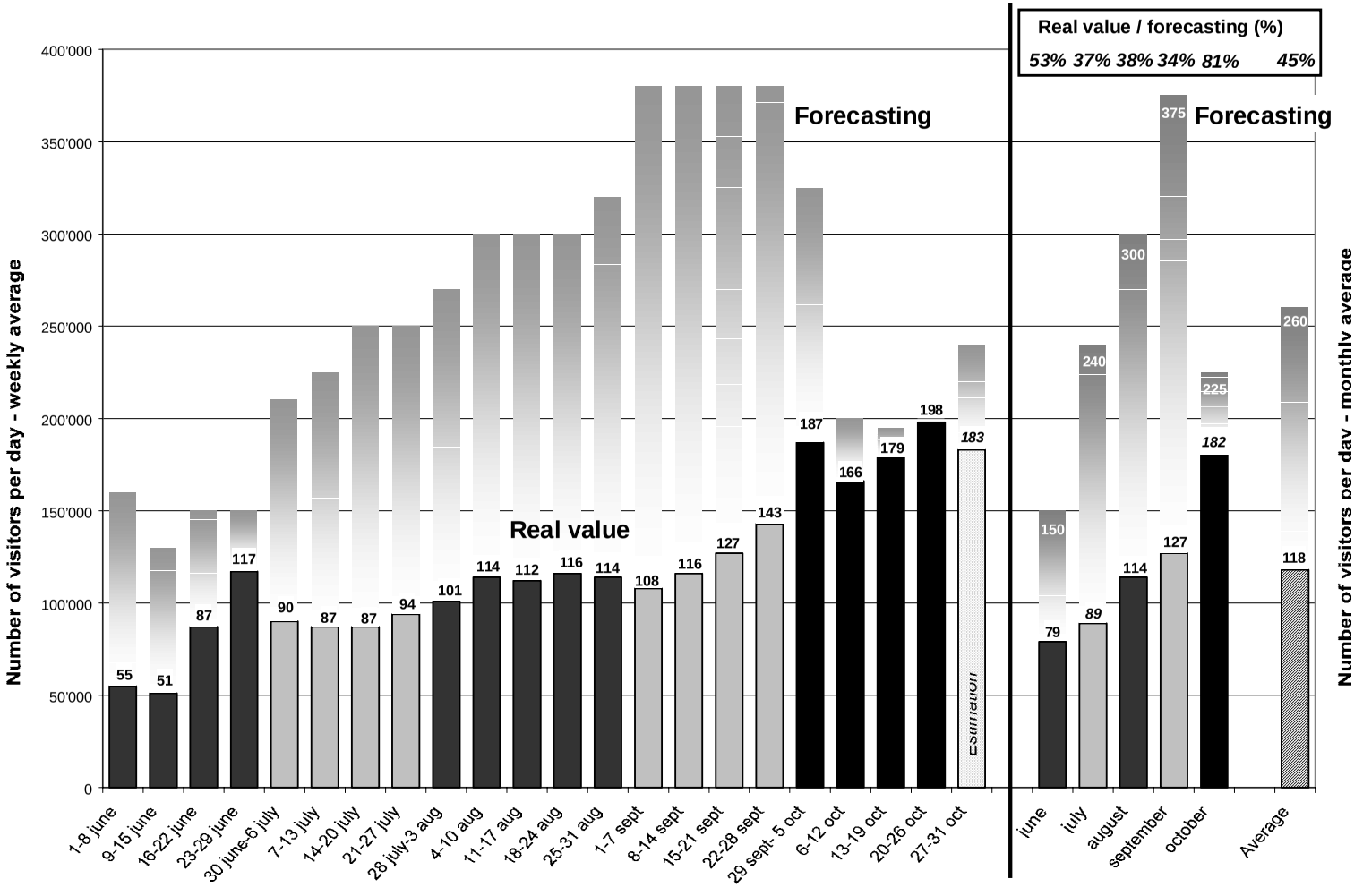
Two types of participant trips must be considered: the "initial" trip for arriving at the city where the event is to take place and the "terminal" trip to reach the site of the event itself.

The modal distribution of flows (among the different modes of transport available during the event) will be estimated for these two kinds of trip, "initial" and "terminal". It can then be broken down into more refined categories, such as type of traffic, type of participant or even geographic origin of participants.

In many cases, depending on the transport plan adopted, there will be different ratios of modal distribution, reflecting distance to the event. Thus, a string of relay parking lots, located some kilometres from the event and linked to it by shuttle bus, will tend to skew the modal distribution towards the automobile outside the zone and towards public transport inside the external access perimeter.

The parking problem is just as critical as the traffic congestion problem. Building parking lots for vehicles and buses can be an expensive undertaking and requires sound estimates of overall

Figure 5. **Expo 2000 Hanover attendance (1 June – 31 October 2000)**



attendance at the event and the timing of that attendance, in order not to underestimate or overestimate parking demand. Estimation errors for Lisbon's Expo '98 meant that many parking spaces provided for the event remained empty and entire parking lots have since gone unused.

3.6. Main lessons/recommendations

The principal horizontal lessons and recommendations from this analysis of events are provided here, as a first approximation of "recommended specifications for organising mega-event transport".

3.6.1 The quality of the host city's hospitality and its "brand image"

Event organisers and host cities are increasingly aware of the "hospitality-communication" aspect. When a major event suffers from severe shortcomings, this can damage the image both of the event itself and of the host city.

3.6.2 Managing transportation nuisances for local residents

The transport-related nuisances suffered by local residents and workers during a major event are both an economic and a political concern. While local residents are usually given a pass, they sometimes encounter difficulties in reaching their home or place of work and these difficulties should not be underestimated, particularly if the event is to last for some time or to be repeated frequently (see 2.2.2).

3.6.3 An ephemeral event: a full-scale laboratory

Managing transport for a major event provides a unique opportunity to test large-scale actions and exceptional flows over a short period of time. There are several aspects of interest: forecasting-modelling, special provisions or actions, communication and feedback from users:

- Forecasting-modelling can be tested quickly, instead of over several years, as for a conventional transport plan;
- Exceptional offers ("special" passes, reduced fares, combined fares) can be tested without much risk to the carriers, since the potential clientele is large. The public relations impact should also not be overlooked;
- Communication relating to such an event is a crucial element. Special and innovative measures can be adopted;
- Quick surveys or polls can be undertaken to assess the service offered and to judge the effectiveness of the "transport" communication tool.

3.6.4 New information technologies and their importance for transportation

Emerging information technologies are opening up new perspectives, making it easier to:

- understand users' travel needs (improved data collection from ticket orders);
- control accreditation, passes, badges, resident permits, remote-recognition chips;
- communicate swiftly over networks accessible to all (via Internet, direct information via mobile telephone or radio, Internet watch or intelligent vehicle);
- establish real-time monitoring -- video surveillance, real-time counting, better interconnection between organisers and partners.

3.7. Conclusion

The typological sheets, which provide virtual images of events, must be integrated into a set of recommended specifications. These specifications, to be drawn up by the organisation responsible for the mega-event, should respond to the major needs and questions of the organisers and others involved in the area of transportation and mobility management.

4. THE LOCAL ECONOMIC AND DEVELOPMENTAL IMPACT OF MEGA-EVENTS

The proliferation of events at all levels of the spatial scale is such that, as the cartoonist Sempé suggested in one of his comic strips, the most attractive feature of a village or small town might be "the total absence of festivals"! Beyond such joking, however, it is clear that increasing numbers of cities are searching desperately for originality and identity when it comes to organising an event, placing logos and specific messages beside their name and making much of their historic past.

The fact is that events have an economic impact. They play a growing role in local promotion and development policies, as illustrated for example in the paradoxical title of the special March 1999 issue of the urban affairs review, *Diagonal*: "The lasting effects of the ephemeral".

Following are a few examples of special facilities designed and created for a specific event: the Stade de France at St. Denis, for the 1998 Soccer World Cup; the new seafront and Olympic Village for the 1992 Games in Barcelona; the new transport and accommodation facilities at Seville and at Lisbon for the World's Fairs of 1996 and 1998.

4.1. Economic and social impacts

There has been very little research into the economic and social fallout from mega-events and the few data that are available are sporadic and heterogeneous from one sector to another and relate primarily to accommodation and commercial interests (important as these aspects are).

To illustrate the importance of the economic and social impacts of major events, consider a few examples.

The overall economic impact (direct, indirect and induced) of a new congress centre for a French city was estimated at EUR 9 million for 1999. The overall economic fallout from exhibitions and tradeshows in France for 1997 was estimated at EUR 4.04 billion or EUR 15 million per event.

Major exhibitions generate considerable revenue. In 1999, the Paris Region alone earned additional revenues of more than EUR 800 million from two exhibitions, EMO (world machine-tool fair) and ITMA (world textile machinery fair): between 4 and 8 per cent of these revenues accrued to the transport sector.

In the cultural area, festivals and special performances attract major flows of visitors, whose local spending contributes greatly to the economic development of the host city or region:

- For Avignon, the In and Off Festivals are estimated to have produced an induced economic impact of EUR 8.3 million in 1995;

- Economic fallout from the “Jazz in Marziac" Festival in 2000 was estimated at EUR 4.6 million;

- During the *Francofolies* of La Rochelle, in July 2000, average daily spending by festival-goers at local businesses amounted to EUR 10.8 million.

The drawing power of a festival can also attract businesses to a city or region. For example, the former mayor of Aix en Provence, J. F. Picheral, claims that "the fame of our festival has brought in ninety new firms".

Major events are also highly appreciated (to the extent that statistics so allow) in terms of their overall monetary contribution. The European Year of Culture, for example, brought between 10 and 14 million pounds in net benefits to Glasgow, while the Edinburgh International Festival generates annual receipts totalling between 30 and 40 million pounds. During the World Cup in France, the various host cities reported "exceptional" economic impacts: in the case of Marseilles, these were estimated at EUR 96.8 million.

Yet mega-events can also result in enormous budget deficits, in keeping with the scale of the event, such as the Lisbon Exhibition, which lost an estimated EUR 274 million, the Hanover Fair, where losses amounted to EUR 1.2 million or the Albertville Olympic Games of 1992, which produced a deficit of 288 million francs.

4.2. Mega-events, locomotives for local development

The role that the Olympic Games can play in a city's promotion, image and development is well known. The planning of major events often makes it possible to squeeze into three or four years the construction of facilities that would normally take 10 to 20 years of study and work to complete. The lasting impact of an event for the host city, then, is often more important than the event itself.

Events also play a growing role in local development policies and can serve as a locomotive for a city's development. Two prime examples of this phenomenon are the 1992 Olympic Games in Barcelona and the 1998 World Cup at the Stade de France, both of which gave rise to large-scale urban development projects.

4.2.1 The 1992 Olympic Games in Barcelona

The prospect of a mega-event in Barcelona, the 1992 Olympic Games, accelerated implementation of the citywide urban renewal programme. Originally adopted in 1979, it was replaced in 1983 (the year Barcelona was selected for the games) by a comprehensive development plan. This was the beginning of a strategic development programme, focused around this major event.

To win the 1992 Olympic Games, Barcelona adopted a policy of major public works to renew urban facilities and communications infrastructure. These projects gave the city an entirely new face: twelve new public spaces were created, in an effort to offset the dominant drawing power of the city's historic centre. These developments upgraded the entire city by rehabilitating a number of rundown areas.

In spectacular fashion, they opened the city to the sea and did much to improve access (the *Ronda Littoral* or shoreline drive, the rehabilitation of the former railway terrain). This previously rundown area has become a popular gathering place, with a seafront promenade along the Barceloneta Pier, a *rambla* in the port complete with shopping and recreation centre and the Olympic Village.

Finally, Barcelona developed a transportation system linking outlying neighbourhoods with the city centre and making them attractive to residents and non-residents alike, who formerly confined themselves to the old city centre. Today, Barcelona is continuing the work of urban renewal in other disadvantaged neighbourhoods.

Since the Olympic Games, which sparked this renewal, the city has experienced strong economic growth, in which tourism plays a heavy role and its social fabric has changed, making Barcelona an important and influential urban centre of southern Europe.

4.2.2 The 1998 Soccer World Cup at the Stade de France

The construction of the Stade de France on the Plain of St. Denis, to host the 1998 Soccer World Cup, led to the redevelopment of this former industrial wasteland and enhanced its status as a strategic site under the master plan for development of the Ile de France region.

The building of the stadium was undertaken as part of a broad urban renewal project that included housing, businesses, hotel and office complexes. The World Cup also provided the occasion for upgrading transportation facilities:

- Under a planning contract negotiated between the central government, the region, the SNCF and the RATP, a new station for the RER Line D was built and the RER Line B station was moved;

- The Porte de Paris metro station was refurbished and Metro Line 13 was extended to the Paris VIII University;

- The Autoroute du Nord was equipped with two pedestrian overpasses, a movable bridge and a 1.7 km concrete baffle;

- The banks of the St. Denis Canal and other public spaces were also rehabilitated.

Finally, the project led to the creation of 4 163 new businesses within the *département* between 1995 and 1997 and did much to boost the local economy. Moreover, the commercial and real-estate sectors prospered, effectively changing the social and economic face of the *département*.

CONCLUSION

In our highly mobile society, with its increasing leisure orientation, the number and scale of cultural, commercial and sporting events are growing. These mega-events, with their enormous media impact, are setting the pace for recreational life. They multiply the opportunities for happy throngs to gather and celebrate, as during the World Cup, the Rouen Armada, the solar eclipse, the Marziac Jazz Festival, the *Fête de la Musique* or the World Fairs and the Olympics.

They concentrate great flows of spectators and visitors in a confined time and space and involve increasingly sophisticated logistics. The demands on existing transport facilities are already heavy in normal times, particularly in cities and on urban beltways. Those facilities are neither designed nor dimensioned to absorb intense and highly polarised traffic flows. Special transport and traffic organisation measures are therefore essential.

NOTES

1. What do we mean by leisure? Simply put, it means all activities that are not related to work, study, health or the daily household routine. Thus, some purchases are included in leisure activities, such as clothing purchases, home refitting, sports, restaurant meals and, more conventionally, culture, recreation, tourism and vacations..

2. This chapter was written in collaboration with Christian Liaudat – ITEP-EPFL.

ANNEX

Typical sheet (empty)

Description Typology

Event ...
Sheet 1

TYPOLOGICAL SHEET 1

1 DESCRIPTION

Event ..... Edition ....
Date/periode ..... Year ....
Location ..... City :... Inhab. Country ....
Conurbation :... Inhab.

Type
- [ ] • SPORTING EVENT
- [ ] • CULTURAL EVENT (show, festival, fete)
- [ ] • COMMERCIAL EVENT (fair, exhibition, market)
- [ ] • CONGRESS (forum, conference, seminar)
- [ ] • MAJOR EXHIBITION (universal, national exhibition)
- [ ] • OTHERS : .....

Description .....

Events
- .....
- .....
- .....
- .....

Participants .....

Organizer(s) .....
Legal status [ ] Compagny Others : .....

2 GENERAL CHARACTERISTICS

Number of spectators
per day
250'000
100'000
50'000
25'000
0

Site of the event
MONO-SITE
MULTI-SITE

Type of event
PRE DETERMINED CAPACITY
XOOOO
Maximum spectator capacity defined
OPEN
?????
Maximum spectator capacity not defined

Number of events
...
...

3 TIME CHARACTERISTICS

Duration
... Days Short
... Days Medium
... Days Long

Frequency
2000 2001 2002 ... Annual
2000 2004 2008 Every four years
2000 .... Years Others

Frequency in the same location
Yes
No

Timing
Day-time
Evening

4 SPATIAL CHARACTERISTICS

Context
Large conurbation
Medium conurbation
Small conurbation

On itinary

Localisation
Urban center
Periurban
Rural

Situation
Inside
Outside

5 ATTENDANCE

Total number of spectators
1 mios
...

Numer of spectators per day
100'000
Peak ...
Average ...

Number of actors and staff per day
100'000
Average ...

Typical sheet - example
Montreux Jazz Festival 2001(Switzerland)

Transport system

Event	7
Venue	1/1
Sheet	2

TYPOLOGICAL SHEET 2

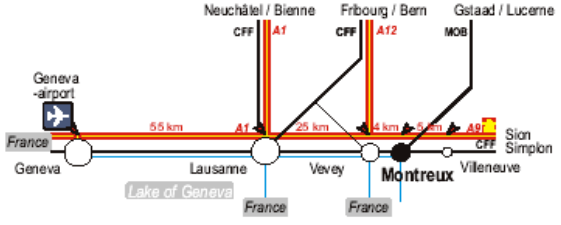
SPATIAL DESCRIPTION 1

Geographical position

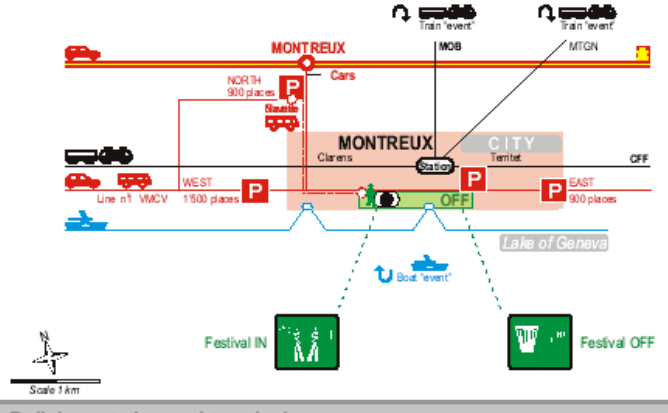
Legend

Highway
Road
Train
Boat
Pedestrian area
Existant
Temporary

Spatial localisation and main infrastructures of transport



Event location



ACTIONS ON INFRASTRUCTURES 2

Public transport infrastructure

North parking: 4 temporary shuttle stops

Road infrastructure

Temporary city parking (600 places)
NORTH carpark in part temporary (700 places)
2 temporary street parkings areas, on city access road with public transports links:
- WEST carpark (1'200 places)
- EAST carpark (900 places)
Total: 3'400 places
Additional temporary parking 2 wheels

New or temporary car parks

Rail, bus station and terminals

National / regional public transport

Station 1 city center main line rail station with international link
1 international railway line CFF; 3-4 trains/hour of wich 1-2 regional
1 regional railway line ; 1 train/hour
2 lake links
1 landing stage closed to the site

Local public transport

1railway touristic line; 1 train/hour
1 interurban line from Vevey to Villeneuve (13 km); frequency 10-20 min.
2 urban bus lines, frequency 30 min.

Existant car parks

City parking (estimated free capacity: 1600 places)
Peripheral carpark (300 places)
North carpark (200 places)
Total: 2'100 places

Typologie/Description de manifestation - EPFL/ITEP/TEA/ChL - 14.11.01

Typical sheet (empty)

Transport services and demand

Event ...
Venue ...
Sheet 3

TYPOLOGICAL SHEET 3

1 ACTIONS ON SERVICES

National / regional public transport	Local public transport	Circulation / stationnement
Additional transport supply	Additional transport supply	Specific transport plan
Extension of services	Extension of services	Parking policy / strategy / pricing
New temporary services	New temporary services	Regulation, access restriction
		Others actions arrangements

2 ACTIONS ON DEMAND

Ticketing : visitors entrance	National / regional public transport	Local public transport	Private car	Bus
Reserved in advance	Pricing	Pricing	Pricing	Unloading of passengers
On the spot	Combined ticketing	Combined ticketing	Combined ticketing	Parking pricing
Free access... On invitation / Free admittance			Parking (and shuttle) ticketing	

3 ACTIONS ON DEMAND

Accreditation (actors and staff)	
Type of accreditation	Accreditation with reduced public tranport rate
Individual	Accreditation with reduced parking rate
Vehicle	

4 OTHER CHARACTERISTICS

(...)

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SUMMARY

Lisbon, January 2002

1. EXCEPTIONAL PUBLIC EVENTS: DEFINITION

The term "exceptional public events" covers a wide range of situations, both as regards the number of people such events attract, their locations, duration and foreseeability. From the standpoint of transport, however, they always exhibit a number of common features: the transport demand generated by such events, its concentration in time and space, its temporary nature and the fact that it is superimposed on the usual transport demand. The latter aspect is of considerable importance in that such events normally take place in large urban centres and daily life must continue as normally as possible while the event is going on.

The Olympic Games or the World Cup -- which are perhaps the two exceptional public events that draw the biggest crowds and get the most media attention -- mobilise over ten million spectators and staff over a period of not more than a month, with fairly differentiated spatial concentrations. In contrast, universal exhibitions last much longer, usually about five months, are in one location and are normally attended by close on fifteen million spectators.

The size of the city or region in which the event is held, as well as the quality of the existing transport infrastructure, also have an important bearing on the transport system that has to be put in place for this type of event. The complexity and scale of the changes that have to be made to the existing system of transport will be all the greater in that the transport demand generated by the event represents a high percentage of the number of passengers usually carried by the system.

Bearing in mind these common features of exceptional public events, the following typology is proposed from the standpoint of the transport system that has to be put in place for them:

- *Size*, as measured by the number of visitors and spectators, direct participants and personnel hired for the event; each of these categories poses very different problems in terms of mobility, before, during and after the various events that make up the overall event. However, it is the peak -- hourly and daily -- transport flows generated by the exceptional demand that will be the crucial determinant in the design and management of the transport system for the event;

- Degree of *concentration* in time -- duration of the event, duration and magnitude of traffic peaks -- and in space -- whether the event takes place in one or several buildings; existence of a special area where the highlights of the event take place;

- *Foreseeability*, i.e. the periodicity of the event and the time available to prepare it. The amount of time available between the moment the decision to hold the event is taken and the date of its opening will determine, to a large extent, the transport infrastructure and systems that can be put in place to cope with the new demand generated by the event;

- Foreseeable *additional cost* of the extra *transport demand* in the host town or region, compared with existing transport demand. The size of this difference will be a key factor in defining the level and magnitude of the changes to be made to existing transport supply;

– *Level and capacity* of existing transport system. The lower the quality of service of the existing system, the greater the depth and scale of the changes that will be required.

The last two parameters depend on the location -- city or region -- where the event will take place; they are thus prior to it and are of direct importance only when the city or region is preparing its bid to hold the event. However, in our view, the other three parameters are of key importance for evaluating exceptional public events from the standpoint of transport.

2. A TRANSPORT-SPECIFIC TYPOLOGY OF EXCEPTIONAL PUBLIC EVENTS

Using data concerning the very diverse range of exceptional public events[1] (see Table 1), events may be divided by size into three major categories. They are classified according to the number of people they attract: around one to two million; between five and ten million; over ten million or even around fifteen million. These figures seem to be fairly closely correlated with the *duration* of the event. The highest attendance figures are recorded for universal exhibitions, which last for a long time (on average about five months). In contrast, attendances of about one million are recorded for national events which do not usually last longer than one to two weeks. The summer and winter Olympic Games and the World Cup, which last on average between two to three weeks, are in the intermediate category, attracting five to ten million people. The number varies according to the size and/or international standing of the host city; the more populated the city or region and the higher its international standing, the more people will be attracted to the event.

The hourly traffic peaks associated with events can vary enormously. However, the following orders of magnitude are fairly representative[2]:

– National events and exhibitions: around 20 000-30 000 passengers per hour;
– Universal exhibitions: between 50 000 and 70 000 passengers per hour;
– Olympic Games and World Cup: between 80 000 and 100 000 passengers per hour.

Obviously, these figures are only indicative and do not cover those events that are a massive success or complete flops. However, they do suggest the kind of transport that is required to meet such a demand. For example, it seems impossible to cope with the demand generated by events such as the Olympic Games or universal exhibitions without dedicated infrastructure such as subway or rail.

The *foreseeability* of the event should be considered from two angles, each of which will have a major impact on the design of the transport system and the improvements that it is realistic to make to existing infrastructure. When the periodicity of the event is known in advance -- for example, every four years in the case of the Olympic Games -- and the lead time between the decision to hold the event and its inauguration is significant, it is much easier for those in charge of the design and implementation of transport networks and logistics to deal with the exceptional demand. The longer the lead time, the greater the scope for building new infrastructure and systems, to innovate in the transport modes that will be used, to set up the ticketing system or to try out new approaches to mobility management; in any case, it is much greater than for one-off events, which depend rather on

political decisions and the electoral calendar, usually spaced over four years in most western democracies.

Table 1. **Number of visitors at major events**

Exceptional event		Visitors or spectators (million)	Duration (number of days)
Olympic Games	Moscow – 1980	5.27	16
	Los Angeles – 1984	5.72	16
	Seoul – 1988	3.31	16
	Barcelona – 1992	3.81	16
	Atlanta – 1996	8.39	17
	Sydney – 2000	7.00	17
Universal Exhibitions	Seville – 1992	36.95	(180)
	Lisbon – 1998	10.0	132
	Hanover – 2000	18.1	153
Millenium Exhibition London – 2000		6.5	365
World Cup	Spain – 1982	1.84	(1 Month)
	Mexico – 1986	2.18	(1 Month)
	Italy – 1990	2.52	(1 Month)
	US – 1994	3.59	(1 Month)
	France – 1998	2.7	(1 Month)

Sources: www.museum.olympic.org; www.worldcuparchive.com; www.theo.tu-cottbus.de/expo; www.terra.es/personal/aranburo; www.expo2000.de

The spatial *concentration* of events also has a significant impact on the transport arrangements put in place for them. High concentration, such as that which occurs during the opening and closing ceremonies of the Olympic Games or the World Cup, generates extreme traffic peaks which determine in a large degree the kind of transport that will be put in place. A breakdown in the transport system at such an event would tarnish the image of the whole event. Also, when the event takes place on several sites, each successively attended by visitors or spectators, an integrated system is required as well as much more flexible timetable and fleet management than during peak periods.

Bearing in mind the aforementioned factors which determine the type of transport system that will be provided for exceptional public events, the following typology is proposed:

- **Large periodic events:** events whose frequency is known in advance, which attract one or two million people over a period that does not usually exceed two weeks and which usually take place on one site. Examples of such events are large international themed shows and events and national commemorative events;

- **Very large periodic events:** regular "mega" events that attract five to fifteen million people for a few weeks or months and which concentrate large numbers of people in space and time, even when they take place on several sites. This type of exceptional public event can be subdivided into:

  - *Long events*, which last several months -- universal exhibitions, for example;
  - *Short events*, which do not last more than three weeks, e.g. the Olympic Games and the World Cup;

- **One-off events:** these are usually smaller and shorter than the previous events and attended by less than a million people over a period of a few days. They concentrate a large number of people in space and time and are pre-programmed. In principle, they are associated with a specific date or event, the commemoration of which requires a political decision. Examples are the commemoration of the discovery of the sea route to India five centuries ago or the arrival of Europeans in Brazil.

In addition to the above-mentioned aspects, which relate directly to the characteristics of each type of event, it is also very important to consider the specific characteristics of the city or region in which they take place. The size of the population and the features of its transport system will obviously determine the modifications to be made to the existing system or the special arrangements that have to be made to cope with the transport needs created by the event. The size of the city, the performance, capacity and operational reserves of its transport system and infrastructure, will determine its ability to cope with the extra demand. In consequence, the complexity and scale of the changes required will be all the smaller in that the initial situation is favourable, that is to say, when the additional demand does not represent a significant percentage of daily transport demand and the available capacity and operational flexibility of the transport system are high.

3. OPPORTUNITIES THAT SHOULD NOT BE MISSED

When exceptional public events are discussed from the standpoint of transport, the focus is usually on the transport supply, irrespective of what it is. However, the *exceptional* nature of such events, with all the range of new situations -- urban and human -- to which they give rise, should prompt us to be more ambitious and to formulate and test new approaches that focus rather on transport demand management.

Also, the decision to host a large or very large event is in itself conducive to the development of a decisionmaking "ethos" at the political and administrative levels: the authorities seek to optimise the resources and means available and thereby maximise potential synergies.

Generally speaking, before such an event is organised, a planning, management and supervisory body is set up to centralise all the basic components of the project so that they are carried out properly. These bodies are usually public entities with substantial delegated powers but which, unlike traditional government bodies, are organised by objective on a cross-cutting basis, so that they can oversee all the facets of the project and ensure that objectives are met on time and within the allotted budget.

It is thus not surprising that complementary public works and infrastructure are implemented in the areas around the site -- especially in the case of exceptional public events which are planned years in advance and are expected to attract large numbers of visitors -- and which can improve access to the site on which the event will be held. Very good examples of this are the Barcelona and Sydney Olympic Games and the Lisbon Universal Exhibition. In all these examples, the authorities and the organising body agreed to equip the host cities and regions with an impressive array of new transport systems and infrastructure which provided the necessary mobility during the event but especially brought very significant benefits to the inhabitants and economic activity of the city and region. The necessary funds for building the infrastructure were raised in a fairly short time, with the impetus generated by the event playing a decisive role.

Such events also provide an opportunity to implement new forms of mobility management and to modify modal choices. The scope for doing so and thus for modifying daily patterns of public and private transport use, not to mention use of flexible modes, is given a strong boost by the festive nature of the event and by the fact that, because it is exceptional -- in some cases, experienced only once in a lifetime -- people are willing to try out imaginative and unusual initiatives. This does not merely involve providing users with new modes of transport such as electric vehicles, monorails, cable cars or high-speed moving pavements, it also consists in getting them to take part in new ways of using existing transport or managing existing systems in a more integrated, complementary fashion.

Almost all the most recent exceptional public events have seen the introduction of:

- All-in tickets, combining an admission ticket for the event and a ticket permitting travel over the entire public transport network;
- Measures to promote car-sharing;
- Restricted traffic and parking arrangements differentiated according to the user -- residents, personnel, press attachés, delivery vehicles, VIPs etc. – as well as the time of day and the different events;
- Special access arrangements for pedestrians and cyclists;
- Park-and-ride systems available to visitors on presentation of their ticket;
- Advance booking and payment of parking space;
- Dial-a-bus services for less densely-populated areas or specific times;
- Real-time travel and parking information systems;
- Web sites and other remote information systems which give the schedule of events and allow tickets to be purchased on-line.

Exceptional public events are an ideal testing ground for innovative transport modes and a test of the planning and management capabilities of the organising body. Events such as the Sydney Olympic Games or the 1998 World Cup show that the results can be surprising and a genuine success.

4. THE CASE OF EXPO 98

4.1. Background and milestones

Five centuries after the Portuguese navigators left Lisbon on the first sea voyages of discovery, the Portuguese capital hosted the 1998 Universal Exhibition. This commemorative aspect, celebrating the encounter of very different cultures, as well as the growing concern world-wide about the future of the oceans and marine resource management, were perceived as considerable strengths by the International Exhibition Bureau (BIE) -- the body responsible for authorising this kind of event -- when it examined Lisbon's bid. The main theme proposed for Expo 98 was the oceans, their diversity and key function in preserving the Earth's ecological balance.

The site chosen -- a large, polluted, run-down area of 330 hectares in the eastern part of Lisbon (see Photo 1 in annex) -- represented an enormous challenge for a country which had recently emerged from a deep economic crisis in the 1980s and had just retaken its place in a democratic Europe. Factories, oil depots, former arsenals and a waste dump had to be demolished and the site completely rehabilitated. A five-kilometre stretch of river-front property on the Tagus River was redeveloped. EXPO 98 was to symbolise the Government's resolve to modernise the country[3].

The main milestones in the decisionmaking and construction processes are summarised below:

- 26 August 1989: the Government sets up an executive commission to prepare Lisbon's bid for the 1998 Universal Exhibition;

- 23 June 1992: 1998 Universal Exhibition is awarded to Lisbon;

- 8 March 1993: setting-up of the Exhibition's commission, an administrative entity and a public company, Parque EXPO 98 SA, to organise and manage the event;

- 16 November 1993: UNESCO announces that 1998 will be the International Year of the Ocean;

- 25 May 1994: approval of the overall urban development plan, representing an area of 330 hectares, including the EXPO site of 66 hectares;

- 14 July 1994: detailed site plan drawn up; four detailed plans prepared of the areas to be redeveloped before EXPO 98 (exhibition site and marina) and subsequent developments; these plans were approved by Parque EXPO in 1995;

- 11 November 1994: work starts on cleaning up the site and dealing with the chemical contamination; work lasted two years and continued with the cleaning up of the Trancao Basin;

- 16 October 1994: work starts on construction of the Oceans Pavilion;

– End-1995: construction of urban infrastructure, thematic pavilions and public areas which would remain once EXPO 98 was over and pavilions and other logistical facilities which would be in place for the duration of the exhibition.

With the theme "The Ocean -- a Heritage for the Future", EXPO 98 was inaugurated on Friday, 22 May 1998 and ran until Wednesday, 30 September 1998, i.e. for 132 days. A record number of 146 participating countries and 14 organisations attested to the interest it aroused.

4.2. Transport: urban access and site

Ensuring proper access for several million visitors is essential to the success of an exceptional major event such as a universal exhibition. Located in the eastern part of Lisbon, just near the airport, transected by the country's main railway line and beside the Tagus River, EXPO 98 was easy to get to by road, rail and river.

No particular planning was required at national or regional level, as major road and motorway construction projects and rail network upgrading projects in the Lisbon area and elsewhere had already been decided and planned within the framework of national road and rail plans. The timetable for projects that could improve access to the EXPO 98 site was shortened: for example, the completion of the Lisbon-Porto motorway link was brought forward, as were the construction dates for the regional motorway system and access roads to the new Vasco da Gama Bridge on the Tagus. Upgrading of the northern rail and outlying Lisbon stations was speeded up considerably.

Among the major motorway and road construction projects, mention should be made of the following (Figure 1):

– Construction of a new bridge over the Tagus Estuary (Vasco da Gama Bridge) connecting to the motorways heading north (to Coimbra and Porto) and south (to Spain);

– Completion of the motorway between Lisbon and Porto and extension of the southern and south-eastern motorway network to Spain;

– Construction of the Lisbon inner (CRIL) and outer (CREL) ring roads.

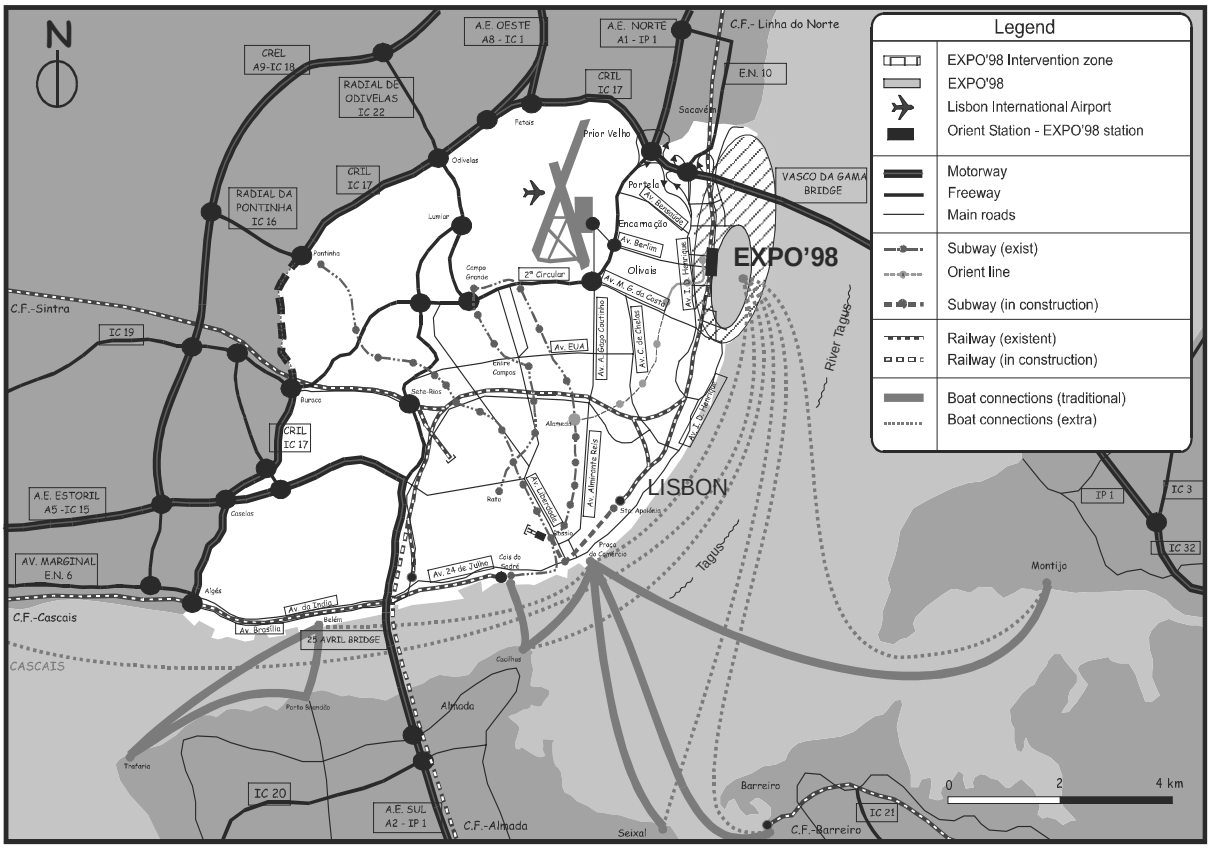
The main rail projects were:

– Construction of Oriente station on the northern line (connecting Lisbon and Porto), a gateway to the exhibition and interface between public rail and road transportation;

– Construction of a 5-km-long new subway line between Alameda station and the EXPO 98 terminal beneath the Oriente rail station.

Construction of a new river terminal (Tagus Entrance) at the heart of the exhibition made possible the introduction of new ferry services to the right bank (Cascais, Belém, Praca do Comércio) and the main towns on the left bank of the Tagus.

Figure 1. **Accessibility to Expo 98**



4.2.1 Urban accessibility

Apart from the construction of the rail station in the middle of the EXPO 98 site and the new subway line, the main urban infrastructure projects were designed to improve access by road. The main arteries leading to the site were redesigned with split-level intersections, parking in the road was banned and restrictions were imposed on access to residential districts except for residents. Access roads to public car parks (20 000 parking lots) and private car parks (2 000 spaces for EXPO 98 personnel and support services) were built.

A vast intermodal hub for the various public transportation networks was built under the new Oriente Station, with a pedestrian walkway to the river terminal (see Figure 2).

Special pedestrian walkways and a free bus shuttle service facilitated movement between car parks, the intermodal hub and the entrances to EXPO 98. Twenty shuttles operated at peak times and fifteen during non-peak times.

Figure 2. **EXPO 98 accessibility plan**

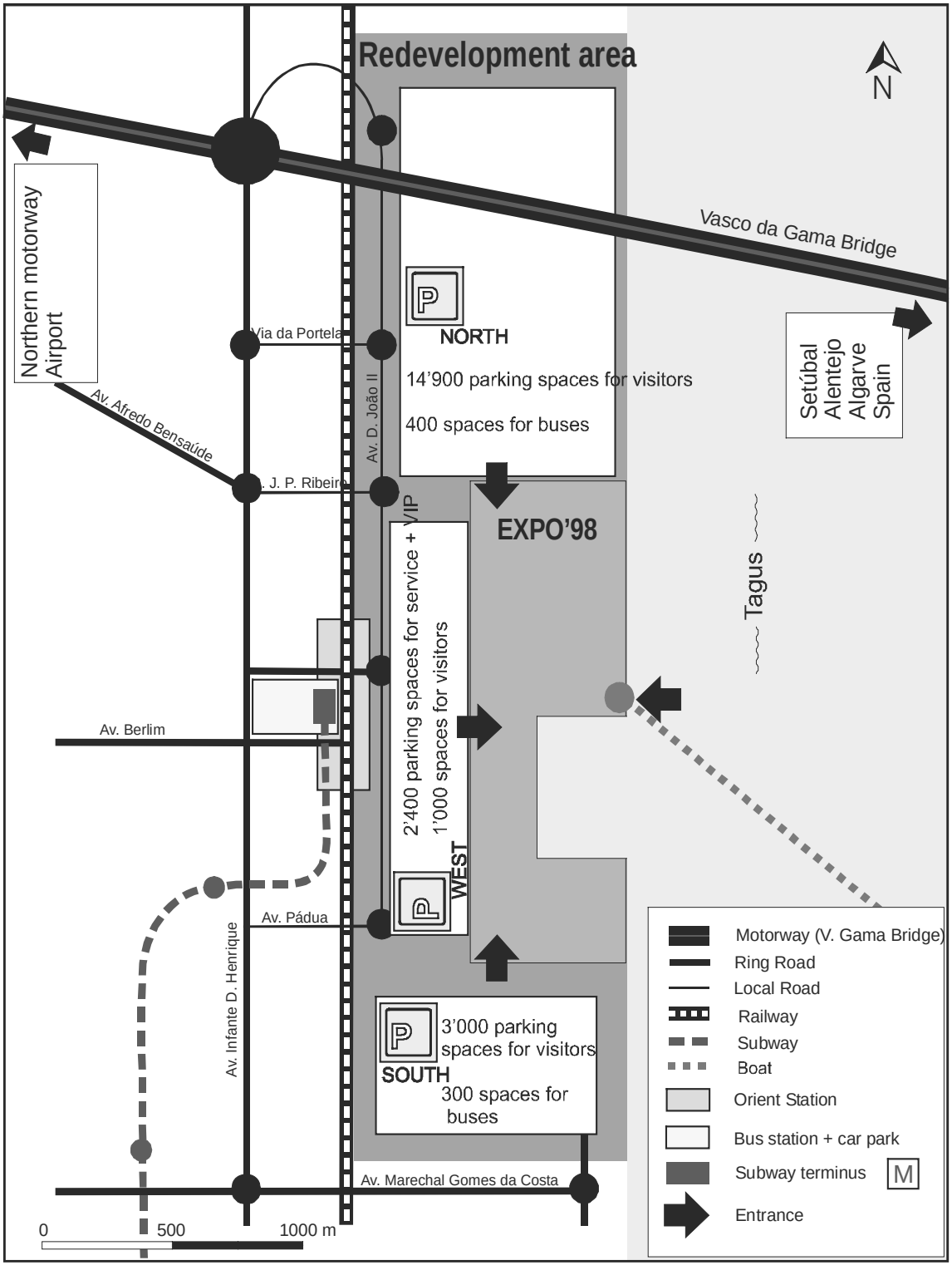
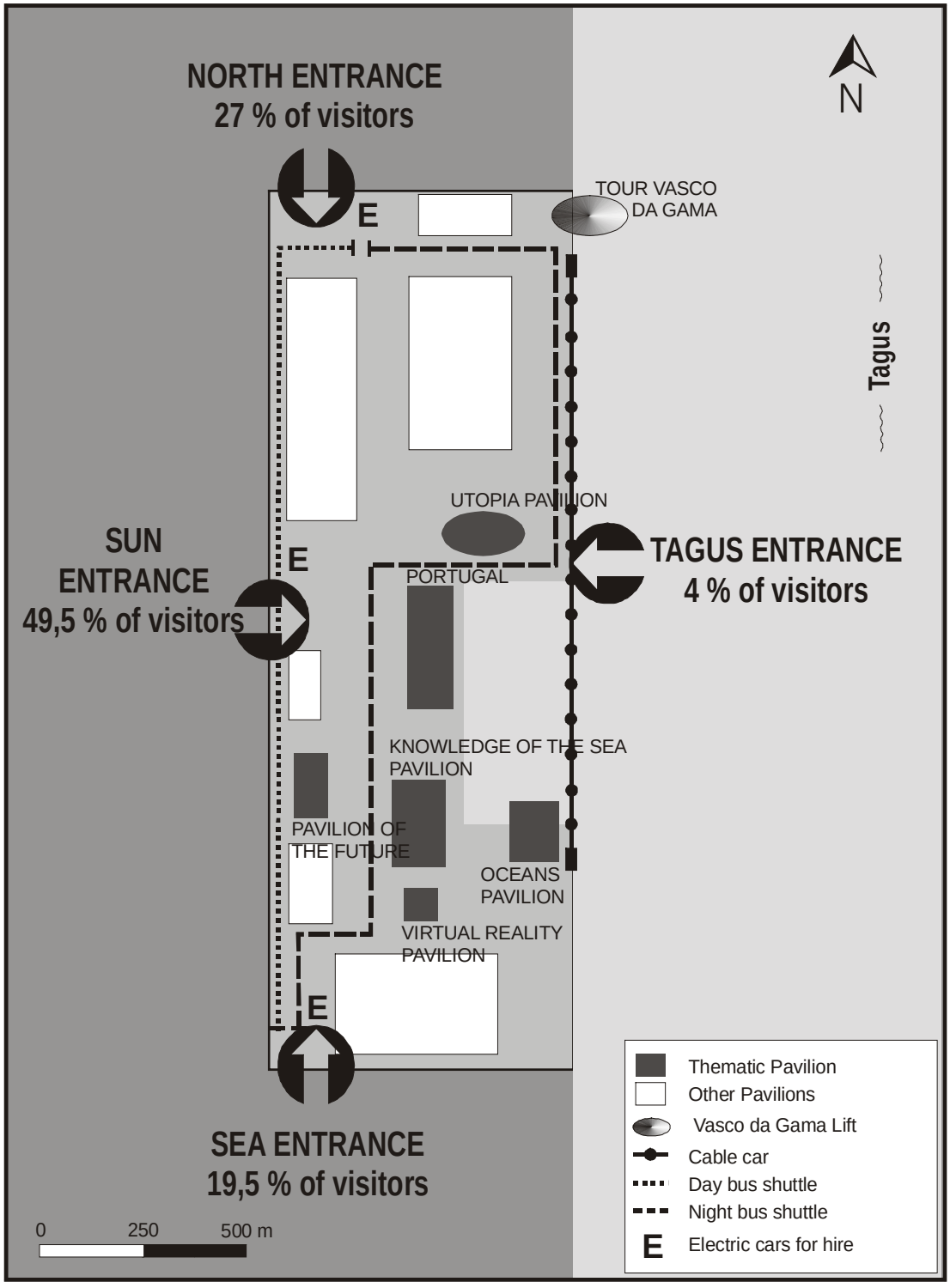


Figure 3. **Breakdown of visitors by entrance and transport mode**



4.2.2 Site access

There were four main entrances to the exhibition for the general public and two secondary gates for VIPs and deliveries. They were equipped with 68 automated ticket turnstiles for visitors and eleven turnstiles for other users.

The main entrances had different characteristics (see Figure 3):

- The Sun Entrance, located at the western end of the exhibition, was the main gate (49.5 per cent of visitors passed through it). It was the point of arrival for those using public transportation systems (subway, bus, rail);

- The North Entrance, the next busiest gate (accounting for 27 per cent of visitors), was used mainly by those arriving by car, with direct links to the northern motorway and Vasco da Gama Bridge. It had 15 300 parking spaces;

- The Sea Entrance, located to the south, was the third busiest gate (accounting for 19.5 per cent of visitors). It was not designed for visitors from any specific transport mode.

- The Tagus Entrance, the fourth and most attractive entrance, was exclusively for visitors arriving by passenger ferry.

4.2.3 Moving around inside the exhibition

The internal transportation system of EXPO 98 was designed so that, in theory, nobody would have to walk more than 300 metres (see Figure 3). Free buses plied between the northern and southern gates, stopping at the thematic pavilions. In addition, it was also possible to hire one- to three-seater electric vehicles for 25 euros per day; a cable car also operated along a 1.4 km stretch of the Tagus River and three lifts served the Vasco da Gama Panoramic Tower, named after the Portuguese navigator who discovered the sea route to the Indies in 1498.

The free bus service was a big success. On average, each visitor made 1.2 trips, reflecting the amount of ground that had to be covered in order to visit the whole site, which measured 2.5 km long by 750 m wide.

During the four months that the exhibition was on, 12 million visitors were carried by the shuttle buses, 3.3 million by the cable car (2.5 euros per trip) and almost one million used the lifts of the panoramic tower (also costing 2.5 euros). Only 30 000 electric vehicle rentals were recorded (see Table 2). On average, each visitor made 1.5 trips on the exhibition's mechanised transport system.

Apart from these transport modes, only emergency and authorised service vehicles were allowed to move about on the site at fixed times.

Table 2. **Expo 98 on-site transport use**

Transport mode	**Cost** (Euros)	**Use** (million trips/4 months)
Shuttle bus	Free	12.2
Lift	Adult 2.50 Free - adult over 65 and child under 15	0.9
Cable car	Adult - 2.50 Free - adult over 65 and child under 15	3.3
Electric vehicles	25.00	0.03

4.3. Transport supply and demand at EXPO 98

4.3.1 Public transport

The transport system was designed for a potential 15.6 million visitors, with roughly 40 per cent using private transport and 60 per cent using public transport, of which the subway and bus shared roughly 20 per cent.

The new subway line, "Linha do Oriente", which was purpose-built for the exhibition, ran between the refurbished Alameda and Oriente stations, every three minutes at peak times and every six minutes for the rest of the day (see Figure 1).

Oriente railway station, which comprised eight tracks and four platforms, handled suburban trains and regional, intercity and international trains - the latter from Madrid and Paris. However, most of the trains were suburban and regional. The international service consisted of only two trains a day and the intercity service did not exceed 14 trains a day.

The bus station, the third element of the Oriente station hub, was the terminal for the urban bus services put in place for EXPO, enhanced rerouted suburban and regional bus services and national and express bus services. It comprised 40 parking spaces for normal operation and 18 in reserve. Given that the subway network covers urban transport needs adequately, suburban and regional buses accounted for the bulk of bus transport -- 45 per cent of the 85 lines serving Oriente station.

By boat was another agreeable way of getting to EXPO 98 but more of a tourist attraction given the time it took -- often more than one hour -- and the fares charged (4 euros for the normal service and 21 euros for the tourist service). A new wharf was built for EXPO 98, used both by the normal ferry service from Almada/Cacilhas, Seixal, Barreiro and Montijo on the south bank of the Tagus River and the tourist service from Cascais, Praca do Comércio (central Lisbon) and the historical district of Belém. Being primarily for tourists, ferries were much less frequent than other modes.

4.3.2 Fairly good parking facilities

The total number of parking spaces built for EXPO 98 was 22 000, most of them (15 000, including 400 for coaches) in car parks located to the north of the site, with direct access to the northern motorway and the Vasco da Gama Bridge. The southern sector had about 3 300 spaces, including 300 for coaches. Next to Oriente station, 2 400 parking spaces were provided, most of them for deliveries and support service personnel, VIPs and official delegations (next to the Sun Entrance). There was another car park for visitors in this area, with 1 000 places (see Figure 2).

A flat-rate parking charge was applied for all the car parks (7.50 euros by day, 3.75 euros at night, after the exhibition pavilions had closed) (see Table 3). Coaches either paid by the hour or obtained a pass for the duration of the exhibition).

Type of vehicle	**Validity**	**Price (Euros)**
Car	7.30 a.m. to 4 p.m.	7.50
	7.30 p.m. to 4 a.m.	3.75
Coach	1 hour	5.00
	2 hours	11.25
	3 hours	18.75
	Over 3 hours	31.25
	Pass for the entire duration of the exhibition	3 000.00

4.3.3 Visitors quickly understood that it was more convenient to get to the exhibition by car

Survey findings show that almost 53 per cent of visitors used public transport to get to EXPO 98 while 43 per cent preferred to go by car. As very few people use bicycles in Lisbon, the other 4 per cent went on foot or by taxi.

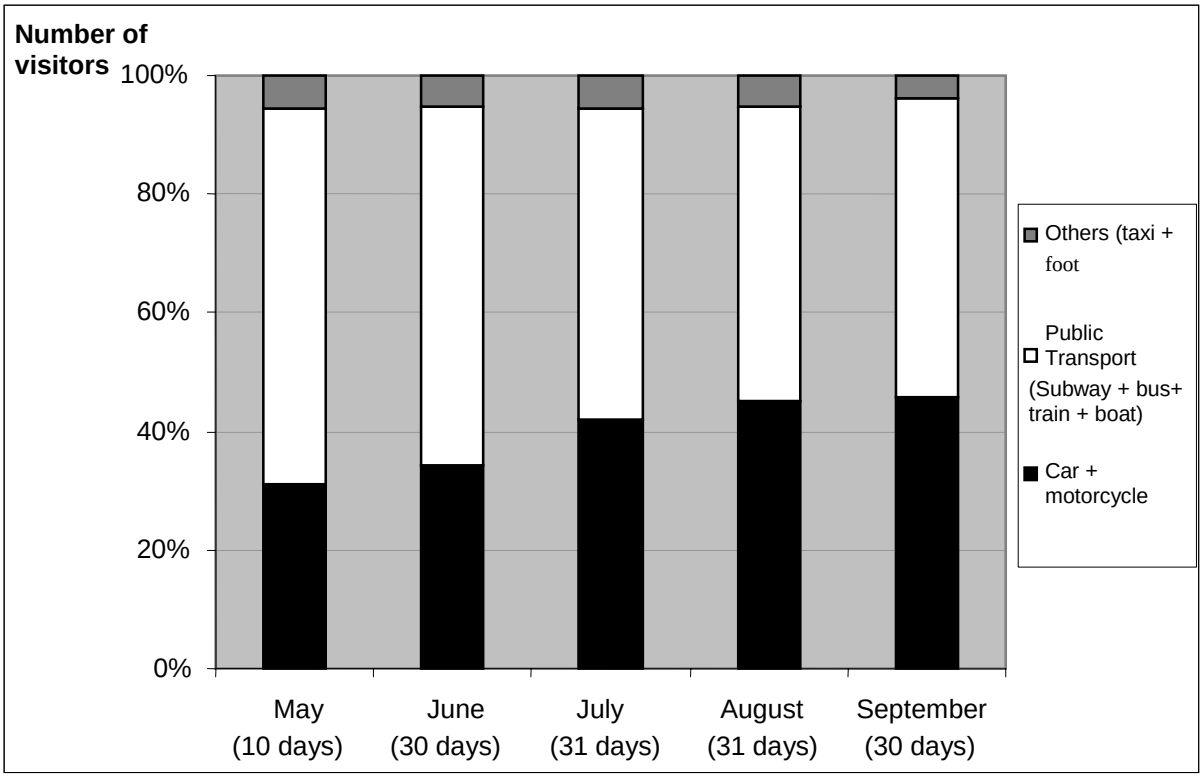
However, this apparent preference for public transport[4] masks a paradox: as attendance at EXPO 98 rose, the modal share of the car rose and public transport use gradually fell off (see Table 4 and Figure 4). Between the start of the exhibition and July, public transport demand was markedly higher than car use. From mid-July, the modal shares were roughly identical. Thereafter and to the end of the exhibition, the share of car use relative to that of public transport rose.

Table 4. **Monthly number of visitors and breakdown by transport mode**

	No. of days	No. of visitors	Monthly breakdown by transport mode						
			Car + motorcycle	***Subway***	***Bus***	***Train***	***Taxi***	***Boat***	***Foot***
May	10	320 000	100 000	110 000	60 000	25 000	8 000	7 000	10 000
June	30	1 600 000	550 000	430 000	390 000	110 000	40 000	34 000	46 000
July	31	1 900 000	800 000	450 000	340 000	170 000	51 000	34 000	55 000
August	31	2 460 000	1 110 000	540 000	350 000	280 000	67 000	55 000	58 000
Sept.	30	3 720 000	1 710 000	880 000	510 000	405 000	74 000	70 000	71 000
Total	132	10 000 000	4 270 000	1 650 000	1 650 000	990 000	240 000	200 000	240 000
%		100	42.7	24.1	16.5	9.9	2.4	2.0	2.4

Source: Parque EXPO 98.

Figure 4. **Monthly modal breakdown of visitors**



This trend was reflected in car park occupancy. During the first months of EXPO 98, average daily occupancy did not exceed 1 000 vehicles. Thereafter, it rose steadily, to 14 000 vehicles during the closing month (see Figure 5). But as the total capacity was 22 000, the car parks were full only during the last two days of the exhibition. As regards individual transport, the only positive aspect to

be noted was the high average rate of occupancy by private cars -- around three times that normally observed in Lisbon (see Table 6).

Figure 5. **Car park use and occupancy rate**

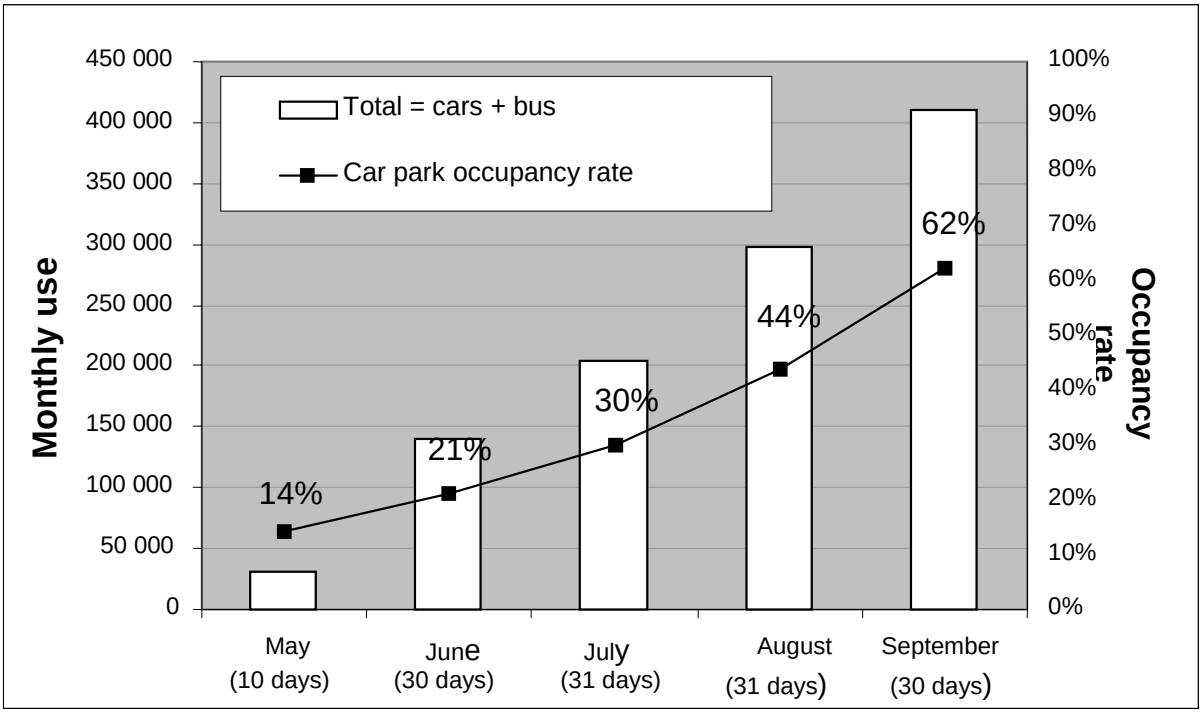


Table 5. **Transport supply and demand during EXPO 98**

Transport		Maximum capacity	No. passengers (millions)	Average occupancy rate
Car		12.7	4.27	34
Scheduled public transport	**Bus**	4.5	1.65	37
	Subway	27.0	2.41	9
	Suburban rail	3.0	0.99	5 (33)*
	Other rail	17.5		
	Boat	3.5	0.20	6
Tourist transport	**Coach**	0.1	0.02	22

* Scheduled public transport + tourist.
** Suburban trains only, given that the number of visitors arriving by other trains was not significant.

In contrast, the remarkable system of public transport put in place for the exhibition was underutilised. Only the bus had an average rate of utilisation close to that of the car parks (37 per cent). The average occupancy rate of all the other scheduled transport modes did not attain 10 per cent (see Table 5).

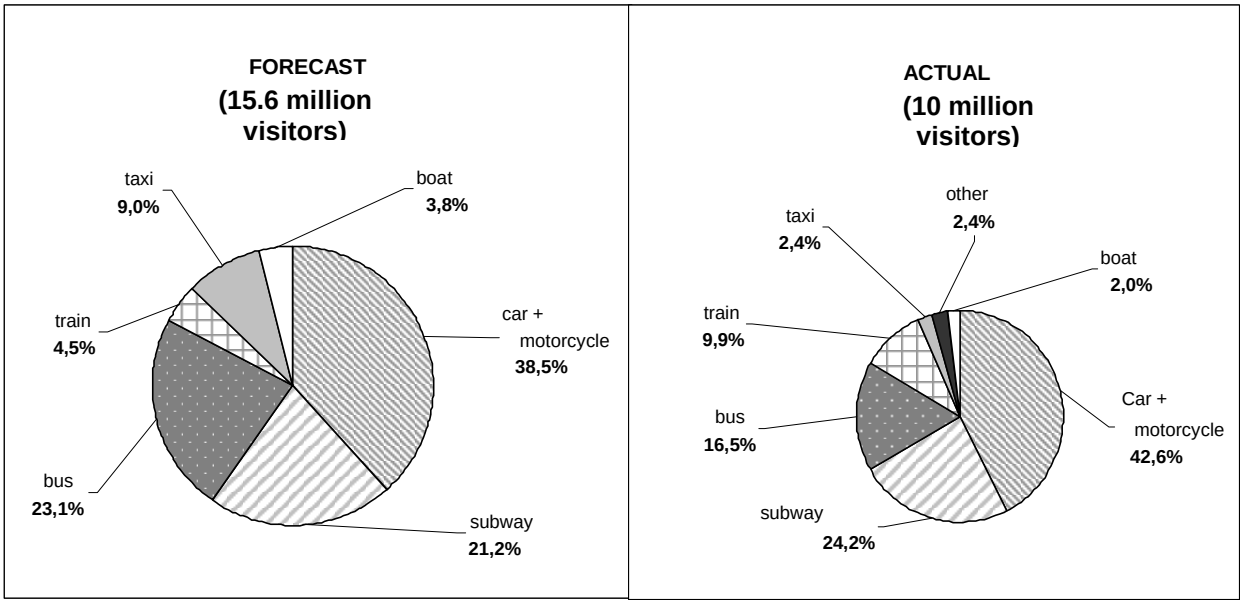
Table 6. **Car occupancy rate**

	Number of visitors arriving by car at EXPO 98	**Approximate number of cars in car parks**	**Approximate car occupancy rate (persons/car)**
May (10 days)	100 000	30 000	3.3
June (30 days)	550 000	135 000	4.1
July (31 days)	800 000	200 000	4.0
August (31 days)	1 110 000	295 000	3.8
September (30 days)	1 710 000	405 000	4.2
Total	4 270 000	1 065 000	**Average rate = 4.0**

Source: Parque EXPO 98.

These findings are not surprising given the prices of the various public transport modes and the ease of access by private car. Users quickly realised that access roads were not all congested and that there were always parking spaces available in the car parks. This was the biggest incentive to using the car. Also, for three-quarters of the population in the Lisbon area, it was more expensive for a family to use public transport than to park at the exhibition. Furthermore, there was no all-in ticket combining admission to the exhibition with public transport[5]. This may explain to a large extent the errors in the estimates of the modal split (see Figure 6). In the circumstances, only the subway was a more attractive mode of transport than the car. The fact that the subway fare was the same all day long and valid for the entire network[6], the quality of service and the novelty effect of a new line with well-designed, attractive stations, also explain the public's preference for the subway.

Figure 6. **Modal breakdown: 1997 forecast and actual**



Source: Parque EXPO 98

4.4. Four estimation errors

One of the main difficulties in planning the transport system for a large event such as a world fair is estimating the number of visitors, the rate of attendance and the modal split. These estimates are crucial since the transport plan and the sizing of permanent and temporary access facilities, in particular public transport facilities, will be based on them.

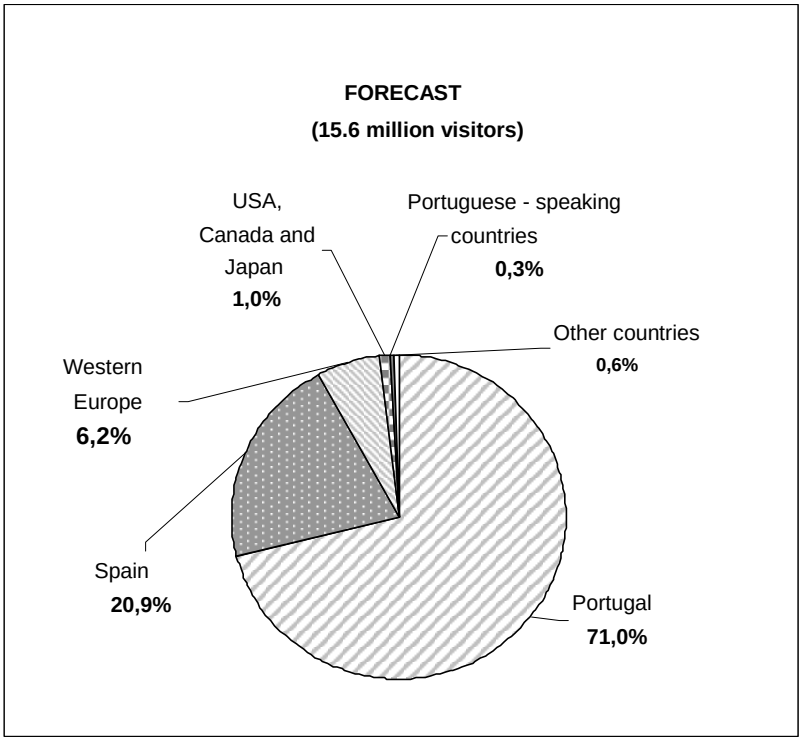
4.4.1 The number of visitors was largely over-estimated

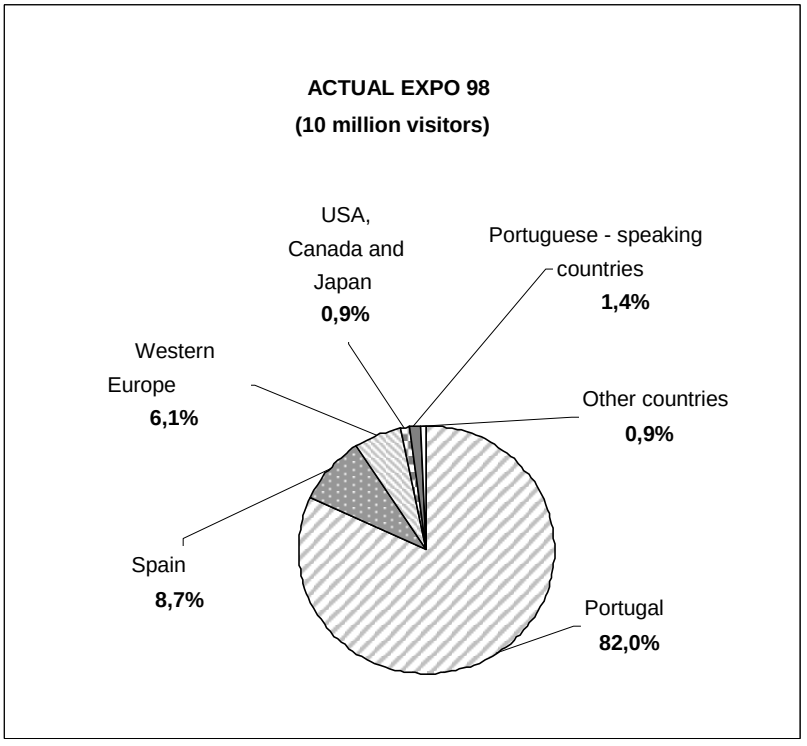
The main estimation error related to the number of visitors: instead of an estimated 15.6 million, it totalled 10 million. Contrary to the organisers' expectations, the exhibition attracted more national and regional visitors than international visitors.

Comparison of the estimates with actual figures shows that the number of foreign visitors, especially from Spain, was overestimated, as was the number of Portuguese visitors from outside the Lisbon area (see Figure 7). In fact, 80 per cent of visitors were from Portugal, of which 70 per cent from Lisbon and the surrounding region. The number of visitors from outside the region was grossly overestimated -- by almost 4 million. The actual number of Spanish visitors was only a quarter of that estimated. These two large discrepancies alone account for almost all the shortfall of 5.6 million visitors.

One of the explanations for the huge difference between the estimated and actual number of visitors was the high price of tickets for the exhibition -- especially for families -- and particularly the absence of all-in tickets combining admission to the exhibition and transport.

Figure 7. **Origin of visitors: 1997 forecast and actual**

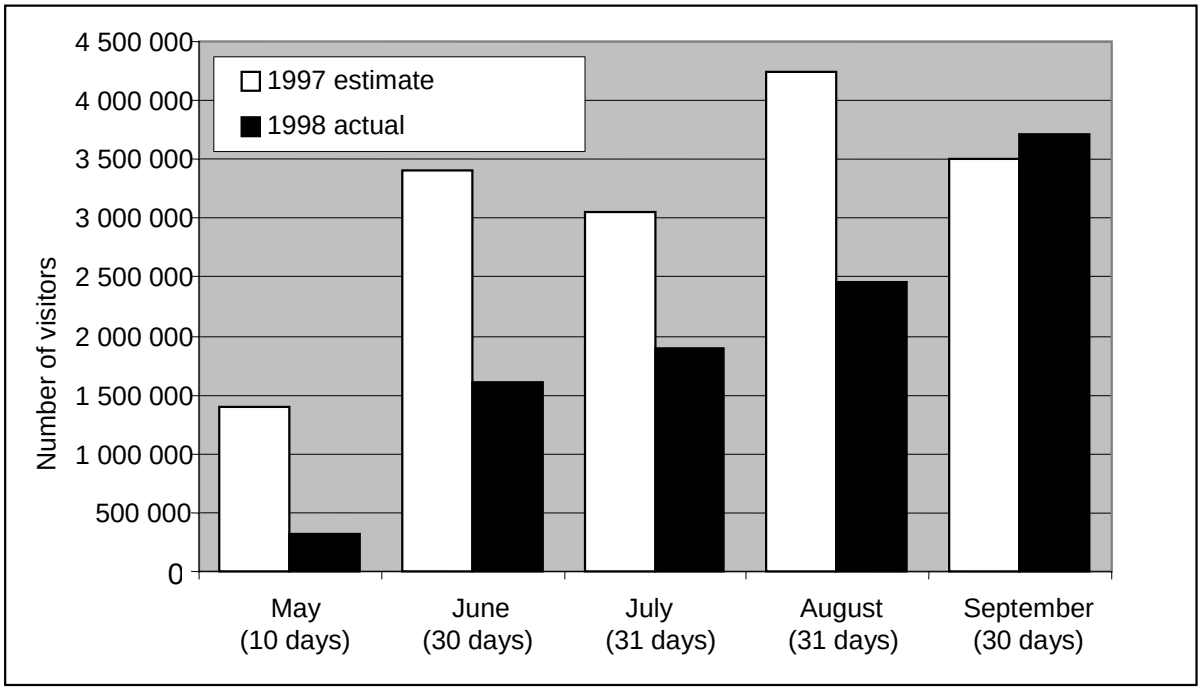




4.4.2 The number of visitors rose as the exhibition went on

The rate of attendance was also mis-estimated. During the first three months of the exhibition, the number of visitors was well below the official estimate. The distribution of visitors during the four months the exhibition lasted was more uneven than predicted, with a surge of visitors during the last month, the only month for which the estimates proved correct. Contrary to expectations, the Portuguese did not change their holiday plans because of the exhibition, most of them continuing to go away in August as usual (see Figure 8). As projected, the busiest days were Friday and Saturday and days on which there were concerts.

Figure 8. **Monthly number of visitors: comparison of 1997 forecasts and 1998 actual numbers**



Source : Parque EXPO '98.

Analysis of the hourly distribution of visitors shows that about 58 per cent arrived between 9 a.m. and 12 a.m., with a peak between 10 a.m. and 11 a.m. and not between 8 a.m. and 10 a.m. as had been expected. The busiest time was between 3 p.m. and 6 p.m., three or four hours earlier than projected: the organisers had expected the busiest time to be around 8 p.m. on account of the half-price night ticket available from that time.

4.4.3 Undersized entrances

Even though the actual number of visitors was well below estimates, the entrances proved to be undersized. The western entrance -- for visitors arriving by public transport -- was congested most of the time, while the river and sea entrances handled very modest flows. The queues at entrances also revealed organisational shortcomings. The inadequate number of turnstiles per entrance -- well below that required -- and the over-sophisticated access control system were largely responsible for the long

queues. The system, which apparently had sufficient capacity, experienced mechanical failures and proved difficult to use.

Finally, the most annoying thing for visitors was the extraordinary long queues for the thematic pavilions and some national pavilions. Of very high quality, the thematic pavilions gave the exhibition its whole meaning. They were thus the most interesting and those that attracted the most visitors. It was very annoying for visitors to have to queue for at least an hour and a half to get into most of the pavilions, especially for those who had already had to queue at the entrance and had paid for tickets that were very expensive for most Portuguese families. Fortunately, the actual number of visitors was well below expectations, given that the queues formed with an average daily number of visitors of 76 000, whereas the exhibition had been designed for 118 000 visitors per day. It seems very likely that the organisers of EXPO 98 did not draw all the necessary conclusions from their own estimates!

4.4.4 Excellent but under-utilised public transport facilities

EXPO 98's organisers made a considerable effort to ensure that it would be served by an efficient public transport system: construction of a new subway line, Oriente Station and a new river terminal, upgrading of the existing service and creation of public transport services. However, overall, the system was not exploited to the full.

Fares that were unattractive and not competitive with transport by car and the absence of an all-in ticket combining admission to EXPO 98 with access to the public transport system, which served three-quarters of the potential visitors, were among the main reasons for the public's apparent indifference towards the efficient public transport facilities that had been put in place for the exhibition.

This under-utilisation of public transport resulted in a paradox: as the number of visitors to EXPO 98 rose, the public transport system steadily lost market share to the car (see Figure 4).

5. A FEW LESSONS THAT CAN BE DRAWN FROM THE LISBON EXPERIENCE

5.1. A crucial connection between modal split and parking policy

Notwithstanding their stated intention to encourage visitors to use public transport to get to the exhibition, the organisers built vast car parks. The capacity of these car parks -- for some 20 000 cars -- was roughly twice or even three times the normal capacity for this kind of temporary event.

The availability of a very large number of parking spaces inevitably encouraged car use, all the more in that parking charges were very low (15 per cent of the admission price for a family), so that it was very cost-effective and even cheaper than using public transport for a family from outside Lisbon, i.e. three-quarters of the population of the metropolitan region, to use their car. In contrast, coaches

were penalised by very high parking charges, whereas at many other events they can park free of charge.

Leaving aside the fact that money was spent without benefit to the exhibition or to the subsequent development of the site, all that these immense parking facilities did was to encourage private car use. The upshot is well known: as attendance rose so did car use, but the car parks were never full apart from during the last two days -- out of the 132 days that the exhibition ran.

5.2. Operational monitoring is essential

Very large disparities were observed between the transport facilities planned for the exhibition and actual demand. All the estimates of number of visitors, their geographical origin and modal split were made before car parking prices had been decided, even though it is well known that parking prices are one of the main means of altering the modal split in favour of public transport.

Against such a background, the usual uncertainties surrounding transport demand for long exceptional public events such as EXPO 98 are magnified considerably. The consequences for the sizing of the transport facilities are enormous, increasing the probability of a very large mismatch between supply and actual demand.

Only a process of on-going monitoring can ensure that supply and demand are adjusted to one another as the event takes place.

Demand-side measures were also completely lacking. The numerous available channels of information and media interest were not exploited to shape transport demand. Those responsible for organising transport for the exhibition did not seek to introduce innovations, such as a ticket valid for the whole network, an all-in ticket combining admission to the exhibition with transport or park-and-ride facilities. Such measures could have helped to balance the modal split as data became available.

In the absence of a real-time monitoring system, adjustments to transport supply were decided solely by each operator or manager (of the car parks in particular), each of whom had his own priorities, which he followed regardless of the overall functioning of the system or the public interest.

5.3. A new direction after EXPO 98?

Expo 98 brought sweeping changes to the city of Lisbon. The site of the exhibition, now called the *Parque das Nacões,* is a high-quality urban space providing services, leisure and cultural facilities for the population. In addition, the exhibition improved access to a large area along the Tagus river and gave a new impetus to initiatives to pedestrianise its banks. The enormous number of people now to be found in the area during the weekend attests to the success of these initiatives.

On the other hand, the occasion of such an event was not used to try out new approaches to urban transport management and especially a sustainable mobility policy. The transport policy adopted was confined to meeting immediate needs and wasted a considerable amount of public money. Enormous car parks which today are completely empty, a colossal rail station with hardly any traffic and a subway line[7] which transports only some two thousand passengers at peak times, stand witness to this. In truth, transport policy has not changed: planning is not based on real transport needs and there is no integrated mobility strategy.

NOTES

1. Among others: the Olympic Games (Summer and Winter); the Soccer World Cup; universal exhibitions; major themed events (Frankfurt Book Fair or the Paris and Geneva Car Shows, for example); major exhibitions and national events; international and world festivals (XV World Youth Day 2000 in Rome, for example).

2. For events of similar size and duration.

3. Between May and September 1998, the Olivais docklands area at the eastern end of Lisbon was completely rehabilitated; a run-down former industrial suburb was transformed into a showcase of modernity and progress -- the new face that the Portuguese capital had decided to show the world. The last major universal exhibition of the 20th century was held there. See "Lisbonne 1998 - Une banlieue devenue phare" by Carlos Gotlieb in the March-April 1999 issue of *Diagonal*, Paris, on the "lasting effects of the ephemeral".

4. Out of the 132 days that EXPO 98 lasted, car use exceeded public transport use only on 18 of them.

5. There were nine types of day tickets (9 a.m. to 3 a.m.) and three types of night-tickets (8 p.m. to 3 a.m.), including half-price tickets for children under 15 and seniors over 65. The standard adult day ticket cost 25 euros and was used by 56 per cent of paying visitors. The three-day ticket (62 euros, 31 euros with the reduction) was used by 24.5 per cent of visitors, while night tickets were used by 15.5 per cent.

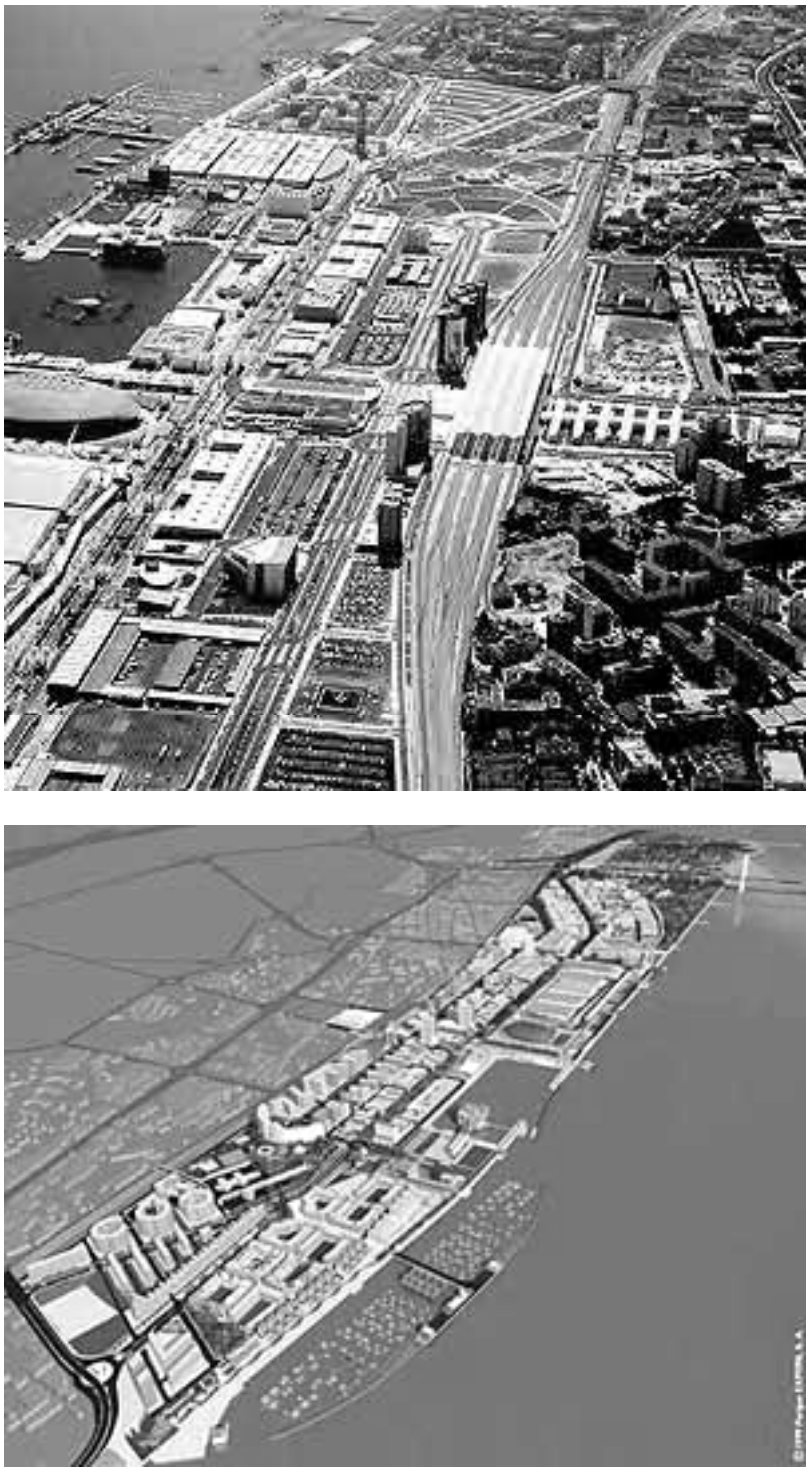
6. In contrast, the buses operated day and night fares which varied according to the distance travelled. The case of the fares charged by the CARRIS bus company was typical: the night fare doubled from 2 a.m. but there was no other transport available to visitors after that time.

7. Which cost nearly 75 million euros per km.

ANNEX

Photo 1. **Olivais area before EXPO 98**

Photo 2. **Nations Park**



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MEGA SPORTS EVENT TRANSPORTATION AND MAIN MOBILITY MANAGEMENT ISSUES

SUMMARY

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1. MEGA EVENTS: MAIN TRANSPORTATION ISSUES

Because of their ephemeral nature (often of short duration and/or a unique mega event in a given site or metropolis), the Olympic Games, the World Cup and other very large events use existing, upgraded and new transport infrastructure that has not been conceived to absorb the intense and highly polarised traffic flows generated by such events or by the simultaneous superposition of multi-site events.

Exceptional transport and mobility management schemes are developed, experimented and applied to cope with these spatial and highly-peaked concentrations of spectator traffic flows in addition to an event's logistical support traffic and to general metropolitan or urban-based traffic loads.

These mega events can be considered as "real scale" laboratories of alternate mobility patterns and travel behaviour, whose monitoring is of significant interest to assess measures and policies which could be partly implemented for day-to-day transport and traffic operations.

Transportation strategy, organisation, management and costs grow exponentially with the magnitude and complexity of very large events. The basic issues concerning large-scale event transportation are mostly characterised by:

- **the unusual magnitude and volume of spectators**, activities, visitors and logistical flows, directly linked to the event's attractiveness as well as to its organisation and logistical delivery;

- **the geographical and spatial concentration of traffic flows** and parking requirements on specific venues, venue clusters and other facilities on fixed or temporary sites;

- **traffic flow time-concentrations due to event scheduling** and their terminal requirements according to predetermined programmes, linked to each event or series of consecutive events;

- **the superposition of various categories of mega-event transport and traffic flows** on normal urban or metropolitan traffic in often already congested areas;

- **the development of innovative temporary transport and traffic management as well as ticketing schemes** to deal with the "exceptional nature and magnitude" of mega-event traffic flows and their specific mobility and accessibility requirements;

- **the definition of appropriate agreements between mega-event organisers and public authorities** in charge of transport operations and security at the local and regional levels. The determination and procurement of adequate supplemental public and/or private transport services, transport management priorities and ad hoc mega-event signage;

- **the systematic development of security schemes** for crowd control and specific traffic management, both "Front of House" (FOH: general public access) and "Back of House" (BOH: all mega-event logistical, vehicular and personal support systems).

2. MEGA-EVENT TRANSPORT : A WIDE SPECTRUM AND VARIETY OF SITUATIONS

A general presentation of the most distinctive aspects of large event typology illustrates the very wide spectrum of events and situations involved and their transportation requirements.

2.1. Mega-event content and growth

In a highly mobile society, despite or because of media and information technology developments, it appears that very large events are growing in size, variety and frequency. Mega or very large events can be found in all kinds of domains: cultural, commercial, single or multi-sports competitions, tournaments, fairs of all kinds, exhibits, fora, festivals, conferences, congresses, etc.

In the sports sector alone, there are more than three hundred large-scale events per year (IOC Sports Department 2000 listing). Close to 75 per cent of all world championships take place in Europe. More than 140 sports are listed in the www.sportcal.com site, which announces 25 000 sports events until 2011.

Mega events also have a tendency to grow in overall size as well as in technological and organisational sophistication. From 203 events in Moscow in 1980, the Summer Olympic Games have grown to 300 events for the Sydney 2000 Games. The Winter Games have experienced an even faster growth, doubling from 39 events in Sarajevo in 1984 to 78 events at the recent Salt Lake City 2002 Olympic Winter Games. As indicated in the concluding remarks of this paper, the growth in the number of Olympic events has a considerable knock-on effect on most support and logistical areas such as transportation, accommodation needs, technology, security and media coverage, to mention but a few.

2.2. Event size and capacity

Event size or magnitude in terms of total spectator drawing-power is a highly relative "measurement". It has to be associated with event duration, types of events or multi-events and their capacity (indoor fixed capacity venues, open-air events, races, rallies, etc.) and their local environment. A 30 000 spectator event in a community of 15 000 people may have larger impacts than a daily spectator crowd of half a million in a metropolitan area of 4 million inhabitants.

Spectator capacities are also increasing. With a designed capacity of 95 000 seats, the new Stadium Australia, which was the focal point of the Sydney Olympic Games, was temporarily expanded to accommodate 115 000 seats during the Games.

In terms of transport loads and burdens, another issue is the tendency of events "clustering" in the same area, within the same park. This can only prove effective if high transport capacities, in particular in rail transport, are available.

2.3. Logistics

Often underestimated is the importance of the logistical and support activities for large events (security and safety, information and communications technologies, vending, catering, general maintenance, cleaning, waste removal, etc.). These generate traffic demands which amount to between a fifth and a third of spectator and visitor flows.

Logistical transportation requirements are generally more demanding in terms of scheduling and reliability than spectator transport. Athletes and all technical support teams and equipment must be on hand well before the event is scheduled to begin.

These traffic flows, which use Back-of-House access, must be carefully screened and protected in terms of security. All persons and vehicles must be accredited. In Sydney, for about 10 500 athletes, there were about 180 000 accredited persons. This ratio of close to 20 to 1 poses extraordinarily tough problems for transport as well as other logistical problems. It is certainly a key element which will limit the growth of mega events in the future.

2.4. Duration and schedules

Large events cover the whole spectrum of time durations, from very short "single day" or "long week-end" events to international exhibitions running from four to six months.

Many large sporting events cover a two-week period, such as the Winter or Summer Olympics. Transportation requirements vary considerably according to the sports programme. A succession of average-load days may be followed by days with very heavy peak traffic demands (semi-finals and finals, for example). The scheduling of single events in a permanent infrastructure obviously does not compare with multi-site, multi-sports scheduling, with variable potential crowd attendance and differing transport requirements.

2.5. Periodicity

Most very large events vary in periodicity from one year (annual automobile shows or races always using the same facilities and in the same city) to four years or more. The Summer and Winter Olympic Games have an alternating four-year periodicity in changing host cities and continents.

Transportation concepts and issues differ totally if large events are organised year after year at the same location or if a new, ad hoc transport strategy has to be developed from scratch for a specific event or multi-event in a new urban and geographical context.

2.6. Mono- or multi-site events

The spatial structure of large events has obviously considerable implications on transportation strategies and operations.

A mono-site event is handled as a hub-and-spoke concept, with traffic flows growing almost linearly from the exterior to the centre of the system. Simultaneous, large, multi-site events place much tougher requirements on urban or metropolitan-wide transport systems, mobility management and delivery, depending on the geography of competition and non-competition sites in relation to available transport systems.

Mega events like the Olympics, with 28 sports, obviously have multi-competition sites but must also rely on multi- non-competition sites for media operations, technical facilities and accommodation for all segments of the Olympic family. All these functions require ad hoc transport subsystems which have to be planned, procured, tested and delivered on time.

2.7. Mono- or multi-scheduling

Here also, large events may differ considerably. Some have similar day-to-day programming, while others are characterised by multi-events, multi-sports, multi-sites and multi-schedules, linked to a specific programme structure (from semi-quarter finals to finals in certain sports).

During the Summer Olympics, for example, specific disciplines have one, two or even three sessions per day (morning, afternoon and evening). Transportation requirements obviously grow with the schedule spread, variety and complexity. But transport equipment and drivers can be used more efficiently and frequently than during the Winter Games where, due to the one mountain-event per day scheduling, equipment is poorly used and transportation costs are proportionally two or three times higher than for the Summer Games.

Another issue is the case of open-air events which can often be significantly affected by weather conditions (rain, snow, wind, etc.) and require transport programme changes, rescheduling or postponements.

2.8. Infrastructure type and overlay

Large-scale events taking place in permanent infrastructure, such as stadiums, exhibition centres and other existing facilities with pre-determined spectator capacities, have a tested experience of traffic accessibility and parking management.

On the other hand, accessibility and traffic management are more difficult to plan and deliver to new venue facilities, expanded existing facilities and temporary facilities because of lack of previous experience. Under these conditions, test events, which duplicate as closely as possible a venue's planned operations, are almost mandatory.

2.9. The environmental context

Transport issues and solutions for large-scale events are highly dependent on a venue's urban, suburban or rural environments. Accessibility and terminal logistics are affected by land-use density and the transport systems available.

Venues in a dense urban environment with high-capacity public transport facilities have very little in common with venues in low-density suburban or rural locations. In both cases, supplementary transport services will have to be planned and operated in relation to the specific drawing-power and needs of each venue.

In Olympic conditions, venues or venue clusters located in high-density urban environments require high-capacity transport systems, generally heavy rail (one or more subway and/or suburban rail lines, sometimes complemented by light rail). Others, in medium-density suburban settings, will be served by adequate multi-mode transport access systems, using temporary shuttle services to and from high-capacity subway or suburban rail stations.

3. MULTI-SPORTS EVENT TRANSPORTATION: ORGANISATION, STRATEGIES AND MANAGEMENT

An overview of the main transportation system components and interactions in support of mega and large sporting events is illustrated by Figure 1. This graph is structured around interacting themes closely linking sports organisation to relevant transport functions. Eight key aspects and system components are mentioned below and developed thereafter:

- Transport as part of the overall sports organisation structure;
- Sports programme and schedule;
- The sports venue's spatial distribution and transportation context;
- The Games transportation system's main components;
- Transportation interactions with other organisational and logistical aspects;
- Transport organisation during the Games;
- Transport testing, risk analysis, contingency planning, monitoring, Transfer of Knowledge (TOK) and legacy: parts of these elements intervene before or during the Games and some after, such as the Games' legacy;
- Transport and traffic delivery for all client groups.

3.1. Transport as part of the overall sports organisation structure

Transport is only one support and logistical component of the Games' or other large sporting event's organisational framework **(**Figure 1, box 1**)**. But it is a crucial sector, having multiple interactions with almost all other domains, from ticketing to accreditation and security, through general traffic management to venue accessibility and selected parking provisions.

Transport is also a highly visible and sensitive sector, where errors, mis-routings, exceptional delays and accidents generally produce very quick and bad publicity. In mega-event conditions, it is also one of the most expensive operating items, in the same order of magnitude as technology, accommodation and security.

By relying heavily on the main metropolitan, urban or regional transport infrastructure and on public transport services, an event's transport organisation must deal directly with the public authorities for its strategic planning, its operations scheme and its traffic management command, control and communications during the Games.

Each mega event and each host city or region is a specific case. The transport organisation set-up varies tremendously, from an almost full public sector, ad hoc authority (like ORTA, the Sydney Olympic Road and Transport Authority, cf. Chappelet, 2001a and 2000) to tailor-made, private/public partnership arrangements, where the mega-event organiser has a heavier role and subcontracts operations to a variety of private and public entities.

3.2. Sports programme and schedules

This is one of the most basic inputs of the transportation task: how many transport users, from where to where, when, with what priorities and how? To a large extent, sports schedules determine transport demand and services required for competition and non-competition venues, such as the athletes' village, media centres, airport arrivals and departures, accreditation facilities, etc. **(**Figure 1, box 2).

Transport scheduling and service deliveries for multi-sports and multi-site events vary from day to day, as shown by Figure 2.

An essential component of the preparation and management of the Games is event facility and transport testing, which should occur up to one year prior to the Games. Immediately before and during the Games, special transport services are required for team movements to training sites.

3.3. The sports venue's spatial distribution and transportation context

Multi-sport and multi-site Games rely on dispersed facilities, directly or indirectly connected to the main components of the transport system, such as motorways and main arterial roads, public rail transport and existing or special bus services. Transport facilities and services must obviously link all competition and non-competition venues **(**Figure 1, box 3**).**

Distances, services offered and general traffic conditions on the urban transport system will dictate travel times to and from competition venues. Travel time reliability is a most important component of the Games' functioning and image.

Traffic reductions in certain areas close to mega-event venues are often necessary. Traffic Demand Management schemes (TDM) are implemented and have proved surprisingly effective in Nagano (1988 Winter Games) and Sydney (2000 Summer Games).

3.4. Games transportation: main system components

The larger the event in terms of space, duration, number of sports, number of sites and expected spectator drawing-power (ticket sales), the heavier the transport burden, as shown by the multiple transport parameters indicated in Figure 1, box 4. They range from transport infrastructure developments, which can be very extensive, such as will be the case for Athens 2004, to transport service procurement and special traffic management procedures during the Games with adequate enforcement and monitoring.

Mega-event transport investment and operating costs are often a major issue. First estimated at US$15 million, the transport operating costs for the Sydney Games ended up about twelve times higher, at around US$180 million. Transport costs for the Salt Lake City 2002 Games will reach around US$300 million, about the same as for technology and security, which had to be substantially increased after the events of 11th September.

Transport networking between all parts of the metropolitan area and competition and non-competition venues, new transport infrastructure and provision for supplementary shuttle bus services, with dedicated priority lanes, are major components of the Games' (or any sports event's) Strategic Transport Master Plan.

Transport integration, accessibility and terminal facilities at sports venues are critical components of the system. Strict security provision, ticket and accreditation controls, the movement of checked goods and supplies and the separation of various client groups all lead to a highly sophisticated physical and managerial venue set up. Figure 3 illustrates the standard FOH/BOH arrangement common to most large sporting events.

A transport system's information and communications are key to successful mega-event transportation. Since transport services and traffic operations are significantly modified in large sectors of the metropolitan area affected by the mega event, a considerable amount of effort must be allotted to accurate communication of the "specific daily traffic scheme" to the media and the general public.

Sydney used sports or other test events to develop new traffic information and communications schemes during the two years preceding the Games. This helped to acquaint the public and the media with the future transport and traffic conditions during the Olympics.

3.5. Transportation interactions with other organisational and logistical aspects

As previously indicated, transportation accessibility and mobility aspects are linked to most other organisational aspects of the Games' and other sporting events' operations. Security, technology, accreditation, the media, ticketing, accommodation and the environment are often in close interaction with the transport organisation and its operations, as indicated in Figure 1, box 5.

For example, ticketing and transportation at the competition venue can be closely linked. As shown by the case of Sydney, with Olympic tickets including 24-hour free public transport, the pressure on automobile access and environmental conditions was strongly reduced.

3.6. Transport organisation during the Games

The organisation in charge, often during two to four years, of the strategic transport planning, operational developments and traffic management during the Games must be substantially reorganised and streamlined to become a Games transport delivery unit **(**Figure 1, box 6).

3.7. Transport testing, risk analysis, contingency, monitoring and legacy

The ever-growing complexity of mega sports events like the Olympic Games (Commonwealth Games, Football World Cup and many others) leads organisers to test new facilities as well as refitted facilities far in advance of large events. Since Barcelona, all Olympic venues must be tested in principle one year prior to the Games **(**Figure 1, box 7).

Training exercises and simulations are required with other parties involved, such as the police, airport services and all agencies dealing with transport sub-systems, including emergency services. Such exercises are conducted, on a reduced scale, during test events. Analysing transport functioning, incidents and accidents and taking appropriate action is an essential task, which must be followed by appropriate communication to the public and the media. Ticketing, accreditation, venue management and communications procedures are integrated in these tests.

More work is being conducted in risk analysis (Chappelet, 2001b) and contingency planning in sensitive domains, such as technology, security, transport, health hazards, etc. Increasing efforts are being made to systematically monitor all aspects of operations during the Games. The aim is to build up an efficient Transfer of Knowledge (TOK) process, which will be directly useful for further Games organisation teams (IOC-TOK, 2000a and 2000b).

The legacy left by a mega event such as the Olympic Games is a very major issue. Much of the necessary sports, cultural and transport infrastructure, which is greatly needed for metropolitan or urban area development, is generally "produced" much faster because of the Games' strict deadlines. Some very specific sports equipment, required by the Games' programme but not really useful for a given host city, should be built as temporary structures only (*Diagonal*, 1999).

3.8. Transport and traffic delivery for all client groups

The most important transportation goal is the safe, convenient and convivial movement of all client groups to and from all venues, as shown in the central part of Figure 1, box 8.

Each mega event's or large sporting event's organisation has its own set of policies and priorities, in particular in relation to transport and accessibility for the various constituent groups. In the case of Sydney, eight transport categories were defined, as explained and illustrated in section 4.3. of the next chapter.

4. EXCEPTIONAL MOBILITY MANAGEMENT: THE SYDNEY 2000 OLYMPIC GAMES

The Sydney 2000 Olympics provide a particularly interesting case of a mega-scale sporting event with worldwide media visibility. Huge human, managerial, technical, technological and financial resources were involved, as indicated by Figure 4: "Sydney 2000 Olympic Games in numbers". By all accounts, the Sydney 2000 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, *inter alia*, sports delivery, transport, security and communications (SOCOG-IOC Official Report, 2002 and ATHOC, 2001).

The following case study focuses on Sydney 2000's transportation and mobility management. Transport is generally considered to be one of the toughest services to get right, due to the multiple client groups and stakeholders: athletes, the Olympic family, ticketed spectators, visitors, various categories of workforce, volunteers and logistical functions, all media personnel and 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.

4.1. Sydney 2000 Olympic Games' spatial structure

The first Olympic Games of the Third Millenium took place from 15 September to 1 October 2000 in Sydney. The 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 were planned and organised along a 75-km 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 5, which is a schematic map of the Games. This illustrates the geographical layout of Olympic competition venue clusters, of other dispersed single venues and of main, non-competition venue sites which are very large traffic generators, like the Olympic Village, the Main Press Centre (MPC), the International Broadcasting Centre (IBC) , the Media Village, etc.

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's accommodation outside the Olympic and media villages. The primary transport interchange node of the metropolitan transport system, Sydney CBD is directly linked to Sydney Airport's international and domestic terminals by new railway and motorway sections, inaugurated only a few months before the Games.

4.2. Concentration of Olympic activities and transport at Sydney Olympic Park (SOP)

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 saw 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 sporting disciplines;
- the brand new, 115 000-seat Olympic Stadium of Australia for the opening and closing ceremonies and for most athletics competitions;
- two media centres with more than 20 000 accredited personnel: the International Broadcasting Centre (IBC) and the Main Press Centre (MPC).

Adjoining the Olympic Park was the Olympic Village, with the capacity for 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, Olympic Park Station, was inaugurated almost thirty months before the Games. The design capacity of the station was 40 000-45 000 passengers per direction per hour. A two-kilometre, one-way, one-track loop line linked the new station to the main east-west Cityrail suburban rail spine. Located about one kilometre south of the Parramata River, the main navigable river leading into Sydney Harbour, Olympic Park was also connected to Sydney CBD by river transport, using comfortable and rapid "Rivercat" 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 to connect the CBD to the important M4 motorway. The M4 serves most of western Sydney, where a large part of the Olympics took place.

The two primary Olympic traffic generators of the Sydney Games -- Sydney Olympic Park and Sydney plus 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 reserved traffic lane in each direction during the Games.

The concentration of Olympic activities at Homebush Bay had numerous advantages, notably that of shortening travelling distances for athletes and team officials (more than 16 500) between the Olympic Village and Olympic Park. A large part of the media (more than 20 000) worked at the Main Press Centre and the International Broadcasting Centre, located inside Olympic Park at walking distance from almost half of all the Olympic venues.

But this concentration had the obvious effect of generating extraordinarily high **spectator traffic demands, exceeding 400 000 people per peak day**, in addition to more than **180 000 accredited support and logistical staff** (workforce, volunteers, media, Olympic family, etc.) active throughout Sydney, and an unknown number of non-paying visitors. The profile of paying spectators at all venues exceeded 500 000 on peak days with close to 400 000 at Sydney Olympic Park, as shown by Figure 6.

4.3. Main organisational and managerial features and client groups

Planning and organising the Olympic Games covered a seven-year span -- in the case of Sydney -- from the Host City designation on 23rd September 1993 to the Games' opening ceremony on 15th September 2000, as illustrated by Figure 7.

Contrary to other Games, Sydney's organisational and managerial structures were decentralised [Chappelet (2000), Management of the Olympic Games]. 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, build, upgrade and operate all Olympic sports facilities and other infrastructure needed for the Games. OCA was also in charge of all specific legislation related to the Olympic Games and of major interventions in 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-operation vital for the Games. It is estimated that about AUS $2 billion of long-term infrastructure investment were spent in conjunction with the Games in addition to SOCOG's AUS $2.5 billion 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 tests such as the 1998, 1999 and 2000 Royal Easter Shows at Sydney's 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 (SOCOG 1997);

- The consolidated *Sydney Transport Strategic Plan*, published by ORTA in January 1998;

- The first full-scale transport testing during the 1998 Royal Easter Show at Olympic Park, about 29 months before the Games.

- The 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 (ORTA, 1999);

- A *Contingency Plan*, finalised four months before the Games.

One particularly interesting characteristic of the Sydney 2000 Games' preparation was the move, about one and a half years before the Games, from horizontal network system planning and operations by functional domains to vertical integrated studies of venue operations. Called "venue-isation" (Figure 8), 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 their own management and staffing organisation 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 and assisted by all functional units such as, *inter alia*, security, medical aid and transport.

Also linked to venue management was the critical issue of transport priority given to various constituencies. For the Olympic Games' operations, Sydney 2000 defined the sequence of decreasing transport priorities as indicated below (Figure 9):

- Athletes, team officials and technical officials;
- Logistics, authorised broadcasters, workforce and volunteers;
- Media;
- Olympic and other key officials;
- Sponsors;
- Paying spectators;
- Non-paying visitors;
- The general public, together with the normal metropolitan traffic.

The (a+b) groups had the highest level of priority since no event can take place without their early on-site presence.

All top groups (a to f) had free transport of different types:

- Olympic family transport (a to d);
- Sponsor transport (e);
- Paying spectators (f) could use most public transport for the 24 hours of validity of their ticket.

In Sydney, non-paying visitors (group g) could come to Olympic Park (in controlled numbers) or enjoy the Games at various free, "live-site**"** locations in central Sydney. These measures were meant to allow the maximum number of people to enjoy the general atmosphere of the Games, but they were also designed to spread the crowd, which otherwise would have jammed the most attractive tourist sites of central Sydney, such as the Opera House, the Circular Quay areas and Darling Harbour.

Although general traffic (h) had the lowest priority, traffic management during the Games was handled in such a way that Olympic venue neighbourhoods remained very calm and traffic on the main urban arterials was lighter during the Games than before and after!

4.4. Sydney 2000 transport: an outstanding mobility management concept

The design of an Olympic transport scheme depends on many factors, such as the host city's urban design and its main transport system layout (motorways, metropolitan railways and subways). Residents' regular travel patterns, both for commuting and leisure trips, are of considerable importance as is the main competition venue's spatial location in relation to existing primary transport infrastructure (for example, Sydney's east-west Olympic corridor).

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

From the start of the Olympics' transport planning, it was considered obvious that keeping to the usual travel modal split patterns during the Games would lead to maximum congestion and chaos on most of Sydney's arterial roads and the few available motorways. But Sydney's candidature bid stressed the will of the host city to organise environmentally friendly Games in all domains, including transportation.

The Sydney Olympics 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 in order to avoid the worst transport "mistakes" which had hampered the Atlanta Games. Three of those elements were:

- the integration, in a single "public" authority, of all road and public transport functions as well as all transport command, control and communications capabilities (this led to the creation of ORTA);

- strong public transport prioritisation during the Olympics;
- a major emphasis on public communication.

Taking into account the limited amount of new transport infrastructure (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 action to drastically modify the travel behaviour of visitors/spectators rather than developing transport infrastructure. Given the exceptional magnitude of the anticipated travel demands, the Olympic transport concept was geared to boost the suburban public transport modal share from the usual 15 per cent to at least 85 per cent, a full inversion! Thus the transport scheme evolved towards a "push and pull" plan, combining full development of public transport services and restrictive car use during the Games.

4.5. The Olympic Transport Plan

The main components of the Olympic Transport Plan were as follows:

- Provision of 100 per cent accessibility to the Olympic venues by public transport, using rail access, a network of thirteen supplementary bus lines, shuttle services from rail stations or a combination of these;

- All paying spectators had free use of Olympic public transport during 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, temporary park-and-ride spaces along the thirteen Olympic bus lines and shuttle routes;

- Single or dual reserved bus lanes on crucial Olympic routes, such as the Victoria Road itinerary, connecting Sydney CBD to Olympic Park;

- Substantially reduced automobile traffic in Sydney CBD during the Games, by an array of actions, such as a complete 24-hour, on-street parking ban, downtown pedestrian priorities, downtown night deliveries only, efficient and frequent, free downtown bus loop;

- A large-scale Travel Demand Management (TDM) programme, aimed at inducing motorised travel reductions during the Games, through such actions as telework, staggered working hours, reduced business activity during the Games, holiday incentives for employees and a state-wide school holiday extension;

- Starting with the 1998 Royal Easter Show transport tests, an effective transport and traffic communications strategy was developed to widely diffuse all appropriate Olympic transport and travel advice.

Olympic transport services associated with the Games required an exceptionally large fleet of 3 850 buses, supplemented by a car and van fleet of about 4 700 units. Of these, 2 700 were operated by ORTA to provide transport services to Olympic client groups. SOCOG and other agencies used the other 2 000 vehicles for Games' staff functions.

4.6. 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 (Bovy, 1999a and 1999b).

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

This two-week Easter Show, attracting more than one million people and up to 40 per cent (175 000 people) of expected Olympic traffic loads, provided a convenient "transport and traffic laboratory". Taking advantage of early completion of the high-capacity Olympic Park rail station thirty months before the Games, the 1998 Royal Easter Show was used as the first transport test event.

The aim of this first test was to boost the public transport accessibility share from the usual 15-25 per cent for Sydney's outlying events to at least 75 per cent, corresponding to Sydney CBD's maximum public transport share during workday peak hours. A full range of public transport services was provided:

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

Private car accessibility was limited to 7 000 parking spaces with mandatory pre-booking at a flat fee of AUS$25 per car. In addition, a ban on visitor parking was imposed in a one-kilometre-wide 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 per cent (versus the 75 per cent foreseen) and the peak public transport share of 93 per cent occurred on the busiest Easter Monday, with an attendance of 175 000 people. Easter Show car parks were used at less than 50 per cent capacity.

This extensive test gave the assurance to ORTA that a carefully planned, well-promoted and advertised "100 per cent public-transport-accessible" scheme would be appropriate, efficient and desirable for all Olympic competition venues. In fact, the second major transport and traffic test, conducted during the 1999 Royal Easter Show, eliminated all parking facilities for spectators, who had 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 the management and delivery of sports events 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 in

the fact that such a bold mobility concept as "100 per cent of spectators using 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: the management capability build-up and the transport and traffic scheme's revision and optimisation.

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

4.7. Successful Games operations: a gold medal for Olympic transport

By all accounts, including the often very critical local media, Sydney 2000's 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. Luck was with ORTA and Cityrail, since rail accidents occurred only 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 per cent of all Olympic Park spectators used the system, which operated 24 hours a day. A reserve contingency fleet of close to five hundred buses was kept ready in case of rail failure, but was not used.

Bus system. The operational risks for the largest ever assembled bus fleet (the Olympic fleet had 3 850 units) were not truly perceived until a few days before the Games, when a host of problems almost triggered a bus system collapse. The main problems concerned untested and poorly-managed bus depots, difficulties in pairing drivers and buses, substantial driver walkouts due to unacceptable accommodation and food conditions and other motives of discontent, lack of knowledge of Sydney's road system and the Olympic routes, etc.

These bus problems occurred when most of the Olympic family was already in town and when many transport services were needed for training, media coverage and technical checks and fittings. The last week before the Games is the real test of an organiser's abilities to react efficiently. As it turned out, ORTA had the capability, in about sixty hours, to take all corrective measures for the bus system to recover and to work quite well during the whole of 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 the weeks of full school vacation. Some estimates suggest there was an average traffic decrease in downtown Sydney of about 20 per cent during the Games, which is far better than all previous attempts to cope with Sydney CBD's traffic.

Sydney 2000's competition schedule and attendance estimates were used by ORTA to draw up a 17-day profile of total paying spectators, as shown above in Figure 6. The global travel demand profile is far from optimal, since very high and expensive transport capacities must be provided just for the mid-Games peak. But the Sydney experience clearly showed that the gradual spectator traffic build-up of the first week was manageable enough to allow the transport system to catch up and adapt itself to rapidly increasing spectator and logistical traffic loads.

5. MAIN TRANSPORT AND MOBILITY MANAGEMENT LESSONS LEARNED FROM SYDNEY

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

5.1. Need for a strongly integrated managerial structure for transport

One major decision taken after the Atlanta Games was to create 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 and communications (CCC). This decision proved extremely worthwhile.

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

5.2. Key transport policies for major events: reliance on public transport and control of automobile access

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

The connection of large-event traffic generators to mass transit is a must and should be a condition for the development of all facilities above 50 000 seats. In Sydney, the creation of Olympic Park 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 per cent of total access and egress capacity.

In the absence of a direct mass-transit connection, large-event sites of lesser capacity must be able to rely on efficient, high-capacity shuttle-bus 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 shuttle-bus 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 in automobile accessibility, mainly by well-enforced parking restrictions. Large-event venues have high 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 almost all Olympic venues.

As the first Games of the third millennium, the Sydney 2000 Games were also the first to have instigated a very efficient 100 per cent public-transport-accessible operation. This successful "Sydney 2000 Olympic transport experiment" for more sustainable urban mobility will certainly show the way for other, similar, large-event transport schemes.

5.3. The crucial role of logistic transport functions

Spectators and visitors at large events 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 180 000 accredited persons of all categories (athletes, media, Olympic officials, workforce, volunteers, etc.) were active in the Games' delivery. Compared to the peak daily attendance of about 500 000 paying spectators, the support and logistic tasks for transport were truly considerable.

They amounted to about a third of the whole operation in terms of travel demand quantity, but substantially more in terms of transport resources because of higher reliability, scheduling and punctuality requirements. One thousand late spectators are embarrassing, but the 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 in the Olympic transport's operating budget.

Support and logistic traffic functions are of critical importance for large-event delivery. They increase the complexity and magnitude of the whole transport operation and require a high level of priority to improve their reliability -- an essential component of large or mega-event success.

5.4. Advantages of Olympic public transport integrated ticketing

In Sydney, all paying 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 personnel.

The linkage of event tickets with public transport access to venues is the strongest possible incentive for public transport use. Moreover, this measure (so-called "free transport") makes sense from an operational point of view. Indeed, very dense public transport conditions make it almost impracticable 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.

The 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 trendsetting for other large events.

5.5. The contribution of pre-Olympic testing towards 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 on the day of the opening ceremony. Large-scale testing is also very expensive. Sydney 2000 is certainly one of the most "pre-tested" Olympic Games, not only in the sports domain but also for transport.

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

- Effective validation of innovative mobility policies such as "competition venue access by public transport only";

- Training for Olympic transport managers and operative personnel in command, control and communications processes;

- Public relations and communications developments around the simple message "Olympic transport will be different but will work well";

- Building-up and improving the transversal integration of functional subsystems, like transport, security, ticketing, accreditation and human resource management;

- Assembling know-how for contingency identification of "what can go wrong?" and "how to cope with it?".

Drastic changes in the normal spectator mobility patterns, as required by the Sydney 2000 transport scheme, could only be validated by large popular event testing. Although testing cannot duplicate the real operational conditions during the Games, it is an essential tool to consolidate transport management know-how and to build up contingency capabilities.

5.6. Main transport delivery features during the Games

After solving the bus crisis the week prior to the official opening, transport operations went smoothly throughout the Games. The traffic load pattern grew in magnitude from Day One until the mid-Games period (Days 8, 9 and 10), when a maximum of approximately 500 000 paying spectators daily had to be simultaneously transported to more than twenty venues. The five outstanding features were:

- Smooth arrivals and departures at Sydney's 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 jointly handling general traffic (RTA, Road and Traffic Authority control centre) and all Olympic transport subsystems (Olympic bus lines, shuttles, Cityrail, etc.) run by ORTA.

- A successful Travel Demand Management (TDM) programme, which resulted in a notable decrease of background traffic in Sydney during the Games. This was largely obtained through a patient and well-oriented pre-Games communications campaign, aimed at citizens, potentially affected residents, local commerce and large businesses.

- The significant contribution by thousands of transport operations volunteers, including spectator and general public guidance.

- The metropolitan media's (newspapers, radio and TV) excellent "real time" communications efforts. Constantly updated and well-documented ORTA transport information was accurately and well transmitted to the general public (the "Sydney 2000 Spectator Guide", for example).

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 appropriate TDM and public communications plans.

5.7. The knowledge transfer and transport legacy of the Olympic Games

The Olympic Games are unique in their magnitude and the complexity of the simultaneous operation of 28 sports, involving 300 competition events, 10 500 athletes, about 180 000 accredited persons and close to 8 million paying spectators. But the Summer and Winter Olympic Games are also held alternatively on different sites each at a four-year interval, as are other mega sporting 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 (IOC-TOK, 2000a and 2000b):

- Contracting SOCOG and related agencies like ORTA and OCA to prepare more than 100 manuals, named TOK (Transfer of Olympic Knowledge), covering all functional aspects of the Games;

- Sending observation teams to Sydney to cover all 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 Para Olympics (IOC, 2000a and 2000b);

In addition to IOC work, comprehensive Sydney 2000 monitoring was also conducted by Athens 2004, the next Summer Olympic Games organisers (ATHOC, 2001). Many other organisations, including candidate cities for the 2008 Olympics, had their own observation programmes.

The 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 large passenger crowds is

a positive legacy. More sustainable mobility patterns for large cultural, musical or sporting events at Olympic Park and elsewhere in Sydney will benefit from the Olympic experience. The Games also gave an excellent image of Sydney and Australia to billions of viewers around the World (Hollway, 2001).

Considered "the best organised Olympic Games ever", Sydney 2000 offered an extremely worthwhile "real-scale laboratory" for mega sports events organisation in a specific domain such as transport, where innovative and more sustainable mobility management schemes are most needed.

6. LIMITS TO THE CONTINUOUS GROWTH OF MEGA EVENTS

Although mega events such as the Olympics do have the same general programme, their organisational complexity, their magnitude and character vary considerably from one host city to the next, four years later. Fundamental differences in culture and urban layout, as well as climatic conditions, are such that the Barcelona Olympics are difficult to compare to Atlanta's and Athens 2004 will certainly be very different from Sydney 2000.

6.1. Athens 2004 is not Sydney 2000

The Games' spatial structure changes drastically from one venue to the next, due to urban geographical characteristics and constraints, the distribution and size of competition venues, clustering or non-clustering of activities and their respective distances and travel-time interrelationships. Substantially different metropolitan transport systems call for different Olympic transport and logistic schemes.

With approximately four million inhabitants, Athens and Sydney have the same urban population. Both are seaside cities with large harbours. Encircled by four mountain ranges and a multi-storey building pattern on large parts of its territory, Athens has a much higher urban density than Sydney, leading to notoriously heavy traffic and parking congestion. At present, the Athens motorway and heavy rail systems are far less developed than those of Sydney. Laxist parking behaviour, a lack of reserved bus lanes and of adequate traffic regulation enforcement, combined with general traffic indiscipline, make efficient traffic management extremely difficult.

Contrary to Sydney, whose Olympic venue had an almost linear general layout (Figure 5), Athens' venue has a dispersed, star-shaped system, as illustrated by Figure 10. Three venue clusters make up about 80 per cent of the overall Olympic activity, with a main cluster at OAKA (Athens Olympic Park), about six kilometres north of the city centre, and two sub-clusters along the southern sea coast.

A major drawback is that the Athens Olympic Village, constructed to house about 16 500 athletes and team officials, as in Sydney, has a peripheral position, making travel for athletes to most venues very long. Combined with the dispersed Olympic venue pattern, this creates a very heavy burden when transporting the Olympic family and general spectators.

Unlike Sydney, Athens is undergoing a tremendous transport infrastructure "revolution", with the opening of a new, high-capacity International Airport (March 2001), the slow but gradual extension of a modern, well-designed subway system and the construction of about 100 kilometres of multi-lane urban motorways, the first in Athens, both in an east–west corridor north of the centre and a north-south corridor, west of the city centre all the way to the coast.

Moreover, the ambition is to complete this system with (a) a new, 35-km suburban rail line connecting Athens city centre to a station just north of the Athens Olympic Park and the new airport; and (b) with a new, 25-km two-line Light Rail system connecting stations of the Athens Metro Lines 1 and 2 to the south-eastern coastal area, where about 40 per cent of the Olympic venues will take place and where public transport is currently insufficient.

Since a number of Olympic sports venues have to be built at the same time, there are great concerns that all the promised transport infrastructure might not be finished in time (July 2004).

As stated above, current traffic management is not up to date (lack of an integrated traffic command and control centre) and traffic regulation enforcement is poor. For traffic during the Games to operate reasonably well, it will be mandatory to have substantial progress made in the area of public motoring education, combined with strict police enforcement of essential provisions like reserved bus lanes. In this regard, it is planned to upgrade and monitor the current 14 km of poorly-enforced reserve bus lanes and gradually expand them to 100 km for the 2004 Olympic Games.

As with Sydney, *the Athens Olympic Strategic Plan calls for 100 per cent of spectators to be carried by public transport to all urban venues***.** Parking being extremely scarce in Athens, it will be exclusively reserved around the Olympic venues for logistical "back-of-house" support services. Spectators will be expected to use the existing public transport system, whose capacity will be more than tripled by the new projects mentioned above, if they are ready on time!

The challenge is truly considerable. If things are developed as planned, Athens and the Attika region will inherit a considerably improved public transport system and better main road network as a legacy from the Olympic Games. The costs of transport infrastructure are considerable, some of them being covered by substantial financial backing from the European Union.

6.2. What are the limits to mega sporting events?

It is well known that the Sydney 2000 Games went extraordinarily well in terms of organisational "smoothness", conviviality and lack of significant accidents. But the official monitoring and IOC observers' programmes showed that these Games were at the limit of sustainability in many domains, transportation being one of them.

With a ratio of 180 000 accredited people in all possible functions for "only" 10 500 athletes and peak-day crowds of more than 500 000 ticketed spectators, of which about 80 per cent travelled by rail, the pressures on the organisers were immense. In rail transport, even a minor derailment in the vicinity of the Olympic Park would have put the system in jeopardy for hours, with strong disruptions in multiple areas and tremendous additional costs.

With the current size of the Olympic Summer Games, it no longer seems feasible that urban areas with less than four million people and without an excellent high-capacity public rail system, connecting most of the key Olympic competition and non-competition venues, could be in a position to run the Games. These same cities must also have a very large inventory of up-to-date sports venue

facilities, well-connected to the metropolitan motorway and highway systems for their logistical support. To substantially reduce travel demands, host cities should have an Olympic village and a media centre as close as possible to the Games' centre of gravity.

As shown by Figure 11, the number of athletes and sports events grows at a slower pace than other parameters. In fact, since Atlanta, the number of athletes has remained almost constant while the total number of accredited people keeps spiralling in most domains, notably among the media, volunteers and the general workforce.

A systematic in-depth analysis of recent Games by the International Olympic Committee (IOC) has shown that limits have been reached in many other domains, such as accommodation, size of sports venues, technology, local and regional financial resources, environmental impacts of various types and so on. Security is also becoming an increasingly complex issue with escalating costs.

As former Chairman of both the Sydney 2000 and Athens 2004 Olympic Co-ordination Commissions, the IOC President, J. Rogge, is calling for an extensive internal review and assessment of all key parameters by comparing the drawing-power and worldwide popularity of the Games, on the one hand, with their sheer size, tremendous complexity and mounting costs, on the other.

First study findings show that, with the same number of athletes and competition events but with drastic reorganisation and optimisation of many functional and logistical areas, a significant reduction in their overall magnitude could be obtained without hurting the Games' reputation. One of the key elements is an improved monitoring of the Olympics from their "real start", the bidding process, all the way to delivery and potential legacy assessment. The Transfer of Knowledge (TOK) programme (IOC, 2000a and 2000b) is a major new undertaking by IOC, which was initiated about one year before the Sydney Games.

LIST OF ILLUSTRATIONS

Figure 1. **Transportation system and strategies for large sports events**

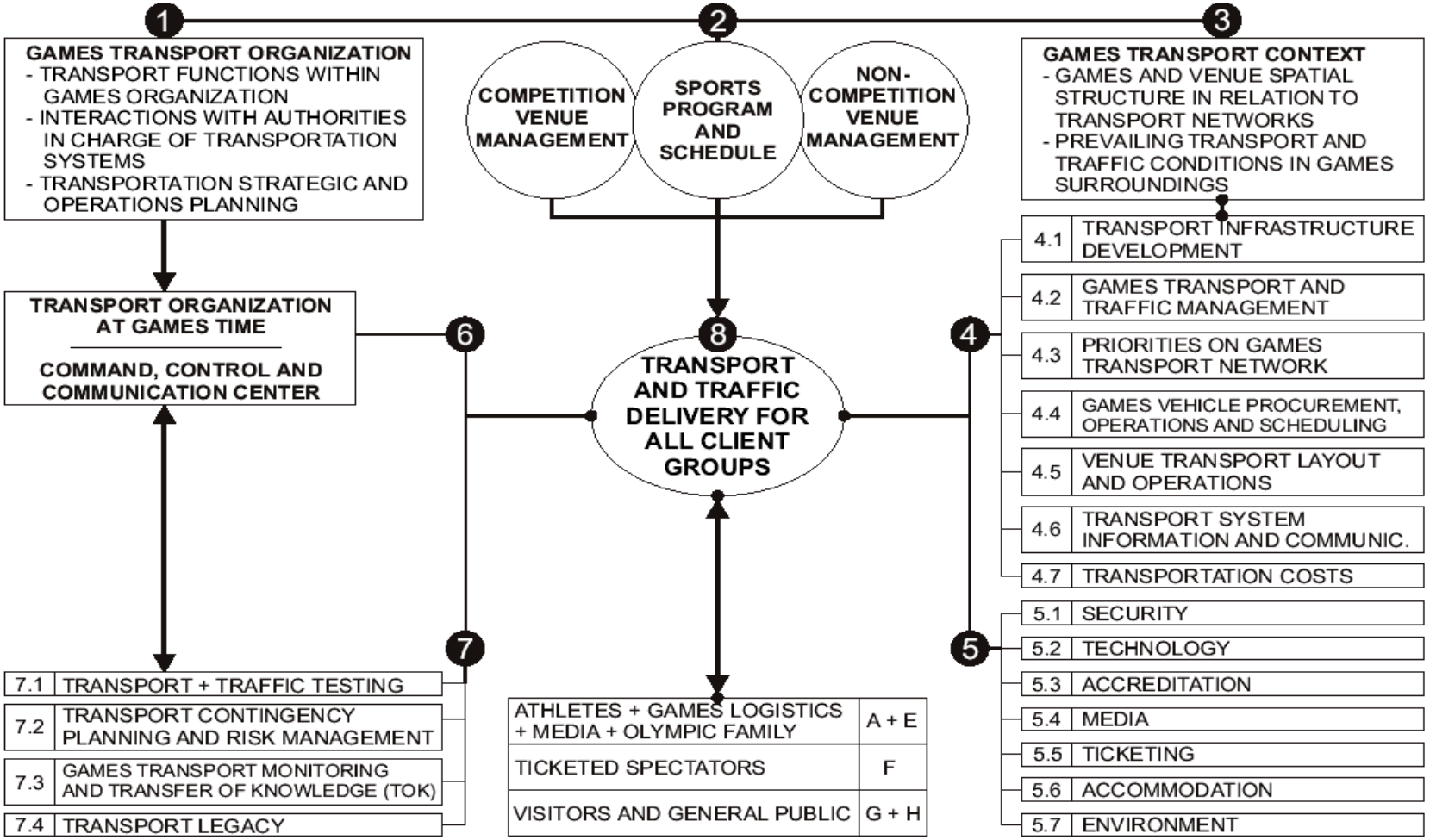
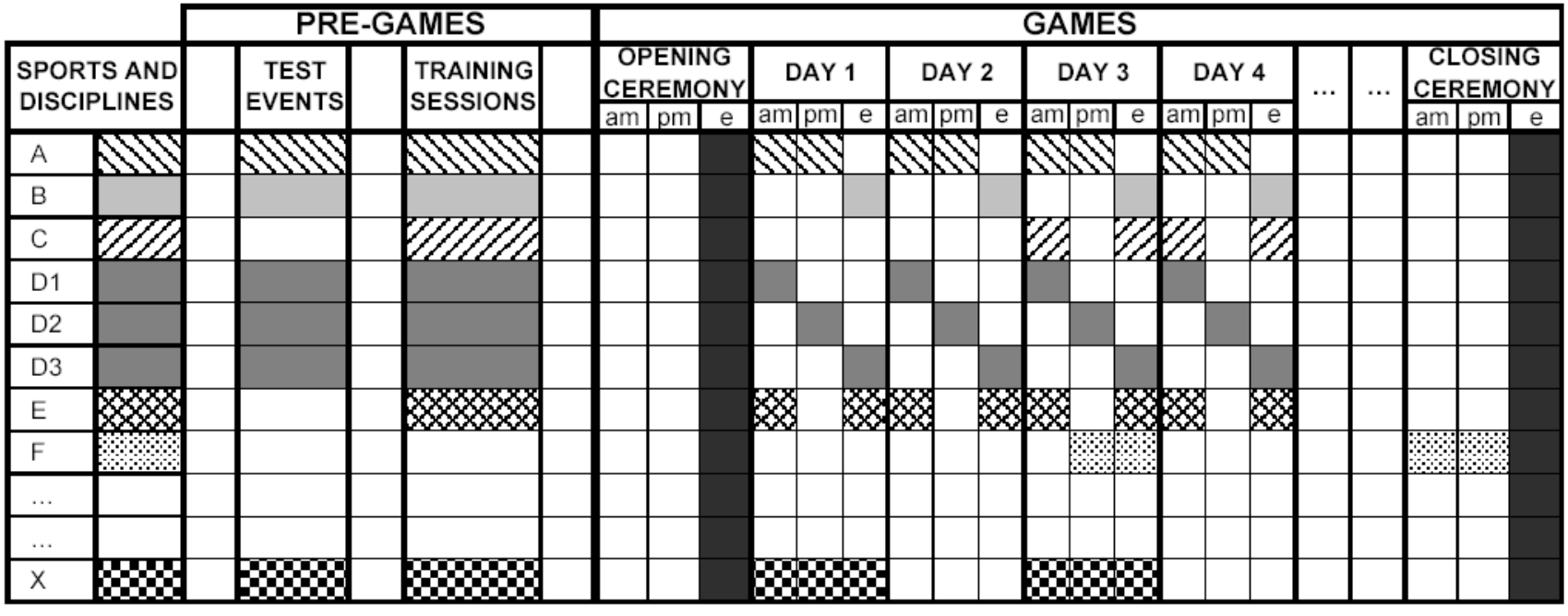


Figure 2. **Multi-sport and multi-event scheduling**



Legend :

am : morning
pm : afternoon
e : evening

Figure 3. **Generic venue layout and transport accessibility and functions**

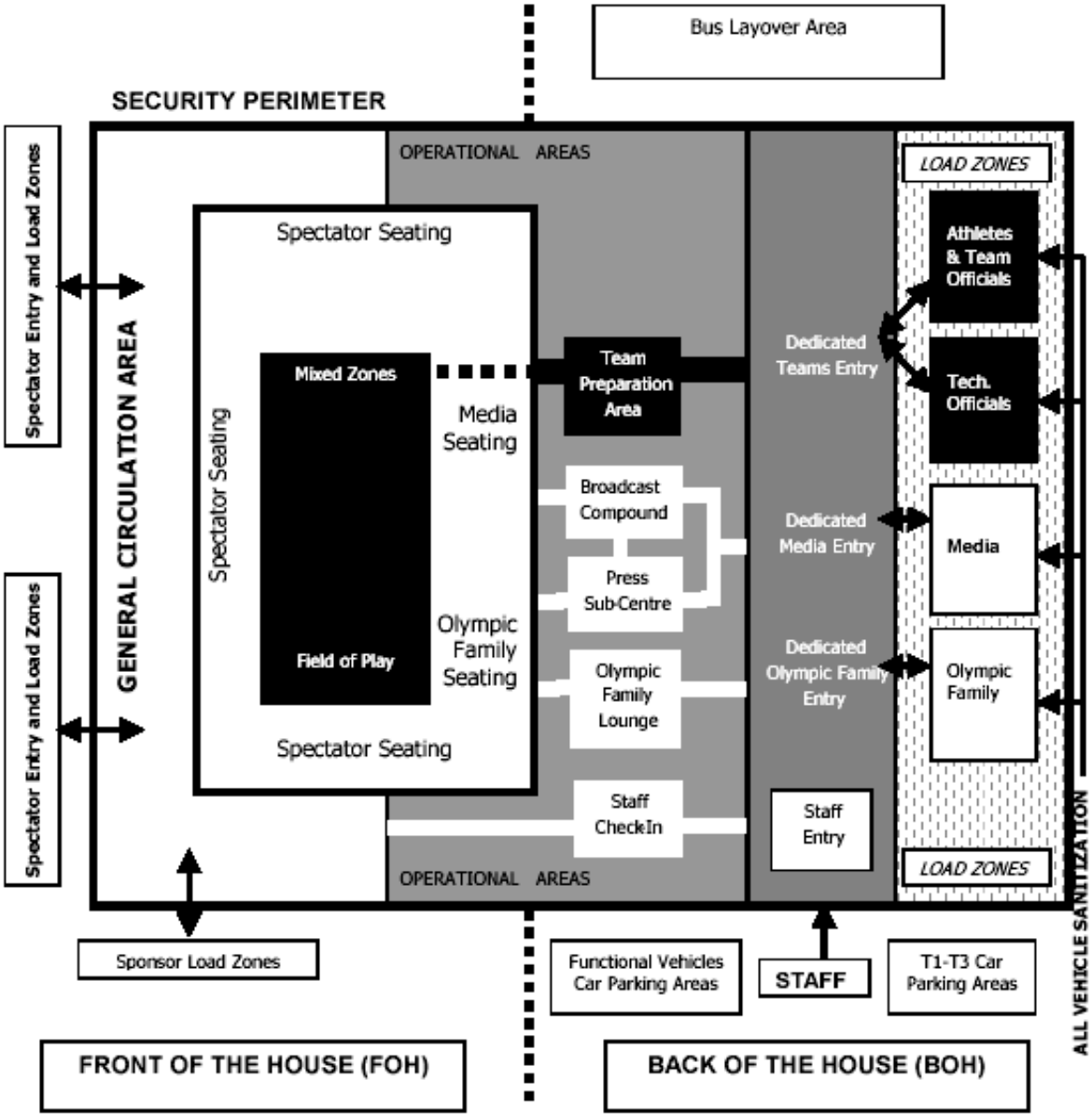


Figure 4. **Sydney 2000 Olympic Games in numbers**

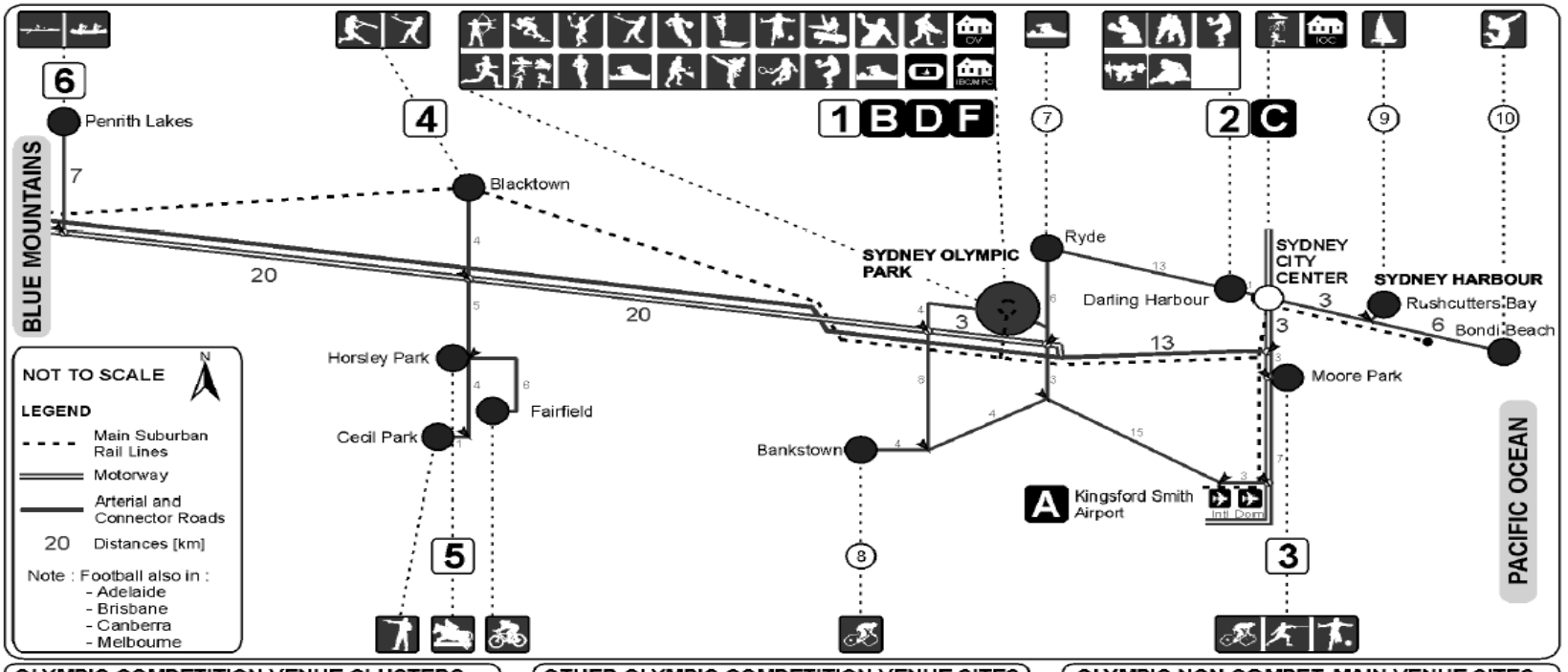
1 Games duration (days)	**Numbers**	**Totals**
Olympics (Opening+16)		17
Para Olympics		11
Total Games operational length		60
2. Sports and events		
National delegations (NOC)		199
Number of Olympic sports		28
Olympic disciplines		39
Competition events, Total		300
*Men's events	168	
*Women's events	120	
*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 photographers	5 300	
*Authorised broadcasters	11 000	
*Host broadcasters	3 500	
Volunteers (approx.)		41 000
Workforce (approx.)		103 000
Ticketed spectators (approx.)		7 000 000
4. Games spatial layout (figure 5)		
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 6)		
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 personnel)		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%	

Notes: Some figures are still indicative, pending the Final Games Report*:*
*section 3, all values are rounded off to +/- 100 *sections 5 and 7, all values are rounded off to +/- 50 000

Sources: SOCOG, ORTA, IOC/Transfer of Knowledge Seminar, Athens, November 2000.

.Figure 5. **Sydney 2000 Olympic venue spatial layout and metropolitan transport system**



OLYMPIC COMPETITION VENUE CLUSTERS

1. Olympic Park
2. Darling Harbour, City Center
3. Moore Park
4. Blacktown
5. Fairfield, Cecil and Horsley Parks
6. Penrith Lakes

OTHER OLYMPIC COMPETITION VENUE SITES

7. Ryde
8. Bankstown
9. Rushcutters Bay
10. Bondi Beach

OLYMPIC NON COMPET. MAIN VENUE SITES

- A OLYMPIC GATEWAY AIRPORT
- B OLYMPIC VILLAGE
- C IOC HOTELS
- D MPC/IBC
- E MEDIA VILLAGE
- F OPENING AND CLOSING CEREMONIES

Figure 6. **Indicative daily ticketed spectator travel demands (without sponsor, logistics and non-ticketed visitor traffic)**

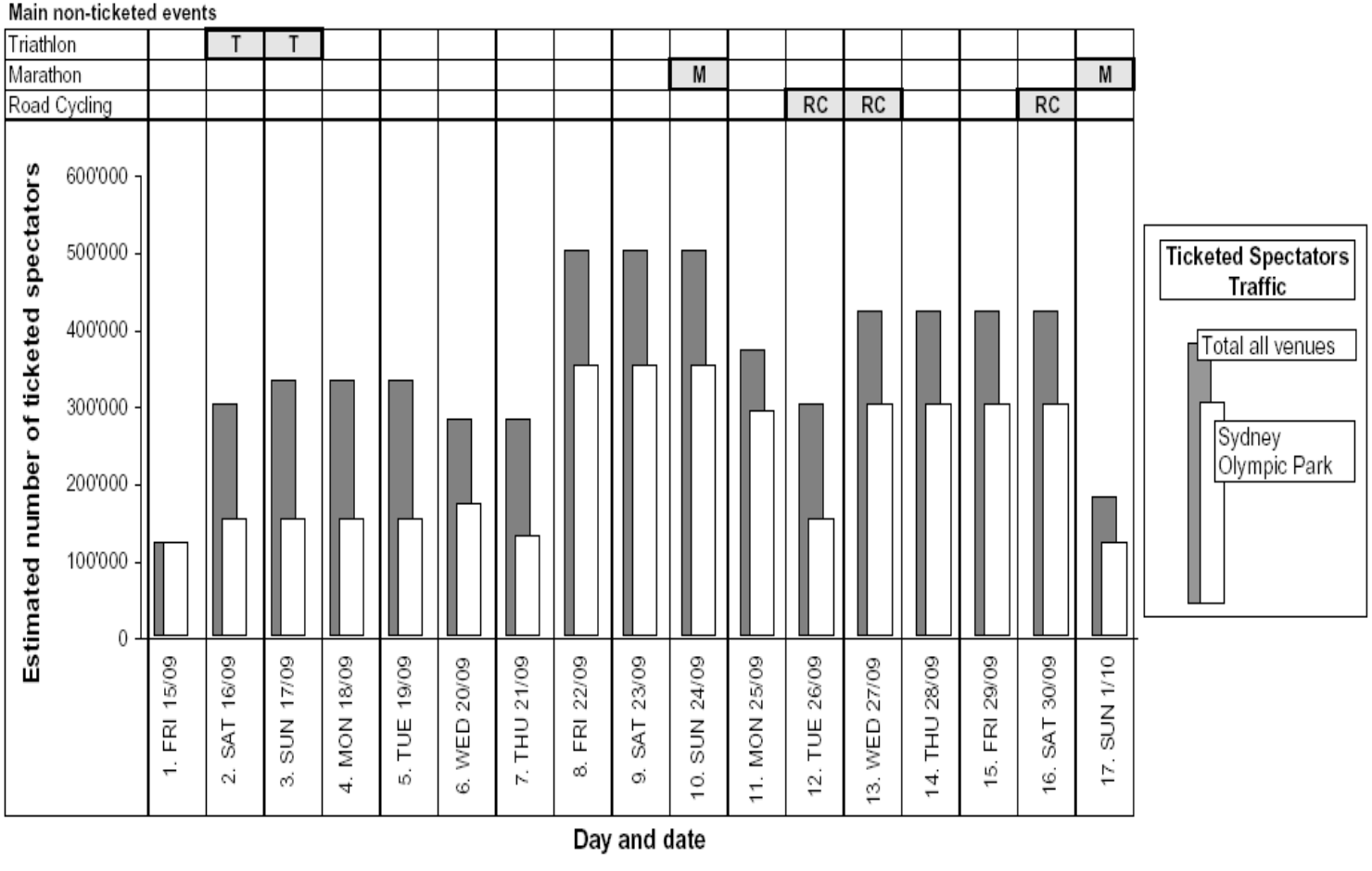


Figure 7. **Sydney Games organisation milestones, 1993-2000**

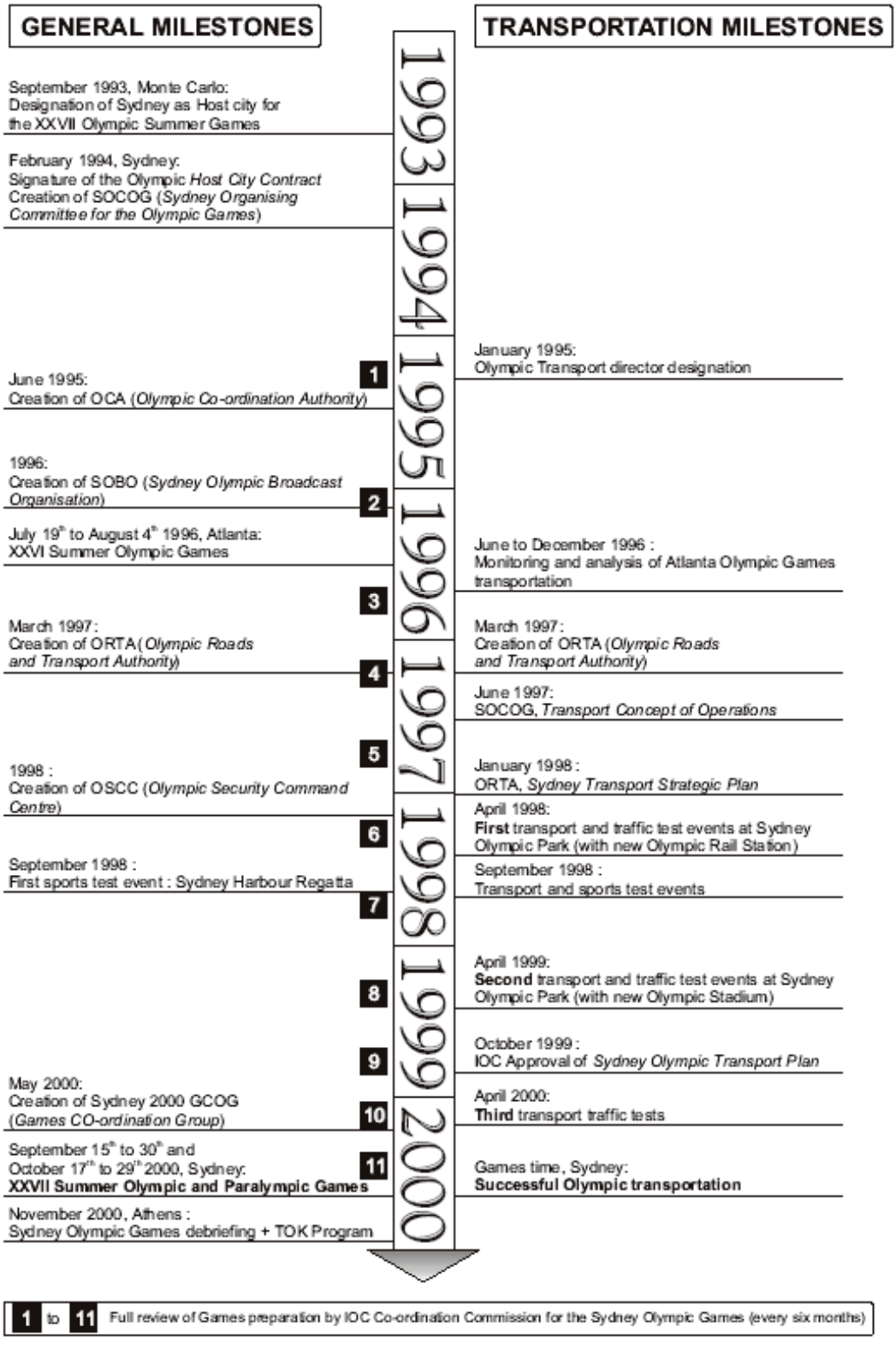


Figure 8. **Integration of Games' functional systems and venue operation and management**

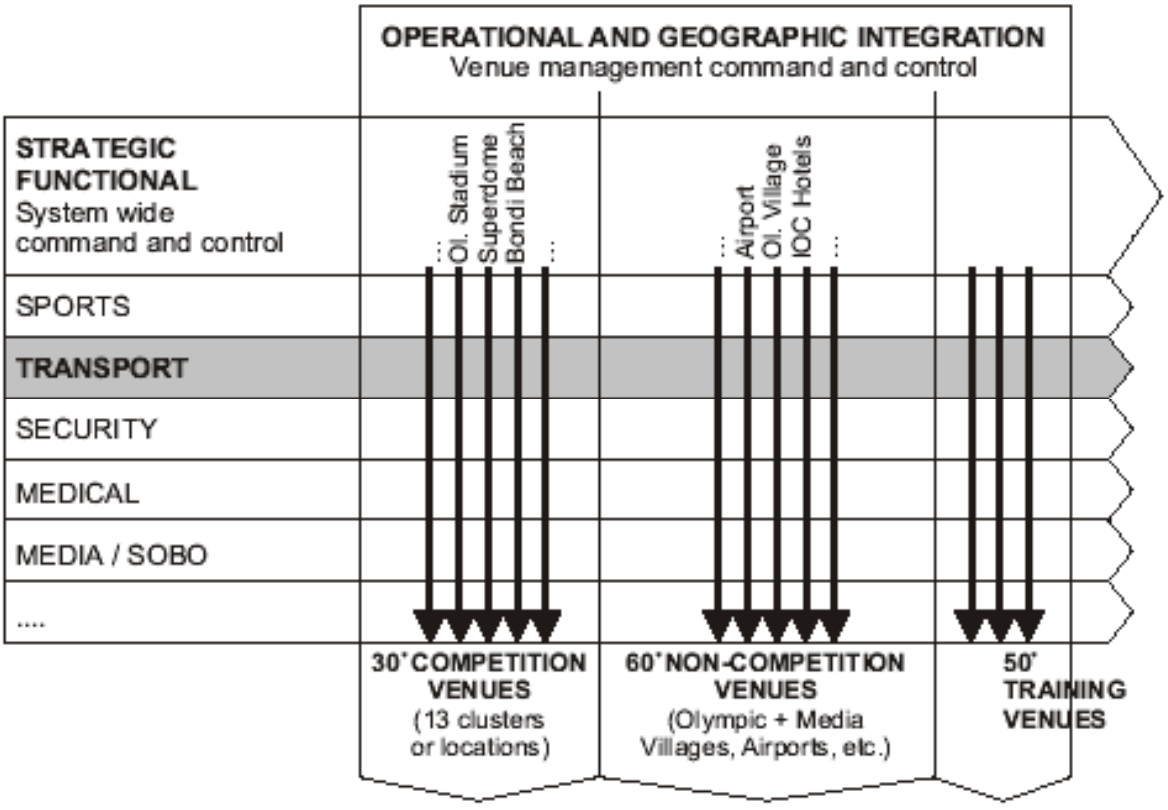


Figure 9. **Different plans and priorities for different transport groups**

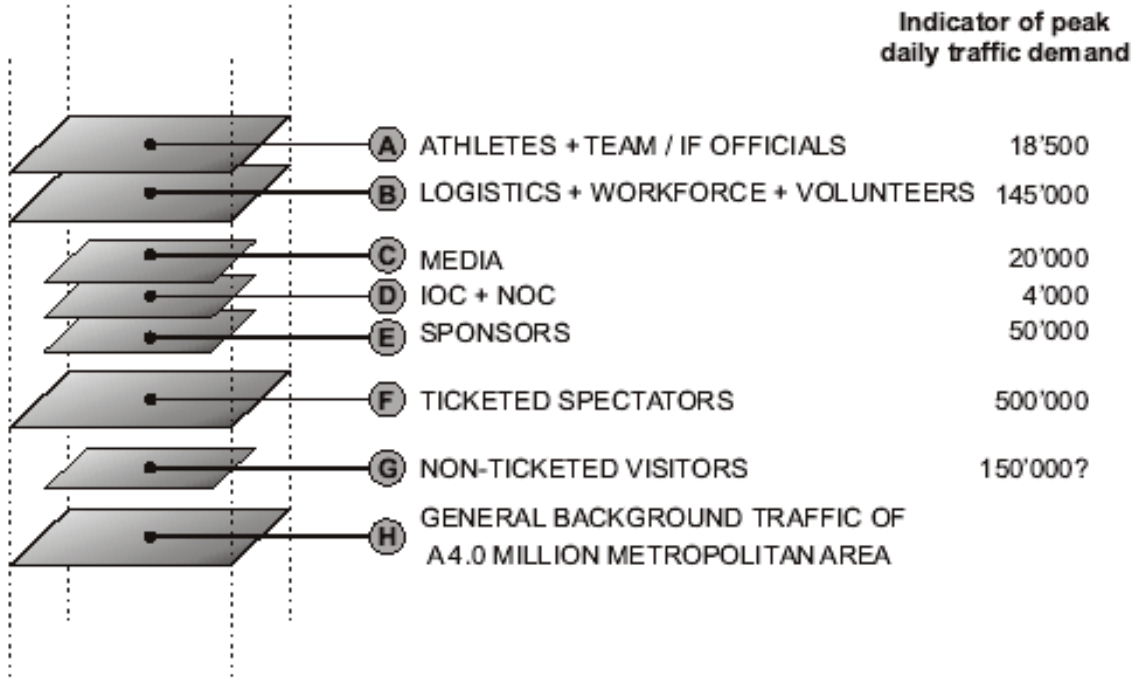
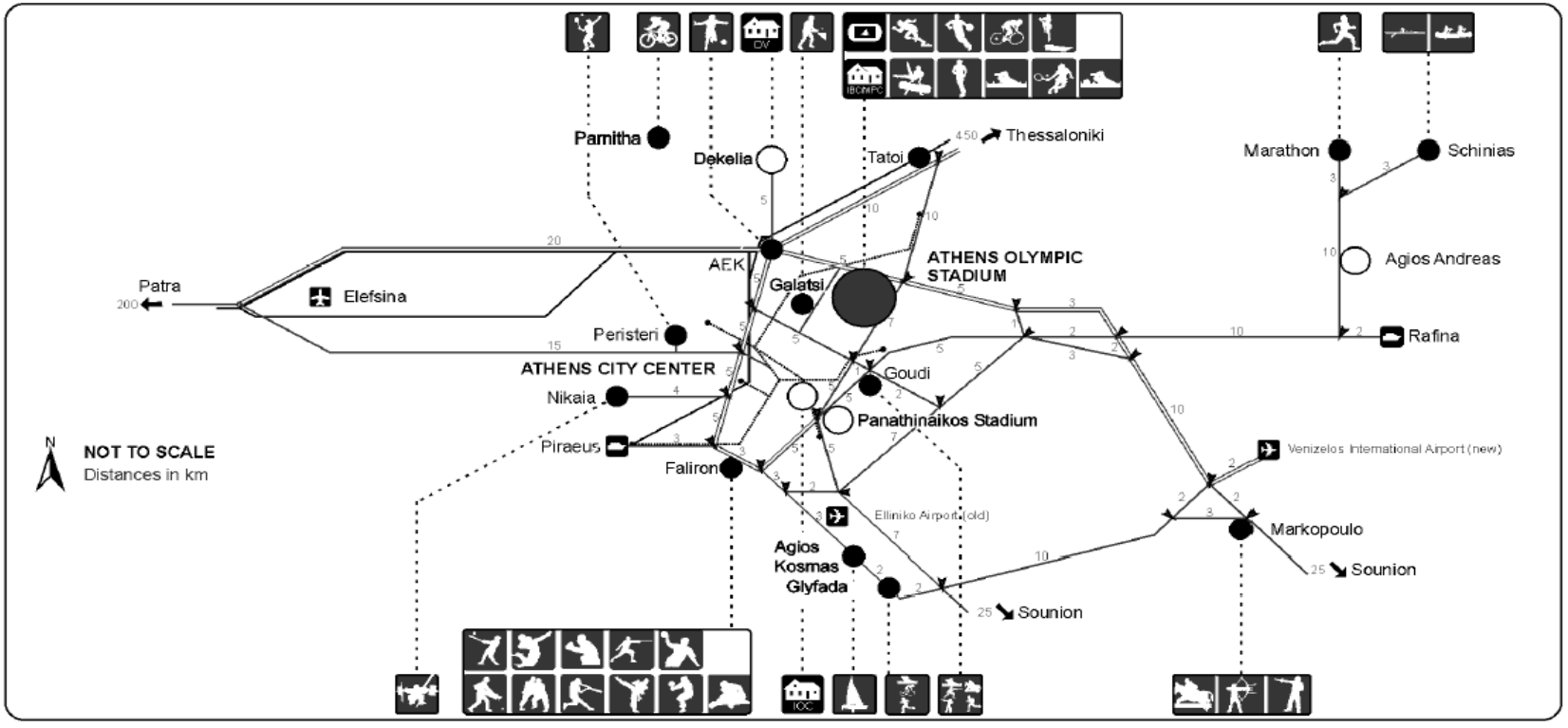


Figure 10. **Athens 2004 Olympic Games preliminary (1997 bid) metropolitan layout**



Sites	Ol. Stadium	Galatsi	AEK	Goudi	Dekelia	City Center	Pamitha	Peristeri	Nikaia	Faliron	A. Kosmas	Glyfada	Markopoulo	Marathon	Schinias	Total
IOC Hotel	-	-	-	-	-	yes	-	-	-	-	-	-	-	-	-	1
Ol. Village	-	-	-	-	yes	-	-	-	-	-	-	-	-	-	-	1
MPC/IBC	yes	-	-	-	-	-	-	-	-		-	-	-	-	-	1
Num. Sports	9	1	1	1	-	-	1	1	1	11	1	1	3	1	2	34
[km/*min*]																
Ol. Stadium	-	*5/10*	*5/10*	*5/10*	10/*15*	10/*15*	15/*15*	15/*15*	20/*20*	20/*20*	25/*20*	27/*25*	25/*30*	35/*40*	35/*40*	
City Center	10/*15*	*5/10*	15/*15*	*5/10*	*20/20*	-	*25/25*	10/*15*	10/*15*	10/*10*	15/*15*	17/*20*	*25/30*	35/*40*	35/*40*	
Faliron	*20/20*	*20/20*	*20/20*	10/*10*	*25/25*	10/*10*	*30/30*	15/*15*	10/*10*	-	*5/10*	*7/15*	*25/30*	*40/45*	*40/45*	
New I. Airport	*25/20*	*30/35*	*25/30*	*20/25*	*30/35*	*20/25*	*35/40*	*35/40*	*40/40*	*30/30*	*20/20*	*18/20*	*5/10*	*35/40*	*35/40*	

Figure 11. **Summer Olympic Games, 1980-2004: Key statistics and trends**

	Moscow 1980	Barcelona 1992	Sydney 2000	Athens 2004
Interval (years)	-	+12	+8	+4
NOC	145	172	199	200 (?)
SPORTS (number)	21	25	28	28 (?)
EVENTS (number)	203	257	300	300 (?)
•Woman events	50	86	120	120 (?)
ATHLETES +T. OFFICIALS	8'300	17'000	18'400	18'000 (?)
ACCREDITED MEDIA	8'000	12'000	19'800	20'000 (?)
TICKETS SOLD (Million)	5.3	3.8	8.0	5.4 (?)
TOTAL TV RIGHTS (Mio US$)	90	635	1330	(?)

(?) Estimate Nov 2001

Source: EPFL.

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OTHER CONTRIBUTIONS

During the Round Table, several participants submitted written contributions. These contributions are reproduced below as complementary information.

REPUBLIC OF KOREA

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TRANSPORTATION PLANS FOR THE 2002 KOREA/JAPAN WORLD CUP

SUMMARY

Gyeonggi-Do, March 2002

INTRODUCTION

The Republic of Korea has been host to several large-scale international events, including the 1986 Asian Games, the 1988 Seoul Olympics, the 1993 Taejeon EXPO, etc. The 2002 FIFA Korea/Japan World Cup (May 31-June 30) and the Busan Asian Games (September 29-October 14) will both be hosted this year. These mega events always create transportation problems: high traffic volume, congestion, considerable strain on local residents and a major impact on the environment.

In Korea, huge movements of people take place during a four- to six-day period in January or February for the Lunar New Year and for a similar period in September for the Chuseok (harvest festival) holidays, when people go home to spend time with their families. Since the volume of traffic during these periods is 150 per cent higher than normal, the Korean Government has usually taken the initiative to provide convenient, efficient and safe transportation to minimise congestion and to cope with the increased traffic.

Transportation plans for these exceptional periods are formulated and implemented in three stages as follows:

- Firstly, the increase in transport demand is estimated;
- Secondly, the extra capacity required for all transport modes is calculated on the basis of the foregoing estimates, making maximum use of all the resources available while seeking to reduce private car use as far as possible and promote safe transportation and security;
- Thirdly, the above measures are implemented by a Joint Special Transportation Task Force composed of representatives of the Ministry of Construction and Transportation, the Korean National Railroads, the National Police Authority and other relevant government agencies.

The FIFA World Cup is a global event not only for football fans but also for people all around the world. The 2002 FIFA World Cup is special in that it is the first global event of the 21st century, the first time the World Cup has been held in Asia and the first time it is being co-hosted by two countries. More than 42 billion people are expected to watch the event on TV or other media, and at least several million participants and spectators will move between the venues. Transportation will thus be one of the most important factors in making the event a big success.

Since this year's World Cup is being co-hosted by Korea and Japan, each country is responsible for providing safe and secure transportation. The Korean Government is currently preparing the transportation arrangements for the 2002 FIFA World Cup, drawing on its experience not only of several major international events such as the 1986 Asian Games, the 1988 Seoul Olympics, the 1993 Daejeon EXPO, etc., but also of special domestic holiday seasons.

The three organising authorities have been assigned different roles in drawing up the transportation plans for the World Cup. The World Cup Organization Committee is responsible for transport demand estimates and transport arrangements for FIFA family members and the press corps,

while the Ministry of Construction and Transportation is responsible for international transportation as well as interregional transportation. The ten host cities are responsible for ensuring smooth traffic flows within their boundaries.

1. OVERVIEW OF THE EVENT AND TRANSPORT ARRANGEMENTS

Before looking at transportation arrangements for the World Cup, it is worth recapitulating the main features of the event as well as the match schedule.

1.1. Event

The event will last for 31 days, starting on 31 May with the opening match between France and Senegal in Seoul, Korea, and ending on 30 June in Yokohama, Japan. A total of 64 matches will be held throughout Korea and Japan, 32 in each country.

In the first round, the 32 qualified teams are divided into eight groups of four. The teams compete on a round-robin basis, with the top two seeds of each group advancing to the next round of 16 teams. Matches from then onwards to the final will be decided on a knock-out basis. The opening and third-place matches will be held in Korea, while the final will be held in Japan. Key figures for this year's World Cup are shown in the table below:

Table 1. **Key figures for the 2002 FIFA World Cup**

- Period: May 31 (Fri) -- June 30 (Sun) 2002, i.e. 31 days

- Venues: 20 cities - 10 in Korea, 10 in Japan
  - Korea: Seoul, Busan, Daegu, Incheon, Gwangju, Daejeon, Ulsan, Suwon, Jeonju, Seogwipo
  - Japan: Yokohama, Ibaraki, Miyagi, Sapporo, Niigata, Saitama, Kobe, Oita, Osaka, Shizuoka

- Participants: estimated 1.6 million (total man-days)
  - FIFA Family, media, etc.: approx. 13 000
  - Foreign visitors: 350 000 (including FIFA Family, etc.)

- Matches: 32 in Korea, 32 in Japan
  - Korea: Group Matches (24 matches), Round of 16 (4), Quarter Finals (2),
  - Semi Finals (1), 3rd,·4th place match (1)
  - Opening Match (May 31) in Korea (Seoul), Final (June 30) in Japan (Yokohama)

1.2. Transportation arrangements

Transportation will have to be provided over a period of fifty days because almost all the football teams taking part -- which qualified through the regional preliminary competitions for the final round -- will be arriving in Korea and Japan at least two or three weeks before the official opening ceremony, in order to set up their training camps, adjust to the time difference, train and finalise their tactics.

The total number of foreign visitors is expected to exceed 350 000, including 340 000 spectators and 13 000 FIFA Family members, sponsors, the media, etc. Details of FIFA families are shown as below:

–	Players	800	- Referees	80
–	FIFA Executives	250	- FIFA Congress Participants	700
–	Sponsors	1 300	- Media personnel	10 000

It is also estimated that about 1.74 million trips will be made by domestic spectators travelling to and from the ten match venues and that, on the days of matches, 1.59 million trips overall will be made in the ten venues.

All types of transportation modes, including scheduled and non-scheduled air services on international and domestic routes, rail, bus services, taxis, subways, rent-a-cars, ferries, etc., will have to cope with over two million extra people, including 350 000 foreign visitors and around two million domestic spectators. In addition, regulations to ensure smooth, efficient and convenient mobility, as well as safe and secure transportation, will also be implemented.

2. OBJECTIVES AND BASIC POLICY

2.1. Objectives

In order to have a very successful 2002 FIFA World Cup, well-designed transportation plans are of vital importance. The primary objective is to establish and implement effective transportation plans for national and foreign spectators, including FIFA Families such as FIFA officials, referees, teams, sponsors, etc., by providing safe, secure, clean and environmentally-friendly transportation services.

The specific objectives are to:

- provide smooth, convenient and efficient transportation services;
- ensure safe and secure transportation services during the World Cup event for the media;
- provide clean and environmentally-friendly transportation with the minimum of congestion.

2.2. Basic policy

Comprehensive transportation plans will be designed and implemented by the central government and local governments of the ten venues as well as by the Korea World Cup Organization Committee (hereinafter referred to as "KOWOC"). In co-operation with one another, these three organisations will be assigned respective roles and functions.

The basic policy can be summarised as follows:

- Firstly, to expand and upgrade existing transportation facilities, including road signs, and even to develop new facilities if necessary;

- Secondly, to increase the capacity of public transport modes to the maximum level commensurate with the safety of each mode;

- Lastly, to take steps to reduce private car use and manage traffic flows while the various fairs, cultural events, etc., are going on.

2.3. Structure of transportation plans

The following table shows the basic structure of the transportation plans.

Table 2. **Structure of Plans**

- Establish and implement *The Comprehensive Transportation Plan* at the central and local government levels, with a view to providing efficient services for the spectators. The Plan consists of two parts:
  - The Special Transportation Program for the 2002 FIFA World Cup at the central government level;
  - A Transportation Plan for each venue, implemented at the local government level.
- Prepare *The Comprehensive Transportation Plan* with a view to providing safe and convenient transportation services for the FIFA Family and media, with separate plans for the teams, referees, FIFA delegations, media and other groups.
- Strengthen mutual co-operation and garner support from related authorities with a view to establishing inter- and intra-venue transportation plans.

3. TRANSPORTATION PLAN FOR SPECTATORS

3.1. Strategy

A well-designed transportation plan is of vital importance if the event is to go off smoothly. According to two forecasts of traffic demand during the event, the first made in September 2000 and the second in January 2002 just after the final draw of 32 qualified teams on 1 December 2001, about 340 000 visitors from abroad and about 1 780 000 Koreans will be travelling to and from the ten venues in Korea. It is estimated that approximately 1 590 000 trips overall will be made on match days in all ten venues combined.

The Ministry of Construction and Transportation (MOCT) set up the World Cup Transportation Planning Team in May 2001. This team has been working on appropriate transport plans in accordance with the match schedule:

- Stage 1: Before the Final Draw on 1 December 2001

  - Steady build-up of transport facilities and inspection of road signs;
  - Execution of various preparatory operations, such as improving transport services and promoting advanced transportation systems;
  - Launch of a transportation safety campaign via the media, driver training courses and the employees of public transportation companies and authorities.

- Stage 2: From the Final Draw until just before the opening game

  - Conduct final checks on the state of preparation of facilities and all transportation infrastructure;
  - Make an accurate forecast of the increase in international, regional and intervenue traffic demand, and local demand in host cities; the schedules of matches are designed to allow accurate forecast of transport demand;
  - Draw up detailed transportation plans to increase the capacity of all public transportation modes on the basis of forecast demand;
  - Design traffic control measures to cope with the increase in traffic and to curb car use with a view to minimising congestion;
  - Implement safety measures.

- Stage 3: From immediately before the start of the World Cup to the final match

  - Transportation programmes will be implemented to increase the capacity of all public transportation modes, and the necessary measures will be taken to cope with the increase in traffic and to curb private car use.

  - The Korea Organizing Committee for the World Cup (KOWOC) has set up a Special Transport Planning Team to implement the transportation plan for the FIFA Family, the media, etc.

  - MOCT, KOWOC and the ten host cities will co-operate closely.

3.2. Preparation

Since the decision to award the 2002 FIFA World to Korea and Japan was made seven years ago, the Korean Government has steadily built up, expanded and upgraded transportation infrastructure, road signs and other related facilities.

Airports

The new Incheon International Airport was opened on 29 March 2001, and Daegu Airport's new international terminal was completed in May 2001. Also, Yangyang International Airport was completed and opened in March 2002, and Gimhae Airport's new passenger terminal will be completed in May 2001 just before the start of the games.

Roads

Construction and expansion of seven highways, national roads and access roads to stadiums:

- Construction of new highways included the Central (Daegu-Chuncheon: 280 km), Suhhaean (Seoul/Incheon-Mokpo: 353 km), Daejeon-Jinju (161 km) highways; these were completed and opened at the end of 2001. Expansion of existing roads such as the Youngdong (171 km) and Jungbu (Hanam-Hobub: 41 km) highways was also completed in December 2001.

- Upgrading of national roads: upgrading of 22 sections of 40 national roads totalling 168 km was completed in 2001. For example, the Suwon-Gwangju (22.2 km) section of national road No. 43, the Dongducheon-Jeonkok section (19 Km) of No. 3, the Oksan-Daeya section (13 km) of No. 21, the Chungsong-Pacheon section of No. 31, the Bubjeon-Socheon section (21 km) of No. 36, and other sections were completed and opened in 2001. This year, 62 sections of national roads totalling 486 km will be expanded or built.

- The national budget provides for the construction of access roads to Seogwipo, Jeonju and Gwangju and the expansion of the Jeju Island Seobu industrial road. Construction of the new access road (0.6 km) to the Ulsan World Cup Stadium, which will link to national road No. 14, will be completed by May 2002.

Railroads

The Government has steadily upgraded regional railways and subways in metropolitan cities. Double-tracking of the line between Songjungri and Imsungri (59.7 km) and of the Honam line which connects Seoul via Daejeon, Kwangju to Mokpo located in the south-western end of the Korean peninsula, was completed in December 2001; double-tracking of the Bupyong-Juan (5.6 km) section of the Gyeongin (Seoul-Incheon) line (27 km) will be completed in January 2002.

The Seoul Subway Lines Nos. 6, 7 and 8 and Busan Subway Line No. 2 were completed in 2000 and 2001 and are now in service.

Road signs

For the convenience of foreign visitors, the size of the text on road signs has been increased 1.5 times, and the English and Chinese characters have been checked. Furthermore, 36 041 new road signs have been installed on highways and national roads, while 71 per cent of local road signs (64 591), which are the responsibility of local governments, are being checked.

Promoting safety awareness

Advertisements and public campaigns promoting safety awareness have been carried out by TV, radio and newspapers. Efforts are also being made to increase safety awareness among the managers of transport undertakings such as bus companies, taxi companies and road hauliers.

3.3. Basic aims of transport plans

To ensure that the 2002 FIFA World Cup is a success, comprehensive transportation plans will be designed and implemented by the central government, the local governments of the ten venues and the KOWOC. These three organisations must do their best not only to perform the roles and functions assigned to them but also to co-operate closely with one another:

- Firstly, by expanding and upgrading existing transportation facilities, including road signs, and even developing new facilities if necessary;

- Secondly, by increasing the capacity of public transport modes to the maximum level commensurate with the safety of each mode;

- Lastly, by taking steps to reduce private car use and manage traffic flows while the various fairs, cultural events, etc., are going on.

The basic aims of the transportation plans are to establish and implement the Comprehensive Transportation Plan at the central and local government levels, with a view to providing efficient services for spectators; to prepare the Comprehensive Transportation Plan with a view to providing safe and convenient transportation services for the FIFA Family and media, with separate plans for the teams, referees, FIFA delegations, media and other groups. They also seek to strengthen mutual co-operation and garner support from related authorities with a view to establishing inter- and intravenue transportation plans. The Plan consists of two parts: (1) the Special Transportation Program for the 2002 FIFA World Cup at the central government level; (2) a Transportation Plan for each venue, implemented at the local government level.

3.4. The Transportation Plan

The Transportation Plan has two components: public transportation programmes on the one hand, and transport demand management measures on the other. This plan specifically aims to increase the transport capacity of airlines, railways, express buses, etc., in order to cope with the increased traffic demand, to improve overall transportation services and to enhance safety and security awareness throughout the whole period of the World Cup. It also seeks to reduce the use of vehicles, especially of private cars, with a view to ensuring that traffic continues to flow smoothly.

Demand forecasts

First of all, the total volume of traffic had to be estimated. In order to forecast the detailed transport demands of the 16 countries on the basis of the final draw, the Korea Transport Institute (KOTI) conducted a second estimate in 2002 following the first one in 2000.

According to this estimate, the total number of foreign visitors is expected to exceed 350 000, including 340 000 spectators and 13 000 FIFA Family members, sponsors, media personnel, etc. This figure includes around 140 000 spectators from Japan, 60 000 from China and 140 000 from the other 14 countries. It is also estimated that about 1.74 million trips will be made by spectators travelling to and from the ten match venues, of which 1.16 million trips by foreigners and 0.58 million trips by Koreans. It is estimated that the total traffic demand volume for all ten venues during the games will total 1.59 million trips -- of which 0.95 million by foreigners and 0.64 million by Koreans. Details of the transportation demand forecasts are given in annex.

The Transportation Plan will be revised on an ongoing basis in the light of the demand forecasts and the outcome of the matches and ticket sales, as the participating countries will be travelling between Korea and Japan for the Round of 16 matches to be held on 15-18 June, the semifinal on 29 June and the final on 30 June.

The Transportation Plan for spectators from abroad

While most foreigners will probably prefer to use their own national airlines, the number of Korean airline flights will also be increased. The number of regular direct flights to China, France, the USA and Brazil will be increased. Temporary extra and charter flights will also start to be operated two or three weeks before the start of the World Cup until one week after it ends.

Currently, 1 165 regular flights are operated per week on 248 international routes, among which 464 flights to China, France, the USA and Brazil. Charter and extra flights may be provided depending on the demand forecasts of the other eleven countries to which regular services are not operated at present. The transportation plan should also utilise the spare seating capacity on national airlines, whose average seat occupancy rates are 70-80 per cent during the months of May and June.

Japan

The number of flights on existing routes between Korea and Japan will be increased and non-stop and charter flights will be established between the venues in the two countries. In addition, temporary, extra and charter flights will be provided for the FIFA Family, players and spectators from the Round of 16 to the final. Charter services will be operated between Kimpo (Seoul's old international airport, currently used for domestic flights) and Haneda during the World Cup in order to meet the increased traffic demand between the two co-hosting countries.

In addition ferry services between Busan in Korea and Hakada in Japan, and between Ulsan, Korea and Kokura, Japan, will be expanded .

China

Special attention will be given to those countries which are expected to provide very large numbers of spectators. Flights to Beijing, Shanghai and Shenyang will be stepped up, while new, non-stop, regular flights will be launched between the Chinese regions and the World Cup venues in Korea. Extra services and charter flights will be operated during and after the matches of the Chinese team (4 June in Kwangju, 8 June in Seogwipo, and 13 June in Seoul). Currently, 210 flights on 42 routes are operated weekly to China.

Ferry services will also be expanded. The services between Incheon on the west coast of Korea and Weehae on the east coast of China, and between Incheon and Cheongdo on the east coast of China, will be stepped up. New services will be launched between Pyeongtaek in Korea and Iljo in China.

USA

Flights to the United States will be stepped up, and code-sharing arrangements will also be expanded under the bilateral open-sky air services agreement between two countries. This agreement between the two countries allows an unlimited increase in the number of services or new routes which any airline wishes to operate.

Other countries

Flights to other countries will also be increased and code-sharing arrangements will be expanded under the bilateral air services agreements between those countries and Korea. Extra and charter flights will be laid on, depending on demand.

Connections between the venues

Plans to connect venues and provide convenient entrance/exit will be drawn up, with strengthened security at all points. Between Incheon airport and the venues, the number of regular flights will be increased and extra services and charter flights will be laid on. At present, four weekly flights (1 370 seats) are available from Incheon to Jeju, and 28 flights a week (7 817 seats) from Incheon to Busan.

Airport services

Welcome Desks, hanging boards with welcome notices, etc., will be installed at Incheon International Airport while facilities such as parking areas and restaurants at main airports will be improved. Support teams such as an Immigration Security Task Force will be set up beginning March 2002, and various safety checks will be conducted on take-off/landing facilities, emergency care systems, etc.

Transportation between venues

Public transportation capacity will be increased to meet demand. For example, since the average boarding rates for express buses, railways and flights are low during May and June except at weekends, ways of utilising the spare seats should be sought. Of course, safety must always be the top priority in devising plans.

For weekend matches (in Incheon, Daegu, Ulsan and Seogwipo), extra services will be put on for spectators. Express and cross-country buses that do not serve the stadiums will be re-routed so that they do. Charter buses are being considered for the transportation of groups.

Information signs will be improved and guidance will be provided for foreign visitors, including transportation guides inside aircraft, buses, trains and other modes of transportation used to travel to the stadiums. From January 2002, it will be possible to book rail tickets over the Internet. Volunteers will be on duty at airports, main train stations and bus terminals from early May to help foreign visitors. The number of road signs containing Chinese characters will be increased for the convenience of the large number of visitors expected from China and Japan, and the regulations are being amended to permit this.

Transportation at the venues

Public transportation will be the focal point of the transportation plans for each venue, with specific transportation plans to be devised before each match.

General

Travel passes will be issued and parking areas designated. Information on remote parking areas, shuttle bus services between stadiums, etc., will be handed out beforehand.

Subway/bus guides and tickets will be provided to induce spectators to use public transport. Public transport services will be extended during the match periods and the number of services increased with the same objective in mind. The shuttle bus services from railway stations, express bus terminals, airports and the main hotels to stadiums, will also be expanded.

Other plans under consideration include combined and reduced-price public transport tickets along with special reduced-price public transport tickets for each venue.

Transport demand management

In order to reduce the number of vehicles on the road, alternate traffic arrangements will be enforced in Metropolitan areas and self-imposed in other regions the day before matches and on match days: vehicles whose licence plate ends in an even number will be allowed on one day, those with licence plates ending in odd numbers on the other. The scope and duration of the restrictions on vehicle use will be decided by the local government of each venue.

Traffic control measures

Special traffic control measures will be implemented before and after matches in those areas where traffic congestion is expected, such as around stadiums and tollgates. Local governments will draw up flow plans for stadiums to ensure safety and to prevent traffic congestion. The police will also establish and enforce traffic restrictions. Cultural and merchandising events should also help to disperse traffic before and after matches.

Taxis

Different types of taxi services will be provided in order to enhance the quality of service, especially for foreign visitors. For the convenience of foreign visitors, receipts will be issued, interpretation systems will be provided and credit cards accepted. These new services will first be introduced in cities in which matches are being held and extended to other regions later.

The use of mini-van taxis for transporting 6-10 passengers is being experimented in Seoul, Incheon and Kwangju, and will be extended to other major cities nationwide. Special "World Cup" taxis are also being introduced -- Seoul corporation taxis and two private taxi firms have introduced them on a pilot basis, and they will be introduced in all ten venues later.

Teams of inspectors in each venue will be responsible for combating illegal practices such as the refusal to take passengers. Simulations of real-life situations involving foreigners will be organised to test and improve services.

Buses

Facilities such as bus stations will be improved and drivers' awareness of driving etiquette evaluated and enhanced. Other improvements involve easier-to-understand road signs, announcements on buses in English as well as Korean, and having match schedules and stadium maps available on the buses in cities where matches are being held.

New bus services will be introduced and existing services increased.

4. TRANSPORTATION PLAN FOR THE FIFA FAMILY AND PRESS CORPS

4.1. FIFA executives/staff

FIFA executives and staff will require transport for 51 days, from 15 May to 4 July 2002. Three basic categories of vehicles will be provided: VVIP -- chauffeur-driven cars; VIP -- shared cars for two persons; General -- shared cars for three persons.

VVIP:	FIFA President, FIFA vice-presidents, Members of the FIFA Executive Committee, Confederation Presidents, FIFA General Secretary, FIFA Honorary President
	General Co-ordinator (if on duty), Media officers in all venues (one shared car per venue), TSG members in all venues (one shared car per venue), Match Commissioner (on match day), doctors responsible for doping tests (on match days)
VIP:	Members of the Organizing Committee 2002 FIFA World Cup Korea/Japan, VIP honorary guests
General:	Members of FIFA standing committees and judicial bodies, FIFA staff members
Bus:	Groups such as FIFA staff, guests, etc. (Participants in the FIFA Congress, Gala Dinner, matches, etc.)

Note: Classification based on protocol guidelines for the 2002 FIFA World Cup Korea/Japan.

Transportation for FIFA officials between Korea and Japan or between venues will be handled by the LOC only when the officials are "on duty". Scheduled flights between Korea and Japan and scheduled flights and trains for long journeys in the host country will be provided.

As was the case at the FIFA Confederations Cup 2001, members of the FIFA delegation [the General Co-ordinator, Media Officers, the Technical Study Group (TSG), etc.] and referees will have open tickets paid for by FIFA for travel between Korea and Japan.

Other transportation to be provided includes:

For Arrivals: VIPS will be met at the airport with private chauffeur-driven cars; for other officials, car pools and bus shuttles to the hotels will be provided. Detailed travel arrangements will be drawn up on the basis of arrival times.

For the various events (FIFA Congress, Gala Dinner, matches, etc.): VVIPS will use private, chauffeur-driven cars, other participants will in principle use buses.

During the World Cup: Cars or air (train) transport + cars will be laid on according to the match schedule. On match days, officials will be conveyed by bus to Seoul, Incheon, Suwon, Daejeon and Jeonju, and return to the FIFA HQ in Seoul where they will be staying. They will travel by air from Seoul to Daegu, Ulsan, Busan, Gwangju and Seogwipo , and driven by car from the airport/station to the venue. The location of hotels may change. The basic principle is that cars will be used for travelling to venues where air travel cannot be provided.

All vehicles provided by the Local Organizing Committee (LOC) will be equipped with interpretation systems to deal with language problems; passengers and chauffeurs will be linked to an Interpretation Centre. Language services will be provided in English, Japanese, Chinese, French and Spanish.

4.2. Referees

Eighty referees in all -- forty in Korea, forty in Japan -- will take part in the World Cup for a duration of 43 days, from 20 May to 1 July. In Korea, they will be headquartered at the Swiss Grand Hotel (SG).

Referees will be provided with chauffeur-driven vehicles for travelling within and to nearby venues. Two passenger cars, two mini-buses, one bus and one vehicle for luggage will be provided for transporting them from the airport to the Referees' HQ (SG), stadiums and other official events for referees.

As with FIFA executives and staff, referees will use scheduled flights for travelling between Korea and Japan and scheduled flights for travelling long distances in Korea.

Transportation services: private cars or trains will be used for travel to venues in Seoul, Incheon, Suwon, Daejeon and Jeonju the day before or the day of the match. For distant venues in Daegu, Ulsan, Busan, Gwangju and Seogwipo, regular flights or train services will be made available, again for travelling the day before or the day of the match, in addition to the vehicles from each venue's transportation centre.

4.3. Press corps

The press corps will be present for the same period as referees: 43 days, from 20 May to 1 July. Shuttle buses will be used mostly for the press corps. In Seoul, transport will be provided between the IMC, hotels and main destinations within an hour's drive of the IMC, and to and from the IMC to stadiums in Seoul, Incheon and Suwon on match days. For other venues except Incheon and Suwon, transportation will be provided on match days between the stadium, media hotels and main locations.

These services will be provided free of charge for media with accreditation cards. The shuttle bus timetables are being discussed with WCABK. The press corps can take airport buses, including Airport Limousine Buses, free of charge from the airport to Seoul city centre. Bus vouchers will be distributed at the Transportation Desk in Incheon International Airport to members of the media after their ID has been checked. For travel between Korea and Japan and between venues, members of the press corps will be given priority on flights, railways or express bus services.

A Media Guidebook containing useful information such as maps of venues and indicating distances and estimated journey times, will be distributed at information desks.

The "KOWOC Transportation & Tourism Service Agency (KTTSA – Hodo Tour)" will have a desk at International Media Centres (IMCs) and Stadium Media Centres (SMCs) to facilitate reservation and ticketing for airlines, railways and buses. Reservation services and rental car information will be provided at SMCs.

4.4. Transportation Centres and Information Desks

The Transportation Centre at the FIFA Headquarters Hotel will be open from 15 May to 7 July. The main role of the Transportation Centre is to:

- oversee transportation;
- maintain and manage communication between Venue Transportation Centres and Transportation Desks;
- manage vehicles for common use (vehicles and chauffeurs);
- manage vehicles for exclusive use (teams and VIPs), check and confirm whereabouts;
- manage fueling, maintenance and car washes;
- manage and operate charter buses, freight cars, rental cars, etc.;
- manage and operate shuttle buses for the media;
- manage reserve vehicles. Prepare standby teams in case of emergency;
- produce, distribute and control parking passes.

About five to six Transportation Information Desks will be set up at the Incheon International Airport, Kimpo Airport, FIFA Headquarters Hotel, VIP Hotel, IMC and Referee Headquarters. The information desks will be operated flexibly depending on arrival/departure times. The main role of the Transportation Information Desks is to:

- maintain contact with the HQ Transportation Centre;
- allocate pool cars for the FIFA Family and transport them;
- distribute travel guides;
- reserve and book tickets for flights, trains, etc. (by the KOWOC Transportation & Tourism Service Agency (KTTSA – Hodo Tour);
- provide information on shuttle bus services;
- help arrange rent-cars and charter buses and provide travel information.

Transportation Information Desks will be set up in the ten venues at airports, HQ hotels, stadiums (in the SMC) and at stations depending on the venue locations. In Seoul, a desk will be set up only at the stadium. In Suwon and Incheon, desks will be installed in HQ hotels, stadiums and stations, and in the remaining seven venue cities, at airports, HQ hotels, stadiums and stations. In stations, Transportation Information Desks will operate alongside Tourist Information Desks. The main role of the Transportation Information Desks is to:

- maintain contact with the HQ Transportation Centre;
- allocate pool cars for the FIFA Family and transport them;
- distribute travel guides;
- reserve and book tickets for flights, trains, etc. [by the KOWOC Transportation & Tourism Service Agency (KTTSA-Hodo Tour)];
- provide information on shuttle bus services;
- help arrange rent-cars and charter buses and provide travel information.

5. AIRCRAFT SAFETY AND SECURITY MEASURES

Security measures will focus on strengthening security in external areas where aircraft are moored, enhancing crew members' responses in cases of emergencies and the supervision of cabin maintenance personnel.

Passenger and cargo inspection and counter-terrorism measures will be implemented to eliminate threats to airport safety; controls will be reinforced in security areas, including prohibited and restricted zones. Inspectors will undergo specially reinforced training for this purpose.

The mooring areas for charter flights between Korea and Japan, and flights carrying World Cup players, need to be secured in addition to routine inspections to ensure normal operation and maintenance of landing and take-off facilities.

Other areas that require reinforcement are: aviation information, radar surveillance and air traffic control emergency procedures for dealing with hijacking and other aircraft-related accidents. Simulations of counter-terrorist operations and dealing with accidents involving aircraft will be conducted. Co-operation between medical, fire-fighting, power and emergency rescue authorities and agencies will be strengthened. Lastly, measures for dealing with airport malfunctions caused by bad weather conditions or natural disasters will be drawn up.

Safety is an area that cannot be overlooked; measures to deal promptly with emergencies must be prepared in advance. In this area, it is important that effective co-operation be maintained between the concerned bodies and the airport police, especially with regard to hooligans, etc., while strengthening overall policing throughout the World Cup. Measures include:

- Co-operating closely with intelligence agencies and sports organizations around the world to collect information in advance, draw up blacklists of those who have engaged, or are likely to engage, in terrorism or hooliganism, and to deny them entry into Korea;

- Operating Immigration Control Teams at major airports and seaports and tightening passport control and search on incoming visitors from so-called terrorist countries, with a view to keeping suspicious people as well as firearms, explosives and other dangerous objects out of Korea;

- Combining the forces of the Ministry of National Defense, the Police Agency and the National Intelligence Service; tightening vigilance in the air, on land and sea, which of course means stepping up monitoring of suspicious people to identify and eliminate risks in advance;

- Designating airspace above stadiums as no-fly zones during matches to prevent air strikes, while putting in place stricter flight security checks to prevent acts of terrorism such as hijacking or suicidal attacks; reinforcing security at venues, key government facilities and areas frequented by large crowds; and

– Providing full security protection to the teams and event officials during their stay in Korea. Dedicated personal protection teams will be assigned to the teams and VIPs, and accompany them throughout their stay in Korea. All food and drinks, mail and packages delivered to participants will be thoroughly checked. Another precautionary measure will be to separate the hotels and seats of rival teams and supporters in order to prevent clashes.

Security at stadiums also needs special attention, and the following measures have been put in place:

– A Central Control Centre at each stadium will oversee all aspects of security such as stadium protection, security checks, anti-terrorism and anti-hooliganism measures, fire-fighting and evacuation;

– Spectators will be checked four times in all as they proceed from the stadium entrance to their seats to ensure that no dangerous persons or objects are allowed in;

– High-level security facilities and CCTV cameras have been installed, as well as moats between pitches and the stands to prevent hooligans from getting on to the pitch; also stands have been divided into four sectors to prevent hooligans from moving around;

– Electricity, gas, oil and communications networks in and around stadiums will be checked;

– Special police units, anti-hooligan squads and fire-fighting and evacuation teams will be deployed at various locations to respond to potential contingencies; sniffer dogs will be used to look for explosives in stadiums, and policing will be stepped up to prevent terrorist attacks or other incidents;

– The military and the police will be kept on high alert while the event is going on; they will conduct special surveillance operations in mountains, beaches, rivers and other vulnerable areas close to stadiums, and designate airspace above stadiums as no-fly zones.

6. OTHER MATTERS

6.1. Immigration control measures

Joint Immigration Control Teams comprising members of the National Intelligence Service, the Ministry of Justice and the Customs Service will operate at major airports and seaports in order to tighten up passport control and customs clearance and to facilitate immigration procedures.

6.2. Personal security measures

Personal protection units will be assigned to the participating teams and VIPs from their arrival to their departure. These units will be responsible for identifying and removing risks to the persons under their protection, and providing escorts to the teams'/VIPs' cars.

6.3. Co-operation with the participating countries

The Joint Korea/Japan World Cup Security Council will play a useful role by sharing information on security and strengthening co-operation. Communication channels will be established with the Security Officers from the 32 participating countries stationed in Korea, with a view to exchanging information.

CONCLUSION

As co-hosts of the 2002 FIFA World Cup, the Korean Government aims to provide a convenient, efficient, safe and secure system of transportation, with a view to making the event the most successful World Cup ever. To this end, it has divided the event into three stages and drawn up transportation plans for each of them:

- Stage 1: Before the final draw on 1 December 2001;
- Stage 2: From the final draw until just before the opening match;
- Stage 3: To the final.

The basic aims of the transportation plans are to establish and implement the *Comprehensive Transportation Plan* at the central and local government levels, with a view to providing efficient services for the spectators; to prepare the *Comprehensive Transportation Plan* in order to provide safe and convenient transportation services for the FIFA Family and media, with separate plans for the teams, referees, FIFA delegations, media and other groups; to strengthen mutual co-operation and garner support from related departments to establish inter- and intravenue transportation plans.

The *Comprehensive Transportation Plan* consists of two parts, the *Special Transportation Program for the 2002 FIFA World Cup* at central government level and *Transportation Plans* for each venue at the local government level.

The aim of these transportation plans is to maximise public transportation use while safeguarding security, and to minimise traffic congestion while the event is going on. Other measures include: advance assignment of parking lots, restriction of private car use by alternating even/odd number licence plates on the day before and on the day of the match, introduction of traffic control zones, shuttle buses between stadiums and remote parking lots, fare discounts to encourage spectators to use public transport. Various other measures will be implemented two or three weeks before the opening match until the week after the final.

The plan to maximise the use of public transportation modes will be revised on an ongoing basis in the light of demand forecasts and other factors such as the outcome of matches and ticket sales, as the participating countries will be travelling between Korea and Japan for the Round of 16 matches on 15-18 June, the semi-final on 29 June and the final on 30 June.

The other co-host, Japan, is also preparing very similar transportation plans. The two co-hosting countries are co-operating to ensure that the World Cup, the first major event of the 21st century and the first event of its kind to be co-hosted, will be a big success.

ANNEX

TRANSPORT DEMAND FORECASTS FOR THE 2002 FIFA WORLD CUP, KOREA

1. Transport demand during the event

- ***International transportation (number of persons)***

  - Overseas - Korea: Approx. 197 000 (including Japan - Korea: Approx. 147 000)
  - Korea - Overseas: Approx. 207 000 (including Korea - Japan: Approx. 137 000)
  - *Total number of entrants : Approx. 344 000*
    - 1st Round: approx. 250 000
    - 2nd Round: approx. 94 000

- ***Domestic transportation between/in the 10 Korean venues***

  - *Total Trips: approx. 1 740 000 (domestic spectators 580 000; foreign spectators 1 116 000)*
  - *Modal split*: - Bus: approx. 680 000 (39.1%)
    - Rail: approx. 430 000 (24.6%)
    - Air: approx. 310 000 (18.1%)
    - Car: approx. 320 000(18.2%)

- ***Transport demand in 10 venues (total)***

  - *Total number of trips: approx. 1 590 000 (domestic spectators, 640 000; foreigners, 950 000)*
  - *Modal split:* - Bus: approx. 671 000 (42.2%)
    - Rail: approx. 345 000 (21.7%)
    - Air: approx. 286 000 (18.0%)
    - Car: approx. 288 000 (18.1%)

2. Forecasting method

These tentative estimates of demand are based on the results of the final draw, ticket sales by the KOWOC, surveys of ticket buyers and professional consultations.

3. Details of international transportation

- Entrants by mode and place of embarkation: Total 344 000 persons

  - ♦ Air transportation: 335 000 (99.4%)
    - Incheon International Airport: approx. 323 000 (94%) (including connections from Incheon to other domestic airports on day of arrival: approx. 209 000)
    - Other domestic airports: approx. 323 000 (94%)
  - ♦ Maritime transportation: 9 000 (0.6%)

- Entrants by nationality

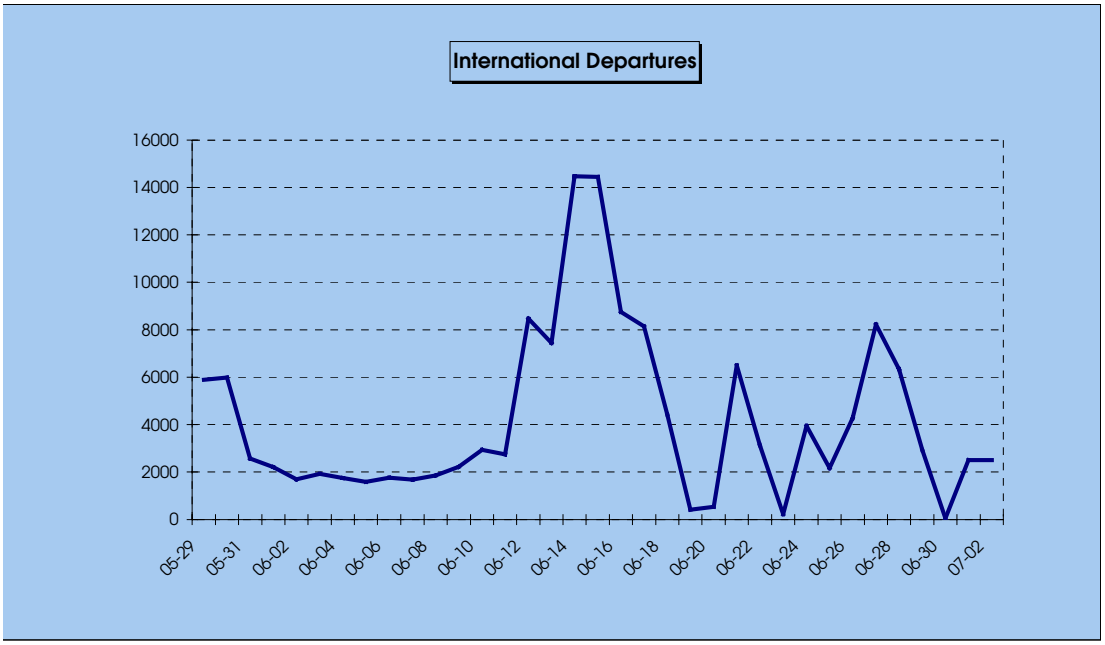
(1 000 persons)

Route	Air	Maritime	Total
Japan→Korea	142	3	145
China→Korea	54	6	60
Other→Korea	139	-	139
Total	335	9	344

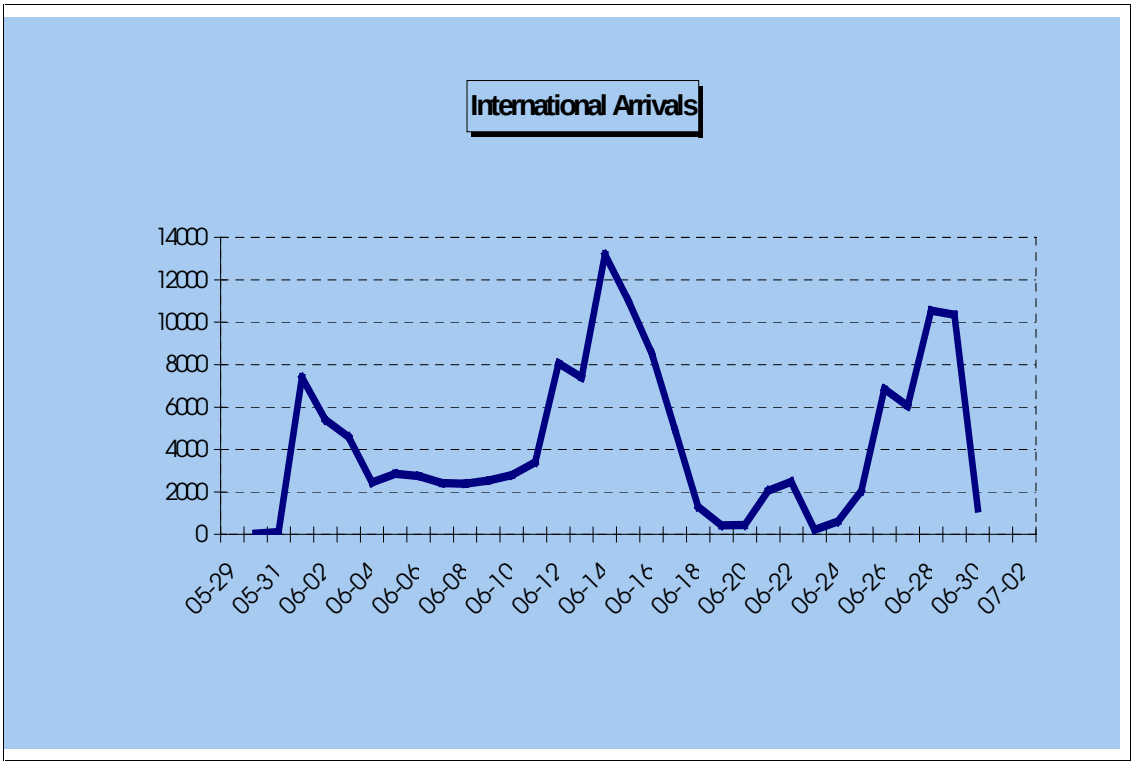
- Analysis of demand and supply on major air routes between Korea and Japan

Route	Dates	Demand	Shortfall
Seoul→Tokyo	6.1-3	5 718-7 118	▲515-▲1 915
	6.11-17	6 377-9 411	▲1 173-▲4 208
	6.26	5 417	▲268
	6.28-29	7 313-7 355	▲2 110-▲2 151
Seoul→Kansai	6.1-3	3 623-4 463	▲623-▲1 463
	6.5-6	3 070-3 100	▲70-▲100
	6.9-16	3 009-4 224	▲10-▲1 224
	6.28-29	3 652-3 770	▲652-▲770

– ***Departures***

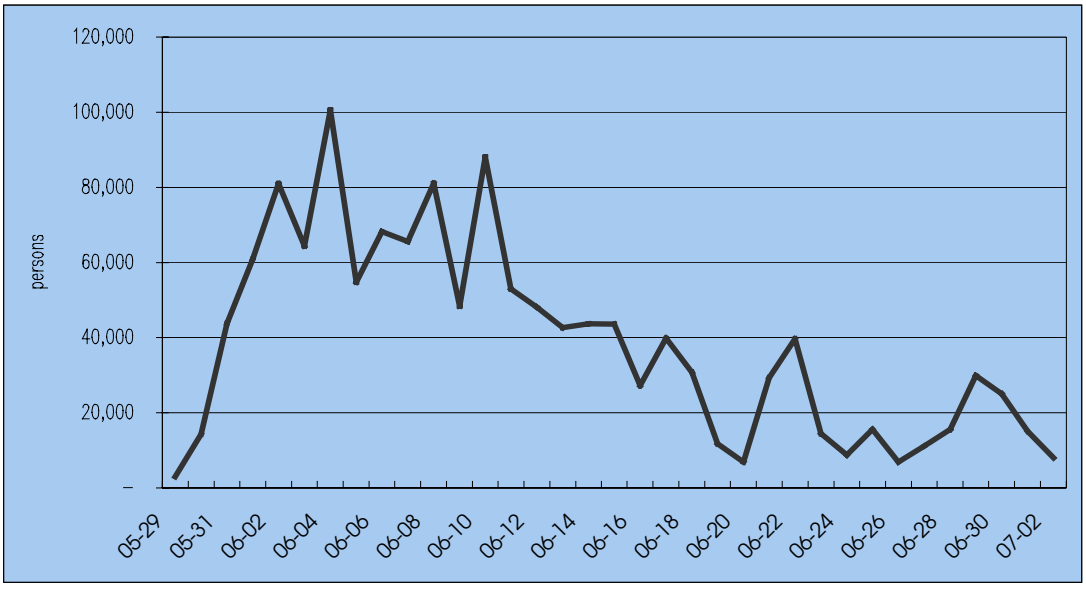


– ***Arrivals***



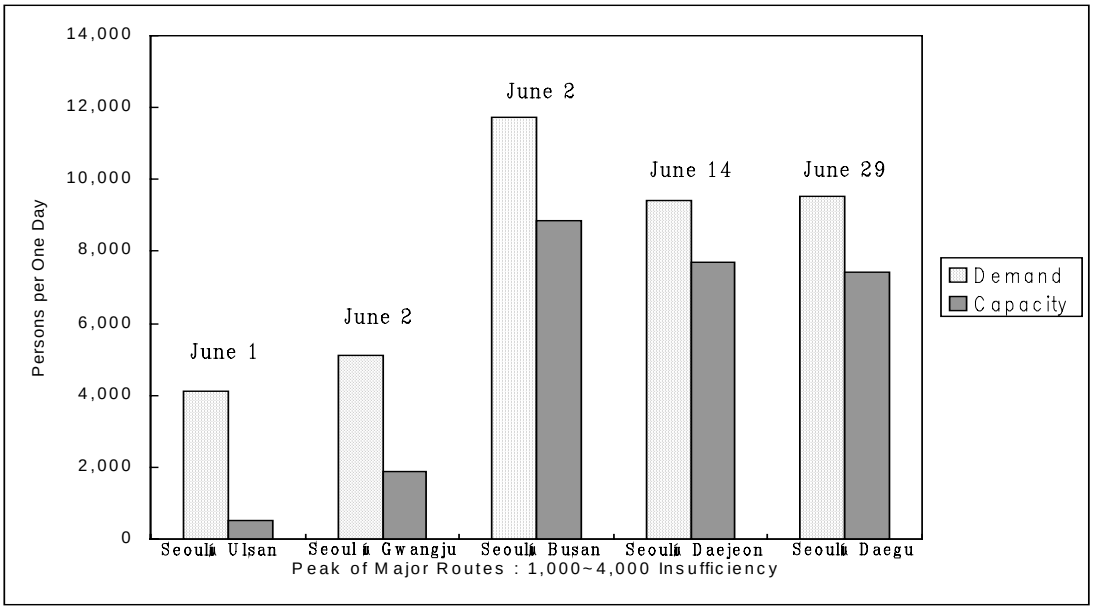
4. Domestic transportation

– ***Peak total domestic traffic demand***

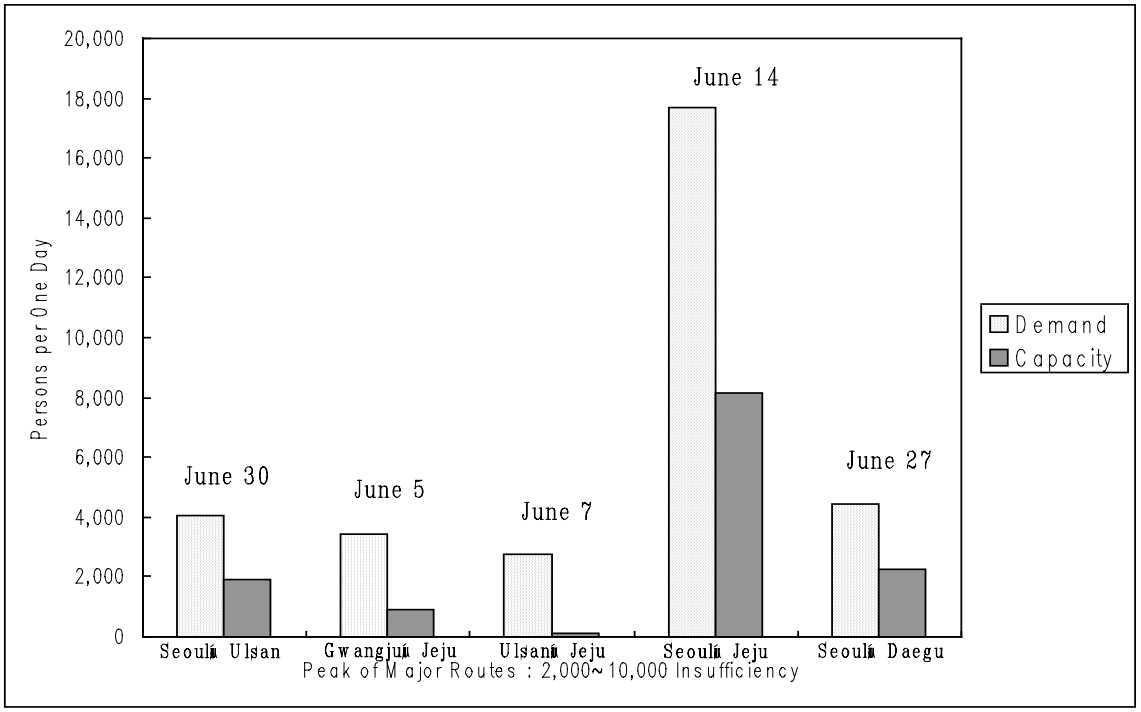


Approx. 20% (351 000 persons) with demand concentrated on 2, 4, 8 and 10 June.

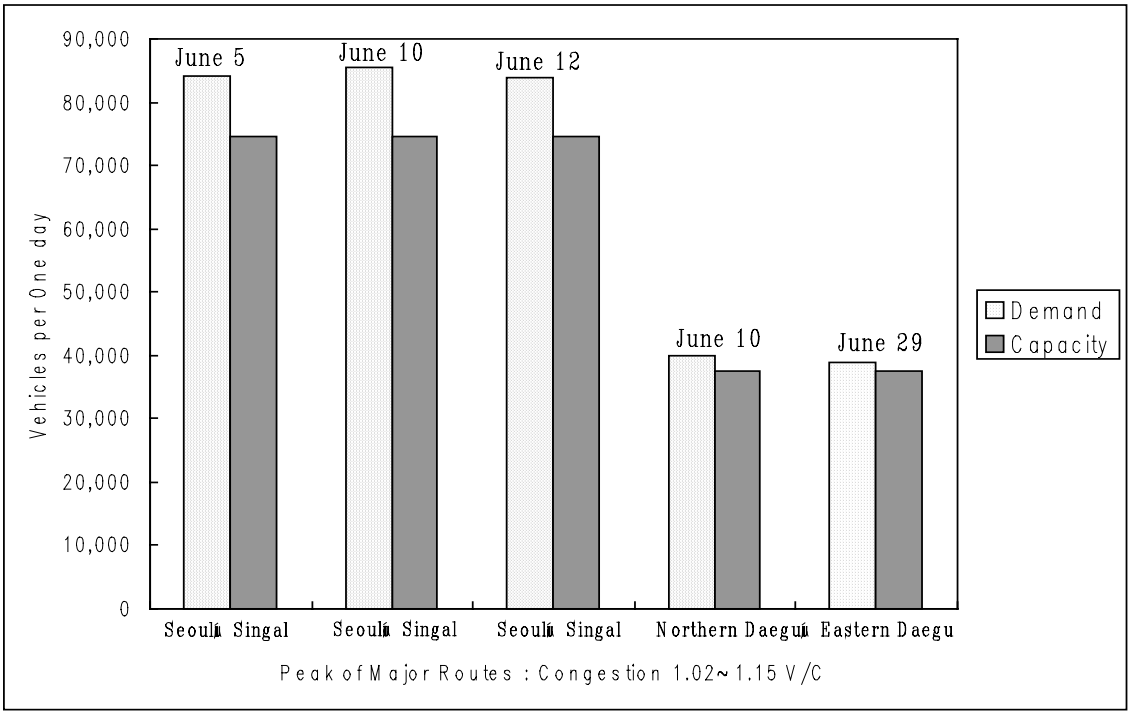
♦ Rail: Capacity shortfall on 55 routes all told



♦ Air: Capacity shortfall on 74 routes all told



♦ Expressway: capacity shortfall on 13 routes all told



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FRANCE

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CITY OF CANNES

SUMMARY

Cannes, December 2001

1. MOBILITY IN CANNES

Mobility as it applies to Cannes has some characteristics that are specific to the city itself, as France's foremost centre for conventions and events outside Paris.

Mobility planning is a requirement of the City's Urban Travel Plan (UTP), spearheaded by the *Syndicat Intercommunal des Transports Publics de Cannes*, Le Cannet and Mandelieu La Napoule.

The programming of measures under the UTP includes recommendations on the accessibility of the city centre areas.

1.1. The UTP

The goals of the UTP are to improve quality of life and urban quality by improving the shared use of public space.

Motorised traffic gives rise to conflicts between pedestrians, two-wheeled and car traffic, and is detrimental to health and safety in an urban environment.

Showing a proper awareness of the issues involved in road accident prevention therefore means reducing the conflicts between urban life and road traffic as much as possible.

1.2. The context in Cannes

Access to city centre areas is primordial for Cannes and the only way to achieve this is by making specific provisions to ensure accessibility.

The population of Cannes is 70 000, but it has to cater for over three times that number when it hosts certain events. The volume of wastes it generates when some of these conventions and events are being held is equivalent to that of a city with a population of 200 000 to 250 000.

The city's road infrastructure does not have the capacity for this influx of people and transport flows must therefore be organised in a way which ensures that the greatest number of people can travel into the city without eroding the level of security in public spaces.

2. CANNES' UTP

The objectives of Cannes' UTP are:

- Regulation of motorised traffic flows;
- Accessibility of the city centre;
- Extension of public transport services.

The pro-active scenario consists of programming measures for a hands-on urban transport policy, aimed at ensuring a better balance between modes of transport:

- Implementation of a public transport network with dedicated infrastructure and connecting bus services;
- Control of car transport and parking;
- Sharing of urban space to the advantage of environmentally friendly modes, pedestrian and two-wheeled traffic.

These measures, which are aimed at a more balanced use of the road network, are a tangible commitment to quality of life and the urban environment.

2.1. Redistribution of traffic flows

The aim is to reduce motorised flows in the city centre areas by providing the city with an access control system and by organising HGV routes in the urban area.

The challenge is to develop a road network hierarchy by lightening traffic on the busiest trunk roads, chiefly roads into the city centre areas.

The volume of traffic means that the space occupied by cars -- up to 80 per cent of the road network -- will have to be divided among the city centre areas.

2.2. Cannes Centre area transport plan

The Urban Transport Plan sets out broad guidelines for five city centre areas, including the Cannes Centre area.

Transport and parking demand cannot be met for all travel. There is a shortage of space for cars. The UTP for the Cannes Centre area provides for a planning and development programme along the following lines:

– The sharing of urban space via: an extension of the seafront pedestrian zone, a motorised traffic flow control system that gives priority to buses, the development of a public transport service with dedicated infrastructure in the very centre of Cannes;

– Introduction of a road network hierarchy by: restricting through-traffic, defining city access roads, city centre bypasses, redesigning major intersections, introducing 30-km zones south of the SNCF station.

3. THE ORGANISATION OF EVENTS IN CANNES

3.1. Immediate applicability of UTP measures

The events hosted in Cannes make the "Croisette Centre" area the most attractive city centre area in the region.

The volume of traffic converging on an area of less than 2 km^2 requires organisation of all access and passenger and freight transport.

Events in Cannes generate substantial goods transport needs over a season that spans 2/3 of the year, with 110 events and conventions held in the Festival Hall (the Palais des Festivals) and 400 seminars held in the main hotels on the Croisette.

The influx of people generates continuous traffic throughout the day; these events attracted over 400 000 participants in 2000.

This level of occupancy of urban space requires congestion management and attention to safety.

3.1.1 Arrangements for the International Film Festival are a particularly interesting example

These measures prevent saturation of the roads, thereby maintaining access to the city:

– Extension of the pedestrian zone to the entire south carriageway of the Croisette;

– Reduction of car nuisance on the Croisette, limited access after certain hours, no access at other times;

– Additional signing for city centre car parks;

– Incentives to avoid the town centre;

- Creation of new routes to city centre districts to improve flow distribution; presentation of new routes to the Croisette Centre area;

- Extended urban bus services on the Boulevard de la Croisette.

3.1.2 Traffic control for the International Film Festival

The organisation of a high-profile event on the sheer scale of the International Film Festival requires controlled access to the Festival and Convention Hall.

- The immediate vicinity of the Festival and Convention Hall has to accommodate crowds of 10 000 to 15 000 at peak times in the late afternoon;

- Pedestrian traffic around the immediate vicinity is dense;

- The space available is insufficient to accommodate all of these people and their transport by modes such as the private car.

In this context, traffic control arrangements are put in place to divert automobile transport to the edges of the Croisette Centre area. The diversion of traffic must enable:

- The permanent extension of the pedestrian zone to the south carriageway of the Boulevard de la Croisette and La Pantiero;

- Two-way traffic on the north carriageway of the Boulevard de la Croisette and La Pantiero;

- The immediate vicinity of the Festival and Convention Hall to be a pedestrian zone in the late afternoon and evening.

These measures are implemented to meet the following requirements:

- The Croisette area of the city-centre must remain accessible from the expressway over the railway via side streets, except for the rue Jean Riouffe in the late afternoon/evening:

    - first diversion set up at 15.00 at either end of the Croisette area (Alexandre III Bridge, rue du Port);
    - second diversion set up at 17.00 on approach to the Festival Hall;
    - enforcement of parking prohibitions on the Boulevard de la Croisette and delivery times until 10 a.m.

- Urban transport networks and taxis must be able to ensure continuity of passenger transport services; extended urban bus service on the Croisette;

- Simple rules for monitoring the arrangements: diversion points, schedules for implementing the arrangements and managing authorised vehicles (official vehicles, public service vehicles, etc.).

3.2. Co-ordination of all the actors

The special safety and security arrangements for events such as the International Film Festival require smooth co-ordination of all the actors; the arrangements are implemented under the authority of the *Préfet* for the Alpes Maritimes region.

3.2.1 Resource-intensive measures

These arrangements require the large-scale deployment of Cannes City services and hinge on four essentials.

- **Establishment of 24-hour cover by police *commissaires***

  The City Centre *Commissaire* takes responsibility for all problems arising in the course of the event.

- **Operations command centre**

  A round-the-clock command centre co-ordinating national police, municipal police and CRS with radio and telephone links to ensure optimum communications.

- **Daily working meetings**

  The organisers, representatives of the services involved in the running of the event and officers of the national and municipal police.

- **Command unit**

  In the event of serious incidents requiring quick decisions (bomb alerts, accidents, attacks, etc.).

3.2.2 Safety and policing

Law and order

Ensuring policing of the Croisette and the Festival Hall at all times, ensuring close protection of the site by implementing anti-terrorist measures and security measures to maintain law and order in the town centre and at Cannes station.

Traffic

A municipal order provides for a special traffic control plan that is widely publicised to the resident population and tourists.

Crime prevention

The influx of several thousand people gives rise to increased petty crime and more serious offences. Prevention efforts are stepped up and the ability to respond to crimes in progress increased. Reception facilities for the public are also manned at night.

CONCLUSION

Internationally renowned conventions and events at Cannes are the driving force for a whole range of businesses that are essential for the city's economy.

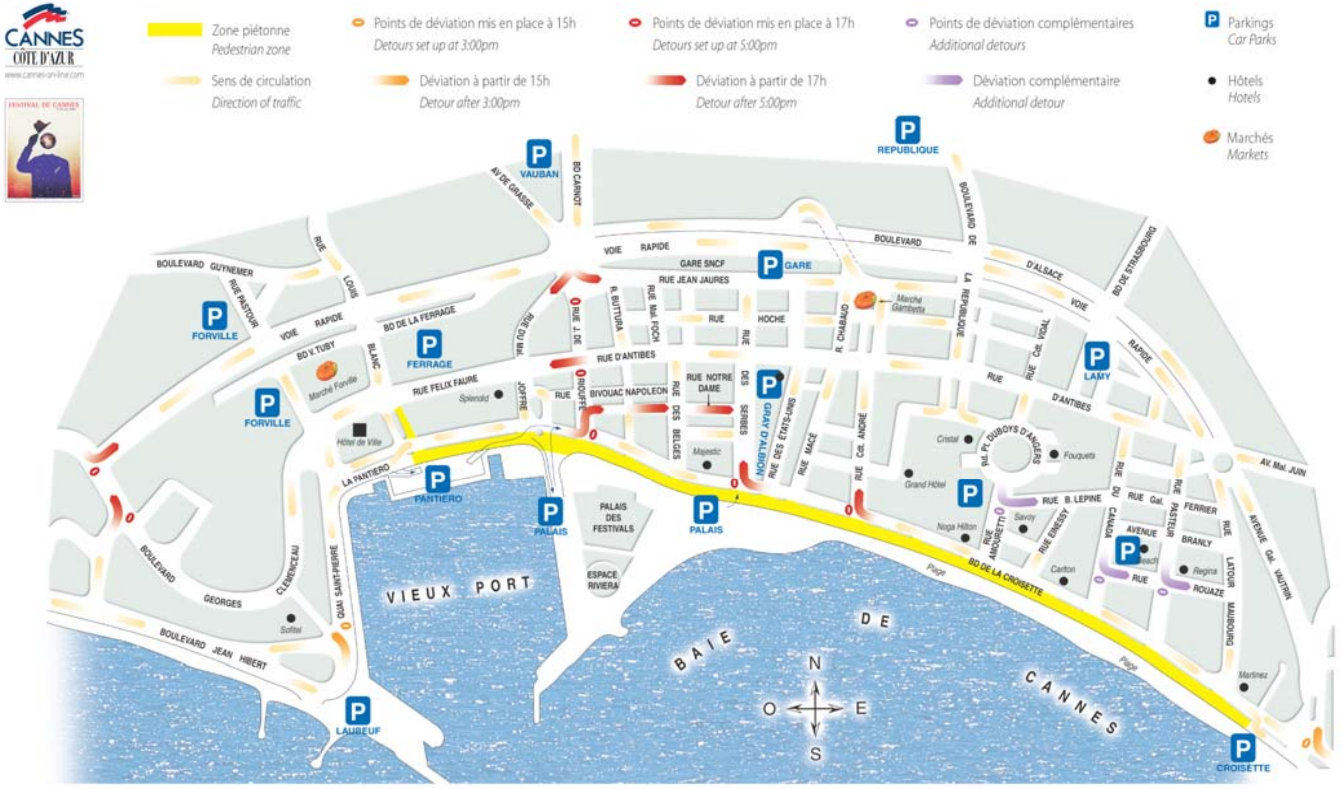
Cannes City policy makes accessibility a priority in planning road traffic control measures, particularly for these events.

Mobility planning for these events promotes, through practical application, the sharing and safe use of urban space for the benefit of residents and guests of the city alike.

54e FESTIVAL INTERNATIONAL DU FILM / *54th INTERNATIONAL FILM FESTIVAL*

RÈGLEMENTATION DE LA CIRCULATION, EN CENTRE VILLE, DU **9 MAI** 2001 À **6H** AU **21 MAI** 2001 À **8H**

TRAFFIC REGULATIONS, *IN THE CITY CENTRE,* ***9 MAY*** *2001 (****6:00am****) to* ***21 MAY*** *2001 (****8:00am****)*



POLAND

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POPE JOHN PAUL II'S VISIT TO POLAND IN 1999

1. BACKGROUND

Every mass event entails changes in the organisation of public transport and often also in the organisation of traffic management. It is essential to adjust transport and traffic to the specific characteristics of each event and to the number of participants involved.

The Pope's pilgrimages are very specific mass events, the most important features of which are the following:

- The number of participants at each event ranges from 200 000 to 1 000 000;
- The meetings last up to 12 hours, which is much longer than the average mass event;
- The congregations at the masses celebrated by the Pope consist of people of different ages, many of whom are disabled.

These features have to be taken into account when organising road and pedestrian traffic, as well as the on-site transport.

The Pope's visit to Sopot had several specific features. Since it was the first day of the Pope's visit to Poland, it was necessary to organise an official greeting ceremony attended by the State's representatives, including the President of Poland, at Rębiechowo Airport. Even this ceremony was a mass event with its own specific transport and traffic requirements. Hundreds of thousands of spectators usually line the the route of the Pope's motorcade, necessitating special security and organisational measures. In Tricity (the conurbation of Gdansk, Sopot and Gdynia), about 300 000 people lined the route. It is important to ensure that the various support services function properly along the route, and that the city also continues to function as normally possible.

2. TRANSPORT ARRANGEMENTS FOR THE POPE'S VISIT

The timing of the different parts of the visit was of crucial importance. The visit was divided into a number of stages:

- 11.30 – 12.30: Arrival and greeting ceremony at the airport (first stage);
- 12.30 – 13.30: Transfer to the Pope's residence (first part);
- 15.00 - 16.00: Transfer to the site where the Pope would be celebrating Holy Mass (second part);
- 17.15 – 19.45: Holy Mass at the racecourse;
- 20.15 – 21.00: Return to the residence (third part);
- 07.00 – 07.30: Transfer to the racecourse(fourth part);
- 08.35: Farewell ceremony at the racecourse and departure for Pelplin.

Each ceremony and transfer was different and had to be organised separately. The transportation network in Tricity created additional problems. There is only one main arterial road connecting the three cities in the conurbation. Other roads have much smaller traffic capacity. If the main artery (Aleja Grunwaldzka in Gdańsk, Aleja Niepodległości in Sopot, Aleja Zwyciestwa in Gdynia) is closed, the other roads cannot cope with the additional traffic. In Sopot, the situation is even worse because when the main road is closed, all the traffic gets blocked. As the Pope's route included sections of the main artery and crossed it in some places, the road had to be closed and re-opened to traffic according to the Pope's schedule. Road traffic was closed in Sopot. By-pass roads for various city services were laid on in the lower part of the Tricity area. The difficult situation was alleviated by the efficient Tricity Fast Train system (SKM), and the fact that the distances from the SKM stations to the sites where the papal masses were held, and between those sites and the Pope's residence, were fairly short.

The transport system for the Pope's visit was put in place on the basis of the following assumptions:

The visit was divided into three problem areas:

- The Pope's journeys in Tricity, and the changes in traffic organisation required in consequence;
- Ensuring proper transport and access to the racecourse where the Mass would be celebrated;
- On-site transport arrangements (at the racecourse).

The aim was ensure that the transport arrangements in Tricity went smoothly, to provide safe access for participants and the crowds lining the Pope's route, and to guarantee the safety of the participants and people living in Tricity. It was also important to ensure that pilgrims could get to the site of the mass easily and then go home afterwards .

The Pope's route was divided into four parts:

- Rebiechowo Airport – Słowackiego Street – Grunwaldzka Avenue – Opata Rybińskiego Street – Cystersów Street;

- Cystersów Street – Grunwaldzka Avenue – Niepodległosci Avenue – Maja Street – Łokietka Street – Polna Street – the racecourse;

- The racecourse – Subisława Street – Pomorska Street – Grunwaldzka Avenue – Opata Rybińskiego Street – Cysterów Street;

- Cystersów Street – Opata Rybińskiego Street - Grunwaldzka Avenue – Pomorska Street – the racecourse.

In addition, back-up roads were put in place. The following traffic restrictions were enforced along the route:

- Roads were closed to traffic two hours before the passage of the Pope's motorcade;
- Crossroads were closed to traffic one hour beforehand;
- The tramways were shut down 30 minutes before.

It should be pointed out that while the Pope was travelling through the Tricity area, the pilgrims were entering the racecourse. In order to ensure relatively easy and safe access to the racecourse, it was necessary to organise transport for around 750 000 people while taking care to ensure that it did not cross the Pope's route.

The following assumptions were adopted:

Pilgrims coming from other locations by car and coach would park on parking lots in Gdańsk and Gdynia. There would be a total ban on road traffic in Sopot (only cars with special permits would be allowed). Parking lots would be located in places with easy access to public transport.

The parking arrangements were as follows :

- Gdańsk - 17 parking lots for buses and parking space for around 1 800 cars;
- Gdynia – 4 parking lots for buses and parking space for 1 260 cars;
- Parking sites for cars in Tricity, and parking lots near supermarkets;
- Parking space in Sopot for around 2 000 cars on the day before the Pope's visit.

All the parking sites were located in places providing easy access to the site of the Mass to be celebrated by the Pope. The Tricity Fast Train (SKM) carried passengers to the stations in Sopot and Gdańsk Żabianka. Buses and trams carried passengers to the terminal in Żabianka (special stops were laid on). Pedestrian-only roads were put in place from Przymorze, Sopot and Gdynia. The underlying concept was that traffic should be organised in such a way that public transport, pedestrian traffic and the Pope's route did not intersect, thereby reducing the risks arising from such a massive volume of traffic and minimising congestion.

The public transport arrangements were divided into two stages:

- Firstly, transporting pilgrims to the site of the Pope's visit; this started early in the morning and finished at 3 p.m.; the transport was co-ordinated with the arrival of trains from other parts of Poland;

- Secondly, the smooth and safe evacuation of the pilgrims after Mass; this was managed "manually" using a system of radio and telephone communication specially put in place for that purpose.

Finally, it was necessary to co-ordinate road and pedestrian traffic at the racecourse.

A network of roads and pedestrian walkways was put in place.

- The racecourse was divided into three main zones -- A, B and C -- covering a total area of 23.45 hectares. The capacity of the site was estimated at 820 000 people. There were 14 entry points in all, and each zone had special entrances and exits for evacuating the pilgrims. The capacity of each exit was estimated precisely on the assumption that 3 000 people could pass through per metre of exit per hour.

- The traffic arrangements on the site had to be co-ordinated with off-site transport systems. It was of key importance to ensure that all the pilgrims were transported safely and efficiently from the site after the service.

3. EVALUATION OF THE TRANSPORT ARRANGEMENTS DURING THE POPE'S VISIT

Analysis of the assumptions adopted during the preparation of the visit, as well as the actual visit, shows that some elements were over- or mis-estimated. However, we would argue that the general assumptions were borne out and that the public transport and pedestrian traffic systems put in place proved efficient. Detailed analysis of the preparations for the visit shows that the volume of coach and car traffic was overestimated. The directions from which pilgrims were expected to come were also wrongly predicted. For example, many pilgrims were expected to come from the north-western part of Poland, and many parking sites were laid on accordingly in Gdynia. As it turned out, only a few of them were needed. On the other hand, the number of pilgrims from Tricity itself was underestimated. They came on foot and caused serious traffic congestion at the Żabianka complex.

Another important factor that was underestimated was crowd evacuation after the event. After the service, many pilgrims wanted to catch a glimpse of the Pope on the way back to his residence. The number of pilgrims who wanted to line the route from the racecourse to his residence far exceeded the capacity of the roads in "part three". As a result, pedestrians crossed the Pope's route. Also, the flows of people leaving the racecourse after the event should have been better managed. Up to now, attention has tended to focus on managing the flows of people arriving at mass events. The experience gained during the Pope's visit teaches us that crowd evacuation after a mass event should also be tightly controlled and adjusted according to the capacity of public transport and the road network. The problem is that people want to leave the site of the event quickly; they are tired and in a hurry to get

home. Lack of proper control and supervision may result in dangerous congestion of pedestrian traffic at public transport stops or train stations. It may also result in evacuation roads being blocked, thereby obstructing access for emergency services. Disabled participants constitute another problem. Evacuation roads and easy access to public transport must be carefully organised for them, otherwise they may mix with the crowds leaving the site.

Closing the roads to traffic in Sopot proved to have been a very wise decision and which contributed greatly to pedestrians' safety. By ensuring that the various flows of traffic did not intersect, dangerous congestion was avoided. In the future, it would seem advisable to lay on more support from traffic control and medical services outside the main site of the event. When the crowds started leaving, the medical service as well as the traffic control service and the on-site police were unable to intervene outside the site. It is important to divide the whole area into different zones and to ensure efficient communication between the various services (via radio and telephone). The outflow of people from the site of the event should be regulated and kept under control.

In order to properly assess the organisation of the Pope's visit, one should compare it with other mass events that have been organised. Mass events have numerous similarities but also differences. The way in which every mass event is organised is similar. Internal factors as well as transportation and security must be taken into account. Events differ in their scale; as well, the Pope's visits have some specific features. Few mass events bring together such large numbers of people of different ages, ranging from people in their eighties to infants brought by their parents, for such long periods of time. Another important difference is that the pilgrims attending such meetings are more disciplined and easier to control. They tend to follow the instructions given to them. However, they may respond quite emotionally and often are more tired than participants in other mass events.

At other mass events, the participants are usually less numerous and of a similar age group. They are often less disciplined. Other problems arise from the consumption of alcohol and drug-taking. Even though the number of participants might be smaller, they can pose more of a problem.

At every mass event, it is important to organise evacuation roads and to control traffic and public transport manually in the light of the situation. A stream of people behaves similarly if the situation is under control. When it gets out of control, it becomes dangerous; crowds at concerts are much less disciplined than pilgrims.

4. CONCLUSIONS

In conclusion, it may be said that the general assumptions underpinning the preparations for the Pope's visit to Tricity proved correct. There were no problems on the Pope's route. The closure of various roads to traffic and the security arrangements also proved a success. The provision of public transport and special parking lots for visitors helped to avoid traffic congestion. It also prevented visitors from getting lost. True, the demand for parking space was overestimated, but adequate parking facilities must be provided at every mass event.

It is of key importance to close roads to traffic in selected areas, taking into account the scale of the event. It ensures that the event passes off safely and facilitates the work of the various public services. In future, it would be advisable to pay more attention to ensuring closer co-ordination between public transport and the arrangements for evacuating people from the site. The time and route of the Pope's transfer after celebrating Mass should not be disclosed to the public.

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SUMMARY OF DISCUSSIONS

SUMMARY

1. CHARACTERISTICS OF EXCEPTIONAL PUBLIC EVENTS

No two exceptional public events are quite the same. This is obvious when we compare an event like the World Cup with the Tour de France. Each event has its own distinctive characteristics. Such events can be broadly classified by:

- Spectator capacity: an open or restricted capacity event (in a stadium), or a single- or multi-site event; alternatively, they can be classified by size, i.e. the number of spectators per day. In the latter case, further distinctions can be made between daily averages and peak attendance.
- Duration: one day (horse show), two to three weeks (Olympic Games), or several months (such as Universal Exhibitions). Events can also be classified by frequency, whether they have been held previously at the same site or different sites and, lastly, by whether they are held in the evening or during the daytime.
- Location: a single or multi-site event, in a town centre or the outskirts, in a specific location or all along a selected itinerary.

While this list is not exhaustive, since the number of variables involved make any typology very complicated, the characteristics outlined above help to differentiate one exceptional event from another and, most importantly, help to show that the term "exceptional public event" covers a multitude of possibilities. We also have to bear in mind that a public event may be composed of a series of separate events. The Olympic Games, which comprise a series of separate or concurrent events, are an example of this type of event. Each such public event has implications in terms of transport, mainly in terms of the logistics behind every constituent or separate event.

In the case of the Olympic Games, for instance, a great deal more has to be taken into consideration than just providing transport to take spectators to the site or sites. There are also all the logistics that enable the events to take place to consider: transport to get athletes to the event on time, for the media covering the events, for Olympics personnel such as referees, or voluntary stewards, for all event management needs, e.g. food, special equipment, etc.

The time available for preparing an event is thus an important factor. For small events, there is often not much time to prepare them; when the organisers have a commercial stake in the event, they often neglect the management side, including transport and security, leaving the responsibility for these to the public authorities. What happens in these cases is that the organiser automatically assumes that he is not responsible for taking care of transport arrangements. When politicians organise an event, they too often take the transport side for granted and forget that preparation time is needed, particularly for the transport operator. The latter then has to chase up the information needed. In practice, there is always a responsibility towards the public, but the perception of that responsibility will vary according to whether there are precedents for the event or it is a one-off occasion.

Every event that is not held at the same site on a regular basis should be viewed as a special case. Previous events can serve as a basis for organising repeat events, but some things will always be different. In fact, even with similar events, close analysis shows that there can be major differences each time, especially if they are not held at the same site.

Difficult as it is to classify exceptional public events, the exercise can be extremely useful for identifying transport parameters. The Round Table accordingly wished to see the work on a classification continue.

2. AIMS AND GENERAL TRANSPORT DESIGN

Exceptional events may be held for festive, religious, social, sporting, cultural or commercial purposes. The public authorities want the transport system put in place for the event to project a positive image of it. This means that the system must be safe, reliable, clean and environmentally friendly. The objectives for transport are therefore not the same as the main aim of the event itself, which is to generate interest and attract people. A punctual and reliable transport system contributes to the overall success of the event.

Transport is intrinsically linked to all of the other components which go to make up the event. For instance, it is linked to safety, accommodation, services, information, etc. On these grounds, the experts at the Round Table urged that, rather than speaking of transport, we should be speaking of exceptional event logistics.

For big events, the logistics are expensive since they include infrastructure costs as well as operating costs. These costs are sensitive to management errors such as the overestimation or underestimation of traffic peaks. Logistics are also sensitive to the unexpected, such as the cancellation or postponement of an event in the Olympic Games. As well as this, logistics are dependent on the quality of information provided to the public, participants and staff.

As already mentioned, logistics for the Olympic Games have to reconcile the differing transport priorities of the athletes, VIPs, the public, etc. While the logistics are not visible to the public eye, they nevertheless determine whether the event will be a success. They therefore warrant close attention. Seen in this light, transport seems to be the key piece in the puzzle, one that is both complex and strategic.

Some of this complexity can be seen away from the event itself, where event-related travel is superimposed on a city's normal travel patterns, making mobility management infinitely more complex. This calls for effective transport management and, in particular, effective car traffic management. Furthermore, overall flow management is not sufficient; flows must be integrated in time and space, with peaks.

As a result, the public authorities quite often want the most efficient, safest, cleanest transport or want to organise environmentally-friendly mass transport, i.e. they want to plan transport services for the event around public transport and to restrict transport by car, which may be banned on certain days.

Quite clearly, an exceptional event must be accepted by the local population and will entail traffic moderation on public roads and proper targeting of restrictions. The festive and sociable side of the event, the friendly atmosphere, cultural openness and community spirit it generates must not be jeopardised because of transport, which is not safe enough, say. Developing a mass transport service that reduces the impact on local residents can be one way of achieving this, as was the case for a Universal Exhibition and the Olympic Games described throughout the course of the Round Table. Environmentally-friendly investments of this kind during and after an event give it a better public image. They become a wonderful legacy of the event in question. In this sense, it is true to speak of "the lasting impact of the ephemeral" and of a "laboratory" for new forms of mobility which will have a long-term impact.

Whatever the size of the event, but more so for major events, the experts at the Round Table considered that one transport objective was eminently possible and desirable: travel by car should be kept below a certain threshold. In order to achieve this objective, apart from heavy investment in public transport, such as the extension of underground transport lines for large-scale events, one possibility would be attractively priced transport by bus or the use of information campaigns advertising the services available. These should include train, air, coach and local services. One cannot leave it up to market mechanisms to guide individual choices: a transport system that channels people away from car travel must be provided, one that sets ambitious targets for switching the modal split towards environmentally-friendly modes. From this standpoint, it seems that the major cities have everything going for them, although all the different components still have to be integrated. In this light, forecasts of the number of visitors and traffic expected are a unifying factor in this integration process.

3. FORECASTS

The experts at the Round Table pointed out the irreplaceable role of experience with past events and lessons learned from them in forecasting flows of spectators and their transport choices. Previous or comparable events can give an idea of what works and what does not. For instance, they let us know that it is possible to opt for a modal split that favours environmentally-friendly modes for spectator transport flows for major events. This said, there is still a need to exercise caution as an event will not necessarily be an exact replica of a comparable event in the past.

It is also important to allow for the fact that real human beings do not behave as uniformly as classic transport forecast models suggest. These models are often based on home/work commuting patterns, and therefore do not reflect the factors that determine choices for leisure travel. Models are not always easily transposable. Behavioural surveys could prove very useful in this context, even though they are complex. The longer the duration of the event, the greater the uncertainties, the more indispensable such surveys become.

The Round Table pointed out that figures can take on a life of their own because of the need to create the impression of a major event and because forecasts can be influenced by private interests. Often in organising an event, the organisers are looking for sources of finance, both public and private. Under the circumstances, giving the impression that this is a one-of-a-kind, mega event is a strong argument in winning the funding battle. Clearly, forecasting errors lead to investment mistakes. On this point, the Round Table stressed the importance of using common sense in dealing with sophisticated tools. It is essential to avoid getting carried away and to select reasonable ratios. The need to call on specialists who are independent of any pressure group to do forecasting work was also stressed.

In addition, use should be made of every available source of information. For instance, by matching advance ticket purchases for travel by air, train or coach with reservations for accommodation and sharing the figures available, one could gain a good idea of the scale of the event. This method made infinitely more sense than the clearly risky venture of gauging the number of visitors from the maximum capacity of the facilities.

Nevertheless, although forecasts are indispensable, it is important to remain flexible, because information often changes and becomes steadily more accurate as the event approaches.

4. MEASURES TO BE IMPLEMENTED

Provided that the precautions outlined above are taken in forecasting, the data obtained can be used to design the transport system for the event in question. For a short-duration event, transport supply can be fairly rigid and inflexible. In contrast, for longer events one should not rely on transport services that will be stretched to the limit. Various measures should be considered, including a transport pricing policy.

The experts at the Round Table highlighted the need to ensure that transport pricing was consistent with objectives: ideally a single ticket would cover admission to the event itself and transport to and in the area. All-in ticketing would save visitors having to purchase three separate tickets, which might prevent them using public transport. Pricing policy should also be designed so that it is not cheaper for a family to go by car; car parking charges should therefore be higher than the cost of group travel by an alternative mode such as coach. Close attention should be paid to the respective prices of travel by car and travel by public transport. This can be the key to the success of an event that incorporates an environmentally-friendly perspective.

Quite frequently, errors in assessing the choice of mode of transport for travel to the event can be put down to the cost of the transport alternatives. In this case, one can hardly claim that visitors behaved irrationally. When high-capacity and conveniently located car parks are provided at a price that makes them less expensive for a family than public transport, it should come as no surprise that even the most efficient public transport services are relatively underused. In this respect, one cannot simply rely on market mechanisms: integrated transport planning is necessary.

At the same time, the challenge is to remain flexible enough so that all of the actors are able to adapt to changing conditions: car mobility plans must keep permanent track of traffic conditions -- when access by private car is not reduced to the bare minimum.

Having an all-in ticketing system reduces admission checks and ensures that the event proceeds more smoothly. However, in practice, political backing is usually needed to set up such a system. The fact is that high-level political support is often needed to secure a local consensus among actors who all have different agendas. Broad community support for the event can motivate policymakers to issue definite guidelines.

As far as open public events are concerned, it may be appropriate for the main transport operators to take the lead and offer an all-in fare, as they do for Berlin's "Love Parade": DB offers a special ticket for rail travel to the city. Transport operators should be kept informed of forthcoming events and invited to become involved in them. When costs are borne by the community but profits are private, it is very difficult, if not impossible, to implement integrated event marketing. So, organisers should be aware of the possibilities of entering into negotiations with the relevant transport operators to ensure close co-ordination between all the actors.

As the event draws nearer, it is essential to check out how infrastructure and the flow management plan are operating. As it is difficult to run full-scale tests – although this is done for the Olympic Games, for instance, where all the installations are tested a year in advance under the same weather conditions as when the Games will be held – it should be possible to test the independent subsystems. These tests are indispensable for permanent events where there has been investment in new transport services. Testing to evaluate the engineering measures selected for road traffic is also imperative. The tests provide a unique opportunity to validate procedures and facilities and to identify any shortcomings. This notwithstanding, reactions to incidents that might occur while the event is in progress should be planned for, and this requires a particularly good monitoring system. Indeed, it is essential to ensure that scheduled resources provide an adequate response to real-time event monitoring.

When such events induce a very substantial additional use of conventional means of transport, it may be advisable to organise parallel activities with a view to staggering peaks and avoiding concentrating all travel around the start or end of the main events. For events that call for no special heavy investment, it is also imperative to influence and channel demand rather than trying to base supply capacity on events that, when all is said and done, remain exceptional. This is a challenge for the organisers and they must rise to it by relying on high-quality information, designed to draw the public's attention to the range of activities available.

5. COMMUNICATION AND INFORMATION

It is important to let the public know in advance what transport options are available for travel to an event. Information networks should be set up for this purpose and should include, for instance, travel agencies, touring clubs, private transport operators, associations concerned with the main theme of the event, the press, media, etc. It may be appropriate to set up interdisciplinary working groups on

information that covers the fullest possible range of communication channels, thus ensuring that the public is kept fully informed of all the transport options available and particularly of environmentally-friendly modes. Press conferences for different social groups or for a wide variety of media should be considered with this in mind. It is important to raise awareness about all the transport options available and to point out alternative modes.

More specifically, communication can be extended in two directions: externally to users and internally to enable all the systems provided to work together and react appropriately to incidents. The experts at the Round Table pointed out that badly designed communication could ruin everything. As concerns internal communication, panic should be avoided and contact should be maintained with all of the different components of the organisational structure. This requires a flow of real-time information both up and down the chain in order to keep the command centre informed and, at the same time, implement the procedures designed to rectify the incident. External information should be comprehensive and clear and communicated via all of the existing channels.

The fact remains that while the event is in progress, a fully integrated and fully operational command, control and communications centre is required. Such a centre requires the most sophisticated communications technologies. Actually, from this viewpoint, it can be said that the Internet facilitates and vastly improves communication and that communications technologies more generally are crucial to the success of the event.

Finally, it should be appreciated that the impact of information is not always straightforward and can sometimes be lasting. For example, providing better public transport and "communicating" about these improved services, may lead people to take it for granted that this is the level of service they can expect henceforward.

6. LINE OF RESPONSIBILITY

At any rate, the roles and exact responsibilities of each of the actors must be defined, bearing in mind that where there are shared responsibilities, there will be overlaps. Indeed, a rule of thumb is that where responsibilities are fragmented or overlap, the risk of chaos ensuing is great.

Liaison between planning and implementation is also imperative. Planning is a centralised function, while implementation is decentralised. What is needed, in actual fact, is to develop a culture of accountability throughout the entire system. Having a body that bears partial responsibility for something the whole way through the entire process is better than having successive compartmentalised responsibilities. Moreover, if a transport planner is also responsible for implementation and operation, one can be surer that the planner will also give thought to implementation needs.

The organisers of an event should look at the event as a whole. Each component should be considered in terms of its interactions with other clearly defined aspects. This entails setting up planning groups whose watchwords should be professionalism, flexibility and interdisciplinarity. While no one concept can be transposed to every situation, some guidelines do exist, such as having

transport management closely integrated with the overall organisation right from the planning phase through to implementation. Transport operators should be involved in the event from the very beginning, in an advisory capacity initially, and later in the implementation phase.

Right from the start, a strategic transport plan should be drafted by the organising committee. The planner should co-ordinate with the organising committee at all times. Indeed, there is no assurance that the planner will be responsible for final implementation. Every country can find a method of organisation that takes local circumstances into account. At any rate, there should always be some link between the two planning and implementation bodies, even if it only takes the form of co-ordination.

Rules should be clearly stated and the persons responsible clearly designated. For large-scale events, the transition from the planning to the implementation stage can begin after full-scale testing. Implementation must be decentralised so that it can be more flexible and responsive, even when a transport manager, i.e. a clearly identified decisionmaking body, is in place.

From a broader perspective, where an event involves several public authorities, it must be possible to tell which body is ultimately responsible and that body must be an agency of whichever authority has the most political clout. If not, there is a risk that the event will fall prey to pressure by lobby groups and organised interest groups.

In the case of a primarily commercial event, it is the organiser who is responsible. However, even where this is the case, the public authorities can intervene and issue a specification containing compulsory objectives and requirements regarding the necessity of a "clean", environmentally-friendly event, for instance, and the definition of respective responsibilities. To facilitate this work, the public authorities in cities frequently called upon to host exceptional events may draft instructions for would-be organisers, specifying the public authorities' expectations and requirements.

Collective responsibilities rest with "politicians", i.e. elected representatives. In no case can collective responsibilities be transferred to the private sector. Elected representatives are in fact responsible for the community. The organisers nevertheless bear some responsibility and cannot just confine themselves to taking in the profits. Things therefore have to be spelled out clearly in black and white. When an exceptional event will bring benefits to the community, it is only natural for it to contribute to funding. The rule whereby the organiser bears all the costs it generates should therefore be interpreted on a case-by-case basis. This entails carrying out a prior analysis to determine costs and who will pay what.

At any rate, it is important to be able to identify who bears ultimate responsibility for the event. This is doubly important as one needs to know who will ultimately pay if the accounts cannot be balanced.

7. SECURITY

Since the Munich Olympic Games, security has become a crucial aspect of any event. In fact, transport, security and environmental protection form a whole by which the success of the event can be gauged. Security comes into play upstream of strategic transport plans. There can be no compromise on the security plan and its priority objectives are the basis for more detailed objectives for different categories of personnel. Security must be an integral part of a broader overall plan that includes transport and is shared by all of the actors.

Security is an ever-present concern at exceptional events. As a result of the attacks of 11 September 2001, the preference will now be for holding events in secured sites away from built-up areas and for the provision of buffer zones to make it easier to manage flows and ensure security. Mobility and security must be considered in conjunction with one another; security specialists must be kept informed of all decisions that will have repercussions for transport. In fact, security warrants a separate process of its own. It is a job that should be left to the experts. Each mode of transport warrants its own working group of security experts. During the event itself, policing should be low-profile, otherwise it may induce a "panic" reaction.

Lastly, the security issue requires an overall approach involving all security managers in every phase, from planning to implementation. These managers achieve their mission of protecting the public by addressing all of the areas concerned.

8. APPRAISAL

When the on-site organisation and staging of exceptional events requires extensive investment, particularly investment in transport, it is true to say that these events leave a legacy to the city.

In some cases, full-scale urban planning operations may be launched to rehabilitate and breathe new life into run-down areas. Redevelopment work on the area concerned provides it with high-quality community amenities and takes full account of the environmental dimension. In these cases, infrastructure evaluation must take into consideration the overall urban design of the area and its future development, and not focus too narrowly on just providing services to it. The appraisal should be wide-ranging and take account of the long-term impact. Thus, heavy investment in transport is not warranted just for the event itself, it must take into account the development potential of the area.

However, some sort of balance must be struck as there is always a risk of over-investment. The return on heavy investment should obviously be assessed over the longer term. It is also important to ensure that the increase in property values that results from the event does not accrue, recovering solely to property speculators, and that the public sector also benefits. A proper valuation of properties in the area is thus extremely important.

Whether it be the Olympic Games or a Universal Exhibition, events are a marvellous opportunity to modernise and look to the future. The return on such operations should therefore be assessed by multi-criteria analysis. While this type of analysis is unquestionably difficult -- since among the induced effects are visits by tourists and an enhanced image for the city, an inevitable by-product of exceptional events -- it is nevertheless essential. Indeed the analysis can serve as a point of reference for anyone else who wishes to stage such an event.

On this point, there is another valuable legacy that events can leave: the records kept of it, i.e. an analysis of how the event went. The method of organisation, how the event proceeded, any incidents, how they were handled, the resources used, should all be recorded and can serve as a basis for anyone wishing to stage similar events. This requires the creation of a database. Such a database would be invaluable for planning future events, and would be particularly useful to the transport sector where transport costs are often the second largest item of expenditure for large-scale events.

The experts at the Round Table were keen to see the creation of a network of all those with experience in staging exceptional events. A network of this type could be used by all would-be organisers of such events. Furthermore, the lead-time between the decision to organise an event and the actual staging of the event is often so long that policymakers change in the meantime. Having a database and setting up a network on large-scale events would enable each policymaker to gauge the size of the task to be accomplished from the time the decision is taken.

The experts took the view that the ECMT would be particularly well placed to lead such a network and manage the database.

9. CONCLUSION

Now that people have more leisure time, exceptional events are not really exceptional any more. The number of such events is increasing and many towns now organise them.

While addressing such events from the standpoint of their transport implications is something new, it is nevertheless quite clear that exceptional events generate major flows as well as very specific transport and logistics requirements. Security is another major consideration that is inseparable from transport and other key aspects of the event.

The Round Table took note of experience with such events in Europe and the rest of the world and concluded that ambitious objectives could be set for transport, more especially in terms of modal split, which could be influenced to promote “greener” modes. In order to do so, transport has to be an integral part of the event, whether in terms of heavy investment, information, ticketing, car traffic flow management by traffic engineering and parking policies consistent with objectives, etc.

A chain of cross-cutting responsibilities must be set up so that throughout the entire process, which covers all the stages from centralised planning through to decentralised implementation, transport must be an integral part of a specification that clearly defines the roles.

Almost every experience is unique and it may be said that one of the main conclusions of the Round Table is that a record should be kept of each event and its organising and staging requirements so as to build up an event "memory", that would be available through the network to any potential event organiser. Accordingly, it would be advisable to draft a review of each event, covering all aspects of organisation and staging, that can be passed on to any third-party interested in setting up a specific event.

The economic and social review of the event should also be long term and it could usefully be included in the information records relating to the event; all the more so since exaggerated attendance figures are often circulated and take on a life of their own prior to the event. Organisers should be guided by prudent use of models and sound "common sense". All of which increases the need to keep track of every exceptional public event for the purposes of subsequent comparison.

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