The Customer is the centre of interest

During the parallel sessions, summarized in the following pages, the common denominator was really the customer - his or her comfort, safety, satisfaction, needs and wishes.

by

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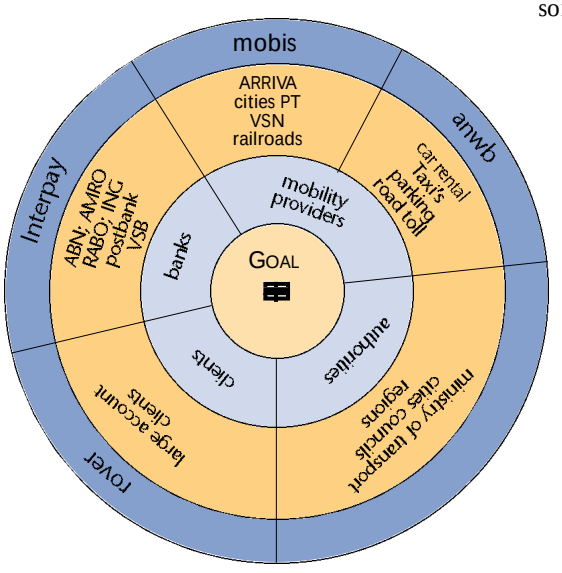
ELECTRONIC CASH AND SMART CARDS

Smart cards and electronic payment forms are creating fresh opportunities for public transport operators. They allow the fare systems to be optimised in order to better meet the needs of the customer. The number of projects and initiatives in this sphere is constantly rising. Nevertheless, not all have reached the same development stage, as was shown by the three trials presented during the session. Whereas the Hong Kong project is already a tremendous technical and commercial success, the system in Helsinki is still being introduced. Meanwhile, a more global process is being developed in the Netherlands. The three projects underline the fact that success depends more on the institutional and organisational blueprint being implemented than on technical considerations (not that the latter should not be underestimated, of course).

The "Octopus" contactless smart card project in Hong Kong, presented by Brian Chambers, has been operational since September 1997. In fewer than 18 months, a total population of 6.4 million inhabitants has bought some 5.3 million cards, with over 4 million transactions being recorded daily. The basis for Octopus is a single "purchaser", Creative Star Ltd, a federation of several operators (train, metro, light rail, bus, ferry), each with the possibility of choosing their own fare system. At present, 85% of public transport customers in Hong Kong use Octopus. In order to expand Octopus to smaller local operators, Creative Star has initiated a low-cost system aimed specifically at them.



Building an open multi-application smart card infrastucture means co-operation
ANWB: Koninklijke nederlandse Toeristenbond (Royal Dutch Touring Club)
ABN: Algemene Bank Nederland
AMRO: Amsterdam Rotterdam Bank
RABO: Raiffessen Boerenleen Bank
ING: Internationale Nederland Groep
VSB: Verenigte Spaarbanken

Octopus is a contactless card, which makes its handling easier and means that access to platforms and vehicles can be speeded up. In addition to its use in public transport, Octopus is also already in use (or soon will be) as an electronic purse and is accepted as payment for other services such as parking, urban tolls, phones in taxis and photo booths. The Octopus card can also be personalised for a certain passenger category or even at the customer's request. Other applications are being developed such as customer-loyalty mechanisms or improvements to intermodal fares. Finally, Creative Star is now in talks with Hong Kong's monetary authorities with a view to changing its statutes in order to allow it to open up Octopus to other monetary applications.

The Helsinki region's contactless smart card should be operational from September 2000. According to Mr Niilo Järviluoma, the project is expected to produce the following benefits: enhanced information about passengers for service-planning purposes, increased public transport ridership, reduced fraud, and a more rapid transfer of payments to operators. The expected period for a return on the investment is some five years. The project has been delayed owing to the constraints of the original organisational blueprint: an increase in the number of purchasers, making it more difficult to determine common specifications; increase in the number of suppliers and a lack of co-operation between suppliers; the sheer size of the system; and inadequate technologies for the architecture of the IT system. To overcome these constraints, a new structure has been put in place in order to facilitate co-ordination between actors and the decision-making process. Furthermore, technical changes have been made to the IT system's architecture. Eventually, the smart card will be operational in the metro system (16 stations) and on board 1,400 buses, 100 tramways, 150 trains (56 railway stations) and at four ferry terminals.

In the Netherlands, an initiative involving an operator – Connexxion, which accounts for 60% of the public transport market – and a banking group - Interpay Nederland BV – is currently in development. René Van den Broek explained how the aim of this collaboration was to add a module to bank cards that will enable them to be used to pay for mobility services (public transport as well as parking, urban tolls, etc.). The starting points for this approach are the fact that there are 17 million chip cards in the Netherlands (or over one card per inhabitant on average), that 95% of Dutch men and women have a bank account, and that there are 120,000 automatic cash machines. This situation is set to be utilised by the project partners in order to create a system that can use the existing infrastructure. Pilot locations are now being tested. The project's various phases will become operational on a gradual basis between now and 2005.

INNOVATIVE SERVICES

Innovative services are vital for undertakings, provided that the innovations in question correspond to the demands of customers and help improve the innovative and attractive image of public transport firms. This session showed that aims at increasing service levels and fare levels were not mutually exclusive. Customers have variable needs that must be catered for as simply as possible, taking all the variables into account and therefore maximise the effect. This has been the case in Jönköping and Zurich.

Bus service in Jönköping

In Sweden, the creation of an express radial bus service serving the most densely populated areas provided an opportunity to overhaul the entire bus system (new vehicles, dynamic information, bus prioritisation, new stations, simplified information signs, etc.). According to Ingemar Lundin, these elements allow the new service to stand comparison with a tram line in terms of layout, capacity, comfort, reliability and high visibility. Together, these factors have brought about an increase in passenger numbers on the route as well as on feeder services and have therefore optimised the economics of both the new route (a cost coverage of over 100%) and the network as a whole (72%). Indeed, the rectilinear route has brought about a reduction in the number of km per vehicle while, at the same time, increasing the number of km per passenger.

In Zurich, too, combined mobility services that include public and private transport are allowing a flexible response to customer demands while, at the same time, improving the firm's profitability. Jürg Rüegger illustrated the VBZ company's new profile as a provider of mobility in the broad sense courtesy of numerous network partnerships with taxis, Swiss national railways, car-hire offices, and so on. The bedrock of services remains urban, commuter and overland public transport, but this is now being topped by a whole host of possibilities involving vehicle hire, taxis, etc. that cover the mobility chain in its entirety. The customer thus enjoys integral, flexible mobility without any fixed costs nor any initial investment; all services purchased are listed clearly on a detailed monthly invoice. By virtue of this system, VBZ is selling more in the way of diversified services.

Philippe Ventejol from Paris informed delegates about RATP's investment in the building of an experimental site on which to operate intermediate vehicles running on tyres. The guided section covers several kilometres of the Trans Val de Marne dedicated busway. This is permitting trials with three vehicles ("TVR" from Bombardier, "Translohr" from Lohr Industries, and "Civis" from Iris Bus) using electric and diesel drive in either guided or driven mode. These vehicles resemble tramways in terms of capacity, comfort and image, but require less infrastructure investment (a single guide rail and no major road works) and can enter service immediately courtesy of the diesel/electric and guided/driven twin option while, at the same time, allowing progressive expansion. The trial phase involving the first type of vehicle ended with positive results both in terms of operations as well as acceptance on the part of users.

AIRPORT LINKS

Airports attract high-value-added activities and are becoming large-scale economic hubs whose access cannot be put at risk by traffic congestion. Peter Gertler and Hanan A. Kivett informed delegates that 62 airports have rail links, while 116 other cities, including Toronto, are now building or planning a rail link between city and airport. These systems include services specifically targeted at air passengers and other connections that form an integral part of the conurbation's regional transport system. The former need to provide a premium product in terms of speed, comfort, luggage check-in, and information about train and flight schedules; in return, the fare for using the service can be high. The Heathrow Express and the ultra-rapid service linking the centre of Hong Kong with its new airport at Chek Lap Kok are perfect illustrations of this former type, which offers air passengers a very high level of service. Connections that are well integrated within regional and cross-country networks, such as those in Germany and in Switzerland, are very popular with air passengers but are also widely used by staff working in and around the airport. The success of a rail link depends chiefly on the level of congestion within the motorway network serving the airport and on the volume and cost of parking near airport terminals. It is noticeable how air passengers are more concerned about journey time and comfort when using the rail link than about the fare being charged. Rail's share of the number of journeys made to airports ranges from 6% on average in the United States to over 30% in both Zurich and in Munich. The decision to build such links and their funding are almost always the joint responsibility of the public authorities and airport management; that being said, the link from Hong Kong to its new airport and the Heathrow Express were privately funded.

The paper by Andrew Sharp examined the design and features of interchanges along airport rail links. The author singled out the case of high-speed trains, high-frequency regional links aimed chiefly at air passengers, rail links that form an integral part of the regional rail network, and metro/tramway line extensions. The services on offer have to be adapted to suit the clientele: the nature of them will differ according to whether air passengers are the main customers or whether the link is used chiefly by people working in and around the airport. In the former instance, the higher fare enables transport facilities to be offered such as baggage check-in, high-capacity information systems, an attentive welcome from staff who are able to speak several languages, and train tickets that are included in the air fare. The author also highlighted other advantages of fast rail links for airports: air passengers benefiting from an efficient, fast, stress-free service; airport operators being able to save money on the amount they invest in parking and increase the revenue they generate from airport businesses; airlines improving their competitiveness in terms of city-centre-to-city-centre journey times; and the community as a whole also benefiting, because rail links like these boost the economy and cut road congestion.

SERVICE PLANNING

Services are generally planned on the basis of information relating to passenger journeys. This is done with the help of modelling and management software. Tools such as these facilitate choices between assorted network-optimisation alternatives.

Flexroute in Göteborg

In Canada, the Toronto Transit Commission (TTC) has implemented a network-optimisation process based on customer awareness. Bill Dawson specified how decisions affecting the planning of public transport services are based on standards that define what may be construed as an "acceptable" service. Established from the passenger point of view, these proposed standards are based on the various components of a journey, such as walking distances and schedules.

Funding regulations are also taken into account, but only rarely provide a means of optimally re-distributing resources between the various services. Information about passenger behaviour has been enhanced, enabling the TTC to develop a fresh approach for the purpose of evaluating service decisions that take account of traditional elements as well as the specific needs of users. One requirement of this personalised approach is to determine the means that will allow optimal use of resources for both the operator and the passenger.

In Boston, the standards used in order to establish quality in regional public transport are not simply orientated towards the criteria of passenger numbers on a particular journey or overall ridership, but also towards productivity indicators, for example net cost per passenger. Moreover, the compiling of detailed information and new data-processing methods have enabled the Massachusetts Bay Transportation Authority (MBTA) to improve the reliability and comfort of the service it provides. This new approach has been implemented in order to ease congestion on certain urban routes and offer a transport mode to every resident living in areas served by the MBTA. Service quality has to meet five criteria that comprise journey frequency, service scale, schedule reliability, occupancy rate, and net cost per passenger. For the first time, objective and analytical measures are being applied to each bus journey in order to ensure that it complies with standards while, at the same time, maintaining a satisfactory cost/efficiency ratio.

In Göteborg, a halfway system between taxi and bus or tram known as "Flexroute" has been introduced. Buses only stop if a passenger wishes to board or alight and has booked a seat in advance. According to Roger Vahnberg, the aim of this action is to attract new customers since the new system is more cost-effective for the local authority. Its success in Högsbo is down to the fact that there are large numbers of retired people who use public transport only occasionally.

However, "Flexroute" can be applied to broader sections of the population. "Flexroute" offers a number of advantages: it means the passenger does not have to walk to the stop and stand around waiting for the bus; the customer is picked up at a point that suits them; and the bus's layout is designed to be convivial and has only a dozen or so seats. If the passenger is disabled, a special seat is reserved. "Flexroute" has proved to be a success, with the number of passengers increasing from 2,000 a year in 1996 to nearly 5,000 in 1998. On average, customers give the quality of the service a score of 9.5 out of 10.

COMPETITION, CONTRACTS, CONCESSIONS

The transport world is in the grips of fierce change: opening-up to competition, mounting private-sector involvement, public-private partnerships, and franchises to build and operate services are just some examples illustrating the new relations that are being established between transport organising authorities, operators, manufacturers and financial institutions.

Marc Billiet illustrated the European Commission's stance on the issue of competition in the public transport market for buses and coaches. The Commission feels that the introduction of market forces and the increased involvement of private operators are contributing to improving the quality of service offered to passengers and to boosting public transport's competitiveness without posing any threat to jobs, as witnessed by changes in the sector in Germany and Scandinavian countries. There is no question of imposing a single model on all member countries within the European Union: local specifics will be respected and the organising authorities are to have an enhanced role in terms of mobility policy and the choice of operators. To make the most of this embracing of competition, the European Commission will be establishing rules designed to instil transparency, prevent the formation of monopolies and oligopolies, and introduce quality as a criterion so that price is not the only element used when choosing an operator.

In the Netherlands, there is no competition at present between public transport operators. The Dutch government has decided to introduce competition on a step-by-step basis over a five-year period in the case of road transport and over eight to nine years in the case of tramway, metro, and regional/local railways.

The aim is to bring decision-making down to local authority level and reduce the level of subsidy from today's 60% of operating expenditure to 50%. In the case of coach services, buses, tramways and metros, the plan is to issue tenders for contracts that will run for a maximum six-year term, except in the case of heavy investment by the franchise-holder. As well as being decentralised, regional rail transport will also be opened up to competition between private operators. In all cases, applicants will be judged on both price and quality. Moreover, provision is being made

to guarantee staff their jobs. Although rail transport will continue as a public monopoly for at least ten years, Dutch Railways will be granted increased management autonomy and not receive any more subsidy. The possibility is also being envisaged of temporarily exposing tramways and metros to competition. The process of opening-up services to competition began with two calls for tenders involving regional road transport that were open to any applicant, Dutch or foreign. These two tenders were awarded to, respectively, VSN (a Dutch public-sector company, now known as Connexxion) and a private group, ARRIVA. Initial results in terms of ridership and productivity are encouraging.

The embracing of competition for the provision of public transport services is also a burning issue in Australia, where undertakings owned by local authorities still played a dominant role until recently. In the eyes of Roger Wilson and Peter Moore, competition is not an aim in itself. In Australia, the pros and cons of the various models are the subject of heated discussions. For example, the case of METROBUS in Perth shows how a monopoly model threatened by competition can bring about a 20% reduction in costs while offering a high level of service quality that has successfully attracted additional customers. However, public undertakings are prepared to face competition once the conditions are in place for equal treatment between public and private sector, chiefly in terms of staff policy and constraints in terms of which non-commercial services have to be operated. On the plus side, the opening-up to competition can be expected to reduce production costs and develop a more commercial attitude geared to satisfying the customer.

However, there must be no favouring of cuts in subsidy to the detriment of service quality, loss of the advantages of integrated networks, or dereliction of public transport's social objectives. Finally, there should be no underestimating the difficulties organising authorities face in introducing competition, chiefly in terms of how to control and handle conflicts with operators and changes of operator without disrupting services. The example of Sydney was used to illustrate the progress brought about by the introduction of contractual relations between the organising authority and the numerous private operators serving the conurbation within the framework of the structural reform of public transport in the New South Wales region. Various methods have been used in order to renew contracts with private operators: the first based on minimum service levels; the second on benchmarking; and the third on calls for tenders.

Federico Bauchwitz described the privatisation process used for commuter railways in Buenos Aires. This network transported 560 million passengers back in 1957. Since then, service quality had declined, with annual traffic falling to 209 million by 1992. In 1990, the Argentine government decided to privatise the public company on a renewable ten-year franchise that was awarded to a group of private operators within the Metropolitano holding. The franchise covered the operation of a 350 km network and investments deemed vital by the State, which retained ownership of the network. The aims were to reduce levels of subsidy without greatly increasing fares and to improve service quality in order to win back customers.

The franchise-holder has to comply with service characteristics and fares set by the government, but has had total freedom in the area of personnel management. The investments made amount to over 300 million US dollars, 90 million of which have been shouldered by the private franchise-holder. Great strides have been made in terms of cleanliness, safety, and the battle against fraud, while productivity has improved considerably. Traffic on lines operated by Metropolitano has risen from 88 million annual trips in 1993 to 219 million in 1998. Across the network as a whole, traffic has risen to an annual 477 million trips. Subsidies have been cut from 335 million US dollars in 1986 to 65 million in 1998.

According to an opinion survey conducted in 1998, passenger satisfaction ratings vary between 63% and 75% depending on the service quality criteria used. For the future, there are plans to earmark 3.5 billion US dollars for investments in capacity and modernisation within the framework of a 30-year franchise.

The South African Rail Commuter Corporation (SARCC) is a public agency responsible for commuter rail services in South Africa. The SARCC owns the infrastructures and rolling stock and contracts out services to Metrorail, a division of the public operator, Transnet. Wynand P. Burger presented the current principle governing relations between the SARCC and Metrorail: a negotiated franchise running for five years, but without tendering. Competition and tendering will only become effective at the end of this five-year period, when Metrorail will be authorised to table its own bid. At the same time, a BOT (Build, Operate, Transfer) pilot-project has been launched by the SARCC in order to test the waters for private franchising (inspired by the example of Buenos Aires) and acquire criteria for benchmarking comparisons with Metrorail performances.

This trial project should be operational sometime in the year 2000. The pilot-project's general aims include: reducing production costs and increasing traffic revenue; the capacity to generate interest in the national and international private sector; sensitivity to the problems of job security; and integration with other transport modes.

Lynton Erskine spoke about the various innovative systems of public/private partnerships used during the construction and operation of new light rail infrastructures, and more especially BOT (Build, Operate, Transfer) and BOOT (Build, Own, Operate, Transfer).

These systems enable private funds to be released for projects of public interest while, at the same time, guaranteeing the private franchise-holder a fair return on capital invested. According to Lynton Erskine, BOOT acts as a spur to technological and commercial innovation. The success of these partnerships hinges on transparency within the tendering procedure (in order to guarantee genuine competition) and an equitable apportioning of risks between the public authority offering the franchise and the private franchise-holder.

A light rail project that is now being implemented in Mexico gave Lynton Erskine the chance to specify criteria for evaluating BOT and BOOT proposals and their stages of implementation. Project analysis needs to focus on how solid contractual relations are between public and private partners, how reliable the financial package is, the proposed transport system's performances, and the socio-economic impact of the project on the community.

WOMEN AND PUBLIC TRANSPORT

Women make up a majority of public transport users, yet researchers and specialists have paid little attention to the specific nature of their mobility. Some studies, such as one conducted in São Paulo, have demonstrated that even though a degree of similarity exists between men and women in terms of when they travel and how women encounter certain difficulties in view of the very specifics of their condition.

The São Paulo study presented by Maria-Luiza Forneck has endeavoured to identify these specific aspects with a view to satisfying women's transport expectations and needs. The results show that only 18% of men travel on foot whereas the rate rises to 25% for women. Moreover, for greater security and comfort, women tend to use minibuses or the private car. In the face of these observations, the São Paulo network undertook a vast study of women to learn about their feelings and difficulties. The study enabled a set of conclusions to be drawn: allowance must be made for women's overall environment both in the metro itself as well as on access routes to the network at isolated points that induce feelings of insecurity. These conditions are the chief explanation why some women choose the minibus or private car. This choice also appears to stem from public transport's lack of both speed and comfort – crucial elements in women's eyes – and is also due to occasional instances of aggressive or disconcerting behaviour by men or young people. Faced with these observations, a global vision must be adopted to confront the external and internal factors affecting women's journeys, their attitudes, and their points of dissatisfaction as well as preference, with the aim of responding better to female expectations and, as a result, inducing them to use public transport or remain loyal customers of it.

In Canada, GO Transit used the services of the Entra company in order to analyse the perceptions that public transport users have of safety. According to Angela S. Iannuzzielo, the general feeling is actually one of insecurity. To confront this problem, a multi-stage approach has been adopted that involves interviews, target-group meetings, consultations with GO Transit staff and a suitable audit procedure. Feelings of insecurity can be reduced by communicating more information, ensuring visibility along platform access routes, and having brighter station lighting. GO Transit has installed cameras and intercom systems on platforms and enhanced visibility at its stations. In addition, GO Transit is also proposing better access to the network for disabled and blind people. In total, it is important first to identify the different types of passenger, then find solutions that they will find acceptable. For this to happen, passengers must be directly involved in this process in such a way that they feel as though their individual voices have been heard and that they have truly played a part in the choice of adopted measures. This is the process through which the implementation of the chosen measures has benefited both the user as well as GO Transit.

INFORMATION TECHNOLOGY

Travelling by public transport requires knowledge about the transit system. This knowledge must be available whenever and wherever needed in order for the passenger to travel in an efficient and comfortable way. Different information products, such as route maps and timetables, are important tools for the passenger to acquire the required knowledge. However, technical development has made it possible to provide the passenger with additional information through new media, especially IT-media. The question is how these services should be designed in order to provide benefits for the passenger - the public transport customer. What information (i.e. content) should be made available? In what form should the information be given? Where should the information be made available? These are the issues discussed during "Information Technology" session and workshop through presentations from Gothenburg, Paris, Hanover, Berlin and Hamburg.

In Gothenburg, a major survey carried out by the Chalmers University of Technology assessed the impact of IT-mediated information services on passengers' perception of public transport, their attitudes towards public transport, and their behaviour in public transport over time.

Mrs MariAnne Karlsson presented main study results, which are the following:

- Information is important to both frequent and less frequent public transport users. Information must, however, be regarded as part of the total service system, which includes also time schedules, bus and tram designs and interiors, ticketing, etc.
- Real-time information on displays and monitors at bus/tram stops etc. holds a value for all categories of passengers, reducing uncertainty and increasing perceived control and overview.
- Real-time information is not believed to dramatically change the choice of means for transport and attract new categories of customers but rather to increase the quality of the service when used.
- Public transport service information on the Internet, both

Real-time information in Göteborg

real-time information and route planning services, holds a value for all passengers with access to the net. However, the content of the service, as well as the interface must be carefully designed in order to be useful to passengers. As in the case of real-time information, Internet services are not believed to result in any dramatic increase of the number of pubic transport customers.

In the greater Paris area, after a long period of providing operational information, then pedagogic or regulation information, and more recently information with promotional and appropriative purposes, RATP is developing an actions' programme integrating: information upstream before coming on the networks, intermodal information, and real time communication.

According to Lorenzo Sancho de Coulhac' speech, to reach these three objectives, information will include new dimensions. It will contribute to build a more modern and more human image of public transport in order to enhance the journey and make it a pleasure.

It will take into account needs of individuals or groups in particular situation: foreigners, disabled and reduced mobility travellers, cycle users, businessmen, etc. It will help integrating city activities and transport: development of transit hubs, direct access to specific commercial activities and services, etc. The next step in information systems development is to get a vision of the clients in their diversities of behaviour and urban life style, by anticipating their needs. Information should reflect to a real synergy between the city, its activities and its public transport system.

The city of Hanover will host the EXPO 2000 world exhibition next year. Mr. Andre Hammer presented how Hanover will take the opportunity of this event to develop an integrated information system combining public transport and road traffic information. To that end, co-operation between all partner organisations dealing with individual transport and public transport is essential and will be established.

The central actor of this system is the traffic management centre called movecentre which will control not only car traffic flows but also vehicles of the public transport company üstra AG.

The timetable information system EFA will give intermodal information for door-to-door trips on the basis of car traffic information, the locations of park and ride places and the timetables of public transport lines. Besides, there are additional plans to co-ordinate the information flows between all public transport operators in the Hanover region. In all these actions, the movecentre has a central role to collect, assess, deliver and disseminate intermodal traffic information.

Workshop on Information Technology included presentations from Hamburg (Mr. Ulrich Sieg) and Berlin (Mr. Martin-Müller Elschner). In both cities, in addition to the provision of conventional print information, computer aided passenger information systems are increasingly used. In Berlin region, VBB, the local operator, considers that lack of information is a main reason for non using public transport. Therefore, it developed an integrated passenger information with both conventional print media and modern computer aided offline and online systems. Moreover, VBB is extending this concept over Brandeburg region by developing an integrated database which processes and harmonises data from the various transport systems and companies.

In Hamburg, the starting point was to carry out a critical analysis of information media and their possible uses and significance for different groups of transport customers. Then, it was easier to identify the right media for corresponding needs of each target user. Advanced information systems include GEOFOX which provides up to date timetable information by phone, from public terminals or the Internet. At stations and interchanges, dynamic digital boards display countdowns and real-time information in case of special events. Onboard underground trains, installation of the TrainScreen system was started in 1998: it give up to date service information as well as other general information, advertising and local news.

Berlin and Hamburg regions are actively involved in the development of a nation-wide electronic timetable information called DELFI aiming at providing online door-to-door timetable information for long-distance, regional and local transport in Germany.

AUTOMATIC RAIL OPERATIONS

Driverless trains are a major technological innovation, but they also provide a new vision of the metro, offering more frequent and safer services at less cost and allowing more staff available for helping passengers.

The world's newest high-capacity automatic metro is Line 14 of Paris, better known under its project name "METEOR", and was presented by Alain Caire. Line 14 is presently 7 km long and has seven stations. It serves the centre of Paris, allowing interchanges with most other metro lines and offers much-needed relief to the saturated RER Line A. Its present Southern terminus is Bibliothèque François- Mitterrand, where an interchange with RER Line C is being built. Once operational, this will bring along another 2,000 passengers / hour. The next station, Olympiades, will become operational in a few years, but is already in use as an on-line workshop for vehicle maintenance. At the other end, works for the extension from Madeleine to Saint-Lazare have started in 1998, for completion in 2003. By that time, ridership of Line 14 is expected to reach 350,000 passengers per day. Total investment (rolling stock not included) was about 6 billion French francs, i.e. about 800 million francs per km, and was only 3% above budget. Cost of the actual automated train operating system amounted to 900 million francs, or about 15% of the total investment.

The advantages of automatic operation are well-known: high quality of service, due to short headways (down to 85 seconds) and good regularity, flexibility to adapt transport offer to demand, safety of operation due to advanced signalling and platform doors, the possibility to allocate staff to customer-service duties instead of driving.

For the Meteor staff of 242 employees, a new organisation has been set up with a line manager, line assistants, polyvalent maintenance staff, etc. Supervisors normally working at the Control Central have also tours on duty on line.

The Vancouver skytrain

Experience of the first months of operation has been good. Two months after the start, there were already 100,000 passengers per day. Apart from an incident in early November, regularity has been very good and exceeds the contractual target of 99.4%. The public appreciates the comfortable ride, the architectural design of the stations with good accessibility for the disabled, the new information systems and the staff availability. Automatic operation as such has not been a big issue, as it is not new to the French public, with systems already operating in Lille, Lyon and Toulouse.

A totally different system is the Vancouver Skytrain, presented by Larry Ward. The Skytrain system was developed in the early 1980's using the Advanced Rapid Transit technology developed by UTDC, now the Transportation Systems Division of Bombardier Inc. The initial phase of 21.4 km and 15 stations opened to revenue service on 3 January 1986, and has since been extended twice. It now totals nearly 29 km, most of which (23.8 km) is elevated, 3.5 km at grade and 1.6 km in tunnel. There are 20 stations. The system's design capacity is 24,000 passengers / hour/direction, but the present fleet of 150 vehicles only allows 8,000 passengers/ hour/direction.

On the technological side, Skytrain has several innovative features: steerable axle trucks, propulsion by linear induction motors, and above all the Seltrac Automatic Train Control system, based on the moving block principle.

Mr Ward further explained various aspects of system performance. Automatic driverless operation has relatively low and reduced unit operating costs and relatively high and increasing labour productivity. Service quality is also very high, because of a basic five-minute interval in off-peak periods and the possibility to rapidly adapt capacity to demand. 96.5% of all trips are delivered within two minutes of schedule.

The safety record is also very good despite a number of accidents, most of which probably would also have occurred on a conventional operator-driven metro. Public acceptance has been very good, and extensions to the Skytrain system are planned.

REGIONALISATION AND TRACK SHARING

Track sharing is one of the most interesting developments in the railway field. This and other innovations would not have been possible without another trend, regionalisation of urban and suburban transport.

The growing interest for track sharing is illustrated by the successful example of the tram/train system of Karlsruhe, which has since become known as the "Karlsruhe Model". Gunnar Heipp explained the main reason for developing this new concept: Karlsruhe's main railway station is too far away from the city centre, and VBK wanted to offer seamless transport, without interchanges, between the neighbouring towns and communities and the city centre.

Several technical difficulties had to be overcome such as the development of a dual-voltage vehicle capable of running both on the 750 Vdc tram network of Karlsruhe and on the 15 kVac network of DBAG railways; the development of wheel-rail interface compatible with both light rail and railways systems; the compatibility of vehicle floor height with different platform heights; and above all, a redefinition of the safety of light rail vehicles, giving a greater importance to the active safety (braking capacity, signalling) to compensate for the passive safety (e.g. resistance to compression) that would otherwise be uncompatible with that of mainline rail vehicles sharing the same tracks.

Solutions to all these problems have been found, and the first light operation on DBAG tracks started in September 1992 between Karlsruhe and Bretten. It was an immediate success: in the first six months, ridership jumped from 2,000 daily passengers to 10,300 and is now at about 14,000.

Jacques Chauvineau, Directeur de l'Action Régionale, Société Nationale des Chemins de Fer Français (SNCF)

The use of new generation light railcars can rejuvenate existing regional lines

The track-sharing experience has been extended to other railway lines around Karlsruhe, each time with success. An interesting point is that 40% of the new passengers are former car drivers.

Mr Heipp finally briefly evoked applications of the Karlsruhe Model in other cities, in Germany and abroad. The best-known example is the Saarbrücken light rail, which is already operational. Other German cities have similar plans, which have only become possible by the regionalisation of local and regional transport in Germany.

This trend can also be observed in other European countries, and the experiment with regionalisation of railway services in France was presented by Jacques Chauvineau. It is based on the transfer to the Regions of the financial support that the national government previously gave to SNCF (French national railways) for its regional operations, amounting to 450 million euros.

So far, seven of the 22 French regions have taken part in this experiment, with promising results. The whole operation, which can be considered to be a revolution in the French railway landscape, is supervised by a Comité National de Suivi. New contracts are being concluded between the Regions and SNCF. They define the modalities of commercial risk sharing, and contain clauses about bonuses and penalties in case of compliance or not with service quality standards.

Regional services run under the brand name TER – Transport Express Regional, with a distinctive corporate style, and are complemented by bus, coach and taxi services.

A totally new generation of rolling stock for TER services, both emus and dmus, has been designed by the regions with SNCF's assistance, and the first trains have been running since 1998. After completion of this 6 billion francs

LOW-EMISSION BUSES

Buses are responsible for only a tiny fraction of all urban pollution. Nevertheless, ever tougher regulations and concerns about image are prompting the industry to constantly improve the eco-performance of both its actual vehicles and their equipment (hybrid vehicles, fuel cells, catalytic converters, particle filters) and of various types of fuel (sulphur-free diesel, bio-diesel, gas, etc.).

In terms of fuels, the unrivalled superiority of diesel continues unabated. According to Adolf Müller-Hellmann, both ecologically and economically the new types of diesel and equipment for the post-treatment of exhaust fumes meet Euro 3 and 4 standards for the four controlled emissions (CO, HC, NOx, PM). A few years from now, irrespective of the position regarding fleet replacement and modernisation, it will be possible to view diesel engines as "near zero-emission". Beyond the effects of fashion, diesel indeed remains the most ecological and most efficient fuel in any global assessment of fuels right across the sector (impact on health, Greenhouse Effect, etc.). Not even the fuel cell can match it as yet, primary sources of renewable energy (wind, sun, water) for the production of hydrogen are exceptions.

Manfred Bonz, Stuttgarter Straßenbahnen; Dale Turvey, Commissioner of Transportation, Ontario, Canada; Adolf Müller-Hellmann, VDV, Verband Deutscher Verkehrsunternehmen; Laurent Dauby, Responsable Commission Bus, UITP; Aldo de Robertis, Azienda Consorziale Trasporti Trieste

Hybrid propulsion should also mean lower consumption and fewer emissions. Laurent Dauby specified the way in which results available to date reflect the experimental state of the technology. In spite of this, diesel-electric drive fed by a thermic/generating motor unit or by batteries already allows (emission-free) operations in electrical mode over parts of the journey, improves passenger comfort (smooth, silent running and integral low floor) and allows the necessary drive elements to be refined for the integration of fuel cells.

The city of Trieste plans to test a ground-fed electrical supply system to counter the visually intrusive nature of overhead power lines. As Aldo de Robertis explained, this type of electric bus will collect energy from a conductor buried in the road through an innovative runner that will also help to guide the vehicle. Infrastructure work is minimal and implementation flexible. This Ansaldo patented system will be put through its paces in Trieste from the summer of 1999 and pursues the same avenue of research as the tramway running on tyres that is currently being tested on the Trans Val de Marne site.

Improving the image of the bus, which accounts for 75% of the production of public transport firms, is vital, and innovative systems are being perfected in order to do just that. However, diesel will remain in the vanguard of fuels for a long time to come. It is clean, efficient and economic, but still receives a bad press.

(915 million euros) investment programme in 2005, 60% of the fleet representing 80% of the transport offer will have been renewed. This is being complemented by a modernisation programme of the stations, and initiatives for better intermodal passenger information and new regional intermodal fare systems. Cooperation between the Regions and the municipalities is growing, leading to various projects for better intermodal suburban ("périurbain") services.

The regionalisation experiment has resulted, in 1998, in an increase of 4.9% in traffic (compared to 2.9% in the other Regions) and of 10% in rolling stock productivity. It has above all brought SNCF closer to its customers and made its personnel more aware of customer care, thus considerably changing its corporate culture.

Sydney is preparing for next year's Olympic Games, and railways will play an essential role in transporting officials and spectators to and from the Olympic sites. The main suburban rail operator, State Rail Authority of New South Wales, is already putting Sydney "on track for beyond 2000", as was shown by Simon Lane.

In November 1998, the NSW Government launched "Action for Transport – 2010", which establishes guidelines, timings and priorities for investment in public transport, in order to meet the targets of the Government's Air Quality Management Plan.

In Australia, track infrastructure is owned and maintained by the Rail Access Corporation. Competition for train paths creates pressures on available track space in peak times, for both freight and passenger operations. In and around Sydney, CityRail has to share track with other users. New CityRail lines and increased numbers of trains are likely to create more congestion on the network and increase issues of access.

The fundamental challenge for CityRail in the next 20 years is to increase rail patronage by 50% from 270 million to 400 million journeys per year. This is to be achieved by providing fast services between major centres with a focus on corridors potential for 5,000 or more trips in the peak hour.

Olympic Park station was already opened in early 1998, and other key stations are being upgraded to enable them to handle large crowds. The Airport Rail Line is scheduled to open by June 2000, and will also allow to bring more trains into the Sydney CBD. Another important project is the 24 km Parramatta Rail Link, due to be opened in 2006 and creating new links with the Western

Simon Lane, State Rail Authority of New South Wales, Australia

suburbs. Longer-term plans may include a second Sydney Harbour crossing. Investment in rail will require in average 300 million $AUS per annum, to be sourced from farebox increases as service quality improves, from Treasury allocations and from the private sector.

Integration with other transport modes is essential, as 45 % of CityRail customers use another form of transport before and/or after their train ride. It is to be achieved by a single integrated transport ticket by 2002, real-time train information at bus/rail interchanges and development of commuter parking facilities.

Land use planning decisions about the location of offices, housing density and parking provision will be key factors for the success of public transport.

Finally, an equitable track access regime is to be established in order to avoid track congestion and to serve the interests of both passenger and freight operations sharing the same tracks.

Quality and approval

Increasingly, operators are including quality in their development and management blueprints, such is the extent to which service quality is beginning to dominate the conquest of new market shares.

The authorities in Berlin, Stuttgart and Zurich are stressing the importance of professional training and daily staff contacts with customers in ensuring a quality service. The concept they all share is "customer orientation". This implies a set of behavioural aspects that enable the customer's expectations to be met while complying with official regulations and ensuring their safety.

Although each of the three organising authorities in question has introduced a modern system of training that meets their own particular requirements, their actual approach is similar.

They explained what the concept of "customer orientation" actually means: it signifies taking action to address the customer's expectations, being open to any service request, and being friendly and considerate. It also means taking responsibility for the safety, reliability and punctuality of the service. Once it has been defined, "customer orientation" is also designed to produce a team of professionals who drive vehicles competently, correct dysfunctions rapidly, have full control over operating and traffic conditions, and react appropriately to customer behaviour. Competent drivers require a modern system of training: after a presentation using modern techniques, drivers receive the rest of their training on computer, simulator and real vehicles.

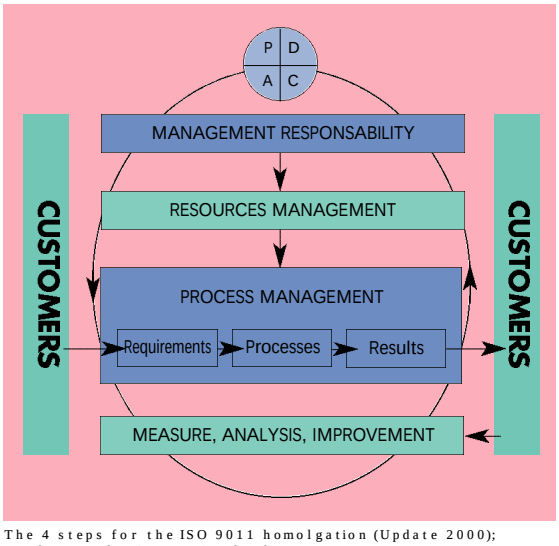
These modern training systems call for the right media design. Simulators provide training away from operations, traffic and outside weather conditions. They also offer systematic training aimed at controlling difficult operating conditions, individual and intensive traffic training, and preparation for new operating conditions. In total, simulator training provides improved approaches in terms of customer orientation. The various types of simulator each respond to particular needs, hence their difference in price.

In economic terms, a complex simulator costs the equivalent of two trams, while its investment costs can be written off within five to seven years if it is used intensively by the company.

In addition, investments involving team qualifications represent strategic investments. Ultimately, the success of such forms of training depend sin the main on co-operation from both instructors and drivers. Instructors have to be involved with the system's development right from the start. They need to be convinced that they have complete control on the simulator. Finally, specific training has to be given to ensure their competence as instructors. In the case of tram drivers, they need to be informed quickly and shown the simulator's advantages and have any anxiety quelled by way of qualified assistance.

Public transport firms need to improve the quality of their services, irrespective of whether this is done to instil loyalty among existing customers or to attract new ones. To this end, firms must have the right sort of tool in place. This has been the philosophy of two public-sector transport operators, De Lijn and Transports publics genevois, in deciding to create a quality system compliant with the requirements of the ISO 9001 standard.

Having collaborated with all the actors involved, they decided to set up this system in two stages: firstly, by entering into a contract with the political authority to which they are answerable; secondly, by putting in place this ISO 9001-complaint quality system for all their transport activities. Stage one is aimed at instilling greater autonomy in the way the company is run within the remit of the objectives that the authority expects it to comply with. Stage two rounds off the first in that the introduction of the ISO 9001 standard allows better quality services to be offered. This quality system allows



The 4 steps for the ISO 9011 homolgation (Update 2000); p= plan; D= do; A= act; C= check

TRANSPORTATION OF PEOPLE WITH IMPAIRED MOBILITY

The number of people with impaired mobility, be it temporary or permanent, is high. Furthermore, demographic changes show an ageing population both inside and outside built-up areas. To satisfy demand from this customer segment, special infrastructures have been introduced in Göteborg, Sweden and Hamilton, Canada.

The city of Göteborg has been organising a special transport service for the elderly and disabled since 1967. From the very outset, the service has been provided using public transport. The vehicles used were not the same as those in the city, but were in fact specially adapted vehicles and taxis. According to Ragnar Domstad, the number of users has risen dramatically: whereas 650 people used this form of transport in 1967, the number today is 25,000. This increase has necessitated the creation of a journey-planning system known as PLANET. In addition, a series of improvements has been made, including Braille signs for visually-impaired people, departure boards in real time, and colour-coding for each tram line. Moreover, there are reserved seats in public transport for disabled people. The authorities are in regular contact with disabled bodies and are usually open to their suggestions for improvement.

The district of Hamilton has put forward a fresh approach to special transport needs: its "family of services". Devised in 1993 as a means of overcoming the problems which these passengers face and of reducing the high cost of existing parallel services, the new approach was implemented by the Region starting in 1994. The "family of services" comprises four service types:

- Vans with wheelchair access offering door-to-door service on a demand-responsive basis.
- Delivery/taxi services offering a door-to-door service on a demand-responsive basis.
- Taxi services offering discount vouchers for rides in commercial taxis.
- Low-floor bus access on scheduled bus routes for wheelchair users and easy access for able-bodied disabled people.

According to William O'Brien, mixed use of these services has boosted the service available to this clientele. Moreover, the reduction in costs has been accompanied by more effective service provision.

efforts to be made towards total quality since the tool involved opens the way to improved control over the process influencing the quality of services while also enabling firms to maintain consistency of service. This quality system provides a basis whose role is that of systematically controlling the main processes involved with transport provision. Other requirements can be added afterwards. This system's flexibility therefore allows the companies in question to avoid being unwieldy and cumbersome in the way they are run.

In France, the first service to obtain certification did so in 1998, based on France's "50 805" trial standard of April 1997 and quality-cycle criteria. In effect, it attempts to translate customer expectations into measurable elements to which a company can commit itself. The SLTC operator in Lyons began its quality action by undertaking to uphold six quality indicators. Any failure to do so would leave it open to penalties.

To consolidate this action, the firm decided to seek recognition for the quality of its customer services via an independent body: service certification was thus set in train. The system of reference for the certification of urban bus transport services stipulated a set of compulsory criteria (e.g. information and regularity) supplemented by a series of specific criteria. This action called for considerable involvement on the part of all the firm's staff and a partnership with the organising authorities. The success of service certification is shown by the fact that the overall customer satisfaction rating has gone up from 12.1 in 1993 to 14.4 in 1998. Meanwhile, the results have encouraged certain metro operators to adopt the same approach.

Following the example of SLTC, the Transport d'Eure et Loir company has obtained permission to use the "NF-Service" mark on its Dreux-Chartres-Orleans route.

INTERCHANGE AND INTEGRATION

Time spent interchanging by passengers no longer represents wasted time, but provides an opportunity to obtain real-time information about schedules and other, more general information, as in Stuttgart. The "PIRATE" project conducted by the European Commission and the design of new stations in metros around the Mediterranean bear witness to the tremendous importance of intermodal interchanges.

In Stuttgart, the public transport network is centred around S-Bahn and LRT lines that are fed by bus routes. Co-ordination of train and metro schedules with buses along with passenger information are therefore the key to service quality. Thomas Porombka explained how the public transport organising authority in Stuttgart has developed a system dedicated to providing information about network service operations and that broadcasts this information to the various interchanges.

As a result, bus drivers can adjust departure times in accordance with train arrivals. This system is also used to tell passengers which bus will be departing from which bus bay in real time. Leisure amenities such as hotels, sporting venues and theatres are also able to receive information about schedules affecting stops located close to them.

Local-authority information and commercial advertising are also broadcast,

which helps to reduce the cost of operating the system.

The "PIRATE" project's starting premise is to compare the views of designers and interchange operators with those of citizens, whether or not the latter actually use these interchanges. The trial began with a study investigating the case of two interchanges (one in the United Kingdom and one in the Netherlands) before being extended to six European countries encompassing 13 interchanges. According to Victoria Butterell, the project is due to be rounded off by the production of a handbook on the design and operation of "tomorrow's interchanges" adapted to the needs of the passenger.

Tim Rosenberger and Panos Papadakos presented a comparative study of older and more modern metro stations in North America, Western Europe and the eastern Mediterranean region. Their main points of focus were intermodalism (presence of bus stops, parking spaces, bicycle storage), disabled access, passenger services, businesses within stations and property developments linked to metro building work that help with its funding. The results show that there are major differences between older stations, which have few connections with other transport modes, have no disabled access and are devoid of passenger amenities, and new stations which, in contrast, are designed as interchanges that are accessible to the disabled more often than not and offer a wide variety of passenger services. Equally, more and more cases are being recorded of joint projects involving metro and urban development.

The metro systems in Cairo, Ankara and Athens come across as less well equipped than more modern metros in western cities in terms of disabled access and the layout of their intermodal interchanges. In the case of the new Athens metro, on the other hand, the emphasis has been placed on incorporating numerous services and businesses. Furthermore, Tim Rosenberger and Panos Papadakos believe that older stations too are capable of accommodating such amenities without excessive re-development costs and operational disruption. These amenities are a source of direct revenue for the operator and a factor conducive to public transport ridership and passenger satisfaction.

The aim of the intermodalism observatory set up by UITP's Regional Transport Committee, presented by Jean-Claude Degand, is to promote innovation in the area of intermodal co-ordination (such as the "tram-train" in Karlsruhe, which operates on railway lines alongside trains in outlying areas and on dedicated rights-of-way in the road area within central districts, or co-ordination between trains and taxis in the Netherlands), arrangements at interchanges (like Hamburg's "Park and Ride" system), multimodal information systems (like OVR, the multimodal telephone information system in the Netherlands), fares integration, and services adapted to people with special needs. Jean-Claude Degand also highlighted the implications of multimodalism: the removal of sector-specific approaches that are so costly to the community in favour of the systematic pursuit of the most effective intermodal solutions, plus the pursuit of consensus and the bringing together of all actors involved with the design and management of interfaces between different modes, such as intermodal interchanges.

Jean-Claude Degand, Directeur adjoint du Périurbain et du Bassin Parisien, Société Nationale des Chemins de Fer Français (SNCF)

Jon Willis related the story of the development of a public transport network - the Docklands Light Railway (DLR) - that has gone hand in hand with urban development since 1976, the year when the first plans were drawn up for the development of this vast disused port area located to the east of central London. The choice of an automated light rail system, part of which would run on track infrastructures used formerly for freight transport, made sense firstly because it offered an economic solution for serving the new business centre at Canary Wharf and the surrounding district.

Despite several extensions and a Tube connection at Bank station, the DLR quickly proved too small to cope on its own with transport demand. Today, with 100,000 passengers daily, traffic levels are five times higher than had originally been forecast. In 1989, the UK Government therefore decided to extend the Jubilee Line towards Docklands. The banks responsible for the Canary Wharf development provided (token) support towards the operation's funding. The 12 km extension with 11 stations will be officially opened at the end of 1999.

The Jubilee Line will then become the only one to provide interchanges with every other Tube line. Moreover, it will be serving the Millennium Dome and Stratford station, where cross-Channel high-speed trains will be terminating from 2007. The transformation of the vast Docklands area into a global business centre is a major milestone confirming the extraordinary vitality of London. It also shows how it is possible to develop a new city in which the role of the car can be cut to a minimum, courtesy here of the service levels on both the Jubilee Line and DLR.

PUBLIC TRANSPORT IN DEVELOPING COUNTRIES

In a great many developing countries, urban transport is in crisis on several levels: rising urban populations, lack of integration between urban and transport planning, institutional transport structures that are inefficient, lack of funding either for investment in infrastructure or for service operations, mobility demand not satisfied by public transport, increase in the number of private cars and in traffic congestion, worsening air pollution, a poorly-maintained road network, increase in the number of road accidents, and so on.

Against such a background, the CODATU VIII gathering held in South Africa in September 1998 recommended the development of international co-operation in the areas of training and institutional consolidation and stressed the need to produce studies and research on the various aspects of urban transport. Furthermore, in order to make allowance for the problems of funding, Peter Freeman recommended integrating transport as part of a global approach to include housing, health, education, and other urban services that are complementary and non-competitive.

The workshop on transport in developing countries was illustrated by two examples from India. The first, presented by V. Apparao, involved the road

transport company in the state of Andhra Pradesh - India's largest operator with 18,500 buses and 130,000 staff. The second paper outlined the need to develop urban rail systems in India's major cities, the number of which is forever increasing. The paper was presented by M. Goyal.

CUSTOMER SERVICE, MARKETING

Increasing market share entails knowing all about customer behaviour and expectations. That being the case, marketing has become a vital activity as a preventive means of avoiding customer disaffection or as a curative means of dragging firms out of the red.

In Munich, Socialdata GmbH has devised a new marketing approach: "individualized marketing" (or "indimark" for short). The approach, presented by Werner Brög, involves developing dialogue between the company and its customers through direct contacts with the entire population in a target zone. After identifying non-interested persons, regular users are questioned. In general, around one-third of them are sufficiently well-informed about public transport services whereas the other two-thirds need more information. Lastly, people who are interested, but who do not actually use public transport, are questioned.

These direct contacts, which are backed up by home visits, often with the offer of free tickets with which to try out the service. This policy has led to an increase in public transport use by 23 trips per person per year. The approach pays for itself in less than 2 to 3 years since the additional trips are generally long-lasting in nature. All of which means that the transport firm will recoup over double its original outlay within five years. The results from a panel of 75,000 people therefore show an increase in public transport ridership levels that is superior to the cost of such a marketing action. It is reasonable to conclude therefore that individualized marketing should be seen not as additional expenditure, but as an actual investment.

UITP's Regional Transport Commission reported that marketing can also be applied to the conquest of new markets, such as leisure mobility. In tourism, the fact that the dominant transport mode is the car has caused many transport firms to withdraw from this market segment. Yet it is one that accounts for 50% of the total market. Nevertheless, policies can act as a check on this action inasmuch as public transport firms generally see it as easier and less expensive to turn existing customers into loyal users of an existing network than to attract new ones.

Moreover, the fact that public transport firms have been absent from this type of market drives up the cost of investment further, making it difficult to derive an early return on this type of investment. Thomas Bieger's proposal involves determining the specific needs of these users as well as the leisure activities that would be viable for a public transport firm. Once established, he suggests forms of service such as journeys linking the point of attraction and residential zones, the introduction of a network on which there are various leisure offers, and even the offer of separate products away from public transport itself that would be leisure activities in themselves. Although it is true that public transport firms must attune their products and their services to this market segment, they nevertheless have the possibility here of reaching new customers in other regions as well as abroad.

Starting out from the premise that a satisfied customer is a loyal customer and one who can help transport firms, London Transport has been busy examining customer-satisfaction measures as well as service quality in metro firms.

Kirsti Nøst, Marketing Manager, A/S/ Oslo Sporveier and Chairwoman of the UITP Marketing and Product Development Commission

First and foremost, the safety and comfort of all users is paramount. Next, their expectations must be understood, without which it is impossible to make sufficient improvements to services. To this end, Jonathan Pott suggests using the following tools: establish relative priorities; conduct general surveys, followed by more targeted surveys; and take user complaints on board.

Factors such as time, cleanliness, safety and passenger information must be considered. It is also worth pursuing results inside the company itself by organising direct training programmes or incentive systems to motivate staff. In total, providing better customer service does not mean having to meet every need at any price, but meeting customer needs by focusing on the available resources.

Copenhagen: bus of the Copenhagen Transport (HT)

In Hamburg, where the public transport operator, Hamburger Hochbahn, is doing well and covers 71.2% of expenditure, marketing is perceived as a necessity that forms part of the framework of market liberalisation in urban transport espoused by the European Union. In order to successfully rival major transnational groups, the company has perfected a marketing strategy aimed at increasing the quality and modal share of its public transport services while, at the same time, reducing costs. The strategy involves identifying all potential growth segments and targeting them. The philosophy behind the action is that customer concerns need to permeate the company from top to bottom and become instilled in its culture.

In Copenhagen, the action taken has been more defensive. The HT undertaking used to account for barely 15% of journeys and had a dreadful public image. The marketing strategy has therefore been aimed at boosting this flagging image and winning back customers. Starting out from the observation that it is easier to retain existing customers than to win over new converts, HT has identified its biggest group of users (the 17-30 age group) and initiated a strategy for extending the period during which people in this group use public transport.

This it has done through individualised communication via electronic mail and the staging of user-group discussions. In a more global perspective, however, HT is also investing in winning over new customers via mass communication campaigns and catchy slogans. Looking beyond its commuters, HT has also singled out a second market: leisure travel. In the case of this segment, commuters are being encouraged to make the most of their season tickets during off-peak times. HT's image has now improved considerably and the movement of disaffection among its customers brought to a halt.

Re-organisation of undertakings

Over the past few years, public transport's institutional framework has been undergoing rapid change with the transition from public-sector monopoly over to a competitive context and the mounting involvement of private capital. Transport firms are having to adapt to this context. This they often do through restructuring, the success of which hinges on pinpoint knowledge of company strengths, a clear definition of objectives, and tools adapted to the management of change.

The public transport operator in Dresden has successfully undergone modernisation and enhanced its appeal since German re-unification. Frank Müller-Eberstein talked about the various stages that have enabled DVB AG to radically overhaul both its legal structures and organisation as well as its means of production in order to modernise the company, the aim of which was to respond to the needs of the market. To that end, the tramway line has undergone refurbishment that has included the modernisation of rolling stock and improvements to both commercial and operating performance. The construction of a single depot for all tramway cars has reduced immobilisation costs. The introduction of an operational aid system means that the network can be monitored more effectively in real time. The bus fleet has been totally replaced with low-floor buses and operations have been awarded ISO 9002 certification. As for fares, a new policy has been implemented, the chief basis of which has been the introduction of an attractive season-ticket scheme. Last of all, a new communications strategy has been devised. Results were not long in coming: public transport ridership increased, and the proportion of expenditure covered by revenue tripled, thereby cutting the firm's deficit.

In Germany, municipal undertakings are generally responsible for providing services in several spheres that include transport, energy, water, and waste. This situation is conducive to cross-subsidies between activities.

Thus, the public authorities in Bonn are offsetting public transport's deficit using revenue generated in the energy sector. The European Union does not judge this system of cross-subsidies to be fair in competition terms, and so the only subsidies that will be authorised in future will be those that do not entail any form of operator discrimination. As a result, the public authorities are to shoulder the full cost of any infrastructures they make available to transport firms either at zero cost or by levying a user charge.

Norbert Klein presented three possible configurations. The first is to define operating costs and fund them exclusively using operating revenue. The second option is to separate infrastructure and operations within the same company to make two independent business sectors. Lastly, the third option is to create two separate companies, with infrastructure remaining in the hands of the public authority (meaning there is no competition at that particular level). The first variant is starting to be applied in Germany, where people are noticing how transparency of costs is enabling the public authorities to take decisions in terms of cost-cutting or increasing subsidies aimed at improving quality.

Ton Kaper, UITP Vice-President and General Manager of Haagsche Tramweg-Maatschappij (HTM), Netherlands

The United Kingdom was one of the first countries in Europe to open up its urban public transport sector to private capital. In 1997, the new Labour government decided to withdraw from its public funding of London Underground Limited (LUL), which was obliged to seek alternative means of funding, chiefly to meet its needs in terms of infrastructure investment. In order to meet this challenge, LUL appointed the PA Consulting Group to analyse the various options open to it and the quantitative and qualitative impact these would have on the firm's performance, plus the restructuring needs they would bring in their wake. Donna D. Mayo spoke about the approach

London Underground, that will be soon known as Transport for London is a prime example of a company undergoing a reorganisation process

Air Quality

The Paris region has set up an observatory with the job of assessing the effect of urban pollution on public health. The epidemiological study presented by Eric Dusseux has allowed the short-term links between the level of air pollution and premature death and rates of hospitalisation to be evaluated. Comparisons are made between days of high and average pollution. On summer days with high pollution, deaths from respiratory illnesses increase by 8%, hospitalisation rates for child asthma go up 25%, and work stoppages caused by cardio-vascular complaints rise by 23%. These results tally with observations made in the United States, which have recorded how average life expectancy in the population groups most exposed to air pollution is 1 to 1.5 years less than it is for the least exposed groups.

The United States is the very place where improving air quality is seen as a priority that has to steer transport policy. Cecilia Ho presented the "Congestion Mitigation and Air Quality Improvement" programme from 1991's "Intermodal Surface Transportation Efficiency" (ISTEA) legislation, the aims of which are to subsidise transport investment that helps improve air quality and assist States with respecting pollution norms by applying appropriate plans for transport. Six billion dollars have been spent to that end between 1991 and 1997. High-capacity public transport projects have been the beneficiaries of this aid; nevertheless, car use still remains broadly dominant in the United States for journeys made in urban zones.

adopted and the model used to simulate potential options over a 30-year period.

The chief finding of this analysis reveals that the way in which a solution is put in place is more important than the solution in itself. Among the three options studied, three actions come across as decisive factors: (1) ensuring the availability and viability of capital, (2) striving to minimise staff turnover to ensure continuity in terms of human capacities and experience during the transition period, (3) strengthening collaboration between the various entities responsible for infrastructure, operations and maintenance. Executing these three recommendations would increase a public/private partnership's chances of success.

Rumania is currently making the transition over to a market economy. One of the implications of this is the need to reduce public spending on infrastructure development. Against this background, public transport in Bucharest is having to be developed and modernised using new funding methods, including the use of private capital. According to Viorica Beldean, the approach needs to differ depending on whether it involves infrastructure development or service modernisation. Indeed, because the public authorities contribute to infrastructure funding, it is recommended that private capital be used to fund operations and rolling stock. This form of restructuring is already underway: maintenance services as well as commercial and advertising activities have been turned into separate, independent companies with a view to their privatisation. There are also plans to award franchises for metro and light rail lines to private partners.

In the Dutch region of Achterhoek in Gelderland province, a new company known as Syntus was founded in 1999 in order to establish permanent co-operation between Oostnet bus services and Dutch Railways (NS). In addition to those two firms, Syntus has a third partner: the French company, Cariane Multimodal International. Frank van Setten presented the Syntus company, whose number one objective is to offer an integrated and multimodal regional service. Syntus has a period of five years in which to demonstrate that this type of restructuring will result in increased public transport ridership.

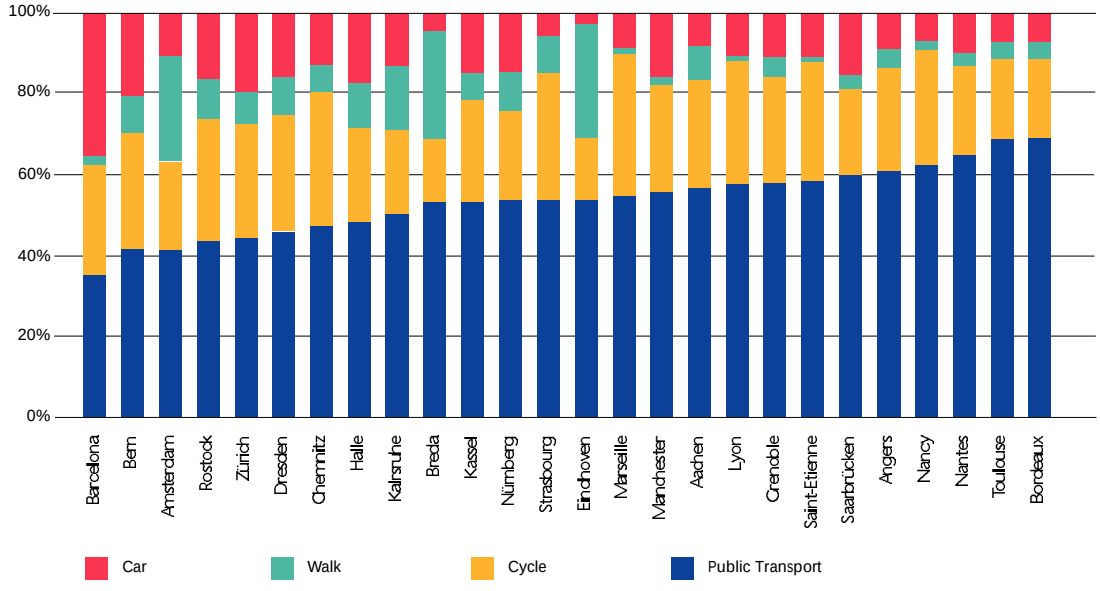
Area planning and urban forms

The relations between the effectiveness of transport networks, urban planning and how cities develop in socio-economic terms are implicitly known facts, but are difficult to highlight, particularly when it comes to ascertaining whether urban planning influences forms of transport behaviour or vice-versa.

The European Commission's SESAME project, presented by Erik J. Verroen, has attempted to add substance to an attractive idea: an international benchmark (statistical collection, drafting of conclusions). However, this project is running into numerous difficulties relating to the method for defining notions and harmonising them. A typology of cities in five categories has been established in accordance with the type of modal split. The latter is influenced by the urban form, by the services that the various available modes offer, and by socio-economic factors. The study's conclusion is that there are two distinctive markets, long and short distance, which are characterised by different competitive factors: car / public transport, on the one hand, and non-motorised modes / car, on the other. The established idea of competition between non-motorised and public transport is refuted, which allows greater co-operation to be envisaged.

In a long-term urban planning perspective, it is more effective to envisage possible scenarios on the basis of analogies and to take measures that will steer the desired evolution rather than to seek answers to selective difficulties. According to Yehuda J. Gur, Tel Aviv needs to find a solution to two major obstacles to its development: shortage of space and increased traffic-flow densities. On the basis of a given typology (Los Angeles, Hong Kong, Europe) reflecting urban and social characteristics and modal-split blueprints, this methodology enables the city to predict what may lie in store for it. Planners are contemplating the feasibility of various scenarios.

The European city appears to be the type best suited to the situation in Tel Aviv: limited space, mixed nature of activities, determination to retain social cohesion, to name but three factors. From that point, policies can be enacted strategically and pro-actively in order to steer the future instead of having to adapt to it. On the basis of these orientations, the local Egged Bus company can decide its strategic and investment



Modal share in most of the SESAME cities (based on trip rates)

choices in full possession of the facts: services feeding heavy rail links in the case of the Hong Kong scenario; or a network of highly dense, intermeshed as services following the lines of the European scenario.

The paper by Jean-Loup Madre outlined the long-term impact of demographic factors (population growth and ageing, peri-urbanisation, etc.) on mobility habits. The INRETS institute in France intends to supplement this static analysis grid using socio-economic data in order to flesh out the analysis with dynamic factors.

The "generation" effect appears to be significant; thus, contrary to what used to be the case, an ageing population is not necessarily beneficial to PT since the first "all-car" generations are continuing to live the same way once they retire. Beyond this, the socio-economic status associated with each period of life plays a major role. Thus, public transport's potential may lie with young people. This user category travels more than its forebears did a few generations back and is dependent on public transport for longer because it enters the jobs market later in life and faces increasingly precarious circumstances. Operators must harness this lengthier period in order to develop appreciation for their services and retain a clientele, even a non-captive one.

SAFETY, FRAUD

The existence of criminal activity and vandalism is a major problem of grave concern to public transport operators in most of the world's cities. Both objective safety as well as subjective feelings of insecurity on the part of users are factors in determining whether they will decide to use public transport rather than another transport mode.

This was the thinking behind the decision of Hamburg's PT operator, Hamburger Hochbahn, to take measures to combat violence and vandalism. In addition, Holger Albert specified the perception of insecurity on the part of the individual in the face of considerable pressure from some sections of the media that publish "shock" reports about violence in public transport. Confronted by these findings, Hamburger Hochbahn has identified the basic conditions behind not only objective feelings of insecurity, but also subjective feelings: vandalism, graffiti and lack of cleanliness, aggressive behaviour, groups of hardened drinkers and drug users, poor visibility as well as anonymity, and lack of communication.

Because these attendant factors feed off one another, any action must be undertaken on an integral basis: decompartmentalising of network access routes, complete with better lighting; systematic cleaning as well as selective additional cleaning; installation of video and visible information to provide better communication; reinforced human presence through the introduction of preventive patrols; staff instructed to welcome passengers individually; and roving staff. In terms of fraud, although Hamburg uses an open access system within its network (no barriers), the rate of fraud is only 4%.

This success is attributable to the specific management style of the inspection team: basic preventive programme pursued full-time throughout the network irrespective of the number of users; additional preventive programmes at locations shown statistically to have high levels of fraud; increase in the productivity of the inspection service through the use of new methods.

Alain Caire, Director, Environment and Security Department, RATP, France

RATP has found that the human element help increase the preception of safety by passengers

Alain Caire, Head of RATP's Environment and Security Department, presented a study forecasting overall changes to the urban environment and the behaviour of rail network users by around 2015-2020. The study's authors set out to establish the main demographic, economic and urban trends and their impact on journey habits. The ageing population in the conurbation will be reflected in problems of frailty, insecurity and difficulties with travelling, all of which requires that lasting security measures be taken. In other areas, the results demonstrate a certain tendency towards multi-tribalism, violence overkill in the media, and spiritualism. These trends should be set in relation to changes in the expectations of passengers as regards air-conditioning comfort, lighting, and dialogue between passengers and staff. Moreover, the study reveals that acts of delinquency are being perpetrated by individuals who are getting younger and younger.

Confronted by these results, a number of long-term suggestions are being put forward: improvements to systems of assistance; separation of platforms from tracks by installing landing doors; installation of video surveillance; easy removal of graffiti; lamination of windows; and access to major telecommunication networks. In the short to medium term, suggestions focus on the shared use of information channels, organising synergies between intervention units, and preventive action by talking to young people in schools, conducting actions targeted at the various groups, and adopting the right fare structure.

In Toronto, GO Transit has sought ways to combat fraud at less cost. Mr Lance Vibert specified that this would now be a matter of ensuring that fares were paid with a view to cutting fraud to an "acceptable" level, even though fraud was theoretically illegal. GO Transit's own statistics show 10% of Toronto's population to be basically honest and 5% to be dishonest, with the rest of the population's behaviour dependent on opportunities for fraud and the consequences they might face if caught.

Therefore, the measures for adoption need to be directed towards these latter two population segments by reiterating two principles: first, that payment is compulsory for travel on public transport; second, that fraud has certain knock-on effects.

These two principles must be intrinsically linked; failing that, the second must discourage the most habitual offenders by reducing the possibilities to commit fraud and imposing penalties. On this account, an adapted fare system is needed that tallies with the customer's service expectations, otherwise he or she will seek legitimacy for fraud on the pretext that the price is too high in relation to the service provided. The penalties imposed for fraud must be displayed on explanatory and explicit posters.

Moreover, different uniforms for different grades of staff not only allow the passenger to identify the person they are talking to and derive a feeling of security, but also deter fraud attempts. Finally, the installation of video is also useful in that it can assist the police with their enquiries as well as provide a means of deterring fraudsters.

Financing and public/private partnerships

Mass transit is a vital investment for large cities but a costly one for public budgets. Recovering value-added on land produced by real-estate developments near metro stations is one appreciable source of funding, as in Washington, whereas Manchester and Madrid are involving the private sector in the implementation of their projects within the framework of public/private partnerships.

The Washington Metropolitan Area Transit Authority (WMATA), the agency responsible for operating the public transport network in the Greater Washington area and for metro construction, has over 30 years' experience in forging public/private partnerships for the development of real-estate projects in the vicinity of metro stations.

WMATA purchases land and offers it for sale to private promoters. Since 1973, 24 projects have been completed, producing annual revenue running at 6 million dollars. When projects now in development are included, annual revenue for WMATA should exceed 112 million dollars.

Moreover, increased density around metro stations generates additional traffic and therefore further metro revenue. The WMATA action described by Alvin R. McNeal illustrates the possibility for the public authorities to steer urban development in a direction that favours mass transit and involves the private sector in the funding of this transport system.

The case of Manchester's "Metrolink" outlined by G.S. Inskip is interesting from several angles. It demonstrates the possibility of developing public transport services and usage within a deregulated framework and of using a "Design, Build, Operate/Maintain and Tranfer" (DBOT) type of private franchise. It also shows how the franchiseholder can be replaced when the project is extended.

Indeed, the Greater Manchester Passenger Transport Authority has chosen a new partner, Altram, to build the extension for project phase 2 and then operate the network as a whole, including the existing line.

Altram has provided 67% of the necessary investment funding. Today, Metrolink carries 20 million passengers annually, 3 million of whom have abandoned their cars in favour of public transport. With the opening of phase 2 and plans for further extensions, annual traffic is set to reach 40 million passengers despite competition from buses.

Madrid is on the verge of completing the implementation of a particularly ambitious development blueprint for its metro network: 56 km of new lines will have been built between 1995 and 1999. The 38 new stations will handle over 110 million passengers annually.

The extensions described by L. Peral Guerra are characterised by a modern metro with stations that are just below surface level, have easy access and allow in plenty of light.

The result is made all the more remarkable by the fact that completion costs have been particularly low: 37 million dollars per km, or half the cost of comparable metros.

Regional coffers have provided 25% of funding. The remaining 75% have come from Arpegio, a public company which has secured market loans whose repayment will be partially covered by revenue derived from real-estate developments on land it owns. Moreover, another 18 km extension to line 9 (with 4 stations) is nearing completion and will be operated by a private franchiseholder.

Metrolink in Manchester

STRATEGIES FOR ACHIEVING SUSTAINABLE TRANSPORT

Developing sustainable mobility means minimising the environmental effects that relate to transport in urban areas while, at the same time, improving transport's social and economic impact. To that end, not only must private car use and flows of cars be controlled; at the same time, public transport must be expanded.

As part of the framework for compliance with Kyoto Protocol commitments, Canada has set up a National Round Table on the Environment and the Economy. This has determined various policies targeting the sustainable development of urban transport through a reduction in greenhouse gas emissions, and was the subject of a presentation by Johanne Gelinas.

An assessment of three integrated options has shown that, in order to achieve the Kyoto target and, at the same time, ensure manageable costs for the public sector, economic efficiency and an acceptable social impact, Canada needs to apply an integrated and global approach chiefly encompassing the following measures: increased fuel taxes; the setting of tougher norms on vehicle fuel consumption, vehicle inspection and vehicle maintenance; more rational parking management; demand management within transport; better public transport; and urban planning.

One of the components of a sustainable transport policy would be to make motorists pay the true costs relating to the use of their cars in order to make them aware of the environmental pollution that cars generate and encourage a modal shift over to public transport.

This was the theme of the paper delivered by Richard M. Soberman. Toronto university's civil engineering department has employed a model as the basis for analysing the potential impact of urban tolls on the production of sustainable mobility.

The simulation's main finding was that the introduction of urban tolls will reduce flows of cars even more effectively if public transport can offer alternative solutions to using the private car. Other effects should be taken into account before introducing an urban toll, such as the relation between urban planning and transport system or the potential uses for revenue from tolls. Indeed, these funds should be earmarked for improvements designed to make public transport more attractive.

In order to obtain attractive public transport that is able to cope with high journey volumes, it is not enough simply to develop conventional bus routes. Public transport links are needed that have dedicated rights-of-way and use technology that is tailored to the size and density of the zone concerned.

This could be metro, tramway, or buses running on separate bus lanes. In French cities where such services have been introduced, a sharp rise has been recorded in public transport ridership as well as a levelling-off or even slight dip in the private car's market share.

The paper presented by Joël Lebreton illustrated how the operator is at the centre of a dedicated mass transit project and has a vital contribution to make to the project's success via their extensive knowledge of the market and its expectations.