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International Transit Studies Program

Report on the Spring 2003 Mission

**Excellence in Customer Service in Transit Operations in Small to Medium-Sized Cities
in Western Europe**

This TCRP digest summarizes the mission performed March 27 to April 11, 2003, under TCRP Project J-3, "International Transit Studies Program." This digest includes transportation information on cities and facilities visited, lessons learned, and discussions of policies that could be applied in the United States.

This digest was prepared by Margaret Mullins of the Eno Transportation Foundation and is based on reports filed by the mission participants.

**INTERNATIONAL TRANSIT STUDIES
PROGRAM**

About the Program

The International Transit Studies Program (ITSP) is part of the Transit Cooperative Research Program (TCRP). ITSP is managed by the Eno Transportation Foundation under contract to the National Academies. TCRP was authorized by the Intermodal Surface Transportation Efficiency Act of 1991 and reauthorized in 1998 by the Transportation Equity Act for the 21st Century. It is governed by a memorandum of agreement signed by the National Academies, acting through its Transportation Research Board (TRB); by the Transit Development Corporation, which is the education and research arm of the American Public Transportation Association (APTA); and by the Federal Transit Administration (FTA). TCRP is managed by TRB and funded annually by a grant from FTA.

ITSP is designed to assist in the professional development of transit managers, public officials, planners, and others charged with public transportation responsibilities in the United States. The program accomplishes this objective by providing opportunities for participants to learn from foreign experience while expanding their network of

domestic and international contacts for addressing public transport problems and issues.

The program arranges for teams of public transportation professionals to visit exemplary transit operations in other countries. Each study mission focuses on a theme that encompasses issues of concern in public transportation. Cities and transit systems to be visited are selected on the basis of their ability to demonstrate new ideas or unique approaches to handling public transportation challenges reflected in the study mission's theme. Each study team begins with a briefing before departing on an intensive, professionally stimulating 2-week mission, after which they return home with ideas for possible application in their own communities. Team members are encouraged to share their international experience and findings with peers in the public transportation community throughout the United States. Study mission experience also helps to better evaluate current and proposed transit improvements and can serve to identify potential public transportation research topics.

Study missions normally are conducted in the spring and fall of each year. Study teams consist of up to 15 individuals, including a senior official designated as the group's spokesperson. Transit properties are contacted directly and requested to nominate candidates for participation. Nominees

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are screened by a committee of transit officials and the TCRP Project J-3 Oversight Panel endorses the selection.

Study mission participants are transit management personnel with substantial knowledge and experience in transit activities. Participants must demonstrate potential for advancement to high levels of public transportation responsibilities. Other selection criteria include current responsibilities, career objectives, and the probable professional development value of the mission for the participant and sponsoring employer. Travel expenses for participants are paid through TCRP Project J-3 funding.

For further information about the study missions, contact Gwen Chisholm-Smith at TCRP (202-334-3246; gsmith@nas.edu) or Kathryn Harrington-Hughes at the Eno Transportation Foundation (202-879-4718; khh@enotrans.com).

About this Digest

The following digest is an overview of the mission that investigated excellence in customer service in small to medium-sized cities in Western Europe. It is based on individual reports provided by the team members (for a roster of the team members, see Appendix A), and it reflects the views of the team members, who are responsible for the facts and accuracy of the data presented. The digest does not necessarily reflect the views of TCRP, TRB, the National Academies, APTA, FTA, or the Eno Transportation Foundation.

EXCELLENCE IN CUSTOMER SERVICE IN TRANSIT OPERATIONS IN SMALL TO MEDIUM-SIZED CITIES IN WESTERN EUROPE

The theme of this study mission was “Excellence in Customer Service in Transit Operations in Small to Medium-Sized Cities in Western Europe.” Over a 2-week period, the study team met with senior management staff in Geneva, Switzerland; Leipzig, Germany; Prague, Czech Republic; and Helsinki, Finland (for a list of host agencies, see Appendix B) to learn how these transit agencies have been successful in promoting a customer service culture by instituting service quality standards and performance measures, using effective communication strategies, stressing staff training, emphasizing passenger amenities, and employing fare media conveniences.

Transit System Overview

Geneva, Switzerland

Geneva is situated in the center of Western Europe on the banks of Lake Geneva. It sits 1,200 feet above sea level between the Jura Mountains and the Alps in the southwest part of the country. The city is home to numerous international organizations, including the United Nations, the International Red Cross, and the World Health Organiza-

tion, and it is an important cultural center, with more than 30 museums and numerous art galleries and theaters. The official language is French, but many people also speak English and German.

In 1987, a public referendum forced the transfer of public transportation services within the canton (state) of Geneva from private for-profit operators to a public company, Transports Publics Genevois (TPG). TPG now provides 93% of bus, tram, and boat public transportation services within the city of Geneva and surrounding suburban areas.

The TPG fleet of 345 vehicles includes 46 articulated trams, 73 articulated electric trolleybuses, 149 articulated buses, 74 standard buses, and 3 minibuses operating on 3 tram lines, 6 trolleybus lines, 29 urban bus lines, and 15 regional bus lines. The service area of 95 square miles encompasses a population of approximately 400,000 and includes the city of Geneva, which has a population of 180,000.

The tram network is a key element of the public transport system, accounting for more than 25% of overall ridership. TPG is focusing on several system improvements, including railway expansion featuring 21 new trams; acquisition of 50 new trolleybuses; and the introduction of 100 new double-articulated, 193-passenger buses to replace the 15-year-old diesel buses. The rail and bus vehicles operated by TPG are connected and integrated with other modes of transportation, including automobiles, bicycles, pedestrian facilities, and parking at numerous locations.

TPG carries more than 127 million passenger trips per year, which represents approximately 34% of the region’s total trips. This amount translates into 343,000 passengers daily and equals almost one ride per inhabitant. With 90,000 unlimited-ride season tickets sold, one in four residents of Geneva is a frequent public transportation user. The company has approximately 1,400 employees. TPG was ISO 9001/PM 9001 certified in 1998, the first public transportation provider to achieve that milestone.

Leipzig, Germany

Leipzig lies southwest of Berlin in the northwest portion of Saxony. With approximately 560,000 residents, Leipzig is the second largest city in the former German Democratic Republic (GDR, or East Germany). Leipzig was the starting point of the peaceful revolution that led to Germany’s reunification in 1989. The city is famous as a center for trade fairs and conferences, and it has been an important center of printing and book-selling since the late 15th century. The world’s first textbook was printed there in 1507 and later the first daily newspaper in 1660. It is also very much a city of music: Wagner was born in Leipzig, and Bach worked in Leipzig from 1723 until his death in 1750.

Leipziger Verkehrsbetriebe GmbH (LVB), the provider of public transit service in Leipzig, is one of Germany’s largest public transport companies. Serving an area of 590 square miles, LVB operates 440 trams on 14 lines along a

188-mile network, and it operates 203 buses on 58 bus lines. Ninety-four of the trams are low-floor articulated vehicles. One hundred forty-four buses are low-floor articulated or low-floor standard coaches. LVB has a workforce of 2,570 employees.

After the fall of the GDR in 1989, almost 15% of the city's population moved away from Leipzig. The large-scale change in demographics and a dramatic increase in automobile ownership resulted in a decline of public transit use. Ridership fell from over 200 million trips per year in 1989 to 79 million in 1998. Since 1998, however, ridership has increased, despite a further decline in population. LVB recorded more than 107 million rides in 2002.

Trams and light rail vehicles, with nearly 75% of all public transportation trips, carry the majority of passengers. In fact, Leipzig has the largest tramway network in Germany. In addition, 20% of the passengers use city buses and 5% use regional commuter buses. There is a concerted effort at LVB to move from conventional trams to light rail vehicles by 2006 as light rail permits higher speeds, more efficient lines, and improved safety and attractiveness. There are 300 conventional trams targeted for eventual replacement. Currently, upgrades are being made to tracks, stations, streets, and adjacent sidewalks.

Prague, Czech Republic

The city of Prague, the capital of the Czech Republic, lies along the River Vltava and is known throughout the world for its beauty and the "one hundred spires" that span its skyline. In 1989, the "Velvet Revolution" ended four decades of communist rule. In 1993, the Czech and Slovak Federal Republic split into two separate independent nations: the Czech Republic and Slovakia. The Czech Republic is scheduled to join the European Union in 2004.

After the political and economic changes of 1989, Prague experienced tremendous growth in automobile ownership, especially through 1995. This, in turn, caused a 20% decrease in ridership on the public transportation system and a significant shift in the modal split from 80% using public transportation and 20% using automobiles to 57% and 43%, respectively, in 2001. In order to address the new emphasis on automobile travel in the 1990s, the city of Prague adopted nine "Principles of Transport Policy of the City of Prague." One of the main principles was to develop a complex system for the rational cooperation of all modes and to emphasize the integration of the entire modal system in the city.

Prague Public Transit Co., Inc. (PPT), founded in 1991, is owned by the city of Prague and is the largest transit operator in the Czech Republic. Serving a population of 1.2 million people within a 191-square-mile service area, PPT made 1.1 billion passenger trips during 2002.

The metro system has more than 4,000 employees and 490 trains providing service on three lines covering 31 miles. The tram system has 3,700 employees and 941 vehicles pro-

viding service on 32 routes covering 85 miles. Bus service is provided by 4,200 employees operating 1,325 vehicles on 208 routes. In addition, the Czech Railway system serves Prague with 400 commuter trains and connects with two international railway stations.

Helsinki, Finland

Helsinki, the capital of Finland, has approximately 1.2 million people living in the metropolitan region, representing nearly a quarter of Finland's total population. The city is the cultural, economic, and government center of Finland, which joined the European Union in 1995. Helsinki City Transport Authority (HKL) has been providing public transportation since 1945. The region served by the HKL is 264 square miles. More than 176 million passenger trips are made annually on HKL's 115 trams, 450 buses and 54 metro train sets and ferries.

HKL employs 2,066 people and is divided into three divisions: metro, tram, and bus. The metro division, with 422 employees, operates 54 trains on three lines and provided 53 million passenger rides in 2001. The tram unit, with 602 employees, operates 115 low-floor, articulated and 4-axle trams that carried 57 million passengers. The bus unit employs 1,042 people who operate 399 (a mixture of articulated, 2-axle and 3-axle buses, of which 213 are low-floor). The bus division logged 67 million rides in 2001.

The city's general plan calls for rail service to serve as the foundation of a public transportation system connected to feeder bus services. The city of Helsinki places a strong emphasis on the environmental benefits of public transportation. Dedicated transit lanes have been in existence since the 1970s, and traffic and parking policies have held automobile trips to the city center to 30,000 a day since 1980. The current modal split is 37% for the automobile, 32% for public transportation, and 31% for walking/biking. The high percentage for walking/biking is a testament to the compact city center and the extensive network of bicycle lanes and facilities.

CORPORATE STRUCTURE AND GOVERNANCE

In the past 15 years, all four cities have undergone significant changes in corporate structure. Leipzig and Prague are no longer ruled by communist governments, Helsinki joined the European Union, and a public referendum in Geneva supported a public takeover of public transport.

Changes in governance have been less dramatic. Elected officials at city, county, or state levels maintain decision-making and policy-setting authority in all four urban areas. In Prague and Leipzig, however, this arrangement represents an increase in local decision-making authority and responsibility for public transportation. Before the fall of communism, the federal government funded and operated urban public transit.

Geneva. Office des Transports et de la Circulation (OTC) is a state body that serves as the public transportation authority for greater Geneva. It sets policies for the development of all public transport in coordination with the canton of Geneva's urban planning department. OTC also manages the region's highways. Transit operators enter into contracts with OTC and are responsible for providing transit services, quality management, maintenance, marketing, public information, and ticket distribution. Subsidy levels, fare increases, salaries, and cost of living adjustments are decided by Geneva's political authorities in the context of these contracts.

Technically, TPG is a division within the state of Geneva's Department of Interior, Agriculture, and Environment (DIAE). However, the relationship is largely contractual and TPG functions very independently. It is governed by a 19-member Board of Directors nominated by the State Council of the Republic and Canton of Geneva: 7 members are appointed by the Grand Council, 6 by the State Council, 1 by the city of Geneva's Administrative Council, 1 by the association of satellite cities surrounding the city of Geneva, 1 by the State Council to represent the French cross-border region, and 3 appointed by TPG staff.

The Board of Directors meets approximately 10 times a year. A 5-member subcommittee of the Board called the Executive Council meets monthly prior to Board meetings. The Executive Council sets the agenda for the Board of Directors, ratifies small projects, and decides low-level policy matters.

TPG's employees are organized into five divisions that report to a Director General: Finance and Administration (43 employees); Human Resources (25 employees); Commercial, which includes marketing and planning (31 employees); Operations, which includes drivers and logistical support (933 employees); and Technical, which includes maintenance, engineering, and capital projects (316 employees).

Leipzig. Prior to 1989, Leipzig's transit services followed the model of most eastern bloc countries. Public transport was primarily the responsibility of the communist federal government. LVB received most of its funding from the federal government and organized its core tram and bus services along functional lines under one large central administration.

The fall of the GDR and subsequent reunification of Germany precipitated a series of changes in how public transportation is organized and provided in Leipzig. In 1992, LVB transitioned into a service provider organization controlled by a holding company that is 95% owned by the city of Leipzig and 5% owned by the county (District Leipzig Land). The holding company combines the administration and financing of several municipal service enterprises including public transportation and electricity, water, and sewer utilities. At present, profits generated by the electric, water, and sewer utilities help subsidize the public transportation service.

In 1993, in order to gain further efficiency in all business areas, LVB decided to separate individual divisions into subsidiary companies. Between 1994 and 2002, LVB created nine subsidiary, semi-independent companies with specialized functions. LVB, as the parent company, retains responsibility for all public transport and infrastructure planning and administration, marketing, and ownership of bus rolling stock and facilities.

Bus operations were spun off into two companies that are still 100% owned by LVB: Leipziger Stadtverkehrsbetriebe GmbH (LSVB), which operates buses and trams within the city of Leipzig, and Regionalverkehr Leipzig GmbH (RVL), which operates bus service outside of the city. LVB has approximately 1,100 employees and is responsible for supplying all bus and tram drivers, dispatchers, operations supervisors, schedulers, and route planners for service within the city. RVL is a fully integrated company. Its 181 employees include all the planning, administrative, operations, and maintenance staff necessary to operate the comprehensive network of 42 bus routes in the region surrounding Leipzig.

Three subsidiary companies, which have attracted outside business partners, were formed to manage the tram system: Leipziger Fahrzeugservice-Betriebe GmbH (LFB), Leipziger Infrastruktur Betriebe GmbH (LIB), and Leipziger Transport und Logistik Betriebe GmbH (LTB). LFB, a tramcar maintenance and renovation company, is now 50% owned by Siemens. LFB's core business maintains passenger rail vehicles, but technical consulting and vehicle modernization and renovation are areas in which the company is expanding. LFB has secured contracts with other cities, including Sheffield, Sarajevo and Bangkok, for overhaul, engineering and technical consulting services. LIB is a rail and electric power system company also owned jointly with Siemens. LIB builds track systems, installs and maintains overhead contact systems, ticket machines, signal systems, electrical substations and switch and operations control systems. LTB owns and controls approximately 900 tram cars in Leipzig and also has a 49% outside ownership interest. The company offers fleet management and vehicle rental services and is branching into fleet maintenance systems, including bus.

In addition, four other service-oriented subsidiary companies were formed. Leipziger Service Betriebe GmbH (LSB) is a joint venture, 49% owned by Deutsche Bank. LSB offers cleaning, janitorial, and light maintenance services, and has the major responsibility for internal and external cleaning of bus and tram vehicles and facilities, such as bus shelters, bus stops, vending machines, transit centers, operating bases, and support infrastructure. LSB also performs landscaping service and operates and cleans several car parks in the Leipzig area. LSB has contracts with other public entities such as the city of Leipzig and the local water utility.

Verkehrs-Consult Leipzig GmbH (VCL) offers planning, engineering, and construction management services for transportation projects, including tramlines and general mainte-

nance facilities. VCL is 50% owned by Rheinconsult. VCL has had a few contracts with private transport and is looking for acquisition opportunities in bordering eastern European countries.

Leipziger Aus- und Weiterbildungsbetriebe GmbH (LAB) is 67% owned by LVB and 33% owned by the other LVB subsidiaries. LAB provides driver education and training services for the transportation industry. Services include new hire testing and screening, classroom and behind the wheel training for bus and tram drivers, vocational/apprenticeship training, and human resources seminars. LAB has succeeded in securing outside contracts with the Leipzig/Halle airport and some local engineering and manufacturing firms.

The last LVB subsidiary is Leipziger Straßeninstandsetzungs GmbH (LSI). LSI provides street maintenance services that include street paving.

LVB's ultimate goal is to use this restructured entity to expand its market and compete for service contracts on a national and international level. Recently LVB launched a cooperative venture and formed the German Local Transport Company (DNVG). The purpose of DNVG will be to make bids on future sales of German public transport companies.

LVB is governed by an eight-member Board of Directors. The board comprises the General Manager/Chief Executive Officer, three management-level staff, three line staff who are members of unions, and one high ranking official representing the city of Leipzig.

Prague. Like Leipzig, Prague experienced significant losses in ridership and funding after the fall of the eastern bloc. The sharp reduction in state subsidies resulted in substantial fare increases that further exacerbated mode shift to the private automobile. In order to turn this trend around, a new regional municipal organization was established in 1993 and funded by the city of Prague. Called the Regional Organizer of Prague Integrated Transport (ROPID), it was given overall responsibility for planning and contracting with service providers in order to establish an integrated system of public transportation in the city and its immediate surroundings. ROPID now contracts with 16 transit operators in the region. PPT is the largest operator.

Each year, ROPID draws up a plan citing annual volumes of public transport services to be provided in a future year and a calculation of the cost. The contract between ROPID and PPT includes price-related provisions that specify the amount of financial loss for services provided, calculated by vehicle kilometer and location in the region. Greater financial losses are permitted in the less densely populated areas. Financial penalties are imposed when service quality falls below specified levels. State subsidies to PPT for capital projects and acquisitions are unpredictable from year to year. Funding for capital investments relies heavily on European Investment Bank loans.

PPT is organized into three functional and three support units. The metro, tram and bus units are responsible for the

direct operation and maintenance of PPT's three modes of public transport. A transport section is responsible for information systems, ticket inspections and traffic supervision. A technical section is responsible for strategic planning, fiscal planning and capital construction. Finally, a sales and finance section assumes funding, accounting, marketing and human resources functions.

Since 1990, PPT has spun off five subsidiary companies and invested capital in another as an 11% shareholder. First, Rencar Praha, a.s., was established by PPT in 1990; it uses PPT rolling stock and property for advertising purposes. Second, Inženýring dopravnich, a.s. (Transport Constructions Engineering, Inc.), was founded in 1994; it provides construction design and management services. Third, Prazska strojirna, a.s. (Prague Machinery Plant, Inc.) was also established in 1994; it engages in the design, production and assembly of equipment for construction and maintenance of tram tracks. Fourth, SPSD, a.s. (Transport Technical College), a secondary vocational and apprenticeship training center, was established by PPT in 1998. More than 1,600 students enrolled in the program during the 2001 school year. Fifth, Elaugen DP Praha, s.r.o., founded in 1997, engages in the heavy duty maintenance of rail profiles, specializing in grinding and welding. Finally, in 1996 PPT invested in Pragonet, a.s., a company that operates an optical wide-band telecommunications network for municipal and state administrative uses.

Most of the subsidiary companies have expanded and negotiated contracts for products and services with companies or governments outside of the Czech Republic. All of the companies earned profits in 2001 that accrued to PPT as a shareholder.

PPT is governed by a nine-member Board of Directors composed of the general manager, three upper managers (including the chief financial officer and the chief administrative officer), four representatives from local political parties, and a high-ranking official from the city of Prague. A nine-member Supervisory Board also reviews the budget and major capital projects and policy initiatives and makes recommendations to the Board of Directors and the general manager. The Supervisory Board includes members elected directly by PPT employees.

Helsinki. As a member of the European Union, Finland has introduced competitive practices into the public transportation sector. Prior to the introduction of market reforms, on a nationwide scale, 39% of public transit service was managed and provided by the public sector directly; 45% was provided in the form of direct concessions to private operators where the municipality set fares, routes, and schedules, but the private operator had a monopoly over operations; and 16% was largely unsubsidized, although authorized and regulated by the public sector. By 2005, the organizational structure of the publicly owned and managed sector of public transport is projected to decline to 27% of the total national output, with direct concessions declining more precipitously

and tendered or contracted services increasing dramatically to 52% to 58% of the total.

Finland is well on the way to meeting its 2005 goals. By 2000, publicly owned and managed operations declined to 28% of public transportation service nationwide. Direct concessions had fallen to 19%, while tendered contract service climbed to 40%.

The changes in public transportation's organizational structure at the national level have had a significant impact upon HKL. HKL provides metro, tram, and bus services within the city of Helsinki with funding and overall policy direction from the Helsinki City Council. In response to the changes in national transport policy, in 1998, HKL split its bus unit into a separate municipal operator and successfully responded to a tendering of bus transport services in Helsinki by the Helsinki Metropolitan Area Council (YTV). YTV is responsible for overall regional public transportation coordination.

Today, five additional private bus companies provide contract bus service in the city of Helsinki and to surrounding communities. Contracts are generally awarded for 5 years. Points are assigned to determine the selection. The point system was developed to determine which contractor's services are most economically attractive; points are awarded for such factors as overall cost and condition of equipment.

Since 1997, when bus services first opened to competitive tendering in the Helsinki region, operating subsidies have fallen by 16% and resulted in a total savings of approximately \$15.2 million. YTV has decided to use one-third of the savings to improve and expand services, one-third to decrease fare levels, and one-third to decrease municipal subsidies. During this period HKL has continued to aggressively pursue bus service contracts in the region. Although HKL's share of the bus transportation market fell from its high of 56% in 1997, the market has since stabilized and HKL remains the dominant carrier with 45% of the market in 2002.

Competitive tendering of Helsinki's tram and metro service is under discussion. Metro and tram systems are more capital intensive and generally more expensive to operate than buses. It is unclear if the same competitive market and economies of scale are present.

Like PPT in Prague, HKL is organized into three operating departments (metro, tram and bus) and three support departments (human resources, technical [including procurement, capital planning and development], and driver scheduling and rostering).

HKL is governed by a seven-member Board of Directors. Members of the Board are appointed by the Helsinki City Council and represent the region's political parties.

FUNDING

As indicated above, the public transportation systems in Geneva, Leipzig, Prague, and Helsinki have different orga-

nizational structures. These arrangements determine the level and sources of transit funding and expenditures.

Sources of Funding

In Geneva, funding to support the services provided by TPG comes primarily from passenger fares and grants from various sectors of government. In 2002, TPG received approximately \$6.1 million in revenue. Of this amount, about 40% was derived from passenger fares. The remaining 60% was from the state of Geneva and surrounding communities that are served by TPG.

TPG's current contract with the state of Geneva calls for a 20% increase in service by 2006. This contract specifies subsidy levels from Geneva and sets operating revenue targets. If operating revenue targets are exceeded, one-third of the surplus is returned to Geneva, one-third is reinvested in capital equipment and facilities, and one-third is distributed to staff.

Because the financial responsibility for transit in Germany lies with the municipality, not the federal government, the city of Leipzig provides approximately \$66 million annually through a Transit Service Financing Agreement (TSFA) with LVB. The TSFA contract contains four financing components: (1) a fixed component for financing infrastructure costs; (2) a declining component for managing structural adjustments; (3) a variable component for financing operating costs according to the number of passengers transported; and (4) a component providing for investment subsidies for investments that are politically desired.

The structure of TSFA provides for a reduction of municipal aid through 2011. During the last 5 years, LVB has already experienced a 50% reduction in revenue from the public sector, requiring the need for other revenue sources. Within 7 years, all financing will be done within the holding structure, with no direct subsidies from the government.

The private-sector model of LVB currently provides sufficient revenue from fares and other subcontracts to support operations. In particular, the marketing subsidiary of LVB has no funds earmarked for marketing in the annual budget, but the subsidiary has generated revenue through other marketing contracts. These contracts provide the funds to support staff costs and all transportation-related marketing activities. However, the revenue for marketing has decreased by approximately 5.4% over the past 3 years to about \$1.7 million. In addition, LVB subcontracts its ticket vending business, which generates a profit in most cases for the contractor. The subcontractor retains a percentage of the ticket value.

PPT in Prague receives approximately 25% of its revenue from the fare box and the balance from the city. Until 1989, the central government funded all capital investments and operating subsidies. After this time, most of this funding was transferred to local municipal authorities. In 1995, a state financial aid program was established to support rolling stock renewal and urban transport construction projects.

As a condition for receiving this state aid, coordination and participation of individual cities is required. The state financial aid program has funded 30% of trams and trolleybuses from 1995 to 1998, and 10 to 20% for buses during the same period.

Fares cover just over 26% of operational costs. Most riders choose to purchase seasonal tickets, which range in validity from 1 to 3 months. This type of media accounts for 58% of all revenue, while single-ride revenue accounts for 37.5%. The balance, about 4%, comes from fines for not paying the fare. In contrast to the overall statistics, the largest increase in fare revenues came from single-ticket sales, which increased 5% during the review period. Student passes are significant sources of revenue for many transit systems, and Prague is no exception. PPT recently established two pass outlets at the University of Prague to handle the demand.

Transportation funding represented the largest portion of the 2001 Prague Municipal Budget. Transport, including roads and streets, accounted for 47.2% of the city's annual budget. Of this amount, 64% was for public transportation, much of which was used for modernization of the infrastructure. Reductions in operating aid from the city began in 1996, with the subsidy being suspended in 1998. The state subsidy was partially renewed in 2000. The system's most substantial funding will be covered by a loan.

In 2002, HKL received \$158 million from municipal taxes to support transit services. Residents pay approximately 17.5% annually in municipal taxes, which is the source of the city's subsidy. Of the \$158 million in revenue from taxes, \$107 million comes from the city of Helsinki and the balance from the other communities served by the regional transit service.

At present, demand for public transport in the Helsinki region is increasing rapidly. The subsidy rate of public transport in Helsinki is about 40% of total costs as compared with 15% to 20% in Finland's middle-sized cities. Approximately 47% of HKL's 2001 operating budget was covered by fare revenues. The remaining 53% was from the city of Helsinki's taxpayer subsidy. About 1% of the city's budget is used to subsidize public transit.

Transit Expenditures

Operating TPG costs approximately \$184 million. Of this amount, about \$109 million is for salaries and related costs; \$37 million, for automation and maintenance; and the balance, for electricity to operate the trolley service.

In Leipzig, the fixed-component portion of the TSFA provides roughly \$23 million annually. The declining component places the burden of financing the costs for the replacement of infrastructure on LVB. Given the aggressive schedule to modernize stations and invest in a light rail system, upgrading the infrastructure will be a substantial cost over the next 8 years. Currently 40% of the system is light rail. The return on the investment, from the perspective of

the city of Leipzig, is the contribution that the LVB infrastructure makes to the city and its residents' satisfaction.

In Prague, the system's major expenditure categories are payroll (40%); operations (54); lines (3.4%); and coordination and control of transportation (2.6%). The system invests heavily in capital improvements for the tram and metro service. A policy of not expanding the bus fleet is being reexamined since the 2002 flood disabled much of the metro service. The current policy only allows for the replacement of buses.

PPT provides extensive services to persons with impaired mobility and low orientation ability. Funds are expended on technologies that allow blind persons to navigate and use the transit services.

In Helsinki, wages account for about half of total system costs, although the cost structure varies from one mode of transport to another. The metro is the most capital intensive, and buses are the most labor intensive. About 25% of total costs represent investment in, and maintenance of, basic infrastructure needs.

SERVICE STANDARDS

Decline in ridership and increased automobile ownership has necessitated that these four cities identify and measure service standards and levels of customer satisfaction. This trend is strongly reinforced by the European Union and the European Committee for Standardization's (CEN's) 2002 publication of *Public Passenger Transport: Service Quality Definition, Targeting and Measurement*. The CEN comprises 20 European countries. All of the countries visited are members of CEN and are required to implement these European standards over a period of time.

CEN establishes eight criteria for public passenger transport service and quality:

- Availability (e.g., area covered, operating hours, and frequency),
- Accessibility (e.g., ease of boarding, transferring, and ticketing),
- Information (e.g., availability, accuracy, and timeliness),
- Time (e.g., travel time and punctuality),
- Customer Care (e.g., staff availability, knowledge, behavior, and ease of ticketing),
- Comfort (e.g., level of crowding, ride, and vehicle and station cleanliness),
- Security (e.g., perception and freedom from crime and accident), and
- Environmental Impact (e.g., exhaust, noise, and energy consumption).

All four of the public transit systems visited use variations of these criteria to define service quality, set targets or levels of acceptability, and measure achievement.

Punctuality

All of these transit systems place great emphasis on punctuality. LVB in Leipzig defined on-time performance for its trams and buses as within 2 minutes of its scheduled arrival and departure time. For service within the city center, any vehicle that is late by 10 minutes or more prompts an audio announcement at the transit centers, informing passengers of the delay. Outside of the city center, a delay of 20 minutes triggers a similar announcement.

PPT considers its trams and buses to be on time if they are no more than 3 minutes behind schedule. On-time performance for the metro system in Prague is better than for the buses and trams. The metro unit runs 95% on time, compared with 80% for the tram and bus units.

HKL requires all drivers to report to dispatch anytime they are running more than 15 minutes late.

Service Levels and Frequency

All four of the transit systems adjust service levels and frequencies to match supply with demand. However, the standards for making these adjustments were often not explicit.

All portions of TPG's service area currently receive some form of public transport service, but less densely populated areas do not have regular fixed-route bus or tram service. These regions have "Telebus," a system that operates only when the customer phones in for a ride, and "Proxibus," which operates as a typical door-to-door general public paratransit service. Telebus service costs \$1.60 per trip, and Proxibus service costs \$3.70 per trip.

LVB operates its buses and trams on 10-minute headways on weekdays between 6:00 a.m. and 7:00 p.m. and 15-minute headways in the early morning and late evening hours; a "Nightliner" bus service operates from 1:00 a.m. until 4:00 a.m. For customer convenience, the Nightliner schedule runs on 71-minute headways.

HKL operates the inner line of its metro system on 4-minute peak period and 10-minute off-peak headways. The outer metro line that serves less densely populated areas of Helsinki runs 8-minute peak-period headways and 30-minute off-peak headways. Trams run every 8 minutes during peak periods and every 10 to 12 minutes off peak. Buses operate on 10- to 20-minute headways in peak hours and 30- to 60-minute intervals at other times. Between 11:30 p.m. and 5:30 a.m., the tram and metro systems shut down. HKL plans its route and service structure so that travel time, including transfers, from various parts of Helsinki to the city center do not exceed 30 minutes.

Crowding

HKL makes sure that crowding does not reach unacceptable levels during peak and off-peak travel times. HKL's published service standards stipulate that a vehicle's degree

of loading, calculated as the ratio of passengers to registered number of seats and standing places, does not exceed 75% during peak periods and 55% at other times. The minimum capacity use rate cannot fall below 20%.

PPT defines passenger-carrying capacity of vehicles as the number of passengers in a vehicle with all seats occupied and four standing passengers per square meter. PPT's current goal is to reduce the number of standing persons to no more than 65% of passenger-carrying capacity during peak travel times and 50% during off-peak by 2005. Currently, the figures range from 80% to 100% during peak travel times. Acceptable access to the city center is defined by the maximum amount of time it will take 90% of passengers to reach the city center. The figures are 20 minutes from Zone 1, 40 minutes from Zone 2, and 60 minutes from Zone 3.

Safety and Security

TPG has an impressive safety and security record. In 1999, there were only six serious or violent incidents on the trams or buses where the police had to intervene. Although TPG has a notable safety and security record, TPG adopted a policy with two major objectives to combat the perception that the system was not safe to use:

- Provide customers with a safe ride and fair service. An individual is not allowed to board any form of public transportation if he or she is perceived to be a security risk or fare evader.
- Guarantee drivers that they can work their shifts without fear and in a safe environment.

Safety, deterrence, cooperation, and repression are four components of the policy that help to accomplish the above stated objectives.

Of major concern for Leipzig, Germany, is the rise of graffiti, vandalism, bodily assaults on passengers and employees, and fare evasion. In 2002, LVB reported that police responded to 500 incidents that occurred on the public transport system with 50% of them involving bodily assaults on passengers and employees. LVB has established a special police force to combat vandalism and installed video surveillance cameras on all vehicles to deter future violence. The surveillance cameras, however, do not operate in real time and only alert officials after an act has occurred. At the present time, penalties are not severe and offenders are hard to apprehend. Also, LVB requires fare inspectors to work in pairs.

Fare evasion among young passengers is another concern of LVB officials. To help counteract this problem, LVB promotes purchasing monthly passes.

The City of Leipzig has developed an extensive public transportation infrastructure that allows for the safe interaction of LVB buses and trams with automobiles, bicycles, and pedestrians. The city has developed a network of path-

ways and traffic signals designed exclusively for bicyclists and pedestrians. This arrangement is coordinated so that the different modes of transportation can operate in a safe manner.

Like the other cities, Prague is experiencing a problem with graffiti. According to PPT, 90% of graffiti damage occurs while the vehicles are in service. The other 10% happens when the vehicles are on-site for nightly maintenance. PPT spends approximately \$247,000 per year in graffiti repairs.

PPT also employs methods to increase the safety of its vehicles. For instance, vehicles contain nonflammable materials, and all train cables will be replaced with fire resistant cables by 2005. In addition, fire alarm systems are installed in all vehicles.

Most of the security emphasis at PPT lately has focused on securing its vehicles and facilities. Every major entry point is guarded by private security guards or, in some cases, army personnel. These guards check identification on every person and vehicle entering and exiting the facility.

Helsinki is also experiencing a high level of graffiti vandalism. HKL spent about \$66,000 in 2001 vigilantly monitoring its vehicles and removing graffiti from them. In addition, HKL lost \$3.4 million in revenues last year due to fare evasion. In an effort to reverse this trend, HKL installed smartcard readers in all vehicles.

Additional Standards

In 1994, TPG began developing a set of standards for public transit quality management in accordance with the ISO 9001 requirements. With the assistance of employees, TPG integrated several of the service quality standards and criteria cited in CEN into an organization-wide quality improvement program that views every problem and opportunity through the following prioritized set of measures:

- Security,
- Punctuality,
- Accessibility,
- Information/communication,
- Rapid/fast,
- Cleanliness,
- Courtesy, and
- Comfort.

In some of these areas, TPG has set goals for improvement. For example, TPG plans to raise the average aggregate system-wide vehicle speed from 14 kilometers per hour to 18 kilometers per hour by 2006. Similarly, TPG has set a goal to improve vehicle cleanliness by organizing teams to “spot” clean vehicles while they are in service during the day instead of waiting until the vehicles are returned to an operating base after a full tour of duty. In addition, TPG is developing an ISO 14001 environmental management system that will minimize harmful effects on the environment,

such as hazardous waste material generation and energy consumption, caused by TPG’s activities.

In 1998, PPT in Prague launched a similar quality management improvement initiative called “Service Quality Program of PPT.” PPT identified and began measuring five key service standard indicators:

- Punctuality of operation,
- Availability of passenger information,
- Courtesy,
- Uniforms/employee appearance, and
- Reliability of ticket vending machines.

As a result of these efforts, PPT learned that the reliability of ticket vending machines was measured at an 89.9% satisfaction level in 2001.

PERFORMANCE MEASURES

The purpose of the service standards is to promote a quality approach to service delivery and focus on customer needs and expectations. The intended use of the standards is to translate these customer expectations and perceptions into viable performance measurements or indicators. This process is accomplished by establishing a quality loop that starts with aligning the service quality sought by the customers with the service quality targeted by the providers. It is linked (or looped) with a measurement of service quality perceived by the customers and the service quality delivered by the providers.

For example, recognizing the importance of a “quality loop,” TPG uses what it calls a “customer satisfaction wheel.” As Figure 1 illustrates, it is a circular process that starts at the top of the circle, goes through each step, and circles back to the top.

To manage quality, performance is measured. Performance measures are based on clear definitions of what is measured, how it is measured, and how often it is measured. Because systems and circumstances vary (e.g., urban and rural), public transportation authorities are directed to:

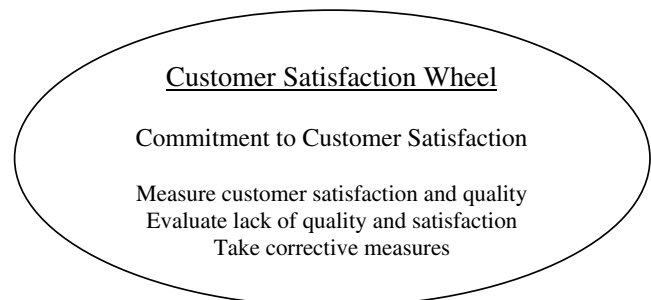


Figure 1. Customer satisfaction is a circular process.

- Select the appropriate measurement methods for the specific location,
- Decide on the frequency of measurement,
- Determine the methods of computation and validation, and
- Document the results.

In order to track trends, satisfaction and performance monitoring is conducted and reported on a regular basis. To ensure that the monitoring process meets the changing needs of the customers as well as the operator, the measurements are continually evaluated.

An international performance-based project known as Benchmarking European Service of Public Transport (BEST) is underway in nine European countries. The project began in 2000 and will continue until 2005. BEST follows the model of the European standards for collecting information and measuring performance. BEST is based on the philosophy that sharing experiences and ideas among peers will improve quality, enhance customer satisfaction, and increase customer ridership. The BEST project begins with a survey of 1,000 citizens in each participating country, continues with the analysis of the survey results, establishes industry benchmarks, and concludes with action plans for improvements. Of the countries visited, Switzerland and Finland currently participate in the BEST project.

BEST objectives include the following:

- Increase travel with public transport;
- Strengthen the focus on customer needs, demands and expectations;
- Create a learning process based on perceived quality;
- Establish a professional network of public transport colleagues; and
- Promote public transport by offering open dialogue on development.

BEST surveys measure the following:

- Citizen satisfaction,
- Traffic supply,
- Reliability,
- Information,
- Comfort,
- Staff behavior,
- Personal security,
- Social image,
- Value for money, and
- Loyalty.

Geneva's 2002 BEST scores verify its commitment to quality transportation and customer satisfaction. Geneva ranked first in 6 out of the 10 categories, achieving the status of overall role model. Helsinki ranked second overall in 2001 and 2002.

In addition to participating in the BEST project, TPG conducts an annual 3-month customer survey feedback campaign called "Our Customer's Voice" as part of its continuous improvement process. Leaflets are distributed to passengers, and more than 1,000 replies are received. These surveys ask riders to respond to the following categories:

- Welcoming,
- Expansion,
- Cleanliness,
- Rolling stock,
- Security,
- Connections,
- Noise inside the vehicle, and
- Sufficiency of control (management).

TPG then analyzes the responses and implements changes in areas receiving a large number of comments. Because of some of the changes resulting from the campaign, the Geneva system reported increased customer satisfaction in 2002 compared with 2001.

Although Helsinki also participates in the BEST project, HKL does not rely on it as the sole indicator of customer satisfaction. HKL tries to survey at least 9,000 passengers each year. To accomplish this massive undertaking, university students are used. The students receive surveys, clipboards, and pens. They conduct face-to-face interviews on board the vehicles. Students try to select six passengers per vehicle to complete and submit the survey on the spot. Questions on the survey relate to the operators and the system, and the grading scale ranges from 4 (poor) to 10 (first-rate). These questionnaires are administered at various times of the day in order to receive a comprehensive view of a particular route. Questions include the following:

- How does the driver treat the passengers?
- How well does the driver drive?
- Can the driver provide a timetable and route information?
- How clean is the vehicle?
- How easy is it to get a seat?
- How comfortable is the interior of the bus?
- Does the vehicle run on schedule?
- How well is public order maintained on the bus?
- How easy are transfers?
- How comfortable are the stops, rain shelters, and timetables?
- How is the traveling speed?
- How would you rate the bus information?

In addition, students also act as mystery shoppers, riding the system and recording observations, making notes on factors such as the following:

- Customer service,
- Driver's appearance and behavior,
- Handling of exceptional situations,

- Condition and tidiness of buses and facilities,
- Timeliness, and
- Route and schedule information availability.

HKL graphs the results of the surveys and observations according to operator and system type (metro, tram, or bus). Results are posted for the operators to review.

A telephone feedback system operates during regular and after-business hours. HKL recognizes that when a customer has made the effort to call and complain, a certain “annoyance threshold” has been reached and these calls are closely tracked and reported. Customer service representatives investigate, follow up on, and respond to each call quickly. HKL receives hundreds of calls each day.

LVB does not yet participate in BEST, but analyzes customer satisfaction using the European standard criteria and two complementary methods—subjective and objective measurements.

The subjective measurements are primarily derived from customer questionnaires that are continuously collected, but they also include customer interviews and interviews at transit stops.

The objective measurements are derived from methods such as the following:

- Supervision of operations;
- Assessments of drivers, ticket inspectors, and other employees;
- Performance evaluations;

- Customer assessments;
- Spot checks of rolling stock and infrastructure;
- Test purchases (mystery shoppers); and
- Assessments of complaints and the agency hotline.

LVB produces quarterly quality reports based on the results of the performance indicators and customer feedback. The results are processed and determine whether the agency needs to modify the quality goals. When possible and advisable, LVB tries to meet the demonstrated needs by adjusting service.

Performance measurement is an integral part of PPT’s quality management program. The PPT reports quarterly measurements of all standards obtained by means of field monitoring, customer surveys, mystery shopping services, and existing technology (central control systems). Follow up actions are taken to eliminate the identified inadequacies of the system.

COMMUNICATION STRATEGIES

The transit agencies visited provide quality customer service by taking the steps to clearly identify the customer base and develop strategies to effectively communicate with the customers.

As part of a communications strategy, each organization uses a “customer service roadmap” (see Figure 2). These roadmaps recognize the relationship between the customer

Customer Service Roadmap

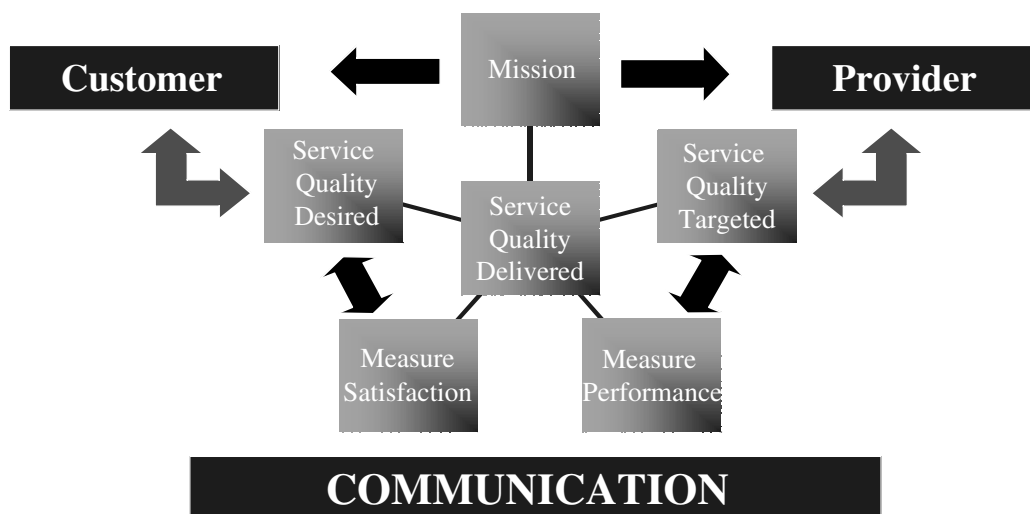


Figure 2. Communication is the link between all the components of a successful customer service roadmap.

and the transportation provider, with each sharing equally in the mission of providing service. The customer's identification of *service qualities desired* impact *service qualities delivered* in the same manner as the *service qualities targeted* by the transportation provider. Satisfaction of the customer is measured against the services desired and the services delivered. The transportation provider must also measure the performance of the services targeted and the services delivered. The link between all the components of a successful customer service roadmap is *communication*.

Identifying the customer is essential to successful customer service. Although each system's definition of customers varied based on its own environment, all agreed to having the following core customers:

- Officials, media, and decision makers;
- General population;
- Employees; and
- Consumers/riders.

Once these customers are identified, specific communication techniques and materials are developed to target these markets. The following are the four specific communication strategies used by the four transit systems.

External Communications

External communications, particularly when directed at decision makers and the media, help to support the use of public transportation services and enhance the corporate image.

To maintain support for the public transportation network, TPG produces a publication four times a year for decision makers in Geneva and the surrounding municipalities and for the media. By producing this publication, TPG reinforces its image of responding and being proactive to the needs of its customers. TPG makes a concerted effort to promote a positive image of its services and spends a quarter of its marketing budget on image enhancements.

Maximizing its relationship with the media, the HKL Helsinki maintains a high visibility in the community. Using a variety of methods, HKL provides information on its services, planning studies, and finances to garner support for public transportation and the HKL corporate image. This approach is accomplished by activities such as the following:

- Issuing more than 100 regular press releases per year;
- Hosting two to three press conferences per year;
- Producing the annual report in Finnish, Swedish, and English;
- Releasing statistical reports on ridership, performance, and finance; and
- Sharing planning studies.

LVB in Leipzig uses almost a dozen tactics for external communications:

- Informing actively (improving information systems),
- Celebrating together (community parties and involvement),
- Creating interest (system tours and apprenticeships),
- Being innovative (new ideas—TVs on trains),
- Being different (making it fun),
- Taking a stand (public service involvement and advertisements),
- Being transparent (current and historic displays),
- Demonstrating presence (community events),
- Changing the image (ad campaigns),
- Being helpful (community partnerships and social support), and
- Improving orientation (system maps).

Marketing

Marketing is another communication tool that is used with the general population, reaching out to communities to support the image of public transportation and to attract new riders. LVB and PPT provide excellent examples of different marketing programs.

LVB uses a preference marketing strategy. Instead of promoting the image that LVB operates buses and trams, emphasis is placed on the attractiveness of public transportation services and the convenience of using public transport to participate in life's activities. For instance, service brochures that include timetables and maps focus on specific themes such as cultural sites, recreation and sports venues, restaurants, and medical facilities. The brochures are made available to specific target markets.

Recognizing the potential that existed with the student population, the LVB created a marketing program to target this audience. A competition was held among the student population to design a special student fare card. What resulted was the Student Mobile Card. The card is offered to students at a 50% discount, and the city of Leipzig subsidizes the remaining 50%. As a result of this program, LVB has achieved increases in ridership, from 30% to 60% among high school and college students.

LVB also provides a service for newcomers called the "Bimmel," the local word for *tram*. The Bimmel service consists of a tour of the city center, complete with a tour guide, and begins and ends at the main railway station. In an effort to attract new riders, especially young people, LVB and LFB created a "Jungle Tram" theme car. The tram is camouflaged as an elephant going down the track. In recognition of LVB's marketing initiatives, it was, in 2001, the first public service agency honored with the Marketing Prize awarded by the Deutsche Marketing Verband.

Capitalizing on the public's frustration with increased automobile congestion, PPT promotes the advantages of using public transport. For example, PPT offers open door days when service is free, period fare tickets at a reduced cost, and a free daily newspaper to all passengers using the metro. PPT also sponsors concerts in the metro stations to

expose customers to their safe and clean environment. In fact, the community has appreciated PPT's sponsored musical performances so much that the Easter and Christmas concerts are now annual events.

In addition, an exhibition entitled "Traveling Prague" was celebrated in the historic cellars of the Prague City Hall. Visitors had an opportunity to become familiar with more than 100 years of public transport through an exhibition of old photographs from the PPT archives. On this occasion, a CD was published presenting original compositions dedicated to traveling by public transport.

In conjunction with other partners, PPT annually organizes one of the major mass sporting events in the Czech Republic—the Prague International Marathon. PPT also supports a project called "Poems for Passengers" where poems are posted on the metro trains for passengers to read and enjoy. In 2003, Prague Public Transport, started a "Passenger's Poems" contest soliciting submissions from riders.

Internal Communications

Internal communications support motivation among employees, the internal customer, resulting in a team that is committed to the common vision and mission. Boards of communication composed of employees from all levels and divisions are common in the organizations visited. Printed information also flows freely within the organizations, keeping all employees up to date on the agency's goals and standards.

TPG uses more traditional internal communications to keep its employees committed to providing excellent customer service. Some examples of its practices include the following:

- Employee newsletters,
- Monthly bulletins with paychecks,
- Internal magazine—published quarterly, and
- News bulletins when service changes are planned and implemented.

Helsinki targets its employees as internal customers by providing information to employees to support motivation, commitment and team spirit. The HKL uses numerous print documents to keep the internal customer educated and up to date on changes within the organization and services. For instance:

- Weekly bulletins: 4 pages, black and white
- Quarterly magazines: 20 pages, color
- Committee bulletins: 20 issues per year
- Intranet
- Special notices on specific campaigns

Information to Riders

Providing timely and accurate information to the rider is

the priority of each system's communication initiative. To accomplish this, each of the transit properties uses the following traditional forms of communication:

- System maps and timetables distributed at customer service outlets, through the mail, and on websites;
- Signage at tram, subway, trolley and bus stops detailing routes, timetables and maps—in both print and electronic format;
- Fare media informational brochures, fare collection vending machines and the actual fare media;
- Promotional brochures associated with specific campaigns;
- Audio announcements on vehicles;
- Newspaper, radio and television advertising; and
- Bulletins.

PPT in Prague did a remarkable job providing information to riders during the devastating floods in August 2002. Since the floods damaged 18 metro stations and 2.6 miles of rail line, PPT had to immediately redesign services and communicate these changes. In order to redirect metro passengers to the replacement services, yellow footprints guided customers from the usual metro stations to appropriate special bus services. Customer service lines were staffed 24 hours a day and received 600 calls per line per day between August 15 and August 21. Twice a day, leaflets giving updates on service restoration and modifications were distributed to passengers and households. Constant interaction with the press was maintained so customers could get the latest information from radio, newspapers, and television. PPT's website was updated daily. During the 8 months it took to resume normal service, PPT provided exceptional service in transporting customers and maintaining customer satisfaction.

At HKL, the marketing department has the principal responsibility for providing customers with information. The public can retrieve information by calling a traffic advice hotline or, in the event of a sudden disruption of services, the traffic supervisory staff. In individual cases, the employee with the most expertise on a particular matter provides the information. Other areas where passengers receive information include express bulletins on buses and at stops, stickers on vehicles, and audio announcements on the vehicles and at the stations.

One of the most notable changes in the availability of passenger information to the public in the past decade is the accessibility of information over the Internet. Internet websites are an important element in providing information not only for schedule information but also for purchasing tickets and arranging paratransit trips. In the last year alone, all of the systems experienced a doubling in the number of visitors to their websites. This trend is expected to continue, as is the trend for the increased use of cell phones to access information, schedule rides, and purchase tickets.

STAFF TRAINING AND MOTIVATION

TPG offers extensive training programs to help staff members improve and enhance the skills needed to perform their jobs or qualify for advancement. TPG employs eight trainers and has a budget of \$735,000 per year. The budget has doubled since last year.

TPG offers four different types of training:

Continuing Education. This education process is conducted outside of the company and provides half day sessions to conductors, customer service representatives and administrative employees. The different training programs offer the opportunity to improve computer, language, driving, and other skills. For example, maintenance personnel receive a CD that explains tram breakdowns, provides examples of past breakdowns, and gives mechanics an estimated time of how long it will take to finish a repair.

Management Training. Employees selected for this training enroll in the State Training School for Management, where they learn skills associated with professional advancement. This program is fairly new, and it is geared to employees who demonstrate the skills to advance in the agency.

Ground Training for Apprentices. This is an apprentice program for high school students. For 3 years, students attend school half the day and then work on site for the remaining part of the day. The participants gain valuable skills that will help them enter the work force when they graduate.

Quality Management. All employees are required to attend this type of training when service changes occur. It usually takes about 2 months for all employees to complete this half-day training. This program allows TPG to conform to ISO standards.

The most important part of TPG's training program is called Analyze, Presentation, Objectives and Professionals (APOP). APOP is a motivational program that TPG created and is a tool for managers to use to help staff succeed. This program is offered to all employees.

APOP is designed so that a manager, who usually supervises 60 people, will meet 3 times over the course of a year with each individual staff member. At the first meeting, yearly goals are established. After 6 months, another meeting takes place, and goals may be changed or adapted based on the workload and how the employee is performing. The third meeting takes place at the end of the year, when the manager evaluates the employee and writes an analysis of his or her findings. This written review is given to the general manager and human resources.

The APOP program keeps the lines of communication open between managers and employees and builds a team

atmosphere where everyone is given a chance to succeed. Employees are also empowered to make their own decisions while working in the field. This makes the employees feel they are part of the company and creates a higher level of employee satisfaction. Presently, there is no connection between participating in the APOP program and salary. A cost of living pay increase is given to all employees every year, regardless of the review the manager writes through the APOP program.

Although TPG gives its employees the tools to succeed, if an employee receives a bad review, the employee meets with a high level manager and has 6 months to resolve the problem. If the employee does not show improvement, he or she will receive a written notice. After two notices, the employee is terminated. Very rarely does termination occur. TPG works to ensure that employees are happy and may reassign the employee to a job better suited to the individual's skills and abilities.

LVB recognizes that image is very important to providing excellent customer service and its "front line" employees play a major part in projecting a positive image. As a result, LVB created a survey that assessed employee interaction with the public. The survey results concluded that one-third of LVB employees are too passive when dealing with the public. LVB believes that customer service skills are a must for employees to succeed in their job.

To determine what training was needed, customer interviews were conducted, asking customers different questions about service. As a result of these interviews, a training program was created that focused on treating each customer like a guest.

Other motivational changes were made as well. Uniforms are worn by all front line employees, making them feel like part of a team. Also, driver group leaders receive bonuses if drivers in their group excel in providing customer service.

PPT provides about 8 hours of customer service training per year to every employee. All training takes place at PPT's new training facility, the largest in the Czech Republic (see Figure 3). Drivers receive up to 16 hours of training. New drivers are required to participate in a program where a variety of driving situations are presented and class discussions focus on what each driver would do in a particular situation. In addition, employees undergo a psychology exam for the purpose of determining reactions to stressful situations and passenger aggression. This test also gauges reflexes, response time and reaction skills that drivers will need to perform the job. Maintenance employees receive additional training by working on actual trams in the new training facility.

Complaints from customers regarding service are logged and investigated by a PPT manager. If the complaint is made against a particular driver, then the driver is required to participate in an additional 8 hours of training. This extra training program focuses on quality of service and customer care.

As part of PPT's motivational strategy, staff goes out into the field to monitor employees' skills. Measurements and



Figure 3. PPT's new training facility has a special room for maintenance training.

assessments of each employee are posted in the driver's area so all results are public and coworkers know where they stand compared with other employees. In the cases where the review is not satisfactory, by posting the results, PPT believes that those employees will be motivated to perform as well as their coworkers.

HKL has a difficult time recruiting and hiring new employees. This is due in large part to the aging population in Finland. Because of this situation, HKL has begun to recruit young people from abroad. Once recruited, each person undergoes a rigorous interview. Questions typically address flexibility of shifts, proficiency in speaking Finnish, attitude, and work ethic.

HKL offers a very extensive training program and has its own training center. The mission of HKL's training center is to promote a positive public transport culture with vocational training in the areas of safety, service, and technical skills. The training center has a series of short, 5-hour courses that drivers are required to attend. The sessions involve learning to drive in extreme road conditions and dealing with "real life" situations. Training lasts about 6 months with 3 months of classroom lessons and 3 months of field training. In 2002, HKL trained 100 drivers. If drivers receive a customer complaint, they are required to attend a 7-hour customer service refresher course. Training continues throughout employment, with 1-day training once per year regardless of how many complaints a driver may receive.

HKL has adopted a motivation plan similar to TPG in Geneva. It empowers employees to make their own decisions while working in the field. Managers and employees meet periodically to discuss goals and to ensure that employee goals match those of the company.

PASSENGER AMENITIES

Intermodal Connections and Facilities

The major intermodal facility in Geneva is the Cornavin railway station in the northern part of the city (see Figure 4). The station serves the Swiss Federal Railway system, TPG trams and buses, taxis, bicycle, motorbike/scooter parking, and a 900-car parking facility. TPG maintains a ticket office in the railway station. In addition, the station has a shopping arcade that includes retail businesses, a market, money exchange center, eateries and a variety of other service-related establishments. There is a rail connection between Cornavin and the Geneva Airport and tram extensions are planned from Cornavin to the Geneva office of the United Nations and to the European Organisation for Nuclear Research (CERN). In addition to intermodal connections at Cornavin, Geneva maintains a number of park-and-ride locations.

One of the busiest intermodal stations is Bachel-de-Pasay, where the main office of TPG is located. This station is served by several tram lines, buses, a park-and-ride lot and bicycle parking. To illustrate the intermodal connectivity of this station, one tram line terminates at this station but feeder buses are available to another tram line that travels to the city center and the Cornavin railway station.

Intermodal connections in Leipzig are centered on the majestic Promenaden Hauptbahnhof rail station and shopping mall (see Figure 5). Opened in 1915, this rail station owes its unusually large size to housing both the Saxon and Prussian railway companies. The railway station was heavily damaged from coal pollution and almost destroyed during World War II. Most of the interior of the station was rebuilt after the war, and, in 1965, the then-East German government began reconstruction of the station to its original design.



Figure 4. Cornavin is a bustle with thousands of passengers passing through each day accessing a wide variety of transportation options and commercial services.



Figure 5. The majestic Promenaden Hauptbahnhof rail station and shopping mall.

The current Promenaden Hauptbahnhof was extensively renovated and reopened in 1997 as a railway station and shopping mall. The 90,000-square-foot shopping complex was the result of a public-private partnership between the state-owned rail system and ECE, Germany's largest shopping center development company. ECE invested approximately \$220 million to renovate and expand the station, resulting in three levels of shopping. The rail system contributed approximately \$55 million to upgrade platforms and rail equipment (see Figure 6).

In addition to parking within the station and a small surface parking lot on the premises, there is an adjacent large-scale parking garage at the rear of the station and ample space for bicycle parking.

Directly across the street in front of the railway station is the major transfer center for LVB buses and trams. This multi-track area is shared by trams and buses, and passengers



Figure 6. Promenaden Hauptbahnhof includes more than two dozen platforms served by the state-owned railway.

wait under standard transit shelters. A central customer service center operated by LVB, where passengers can obtain route and schedule information and purchase tickets, is directly across the street from the bus and tram station.

Beyond the central railway station, most intermodal connections are made between LVB trams and city and regional buses. Presently, there is ample parking in the city center and limited automobile congestion. However, since reunification in 1989, automobile ownership continues to increase and there are future plans for park-and-ride lots in outlying areas that will connect residents with regional trains. Another mode of transportation available in the city is an extensive system of bicycle lanes. The lanes are paved with a different material than the adjacent sidewalk and designated with frequent signs.

Rail transportation is at the core of the public transport system in Prague with buses used primarily as feeder routes to the metro stations and stops. This integrated network includes numerous park-and-ride facilities aimed at intercepting automobile traffic and lessening its impact on the congested city center. All the park-and-ride lots are connected to metro stations.

There are 200 to 300 transit stations and stops that offer connections between buses or trams and the metro system. In order to supplement existing intermodal connections, PPT is establishing a number of secondary stations and stops in neighborhood centers outside the city center. At least a dozen such secondary centers are planned in areas with high density residential zones and commercial areas that will be served by rail transportation, park-and-ride facilities, and feeder buses. Extensive expansions of the public transportation system are planned. For example, Metro Line C will be extended to the north to accommodate the growing population in that area.

HKL has approximately 2,000 stops within Helsinki, affording passengers many opportunities to transfer between different modes of services. The major terminuses are located at Kamppi, Elielinaukio Square, and Railway Square. There are also 24 transfer stops where HKL emphasizes easy transfers between modes. At both terminuses and transfer stops, bicycle and automobile parking are available.

The main intermodal facility in Helsinki is Railway Square, designed by Eliel Saarinen in 1916, which comprises the Railway Station (see Figure 7), the National Theater, the Fennia Building and Ateneum. Transportation services at Railway Square include the Finnish State Railway trains, the Rautatientori metro stop, dozens of connections to buses, service by eight tram lines, taxis, and bicycle and automobile parking. The Railway Station itself includes a variety of shops, services, restaurants, and retail establishments for passengers and visitors.

The Helsinki bus station in Kampii is undergoing a major reconstruction that will result in a mixed used commercial development and bus terminal (see Figure 8). The station will serve the metro, local and regional bus lines, and trams while parking will be accommodated on adjacent tracts of



Figure 7. The Railway Station at Railway Square.



Figure 9. Itakeskus shopping center.



Figure 8. Kampii bus station under construction.

land. The bus terminal will be completed in 2005 and the commercial portion of the project is expected to be finished in 2006. Due to the extensive ongoing construction, bus transfers are made on adjacent streets.

Beyond the main railway station, there are other intermodal centers, the most notable of which is the Itakeskus (East Centre) shopping center located about 6 miles from the city center (See Figure 9). Itakeskus is the largest shopping center in the Nordic countries and has 240 shops and 30 restaurants situated within a multi-level enclosed shopping mall. The Itakeskus metro station serves the shopping center, and connections are provided from this station to more than a dozen bus lines, taxis, automobile parking facilities, and bicycle parking.

Other intermodal connections include bus and tram connections at all 16 metro stations, including automobile parking at several stations. The Ruoholahti metro station includes tram, bus, and ferry service. In fact, trams tie into

the ferry service at Market Square and Katajanokka, connecting these areas to Suomenlinna, one of Finland's most important tourist attractions and recreational locations.

There are future plans for expanding public transportation services in Helsinki. These include an extension of tram services, the expansion of the metro subway system with the addition of the Kalasatama station, the Toolo line and the Western Metro to Espoo, and augmentation of bus services by adding lines that are expected to begin service in 2005. These types of future expansions across different modes of transportation are aimed at continuing Helsinki's commitment to intermodal connections for many years to come.

Passenger Amenities at Bus, Tram, and Train Stations

In most of the city centers, a high percentage of bus and tram stops did not have benches. The reason for this is the high frequency of service. In most cases, the vehicles arrive every 4 to 8 minutes during peak times and every 10 to 15 minutes during off-peak times. Train and subway waiting areas have no benches except in designated waiting areas away from the platforms. Benches are plentiful outside the city center.

Passenger stops are clearly marked with exactly what type of service that stop provides, along with timetables and multiple route designations. Many stops provide real-time information. Shelters are provided and are aesthetically pleasing and functional.

Bus stop passenger amenities in Geneva include 17 automatic information booths, raised red vehicle-stop indicators at ground level, and vocal announcements by loudspeaker for 72 stops.

In Leipzig, passenger information is greatly enhanced by the real-time signage that displays the time of day and arrival times for each bus and train. This type of signage is also extremely effective because it has a clean simple design and is easy to read and understand.

Passenger Services at Terminals and Parking Facilities

Passengers using trains at the Geneva-Cornavin railway station and Geneva-Cornavin airport outside of the operating hours of transit have access to a service called “Taxibus.” This is a shared taxi service that must be prescheduled before 11:30 p.m. the previous day for next day arrivals. It provides discount trips to and from these terminals for passengers and their baggage. Rates are based on the number of zones crossed and start at \$4.40.

For some time TPG has offered car sharing services. This includes a partnership with Mobility Carsharing Switzerland, the largest cooperative car sharing society in the world. This service allows short term rentals at discount rates. TPG also cooperates with employer sponsored programs that benefit employees commuting to work in ways other than a private vehicle. Also, to encourage limited use of motor vehicles, motorists can travel fare-free on TPG for 90 minutes from the time of entering a parking station. The discount applies to the driver and a companion. TPG validators are set up at the parking facilities near the automatic cashier.

PPT offers park-and-ride facilities located near metro stations. The fees at Prague’s network of park-and-rides reflect the “popularity” each location rather than zones or distance from the central city. PPT provides discounted bus fares for park-and-ride users, including reduced full-price all-day tickets and transfers. Also in Prague, travel information centers are playing an increasingly important role in providing information to passengers, especially foreign visitors. These new centers provide multilingual informational materials and sell all types of tickets, including the new annual season ticket and the short-term season tickets often called “tourist tickets.” These centers are located at area airports and train stations.

In 2001, PPT began a pilot project called SWIFT information system at three metro stations. This system involves “communication posts” that contact Travel Information Centers using projection screens mounted on station walls above the track. These screens present information as well as provide advertising spots.

Passenger Amenities for the Aging Population and Persons with Disabilities

Several transit systems have determined that their long term viability in the community is linked to improved services for elderly riders and riders with disabilities. With the increasing percentage of elderly people in the population and the growth of treatments and assisted devices for individuals with disabilities, each of these four transit systems is challenged with serving an increasingly frail and disabled service population.

In recent years, TPG management has made significant progress addressing the needs of passengers with mobility difficulties. The network’s vehicles and stops have undergone technical modifications that include easy to read frontal

and lateral inscriptions, visual announcements of routes and stops on 283 vehicles, a special “wheelchair button” to avoid closing doors, white or yellow highlighted step nosing on all vehicles, color code indicating line numbers on signposts and vehicles, and strap holds.

In addition, TPG has a service called “Mobility for All.” This service provides free assistance to persons with impaired mobility not requiring a wheelchair to use the fixed-route system. A specially trained attendant will meet the customer at home at the agreed upon time, help him or her to purchase the ticket, and assist the individual door-to-door. This help is not restricted to medical treatment travel.

The transit system reported providing about 21,600 trips per year for people with special needs. TPG operates special paratransit buses that make about 2,000 trips per month. The paratransit service is paid by social service agencies.

In 7 years, approximately 35% of the population in Leipzig will be more than 65 years old. As a result, LVB predicts a loss of 15 million trips per year by 2010 unless there are changes made to the system. One of its key strategies for offsetting these losses is providing easy access to older riders. To help achieve this goal, approximately 37% of Leipzig’s rolling vehicle stock are now low-floor vehicles.

The Leipzig transit system also found that many senior citizens do not use the mobile ticketing and vending machines. As a result, LVB has started a training program to assist these individuals in becoming more comfortable with using these machines. In addition, since many seniors on fixed incomes are looking for a bargain, a new fare program is being developed that allows seniors who buy a ticket at full price to receive an additional ticket at half price for a spouse.

Prague has estimated that approximately one-third of the population is in need of special service. PPT operates seven regular buses for people with disabilities in areas of the city where people with disabilities live. These seven buses transport people with disabilities from home to a central location to access the fixed route system. PPT does operate two special bus lines for people with disabilities. These special bus lines are equipped with two operators to assist those who may need support.

In addition, PPT uses special devices to aid the visually impaired on fixed route buses. For example, Figure 10 shows a device that doubles as a cane and a receiving unit that allows a visually impaired customer to hear information about the route number and destination of the bus. PPT also has Braille signs and special tile units at stops, barrier-free access to shallow stations, special acoustical beacons in stations that lead blind people to their destination, and reconstructed escalators that provide a barrier-free environment. Recently, PPT received a special commendation for its service assisting blind and partially sighted people.

About 70% of the fixed route system in Prague is wheelchair accessible. However, persons with disabilities in wheelchairs may be transported subject to the driver’s approval. The driver can deny such transport if existing or anticipated situations along the route do not guarantee the safety of an



Figure 10. The specially designed cane to assist the visually impaired riding the bus.

immobile person and other passengers or if the immobile person has not complied with some of the provisions or conditions of transport. Also, persons in wheelchairs may be transported only if accompanied by another person. Low-floor vehicles operate on 66 routes of the public transport system.

HKL contracts with Transportation Helsinki, Ltd., to provide paratransit service. However, the Korsisaari Group is responsible for dispatching paratransit trips through the Travel Dispatch Center (TDC), which began operation in 2002. TDC is providing more efficient use of existing services and financial savings.

Paratransit trips can be scheduled using e-mail, telephone, cell phone, web page, or Personal Digital Assistant (PDA). It is a real-time system that only requires customers to call 20 minutes before the actual trip. However, to schedule a trip via the website or a cell phone requires a 1-hour advance notice. Customers are allowed to take up to 18 nonmedical trips per month free, and additional nonmedical trips booked at least 24 hours in advance are charged half fare. All medical trips are free. Eligible people may be accompanied by an attendant.

Paratransit service currently operates only within the city of Helsinki and provides approximately 500 paratransit trips per day. Each trip costs the contractor \$13 and the city of Helsinki reimburses the contractor \$15 per trip. The paratransit system operates 7 days a week, 24 hours per day.

Service grew 100% last year and the budget has doubled in the past 10 years.

In addition, HKL reserves seats near the door for passengers with disabilities. Wheelchairs can be used on the metro, on low-floor buses and trams, and on the Suomenlinna ferry.

Other Types of Passenger Amenities

In-line skates and roller skates are allowed on board vehicles in Geneva provided they do not cause any inconvenience to other passengers. Miniscooters and bicycles are allowed as long as they are folded up or stored properly.

PPT allows passengers using the rear doors to travel with dogs on trams or buses. The fare for the transport of a dog without a container is identical to the price of a single transfer ticket for a youth. There is no charge for strollers, one set of skis with poles, pets in containers, or bicycles. On the metro, bicycles are allowed only during off-peak periods and can only be transported in the last car.

HKL allows bicycles to travel free on the metro and for a small charge on the ferry. Outside of rush hour, bicycles can be carried on trams. There is no charge for transporting pets on buses, trams and metro. A ticket is not needed for a small child or stroller. In fact, there is a special stroller button on the middle door of buses and trams to keep the door open longer. There is room for two strollers in the area opposite of this door.

FARE MEDIA

Geneva, Prague, and Leipzig all use chip cards, which are similar to credit cards, as fare media. To work, the card must be swiped or inserted into a reader to transfer information. Helsinki uses a smartcard system. With a smartcard, no contact is made between the card and reader. A transponder, built into the card, transmits the information up to a distance of approximately eight inches.

In 2001, Geneva formed a fare collection partnership both to streamline the collection of fares and to increase business practice efficiencies. The Swiss refer to this relationship as an “integrated tariff community.” The name of the system that binds the railway, lake boat operators, and public transportation operator together is Unireso. One goal of the Unireso partnership is to update fare media technology with an emphasis on using electronic fare payment methods. Currently, paper tickets, which are seen as vulnerable to counterfeiting, make up a large percentage of fare payments.

Unireso cards—called Cart @ Bonus, or Cards with a Bonus—used by TPG, may be purchased in three different denominations: CHF 20, 30, and 50 (CHF 20 = US\$ 14.75 at the time of writing). They are not capable of having additional value added to them, but they include three bonuses: First, extra value of CHF 1, 2, or 5 can be loaded on the card, depending on the value of the card. Second, when a card is nearing the end of its value, one last ride may be purchased

up to a value of CHF 2.20 if at least CHF 0.10 remains on the card. Third, expired cards with a total original value of CHF 200 may be exchanged for a free CHF 20 bonus card.

Geneva has a multi-tiered fare structure, with ticket prices varying by mode, zone, and length of time during which the ticket is valid. Tickets can be purchased at vending machines (see Figure 11). To purchase a ticket, a transit patron must select the desired fare option, insert a valid card into the machine, and withdraw it. Then the validated ticket is dispensed. Ticket vending machines also accept cash, but they do not give change.

The Unireso machines are widely available. Many purchases are made at neighborhood news stands. For trams, the fare machines are located on the street about every block or half-block depending on the character of the street and the amount of transit activity. By December of 2002, all buses had ticket machines. At the Mouette boat docks, fare machines are powered through the use of solar panels located on the tops of the machines.

Passengers who are eligible for discount fares must show their identity card when boarding. There are family fares, as

well as special fares for youth and seniors. “Uniform” personnel are eligible to ride free. The base fare is just over \$2.00.

In Leipzig, the collection of fares is perceived as a “point of sale” function. Tickets for LVB trams and buses can be purchased at stops, service centers, and on the vehicles. Fixed-in-place ticket machines offer the full combination of single tickets up to monthly passes. Fare zones are shown on every LVB vending machine. All machines provide simple instructions on how to purchase a ticket in many different languages. These machines accept cash or debit cards. If an individual ticket is purchased from a static machine, then the ticket must be validated when boarding the bus or tram. The fare machines on the buses and trams only accept debit cards and sell individual ride tickets that are valid only for that trip. When purchasing a ticket aboard a bus or tram, the ticket is already validated.

Although tickets are available for sale on every vehicle, the LVB has established an extensive network of sales outlets for advanced purchases. These locations include more than 500 ticket machines throughout the city (see Figure 12), 18 different retail partners, 300 customer agencies, a walk-in service center and even an “Infomobile,” an oversized Volkswagen van that is available for employer site visits and community events.

Leipzig has had an integrated fare system since 2001, when it adopted the fare structure of the Central German Transport Association. The entire city of Leipzig is one fare zone, and only when leaving the city limits does the fare increase. In addition to Leipzig, there are three additional fare zones. The base fare for Leipzig is about \$1.70. The base fare for a child is \$0.90. An adult day pass for travel within Leipzig costs \$5.90. The LVB also sells a Kurtztrecke (“short trip”) ticket good for a ride no longer than four bus or tram stops. It sells for \$1.00. Leipzig offers a wide selection of interesting passes to specialized markets desiring fare savings. For example, “10:00 A.M. passes” allow a passenger to use the system from only 10:00 in the morning to 4:00 in the afternoon.

Based on pricing and LVB marketing literature, the individual base fare is designed only for the very occasional rider. Frequent rider discounts are available and commonly used. The LVB also sells weekly and monthly tickets. A monthly ticket costs approximately the same as 2 weeks’ worth of daily fares. An annual pass provides 124 days of round trips at a cost of \$392.

The most interesting monthly pass concept is the ABO-Karte because it is like subscribing to a “transit pass-of-the-month club.” In fact, the name ABO is short for “abonnenten,” which means “to subscribe.” The ABO allows customers to buy 10 consecutive months of passes and then get the last 2 months free. These passes are mailed to the subscriber each month. The ABO card also allows a second adult and up to three children to travel without charge. ABO members get a special magazine mailed to them four times a year that contains articles, coupons, and other special offers. ABO-Kartes are sold in 11 different fare combinations.



Figure 11. The Unireso ticket vending machine: the card is inserted, a fare is selected, the card is pulled out, and a paper ticket showing the valid zone and fare period is dispensed.



Figure 12. A ticket and pass vending machine in Leipzig, Germany. This machine is located in a bus shelter at a major downtown boarding zone.

Prague and its suburbs first integrated fares in 1993. The complicated fare structure and the 16 different transit operators working within greater Prague required an integrated transit ticket system. ROPID is the responsible authority for ensuring this integration. According to ROPID, Prague and its neighborhoods are referred to by the acronym PIT. Rail is the core of the PIT system and buses act as feeders. There are seven fare zones in the PIT and fares are determined by zones and travel time. To illustrate the rapid growth of the integrated fare system, in 1994, 17.4% of all rail tickets were for PIT. By 2001 that percentage had increased to 43%.

PPT recently upgraded its fare collection system by introducing contact-based cards in February, 2003. This upgrade has replaced the old style season tickets with a more flexible season ticket that can be bought with effective dates selected by the transit customer.

PPT has ticket vending machines located at all metro stops, many bus stops and most surface transport stops. Ticket offices at metro stations offer a full assortment of tickets including short-term, long-term, transfer and non-transfer tickets. Season tickets and tickets with optional commencement of validity periods are available. Offices of the Czech Post in the city of Prague sell tickets, as do selected newsagents. Additionally, ticket purchases can be made from bus drivers.

Helsinki uses a smartcard system to collect and monitor fares. The first smartcard in Europe was introduced in Oulo, Finland, in 1992. Oulo has a population of 150,000 and is known for its high-tech heritage. It is also the home of Nokia phones. The basic cash fare is \$2.25, children riding at half price.

The smartcard, called Travel Card, can be used on the buses, metro, trams, and ferries. There are two types of Travel Cards: the Personal Travel Card and the Multiuser Card.

The Personal Travel Card can only be purchased by local residents of the four municipalities served by the transit system: Helsinki, Espoo, Kauniainen and Vantaa. As the name implies there is a level of security associated with this card. If a fare inspector catches the wrong person using a Personal Card, that rider will be made to pay an inspection fee and required to buy a single ride ticket on the spot. Personal Cards can be ordered via the Internet, as well as through conventional outlets, including newsstands. Once loaded by the issuer the card is ready for use. Since the cards are contactless, they do not need to be removed from a case to be used. This card, if lost or stolen, can be cancelled by using an identifying number.

The Multiuser Card can be used by anyone, including different members of a single group. A lost Multiuser card can be replaced, but only if the owner's personal information or company identification has been registered. Fares are cheaper using the Personal Card compared to the Multiuser Card, but the initial cost of the card is the same for both types, \$6.20. Cards that malfunction are replaced free of charge.

These two Travel Cards can be "loaded" either with monetary value ranging from \$5.65 to \$227 or for a time period ranging from 2 weeks to 1 year. A rider can use the value portion of a card to purchase rides for other riders. This works by returning the card to the card reader, and then pressing a designated button. Up to 31 rides of equal value can be purchased at one time. If loaded for a period, use can start immediately or up to 35 days in the future. The more time put on a card, the cheaper the travel. An unusual feature is that a card can be loaded with two time periods at once but up to 35 days apart.

To travel using the time period function, the card is placed next to the reader and a green light flashes (see Figure 13). Using the value function is slightly more complicated. There are three number buttons on the fare reader, which stand for a local, regional, or tram trip. To operate, the passenger



Figure 13. A customer smartcard fare reader on a trolley in Helsinki. The card reader portion is located in the center of the unit, between the 0 and the 2. The numbers are pressed to validate various types of service. A customer readout screen is directly above the numbers. On top are three different lights that flash a specific color depending on whether a card has worked successfully or has sufficient value.

touches one of these buttons while simultaneously holding the card next to the reader.

Transfers between vehicles are done by placing the card on the reader. A green light indicates that a transfer is valid between these modes. Transfers for local trips are valid for up to 1 hour. Transfers that are regional or take place in smaller cities with less frequency of service are good for 80 minutes.

The Travel Card has a standard life of 4 years. After this time the card cannot be used and must be exchanged at a Travel Card service point. The balance from the old card can be transferred to a new card. Card balances can be printed out from ticket machines, at sales points, and even by the driver.

There are Group Travel Cards as well. These are discounted cards that can be configured to meet certain company

or community group travel needs. Purchasing additional periods for travel within a home city, as well as obtaining a discounted rate, is possible with this type of card. Also, a special "Helsinki Card" is available to visitors for a nominal fee; it entitles the holder to free travel on public transportation; free admission to museums; and discounts on tours, theater, concerts, and restaurants.

HKL also provides a service for purchasing a single ticket by mobile phone for about \$2. By sending a text message to a phone number, a single ticket, which is valid for 1 hour on trams, the metro, and the ferry, can be purchased. The fare is debited from a rider's account. This type of ticket must be purchased before boarding a tram or ferry or entering the metro platform area. If stopped by a fare inspector, the rider can show the validation number indicated in the return message.

SUMMARY

Several observations can be made based on what the team saw and heard on the mission:

- With the help and guidance of the European standards and the BEST role modeling process, the ongoing efforts of the transportation providers will achieve further improvements in customer service.
- Providing an integrated fare structure along with frequency of service and real-time information contribute significantly to cultivating a customer service environment.
- These European transit systems invest money and capital in their employees to ensure that they are adequately trained, in hopes that they meet the expectation that is set by the company.
- These transit systems operate efficient services for elderly riders and riders with disabilities, making it easier for them to use the fixed route system.
- Transit systems are adopting market and private enterprise models. Several of these ventures have generated revenues and attracted additional capital and technological investments.

APPENDIX A—STUDY MISSION TEAM MEMBERS*

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 Nancy Carroll, Deputy Administrator, Norwalk Transit District, Norwalk, Connecticut
 Barbara Cline, Transit Director, West River Transit Authority, Inc., Spearfish, South Dakota
 Valerie Cook, Vice President, Operations, LifeStream Services, Inc., Yorktown, Indiana
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 Stephen Earle, General Manager, Mountain Line/Missoula Urban Transportation District, Missoula, Montana
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 Scott Morris, Marketing Manager, Pierce Transit, Tacoma, Washington
 Miriam Perry, Director, Public Transportation Division, North Carolina Department of Transportation, Raleigh, North Carolina
 Kathryn Harrington-Hughes, *Mission Coordinator*, Director of Operations, Eno Transportation Foundation, Washington, DC

APPENDIX B—STUDY MISSION HOST AGENCIES/COMPANIES

GENEVA, SWITZERLAND
 Transports Publics Genevois (TPG)

LEIPZIG, GERMANY
 Leipziger Verkehrsbetriebe GmbH (LVB)

PRAGUE, CZECH REPUBLIC
 Prague Public Transit Co., Inc. (PPT)

HELSINKI, FINLAND
 Helsinki City Transport Authority (HKL)

*Titles and affiliations are as of the time of the study mission

APPENDIX C—LIST OF ACRONYMS & DEFINITIONS

APOP—TPG’s motivational staff training program called Analyze, Presentation, Objectives and Professionals.

APTA—American Public Transportation Association.

BEST—Benchmarking European Service of Public Transport.

CEN—European Committee for Standardization.

CERN—European Organisation for Nuclear Research.

DIAE—state of Geneva’s Department of Interior, Agriculture, and Environment.

DNVG—German Local Transport Company.

GDR—German Democratic Republic (East Germany).

HKL—Helsinki City Transport Authority.

ISO—International Organization for Standardization.

LAB—Leipziger Aus- und Weiterbildungsbetriebe GmbH—provides driver education and training. LVB owns 67%, and 33% is owned by the other LVB subsidiaries.

LFB—Leipziger Fahrzeugservice-Betriebe GmbH—operates a tram car maintenance and renovation company.

LIB—Leipziger Infrastruktur Betriebe GmbH—rail and electric power company—also owned jointly with Siemens.

LSB—Leipziger Service Betriebe GmbH—offers cleaning, janitorial, and light maintenance services. Owned 49% by Deutsche Bank.

LSI—Leipziger Straßeninstandsetzungs GmbH—provides street maintenance services in Leipzig.

LSVB—Leipziger Stadtverkehrsbetriebe GmbH—operates buses and trams within the city of Leipzig.

LTB—Leipziger Transport und Logistik Betriebe GmbH—owns and controls approximately 900 tram cars in Leipzig, offers fleet management and vehicle rental services, and is branching into fleet maintenance systems, including bus.

LVB—Leipziger Verkehrsbetriebe GmbH—the provider of public transit service in Leipzig and one of Germany’s largest public transport companies.

OTC—Office des Transports et de la Circulation, state body that serves as the public transportation authority for greater Geneva.

PPT—Prague Public Transit Co., Inc.

ROPID—Regional Organizer of Prague Integrated Transport.

RVL—Regionalverkehr Leipzig GmbH—operates bus service outside the city of Leipzig.

TDC—Travel Dispatch Center in Helsinki, Finland.

TPG—Transports Publics Genevois—provides 93% of bus, tram, and boat public transportation services within the city of Geneva and surrounding areas.

TSFA—Transit Service Financing Agreement—contract with the city of Leipzig that contains four financing components.

VCL—Verkehrs-Consult Leipzig GmbH—offers planning, engineering and construction management services.

YTV—Helsinki Metropolitan Area Council—responsible for overall regional public transport coordination.