PUBLIC TRANSPORT IMPROVEMENT POLICIES: ASSESSMENT OF THE ROLE OF ROUTE AND FARE INTEGRATION, MODAL REORGANIZATION WITH SPECIAL EMPHASIS TO IZMIR CASE

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ABSTRACT

PUBLIC TRANSPORT IMPROVEMENT POLICIES: ASSESSMENT OF THE ROLE OF THE ROUTE AND FARE INTEGRATION, MODAL REORGANIZATION WITH SPECIAL EMPHASIS TO IZMIR CASE

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Public transport improvement and new public transport management approaches are accepted as the most effective tools in order to cope with the urban transportation problem threatening sustainable urban life and efficient functioning of urban areas. The need for new solutions to replace, or support, costly new capacities created two new concepts at the two ends of the transportation phenomenon; Travel Demand Management (TDM) on the demand side and Transportation System Management (TSM) at the supply side.

The main aim of this thesis is to show whether such public transport improvement policies and measures can make a difference in urban transport and traffic, and contribute to the attainment of a more sustainable transport system. In particular, it is intended to assess the role of fare and pricing policies together with modal reorganization strategies in improving public transport, and increasing its ridership.

Keywords, Public Transport, Modal Integration, Fare Policies, Izmir

ÖZ

TOPLUTAŞIM İYİLEŞTİRME POLİTİKALARI:HAT VE FİYAT BÜTÜNLEŞMESİNİN, TÜREL YENİDEN YAPILANDIRMANIN ROLÜNÜN İZMİR ÖRNEĞİNDE DEĞERLENDİRİLMESİ

ÖNCÜ, Mevlüde Ayça

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Toplutaşımın iyileştirilmesi ve yönetimindeki yeni yaklaşımlar sürdürülebilir kent yaşamını ve kentlerin verimli işleyişini tehdit eden ulaşım sorunlarının üstesinden gelmek için en etkili araçlar olarak kabul edilmektedir. Yüksek maliyetle yeni kapasiteler oluşturma yaklaşımları giderek yerini ulaşım olgusunun iki ucunda yer alan.iki yeni kavrama bırakmakta veya bu yaklaşımı desteklemektedir; talep tarafında Yolcuk Talep Yönetimi ve arz tarafında Ulaşım Sistem Yönetimi.

Tezin ana hedefi toplu taşım iyileştirme yaklaşımlarının ve önlemlerinin kentsel ulaşımda ve trafikte olumlu etkiler yarattığını ve daha sürdürülebilir ulaşım sistemine katkıda bulunduğunu göstermektir. Özellikle toplu taşım fiyatlandırma ve diğer fiyat politikalarının türel yeniden yapılandırma çalışmaları ile birlikte, toplu taşımı iyileştirmede ve toplu taşım yolculuklarını arttırmada rolünü değerlendirmeyi amaçlamaktadır

Anahtar Kelimeler: Toplu taşıma, Türel Yeniden Yapılandırma, Toplu taşıma Fiyatlandırma Politikaları, İzmir

To My Parents

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CHAPTER 1

INTRODUCTION

Public transport improvement and new public transport management approaches are seen as the most effective tools in order to cope with the urban transportation problem threatening sustainable urban life and efficient functioning of urban areas. Many studies carried out at different parts of the world and various reports prepared by national and international committees have defined a policy path towards a more sustainable and efficient transport system, in which public transport is to play a significant role. Most city governments and policy makers had finally acknowledged that automobile oriented solutions; such as construction of new roads cannot overcome present transport, traffic and congestion problems. On the contrary, additional road capacities create new demand on roads and lead to more serious traffic congestion levels. In many countries both decision makers and technicians are in search of various ways of using the road capacity more effectively instead of adding new capacity at high cost. This brings public transport into the focus of contemporary transport policy.

Effective use of existing capacity is an important issue for public transport. There is a general tendency to meet the growing travel demand through the construction of high capacity public transport systems. However, public transport improvement is not limited to public transport capacity investments. It is possible to effectively respond to transport needs and demand with measures that cost much less, and that focus on ways to influence travel demand and effectively manage the transport infrastructure. Such measures can be alternatives to high-cost investments in public transport; but they can also be implemented together with high-cost investments in order to complement the new investment and increase benefits expected from that investment.

The need for new solutions to replace, or support, costly new capacities created two new concepts at the two ends of the transportation phenomenon; Travel Demand Management (TDM) on the demand side and Transportation System Management (TSM) at the supply side. Travel Demand Management is defined as “the art of influencing traveler behavior for the purpose of reducing or redistributing travel demand” (Kozak, 2007). TDM aims to reduce the amount and concentration of the travel demand on the network while TSM aims at improving utilization and efficiency of the existing transport network and services through modal integration arrangements and other physical arrangements on existing transport modes and infrastructure. Both approaches try to redistribute travel demand on the network and in time in a more balanced way by encouraging more sustainable modes of travel (public transport, walking, cycling) and reducing car use through several measures.

Among TDM policy instruments, fare and pricing policies have gained growing importance since they can be extremely effective in increasing public transport usage as well as in helping reduce private car usage. Fare and pricing policies can make public transport more attractive and advantageous (in accessibility and cost terms), while making private car usage more costly, and hence less attractive. Fare and pricing policies are often considered as one of the most effective tools in changing travel behavior and increasing public transport ridership; however, they cannot be successful without other TSM arrangements. Complete integration must be provided in order to implement fare instruments and strategies. A reorganization of the transport network, and the full integration of public transport modes in particular must be introduced together with fare and pricing policies. The reorganization of the network, in itself, can help increase the attraction of public transport systems, and reduce the appeal of private car usage by making it less convenient and less advantageous. TDM strategies together with TSM strategies can increase public transport ridership and decrease congestion levels in traffic. It has been increasingly recognized that a policy package that incorporates these different measures for public transport improvement can be effective in attaining a more sustainable transport system, in which public transport ridership can be increased.

The main question of the thesis is to explore how far integration arrangements with fare and pricing instruments contribute to solving transport problems and traffic congestion in cities and improving livability of our cities, increasing efficiency of public transport, making public transport more attractive, and restructuring travel demand patterns. The thesis also analyzes effects of various supplementary measures that need to be implemented by local governments to assure achieving these aims during restructuring different components of the transport system of the city.

In particular, it is intended to assess the role of fare and pricing policies together with modal reorganization strategies in improving public transport, and increasing its ridership. Main question of the thesis is to explore how far integration arrangements with fare and pricing instruments contribute to solving transport problems and traffic congestion in cities, increasing efficiency of public transport, making public transport more attractive, and restructuring travel demand patterns.

The thesis also analyzes effects of various supplementary measures need to be implemented by local governments to assure achieving these aims during restructuring different components of the transport system of the city. It is intended to carry out the assessment on the metropolitan city of Izmir, where a comprehensive policy package was introduced to improve public transport under the title “Transformation in Transportation Project”, comprising fare and pricing policies, modal reorganization and integration, and a new yet small-scale light rail system.

The thesis begins with describing indisputable positive effects of public transport usage on urban sustainability, using results and conclusions of international study groups, case studies and implementations. It attempts to show the role public transport improvement and fare policies can play in solving conflicts and failures of urban transportation system by methodical evaluation of international achievements, national policies, their local reflections to local government implementations. Study phases and their contents are illustrated in Figure 1.1.

A brief historical development of urban transportation and public transport is given in the first chapter illustrating developments from the 1950's to present with a number of distinct stages. After introducing public transport development strategies in general, transport system and network development is discussed briefly. Public transport mode choice and system investments are examined in terms of their demand levels, costs and efficiency. After system development approaches management approaches are handled under two categories "Transport Demand Management" (TDM) and "Transport System Development" (TSM). These approaches focus on how existing transport infrastructure can be used more efficient and more effectively through physical and demand management arrangements. Fare and pricing policies under TDM section and Modal Integration under TSM section are emphasized as the most effective ways for influencing demands and using capacity more efficiently.

The methodology used for assessing and evaluating Izmir implementations as a case study is explained in the third chapter. Research proposal is described specifically after clarifying the aim of the case study. Methods of measuring benefits are defined according to different stakeholders affected from public transport arrangements in the city. Required data is identified after defining the indicators and selecting the case study.

Characteristics of main urban transport components, public transport system, fare structure and policies in Izmir Metropolitan Area are described for periods before and after the “Transformation in Transportation Project” in the fourth chapter.

Components and implementation stages of the “Transformation in Transportation Project” are described together with the assessment and evaluation of the project benefits through previously identified indicators in the next chapter.

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The last chapter contains the conclusions of the thesis study with comparison of resulting benefits of the case study with other implementations described in chapter two. The study concludes with proposals and recommendations for improving the implemented scheme after evaluation of strengths and successful components as well as deficiencies and shortcomings of the project.

Main tasks of the thesis are shown below at Figure 1.1.

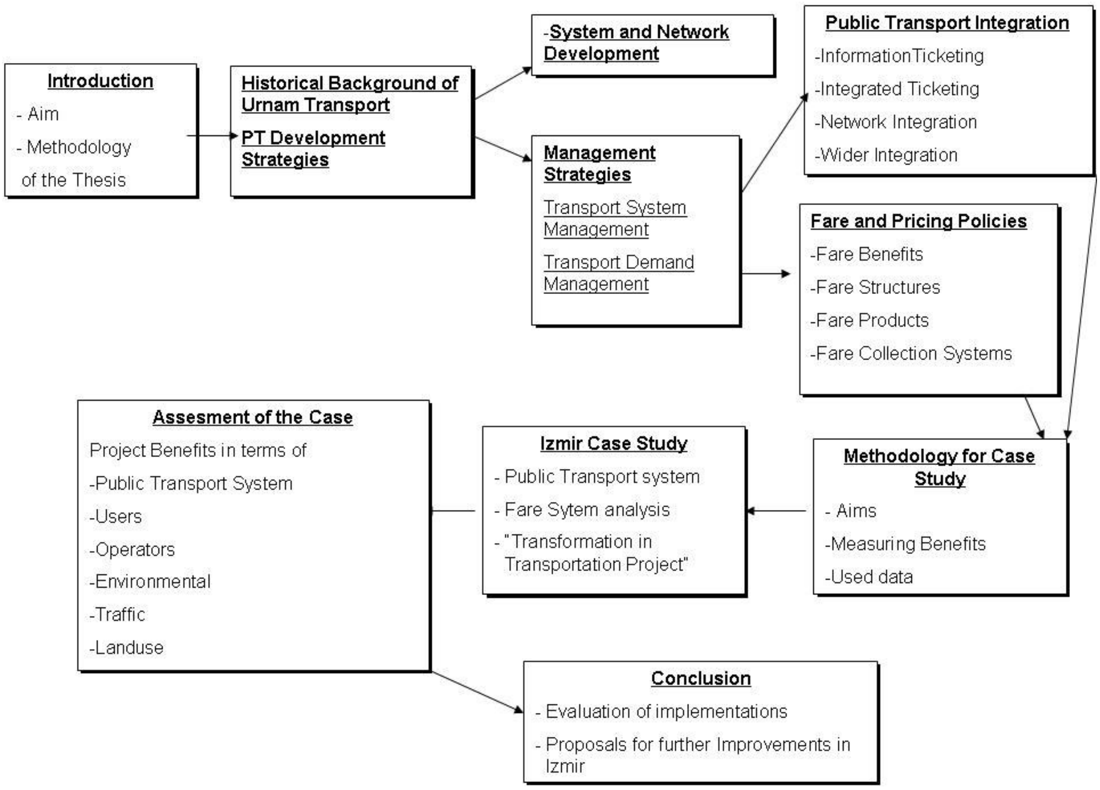


Figure 1.1 Main Tasks of the Thesis Study

CHAPTER 2

URBAN TRANSPORT BACKGROUND AND EFFECTIVE TRANSPORT PLANNING APPROACHES

2.1. Historical Background of Urban Transport

Rapid growth of car ownership and usage have become the major urban transport problem in many countries in the world. The problem started in the 1950s, when car ownership became widespread along with industrialization. Urban development started to be shaped and planned to answer the needs of car-based suburbanization in these years. This was the consequence of conventional approach in transport planning, which considered solving the urban transport problems only with physical aspects and proposed new road infrastructure and road building in order to cope with the growing travel demand. Since traffic congestion was not at critical levels yet, car drivers could easily drive in traffic and park their cars without being affected by any traffic management and parking restrictions. Tramway lines were torn off to create additional capacity for cars and parking areas were built in central areas of the cities. Public transportation systems deteriorated in most of the cities around the world and especially in the North America.

Main deficiency of the conventional approach was its ignorance of social and economic aspects of urban transportation (Grey, 1975). Transport behaviors are seriously affected by the social and economic conditions. Criteria like income, age, job, education level, gender, car ownership are main components of transport planning. Capacity based approach disregarded interaction between demand and supply and other factors influencing demand. Transport plans and infrastructure decisions were given without considering the real needs and characteristics of the population at this era.

Car oriented planning approach, supporting infrastructure investments continued in the 1960s. Towards the 1970s, travel in many cities acquired an intricate position with improvement of economic situations and increased car ownership and traffic problems in cities.

Public transport passengers had to travel as stuck in buses in traffic congestion or wait hours long at bus stops. In addition to continuing of same car oriented attitude, rapid technology developments affected transport planning in a negative way. Despite the recognition that new infrastructure building efforts do not solve the congestion, transit and express roads continued to be built as solution. However, new social and economic pressures made it very difficult to tackle them through the road building solution (Grey, 1975). Little attention was given to the political and management sides of the issue in these solutions. Existing attitude; handling transport and traffic problems without taking in consideration community problems needed to be changed. Mobility had to be considered as a social need to be met in the context of vigorous and integrated attack on more pressing social disadvantages and problems found in other fields (Grey, 1975). The petrol crises in this decade also started to change official attitudes. Governments recognized the importance of developing public transport system and began to implement projects for high capacity and quality public transport. However, investments for building new roads and increasing capacities through additional lanes on existing roads still continued in this decade.

In the 1980s, public authorities began to realize that building new transport infrastructure poses new demand. They switched their interest from large capital investments to low cost projects. In addition, environmental concerns and an increasing policy orientation towards sustainability had an important impact on transport. It has been recognized again that the most effective and sustainable solution for urban transportation problem is the development of public transport systems and supporting it with deterrence for private car use and ownership by providing safer and more comfortable public transport services. Primary objective was maintaining and improving existing systems and operations, although many cities also experienced construction of new urban rail systems. Investment for public transport systems, and arrangements for improving the speed, comfort, reliability and service quality of these systems have today become policy priorities over investments for building new roads.

After the recognition that new road investments can not alleviate urban traffic problems, demand management and system management have become a part of transport policy in urban areas during the 1990's. "The new policy toolbox includes pedestrianization, traffic calming and traffic management aimed at maintaining a quality margin of reliability by reducing flows to significantly less than capacity" (Goodwin, 2004:11). In general terms, these strategies attempt to solve urban transport problems with more efficient use of existing capacity, rather than any further additions to the existing road network.

In the 2000s, sustainable transport has become a key issue in urban transport policy. In most countries, national policy documents incorporated the need for, and principles of, making transport more sustainable in environmental, economic, and social means, the three dimensions of sustainability, all of which point to the advantages of public transport for helping reduce pollution and emission, fuel consumption, and providing affordable and accessible transport for all. In addition to national policy documents, various supranational policy papers today provide principles and guidelines for sustainable transport. European Commission's White Paper for transport, which was released in 2001, is one of the leading examples. In order to achieve sustainability in urban transport, traffic congestion has to be decreased in urban areas. Demand and passengers should be redistributed among modes by shifting balance from road transport. For this aim, quality improvements should be made on public transport as well as demand management strategies, effective charging, integrated ticketing and continuity of journeys should be provided for ensuring regulated competition between modes.

Increasing importance of public transport improvement and main strategies are briefly explained in the next section. After drawing a general framework of these strategies, integration and fare policies are discussed in detail in the following chapters.

2.2 Public Transport Development Strategies

Need for extended public transport network and services are growing as cities get larger, crowded and human activities became more complex and dense. “Many cities have reached a size and level of traffic demand that justifies more reliance on transit, including many areas previously classified as suburban that are becoming more urbanized, and so experience increased congestion, commercial clustering, increasing land values and parking problems that make transit cost effective” (Littman, 2006: 4).

Increasing automobile dependence creates various problems for urban life such as traffic congestion, air pollution, extended travel times and delays, safety problems and accidents. Extension of public transport networks and increasing usage of public transport are accepted as the most effective way for decreasing congestion levels created mostly by private car use. Public transport capacities can be increased by introducing various systems into the operation. As new higher capacity public transport systems begin to operate, congestion along their routes can be diminished. However, planning and development process is not ending with introducing new public transport systems in to operation. Transport system management and demand management processes are needed for improving present and newly introduced systems and services.

Transport System Management focus on improvement of transportation system performance with measures implemented on the supply side; transport networks, services and operations. These measures include several physical and operational improvements on existing modes, integration of modes, operators and services including private cars, bicycles and pedestrians. Transport System Management (TSM) intends to improve performance of the system at various levels; services, operators and modes and as well as the transportation system as a whole. “Integration” becomes a keyword for TSM measures where improving performance of the whole system where seamless services are offered to travelers in multi modal and multi operator environments.

Travel Demand Management on the other hand focuses on supply side of transportation with the aim of reducing motorized travel demand and directing demand to more efficient modes namely from private cars to walking, biking and public transportation. “Demand management” indicates several actions and strategies to influence demand, firstly satisfying it with non-transport measures such as telecommunications, tele-working, relocating jobs at the walking distance of residents, etc. Secondly, TDM intend to balance the use of the existing capacity by shifting demand from private car to non-motorized modes and public transport modes using various measures.

Public transport system improvement strategies will be discussed in the following two subsections for public transport system planning and development with new investments to create additional capacities and public transport management strategies using low cost management strategies. Two of the management strategies, multi modal integration and public transport fare policies will be discussed in detail in the following sections.

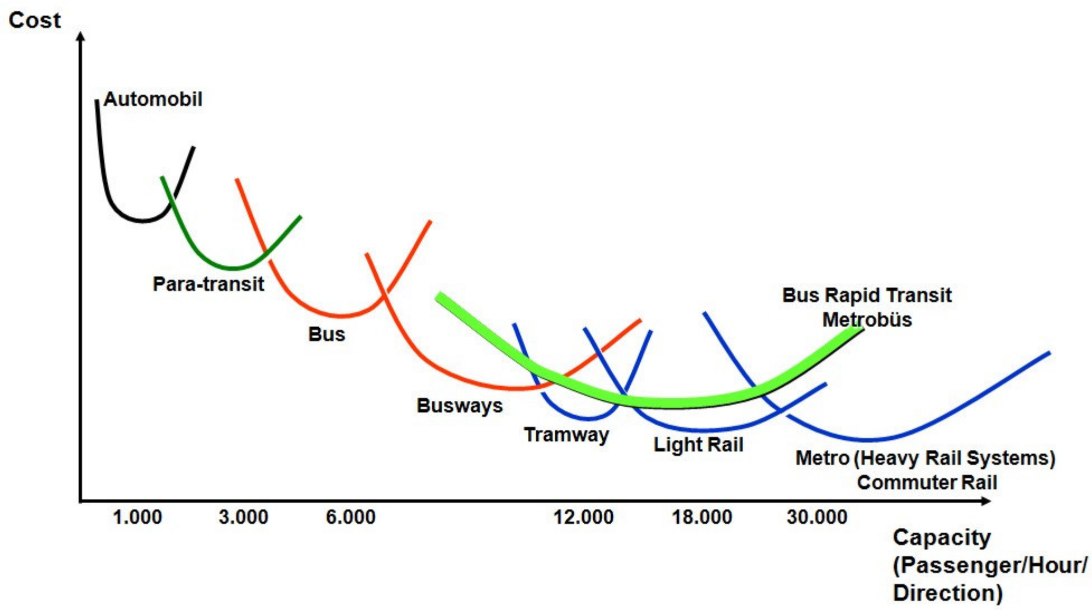
2.2.1 Public Transport System and Network Development Strategies

Various highway, rail and maritime public transport modes are operated together to respond to the travel needs of citizens depending on the geographical and historic characteristics of major cities. Land based transport modes are divided into two main categories as highway and rail based systems. Highway based urban public transportation modes include various sized bus systems operating in mixed traffic or reserved right-of-way while rail based modes consist of tramways operating in mixed traffic environments and light rail transit, metro and commuter train having reserved right-of-way for operations.

Maritime public transport modes operate with varying sized vessels among piers defined according to characteristics of demand on routes between origins and destinations. Maritime transport is an opportunity for coastal or riverside cities assuring operation independent from highway motor vehicle congestion and land limitations.

Each transportation mode has different operational and technical characteristics. They are planed and are operated on different corridors of cities to serve different demand levels. Urban public transport can be evaluated as a complex machinery with many components each fulfilling a specific role and working in harmony with each other for a system objective. As Litman indicates, there is a growing realization among transportation professionals and much of the general public that there is a value to having a more diverse transportation system (Littman, 2006: 4).

Classical buses on mixed traffic can serve efficiently to demand levels of 4000-6000 person / hours in one direction. This level can be increased to 30.000 person / hour with physical and operational measured such as busway or bus rapid transit (BRT: metrobus) operations. Tramways, light and heavy rail systems are operated on rails with fixed routes serve to demand levels above 10,000 person / hour (Figure 2.1). Heavy rail systems have certain advantages over light rail and trams in terms of operating speeds and capacity in large metropolitan areas with higher passenger demand (UA, 2006). However, construction of heavy rail system involves high costs; therefore it is economically inefficient for urban corridors with low or medium demand levels.



Source:UA (2006: 36)

Figure 2.1 Public Transport Modes and Capacities

Each transport mode need to serve at a corridor with demand level appropriate for that specific mode on different parts of a city. High speed and high capacity rail systems with long distance between stops depend on lower capacity feeder modes such as buses and bicycles to increase their catchment area since adequate number of passengers cannot reach to the stations within walking distances. Therefore, it is particularly important that these modes are efficiently integrated to gain maximum benefit (Litman, 2006). There is growing appreciation of potential benefits from integrating transport and land use planning to create more accessible, multi-modal communities. Transit options might include small, medium and large service improvements, plus transit improvements combined with various support strategies such as ridership incentives and transit-oriented development (Litman, 2006).

Multi modal integration issues will be discussed in more detail in the following sections.

2.2.2 Public Transport Management Strategies

Transport management strategies are policies and measures focusing on increasing efficiency of existing public transport infrastructure, facilities and other resources including lines, vehicles and staff instead of creating new and additional capacities. This approach has two distinct strategies, each are dealing with different end of the transportation; demand and supply.

2.2.2.1 Travel Demand Management (TDM)

Travel Demand Management (TDM) is use of incentives, disincentives and other market devices to shift travel in towards non-motorized or higher-occupancy modes, to reduce or eliminate the need to travel onto less congested routes (Wisconsin Department of Transportation, 1994: 2). The main goal of TDM programs are, reorganizing mobility needs of people and decreasing traffic congestions by influencing demand and for this reason, it uses strategies for shifting demand to more productive modes and away from private car use. TDM measures include a variety of instruments, focusing on different components of urban transport systems. They range from shifting demand to less congested time periods to shifting demand to alternative modes; i.e. public transport, cycling and walking.

In order to make the alternatives sufficiently attractive to encourage their use, it is necessary to consider various inducements that can cause the traveler to re-evaluate his/her choices. The inducements range from “incentives” (carrots) to public transport users to ”disincentives” (sticks) for private car users and range from national and local support actions to the alteration of existing travel time and cost relationships (ITE, 1993).

Demand management is necessary for making economies more effective, reducing environmental damage, and improving the quality of life. There are practical and proven methods of achieving it, using pricing, planning, market and political levers. It is important that these levers should be used in combination, and should be consistent with each other for full effect (ECMT, 2003).

TDM Incentives and Disincentives

Substantial portion of TDM measures serve the aim of changing people’s travel behavior to use more effective transport modes. Several factors influence travel behavior of people. Among these factors, it is often stated that measures that bring financial advantages to using public transport modes can be more effective in attaining the desired aims than other more arbitrary criteria like comfort and speed improvements.

There is also the concept that road users who contribute to congestion are a cause of additional costs to society and if they were to be charged for these costs, some would travel at different times, by different routes or by different means, and congestion would therefore be reduced (O’Flaherty, 1997). In travel demand management approach; not only private car travels are perceived as the cause of congestions, delays and crowding but also all human activities requiring any transport mode fall in the scope of transport demand management and are aimed to be shifted to less congested modes, routes and times. Several physical, fiscal measures and other management tools are used in order to direct demands to underused alternatives, which are often more sustainable forms of transport (Table 2.1).

Table 2.1 TDM Measures Evaluation

	Physical	Fiscal Measures	Management
Reducing Travel	Land-Use Planning		Tele working
Changing Travel Corridor	Bus Lanes Pedestrian Improvements	Congestion Pricing User Pricing	Mobility Management
Changing Travel Time		Time of Day Transit Pricing Congestion Pricing	Free Work Hours Extended Work Hours Staggered Work Hours
Change in Mode	Parking Management Bicycle Parking Bicycle Roads	Congestion Pricing Park & Ride Vehicle Tax Pay-As-You-Drive Insurance Distance Based Pricing	Mobility Management Car Sharing Modal Integration Walking And Cycling Encouragement

Public Transport Fare Policies

Since travelers are highly sensivitive to costs, pricing and fare arrengements are most effective means among TDM Measures for influencing demand. Role of public transport fare policies are discussed below in section of 2.4.

2.2.2.2 Transport System Management (TSM)

Similar to TDM strategies, the objective of TSM is to improve the efficiency of existing transport system. However, TSM use more physical measures to optimize the use of existing infrastructure. Wide ranged TSM strategies include initiatives such as modal reorganizations, route restructuring, transit priority facilities and measures, intelligent transportation system strategies, reserved bus lanes and bus rapid transit arrangements, park-and-ride facilities and other physical and operational arrangements increasing system efficiency.

Modal integration has increasing importance in larger cities that have complex multi modal public transport systems. Urban transport systems are composed of various transport components, such as, pedestrians, cyclists, private cars, public transport buses, rail systems, maritime modes etc. These components should be analyzed correctly and must be integrated to each other, in order to have continuous and seamless urban transport system.

Modal Reorganization and Route Integration

Integration in transport means providing continuity between transport components through management and physical strategies. Modal reorganization and route integration are crucial especially for cities that have multi modal public transport network. Integration between public transport modes should be achieved in order to provide continuous travel facilities without having delays and traffic congestion. However, modal integration term is not limited to public transport. Facilities to promote transfers from/to private cars, bicycles and pedestrians fall within the term integration. Modal reorganization and route integration strategies and principles are examined in more detail below.

2.3 Public Transport Integration

Public transport brings convenience in urban life for travelers. Integration is important to achieve an efficient transport system for operators and system management. Better integration between public transport services would increase passenger figures. There are several recommendations about how this might be achieved including through-ticketing, unified bus and rail timetables, and better links between urban and rural areas. (Litman, 2006). Levels of integration are defined by University of Oxford Transport Studies Unit in four categories considering integration instruments included and the context of integration:

1. **Integrated information on routes (such as common maps, etc.), timetables and fares:** Information integration is an attempt to inform citizens about transport services and facilities. At this integration level several instruments such as brochures, maps, bulletin boards, announcements on TV's and radios about time tables, fare and routes are used in order to inform people. One point that should be noticed is that urban public transport should be perceived, as "one" and information of any mode should be gained at all public transport services.

   University of Oxford Transport Studies Unit describes this "Integration of information" level as "lowering the barriers to utilization". However, this level does not include any transport planning or modal/routes arrangement study. . It is focused on communication and marketing.

2. **Integrated ticketing (total or partial, such as limited to seasonal passes), availability of tickets (points of sales) and integrated fares (partial or integral):** This level aims to eliminate obstacles in front of public service use. Integrated ticketing means that

all public transport operators use the same or compatible payment media on their services. Thus, fare media can be bought at from public transport service providers and can be used at whole public transport network for payment. This is an issue which can be achieved with only operation of same payment media. On the other hand fare integration have a wider content. Fare integration attempts to collaborative operations of different public transport service providers, which include by elimination of “fare difference between similar journeys which are given by single or multiple operators”.

For example, the introduction of a common ticketing arrangement between bus and rail transport operations in London is estimated to have increased the patronage of public transport by about 33%. (http://www.worldbank.org)

In Turkey too there are examples for integrated ticketing. Ankara Greater Municipality has a limited integrated ticketing system on its two rail operations (Ankaray and Metro) and municipality bus operation (EGO). Same magnetic card can be used both on Metro system and municipality buses and it allows to a free second journey in one hour after fare deduction from the card. However, this fare technology does not cover all public transport providers such as privately operated public transport buses, minibuses (dolmus) and commuter railways so it can not be evaluated as a full ticketing system integration.

3. **Network integration, both at the planning stages and at the operational stage (such as guaranteed interchanges), but also in terms of the co-ordination of infrastructures and main interchanges at the investment stage:** At this stage integration have planning scope both for existing infrastructure and further investments. Routes, fare tariffs and time tables are arrenged in order to respond transport demand by directing it to high capacity and underused modes

like rail system and maritime transport. Planning of integration facilities has significant role especially on high capacity investments with high costs. Urban rail systems require large numbers of passengers which cannot be found within walking distance of stations. Rail passengers typically depend on buses or cycling as feeder modes. Therefore, it is particularly important that these modes are efficiently integrated to gain maximum benefit. (www.worldbank.org)

In Turkey, the city of Izmir underwent several inteegration studies since the begining of "Transformation in Transportation" project in the late 1990s. In this project, the previously underused Maritime transport, newly inttroduced light rial system and further investment in Aliağa-Menderes Regional Railway Line are planned to be integrated with the existing bus system. In order to begin this planning phase of integration ticket and fare integration is implemented on exiting modes. Public transport of Izmir has gained advanced integration level with this comprehensive project, which will be examined further in Chapter 4 and 5. It is one of reasons why Izmir is selected as case study in this thesis

4. **Wider integration.** Wider integration includes integration with non-public transport modes. Park and ride arrengements for private cars, parking management and integration with alternative modes such bicycles and pedestrians are important at investment, planning and operational stages. In addition, transport planning is an issue which must be evaluated in relation with urban planning and other social polices.

2.4 Fare and Pricing Policies in Transport Planning

Pricing and fare polices in transport have a wide context which includes actions both at local and national government levels. However, focus of this thesis will be on public transport fare policies of local governments. Detailed information is given about public transport fare implementations examining public transport fare structures, fare types, and pricing instruments used in the transit market with possible effects on various components.

Urban dwellers face up traffic congestions and spend considerable time and money in traffic today. In addition, they are exposed to noise and air pollution in increasing amounts day by day. It is accepted by everybody that people should leave their cars and begin to use public transport more to make cities livable. “People usually can not behave for public benefits when there’ll be no limitations or any order. If it is left to their choice, it seems the easiest and most convenient way to have a private car and every day to park in front of the house and workplace” (Litman, 2006). Pricing and fare incentives (and disincentives) are among the most effective tools in managing transport demand and patterns. Travelers are generally very sensitive to the total costs of the travel.

National governments use various instruments (fuel taxes, private car insurances and taxes, road pricing, etc.) in order to manage car ownership and usage. On the other hand, there are different methods, which local governments adopt to cope with traffic growth. Congestion pricing is a striking example of a disincentive for private car use. London has been implementing congestion pricing in central area of London since 2003. Motor vehicles must pay a cash amount (£5 in 2003, increased to £8 in 2006) in order to enter central zone on weekdays between 7:00 am and 6:30 pm. As Banister (2005) indicated, 50,000 (16 percent) fewer cars are entering the charging zone, with many switching to alternative public transport and other modes that are exempt (taxi, cycle, motorcycle), from the charge, or diverting from the zone. Bus services are more reliable because of reduced congestion (TfL, 2003).

Parking management and pricing is another instrument that attempts to decrease private car usage and congestions in central areas. Through promoting park and rides at city belts with creation of parking areas and parking price incentives, people can be attracted public transport.

Public Transport Fare policies also have an important role in increasing public transport ridership. Components of public transport and their relationships are discussed in detail below.

2.4.1 Public Transport Fare Policy Benefits

Public transport has a vital role for urban transport since it decreases traffic congestion through offering mobility facilities to population, and improves livability of cities. Integrated ticketing increases public transport travels in addition to enabling implementation of several fare policies. Benefits vary according to level of integration. An advanced integration level brings wide ranged benefits both for operator, for consumer/community, for environment and urban development. These benefits, which are emphasized by Grey (1975), Vuchic (2005) and Litman (2006), are summarized below.

2.4.1.1 Consumer/Community Related Benefits

- Consumer cost savings can be obtained with fare integration, since people begin to pay for real costs of the public transport service they use like distance they travel.

- Travel opportunities can be improved especially for non-drivers and disadvantaged groups such as the old young, the poor, the handicapped, and those without full time access to a private car.

- Private car users would be exposed to a lower level of traffic congestions.

- Overcrowdings on transport vehicles can be reduced during the peak hours with implementation of time of day based fare system.

- Frequency, speed, reliability of public transport services can be improved.

- Buying and validating process of fare media become more convenient and easy through electronic fare collection and card installation facilities.

- Free or reduced car, motorcycle and bicycle parking opportunities can be offered at public transport transfer points in order to promote transfers to Public Transport

- Pedestrian safety and fitness can be improved.

2.4.1.2 Environmental/ and Urban Benefits

- Energy conservation and pollution reduction can be achieved, as private car users prefer public transport.

- Alternative land use aims such as sprawling and compact land use effects, can be reached through public transport fare policies according to them being distance-based or not.. In the long run fares often have significant impact on the form and development of central cities and their surrounding area and suburbs.

- Fare incentives and disincentives can be used by planners in order to direct movement to strategic centers

- A distance-based fare system can encourage geographically more compact communities requiring less reliance on motorized and especially private transport

- Traffic congestions and waiting times can be reduced, if public transport usage is increased through fare incentives.

- Air pollution, noise and visual intrusion can also be reduced if traffic is reduced.

- Land consumption can be reduced and green space preservation can be provided if the fare system can help control urban growth.

- Number of Traffic accidents can be reduced, pedestrian safety can be improved, if reductions can be made in motorcar traffic through fare incentives and disincentives.

2.4.1.3 Operators Benefits

- Public transport fare arrangements can maximize revenue, minimize unit cost and of operation, conserve energy through efficient use of scarce capacity

- It can also preserve flexibility for adjusting fare levels to meet new revenue targets or market demands

- Access to information about passenger travel information is maintained through an advanced fare system. Thus, efficiency of ticketing/fare collection and public transport services will be improved. Incentives to improved management performance can be maintained.

- Fare collection system can facilitate one-man bus operation and alleviate staffing difficulties.

- Crucial deficiency of paper ticket system; fare evasion and fraud, can be eliminated with implementation of electronic fare collection system

Definition of Fare policy

Economic, social and operational objectives and requirements cannot all be achieved simultaneously since some of them are mutually conflicting. For example, in order to ensure equity for disadvantaged people, public transport fare levels should be decreased to a minimum level; however this would result in operator loss or service quality decreases. Compromises must be found between conflicting objectives. Therefore local authorities should assess their own specific conditions, aims and needs to define proper fare policy, which suits their situation.

Grey (1975) defined methods for best policy selection as fallows;

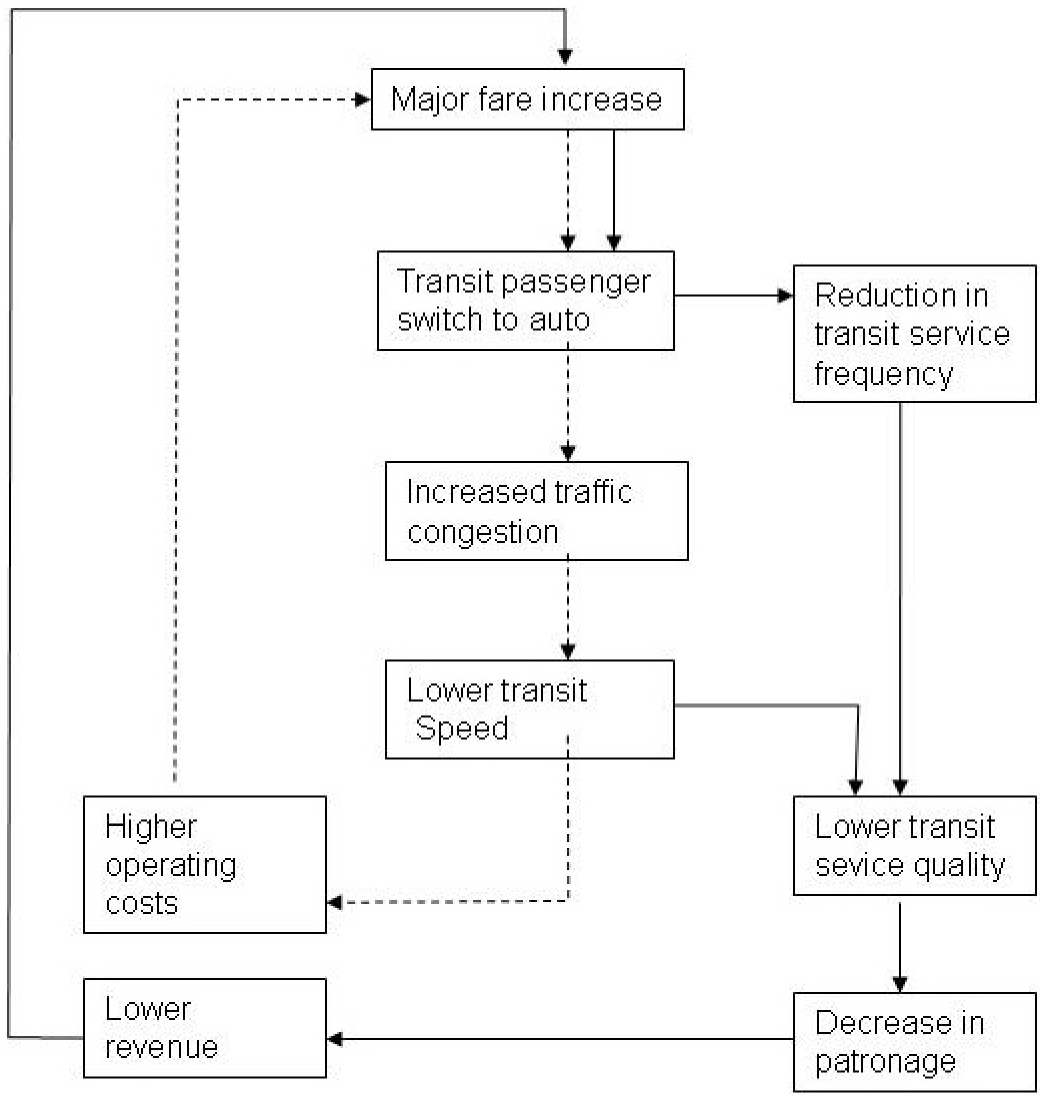
a. To choose one of the most important objectives and threat others as constraints.
b. To convert several objectives to a single one by assuming a predetermined trade off between them
c. To search for solutions which are satisfactory or good enough rather than optimal

In order to derive a political decision social aims can be considered more important than economic benefits. “In particular, the objectives of attracting passengers in order to increase the mobility of the population, increase job opportunity or access to schools by students, reduce traffic congestion, and make a city more livable are in most cities considered more important than collecting maximum revenue.” (Vuchic, 2005: 375)

2.4.2 Public Transportation Fare Systems

Public transport has a vital role for urban transport since it decreases traffic congestion through offering mobility facilities to population, and improves livability of cities. In order to attract passengers to public transport, fare arrangements are used widespread. Characteristics and objectives of transportation pricing policies are already discussed above in general. In addition to these features, public transport fares have some differences in implementation process.

In most cities that have rational transportation policies with positive treatment of transit, the objective of attracting riders is far more important than maximization of revenue (Vuchic, 2005). Appropriate fare structure and fare level is decided for public transportation system within these political decisions after the selection of a policy. Since transport users are affected directly by prices, a major increase in transit fares will result in passengers choosing to use their cars in urban transport. Higher car use will have the result of more congestion, longer, lower transport speed, and longer drive time. On the other hand, public transport will have lower revenue in long term because of passenger loss, lower service quality and frequency. Vuchic (2005) emphasizes this relationship between transit fares and transit system components such as revenue, costs, travel time, service frequency. (Figure 2.2)



Source: Vuchic (2005: 375)

Figure 2.2 Two vicious circles caused by fare increases

The starting point of the cycle is more different in Turkish Cities than US cities. Number of people who use cars for daily commuting trips is growing which results with extreme traffic congestion. However, main criterion for selecting car for daily travel is not only high transit fares. There are insufficient transit planning arrangements, lower service quality and lower transit speed, longer travel times etc., as well as a general pro-car attitude in road planning that results in favorable conditions for car drivers. Here, transit fares can be used not only with its quantitative meaning, but as a political manner in order to improve transit system operation and attract new passengers for using public transport. A reliable, convenient, efficient transit system will constitute an alternative for car use and attract users for using public transport.

Public Transport Fare policies have an important role in increasing public transport rider ship. The amount of fare, its relationship to distance traveled, integration between different transport modes, quality of service facilities, and convenience of payment influence use of transit.

In addition to the increase in rider ship, as Vuchic (2005) emphasized, fare types and collection affect efficiency of operations. As operations improve, convenience and reliability increase and consequently rider ship increases too. Fare Components and their relationships are summarized below at Figure 2.3. Defining general objectives for Urban Transport will shape subsidy instruments like general government or local government subsidies. General pricing policies (vehicle fuel taxes, insurance costs) and local government pricing (congestion pricing)/public transport fare policies are defined according to general pricing objectives and subsidy instruments. Public transport operation objectives are set after defining urban transport operation objectives. After definition of public transport fare policies; available fare structure, types, fare technologies and by products of the technology will finally shape fare structure. Both pricing and fare policies result in above stated benefits for user/community, for environment/urban development and for operator.

Fare structures, fare types, fare products and fare technologies are discussed below in the following sections.

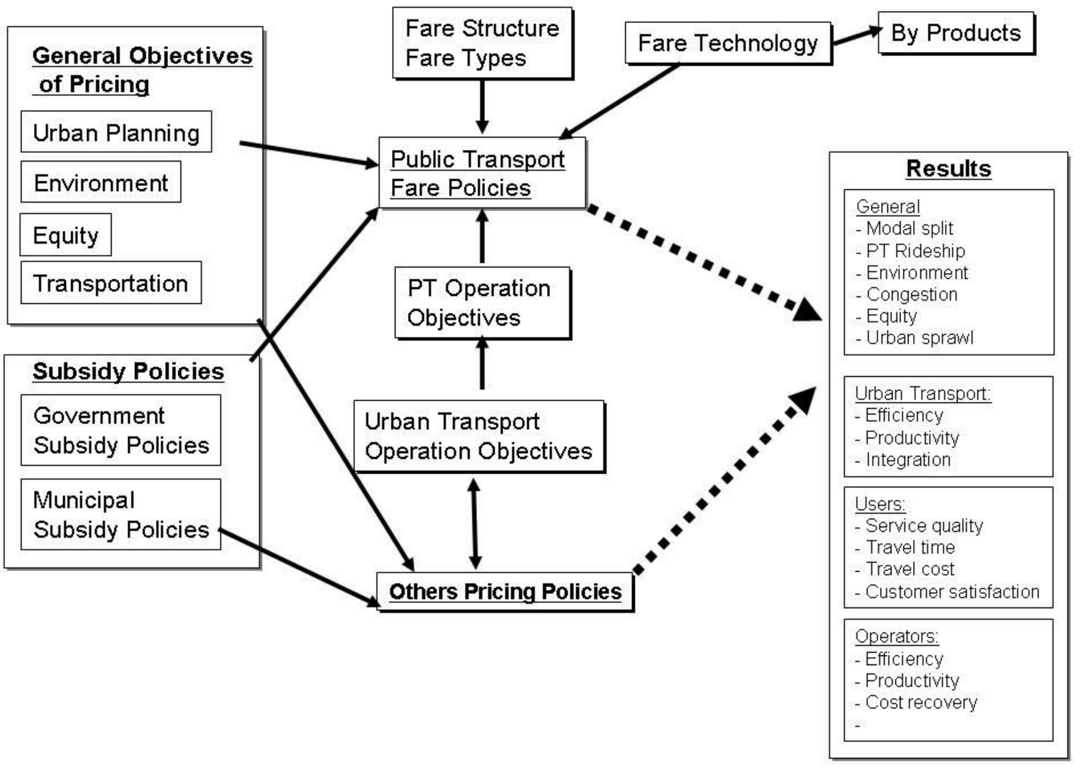


Figure 2.3 Components of Fare System

2.4.3 Fare Structure

Fare Structure is the way which fares are paid. Fare structures can be categorized under two general categories as flat and differentiated fare structures. In flat fare structure, riders are charged the same fare regardless of length of the trip, time of day, speed or quality of service. Alternatively, fares can be differentiated by one or more of these parameters, resulting in distance based or zonal fares, time based (peak/off-peak) differential, service based differential. Basic characteristics, advantages and disadvantages of different methods and technologies will be discussed here.

2.4.3.1 Flat Fares

A predetermined amount of fare is charged for every boarding of each vehicle in the system. The same fare is paid regardless of the distance traveled, quality of service offered and the time of day the travel is made. The same amount of fare (flat fare) is applied for all vehicles and all lines of an operator or all operators of an entity if integration among multi operators exists. Fare collection can be made in vehicle, at exit or entrance of vehicle at the station.

Flat fare is the simplest type among all other fare structure alternatives since it offers several advantages. Easy comprehension of users can be achieved with simplified tickets and fare level changes can be easily applied. However, it has various disadvantages too, such as inflexibility of not allowing any fare differentiation of the travel distance, travel time and service level. It is most appropriate fare structure for networks, where trip lengths do not vary, where travels do not have peak crowded hours and where service qualities do not differ.

In multimodal systems, the flat fare scheme can be supported with free transfer possibility to other vehicles in combination. Transfers between different tips are limited usually with number of trips or time between two travels (for example in one hour).

In many cities, flat fares are preferred as fare structure predominantly since it is convenient both for passengers and for operators to understand pay and handle. However, flat fares have several drawbacks in large cities (Vuchic, 2005). White indicated the drawbacks of flat fares as follows:

“Where a flat fare is charged each time a passenger boards a vehicle, the cost to someone making a linked trip becomes very high, increasing by the whole flat fare system makes it easy to incorporate a transfer facility, by permitting unlimited transfers within a given period, the time of issue being printed on the ticket. “ (White, 2002)

2.4.3.2 Differentiated Fares

a. Graduated Fares (Distance Based Fares)

The basic feature of graduated fares is the travel charge differentiation related to distance traveled. The amount of the distance fare is accumulated amount of the basic unit fares for traveled unit distances. The unit can be composed according to kilometers traveled or blocks of unit distances (zone or stages).

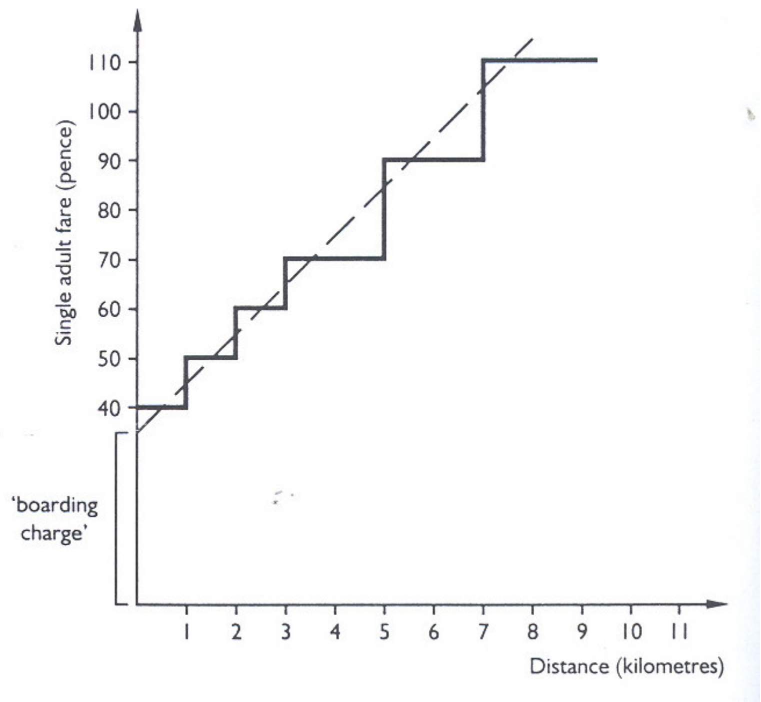
Kilometric Fares:

The kilometric fares are not directly and easily applicable for the public transport serviced due to the practicable considerations of fare collection technologies and complexities of urban trip behaviors. (IsGM, 1994)

Stages Fares:

Travel distances of routes are divided blocks or stages based on a unit distance without any geographical zones in the “stage fare system”. The unit stage distance may vary slightly for social, marketing or practical reasons at the city center and periphery of the city. The stage fare system intends to solve inequality of flat fare and zone systems related to the travel distance. Graduated fare scales are illustrated below at Figure 2.4

In practice, perfect graduation is not attainable. Although for railways station-to-station prices can be set, for bus services there are too many stops to make this practical, and stops are grouped in to stage-to stage basis. (White, 2002)



Source: White (2002:116)

Figure 2.4 Graduated Fare Scales

The Dutch "Strippemn kaart" prepaid ticketing system displays this feature, as minimum of two strips must be cancelled on boarding the vehicle then a further strip for each zone boundary crossed. (White, 2002)

Zonal Fares

Zonal fare system is a variation of distance fares. In this fare system the city is divided into several zones, with fares at a flat rate for all travel within designated number of zones and extra charges made for crossing the boundaries.

However, passengers making short trips but crossing the zone borders have to pay two zone fares, while long trip making passengers in a fare zone pay only a single fare. (IsGM, 1994) Nevertheless, the systems discourages long-trips within the urban area, and hence help reduce trip distances and overall emissions, as well as help land-use strategies, such as limiting growth at boundaries.

b. Time-of-Day Pricing

Time-of-day pricing refers to charging more at peak hours or charging less at off-peak hours. If the travel begins or ends in defined peak period, higher travel fares must be paid than those at the off peak hour. In London, if the payment is made with Oyster Card during the off-peak hours, fare discounts can be received between 0.20 and 0.70 £ varrying according to distance.

c. Quality of service pricing:

Various fare levels are offered at various qualities on several special routes or lines. The main aim of this service type is to encourage car drivers to leave their cars and use public transport. Reliable, frequent, high quality public transport service should be given with definite time schedules so that it can constitute an alternative to private car travels. Non-stop bus/rail services with high fares between suburbs and city center can be classified as quality of service based pricing; while similar service on the alternative bus/train lines having various stops would charge lower fares. However, it does not include a special service on the whole or large part of either the road or the rail network, on the grounds that this would lead to such a large diversion of passengers from the other public transport services as to make it an impracticable proposition (Grey, 1975).

2.4.4 Fare Marketing Types

Each of these pricing alternatives could be implemented via differing amount and styles of purchase. Generally, high amount purchases provide substantial discounts. Main methods are;

1. **Single Tickets** are sold for one trip.
2. **Multi journey Tickets,** sold in books or strips of single tickets
3. **System Passes** allow unlimited travel on any vehicle in the system during period of validity of ticket.
4. **Period Passes (Season Tickets),** valid for certain period for any predetermined or unlimited number of journeys between two defined points of system
5. **Special User Groups:** no charge for all children between certain ages, discounts for students, retainers

2.4.5 Fare Collection Technology

Fare collection system is the medium, which constitutes a contract between passenger and operator at each use of the transport services offered and used. A proof of payment by a media is usually needed for different operating reasons such as:

- to measure the amount of fare which may not be defined at the beginning of the trip or control trip distance
- to prove that the passenger is entitled for a bonus at a transfer trip
- to control that time duration is valid
- to prove the payment since the seller and operator are different parties in most cases

Various fare collection media is used in public transport services of many cities in the world. Complexity of functions and technology of media is increases as city becomes larger and user preferences diversify (IsGM, 1994). Main types of fare collection systems are discussed below.

Cash Fares

Cash fare is the simplest way of payment in which passenger directly pays to the operator with money at the beginning or at the end of the trip. This type of fare collection is the easiest way for users to understand and requires the least amount of planning by passenger before boarding. For operators, it is easiest way to implement and change. However, it has several drawbacks and Vuchic (2005) stated these in three groups; first, cash handling causes security problems in high-crime areas; second it is a time consuming transaction; and third when performed on vehicle and in stations it is a process that requires safety protected procedures and labor intensive handling in offices and transfer to banks.

On the other hand payment in cash cannot be easily adjusted to various complex needs of different fare systems and pricing methods such as transfer bonuses, multi trip selling, differential pricing, etc. (IsGM, 1994). These planning arrangements bring several advantages to public transport users such as convenience and lower transport fares upon different choices of people and therefore affect public transport use seriously. Because of shortcomings and other needs of transport planning cash fares are leaving their places to prepaid fares.

Prepaid Fares

Prepaid fare provides considerable benefits to both passengers and operators. In this form of payment, since cash-handling process is performed before boarding vehicle, it brings significant time savings. Prepaid fares usually are sold at major stops or stores and often bring users a discount or a deduction when sold as batches.

Paper* Tickets*: Paper tickets can be purchased before trip, at the entrance or on board. Paper tickets are used in tree forms according to purposes and trip types.

Simple Tickets: These are manufactured in counterfoil or in other form with unique numbering for easy control and handling. Fare distinction is ensured by design, size and color. These paper tickets are used with or without manual or mechanical (stamp) for transfer inscriptions possibilities, zone or distance definition (IsGM, 1994).

Hard Paper Tickets: Also manufactured in counterfoil or other forms with unique numbering these tickets are more durable and generally pre-sold and validated by a mechanical punch with a hole or cutting a piece of the card. Fare distinction is provided by design for different time, zone or distance definition and with mechanical inscriptions for transfer facilities (IsGM, 1994). Paper ticket was a proven media being used in many cities for many years. Main advantage of paper tickets are simplicity and cheapness. However, it has many disadvantages. Paper ticket cannot be read or validated automatically and therefore they result in time losses at boarding and data collection problems. Another disadvantage of tickets is about inspection. They are subject to fraud and abuse since it is easy to falsify. (IsGM, 1994)

Tokens: Metallic or plastic tokens are also very common media for fare collection where the token is dropped in a fare box or in turnstiles at the entrance of the vehicle or platform. Since the media is left at the entrance it cannot be controlled during the trip and requires a closed fare collection system. Operating speeds of token transactions are higher than paper tickets especially where a paid area with turnstiles exits (IsGM, 1994). They can be automatically validated with mechanical fare boxes and turnstiles.

Tokens are cheap because they are reusable; however, they are not flexible for using on differential fare schemes (distance, peak time pricing, etc.) or for transfers between different travels. Another disadvantage of tokens is that recycling of tokens reduces the security and creates risks for delivery and handling.

Magnetic Cards: Magnetic card technology requires electronic validators for reading and checking the electronic data on the stripe. Magnetic cards can be automatically read and validated and enables transfer trips and fare differentiation. Automatic Data collection is possible with magnetic cards.

Electronic Smart Cards: Smart Cards contain a small embedded computer chip in it. These cards were developed to provide a data storage location that had more capacity and was less vulnerable than the magnetic stripe on fare cards (TCRP, 2003). Contact and Contactless types of smart cards can be used for public transport payments as well as park and ride lots, tolls, telephone calls or other money transactions. There are various advantages of electronic cards for users and operators.

Electronic fare card; Octopus, in Hong Kong, first began to be used at bus, rail and ferry operations, was developed for non transit use of the card, such as retail purchases (currently accepted at 300 vending machines and 160 retail establishments, including Starbucks, Watsons, 7-Eleven Convenience Stores and Hong Kong's two largest groceries), parking meters and telephone calls. (Vuchic, 2005)

User Benefits of Electronic Cards

- Cards can be reloaded easily at loading points when needed. These reloading points can be located at several places in city such as at markets, kiosk, cinemas etc.

- Multi passes can be made easily with a single card.

- In case of lost refund can be given to users if ID number is declared to Electronic Card Information Center.

Operational Benefits of Electronic Cards

- Differentiated fare structures (time of day pricing, distance based pricing, quality of service pricing, etc.) are possible with electronic cards.

- By eliminating manual travel cost collection in vehicle, maximum driver concentration to the traffic is enabled.

- Electronic Fare Collection enables considerable potential, for improving both the planning and operation of public services (in route planning) in accordance to daily statistical reports

- Fare evasion and fraud, will be eliminated with the electronic fare system

- Fuel savings can be achieved by faster fare collection

- Operational costs are reduced through staff savings

- Achieving control and operation transparency through automatic transition of fare information, which are collected in banks, to vehicle owners accounts in the following day.

- Operators' control over drivers and vehicles can be increased through vehicle tracking system

- Ticket counting, storing and pressing issues are eliminated.

2.4.6 Side Benefits of Ticketing Technologies

New media is being used at not only public transport services but at different urban services, i.e. parking areas, and commercial areas such as cinemas, theaters, etc.

Vehicle Tracking System

Vehicle tracking system is the application, which provides vehicle tracking. Position information of vehicle is determining with GPS module on the validator locating in vehicle and it is transmitted to center through GPRS Module, which is again a part of validator. Thus, real timed vehicle tracking system will be provided on the maps in computer.

Real timed vehicle tracking system is also provided on photos from satellite. This system enables message connection with vehicle and stores position information weekly, creates reports, which can compose different statistics.

Vehicle owners and bus operators have the monitoring facility of vehicle movements in real time and in past time period. Previously bus operators were able to perform this service only from central office, but now bus owners can access this data from anywhere.

Through tracking systems control over vehicles and drivers can be increased and therefore unnecessary cost can be eliminated.

Main Goal of vehicle tracking system is to decrease costs and increases the efficiency of different organizations like minibus and bus systems through real timed tracking and reporting facilities and thus profitability increases can be achieved. (www.kentkart.com)

Integrated Solutions (E-Purse)

Another aim of electronic payment system is to make the city life more convenient through applying integrated solutions and multipurpose solutions. Payments are planned to be performed with smart cards at automats on parking areas, at sport facilities, fair grounds, cinemas, buffets etc.

Passenger Information

Another feature gaining wider implementation is using electronic fare system technological infrastructure for real time travel information. With this usage travelers will be informed by a message on their cellular phone after sending a message, about bus number and time schedule at destination direction which would reduce waiting time at the stops for passengers.

Credit Card Application

This project is developed for travelers coming from out of city and using the system rarely because they usually do not have valid smart cards. Therefore, credit card reader is integrated to validators and travel cost collection is enabled through using GPRS infrastructure. (Litman, 2006)

2.5 A summary of literature on public transport improvement policies and measures

The review of the literature and previous experiences in the world show that new public transport investments or the improvement of existing ones are required in order to response increasing transport demand in urban areas. It is extremely important that any public transport investment is accompanied with TSM and TDM strategies. As mentioned above TSM and TDM strategies are effective tools for improving public transport systems. Among TSM strategies modal integration and among TDM strategies fare policies have comprehensive positive effects in increasing public transport ridership and providing environmental, operational, and land-use benefits.

Fare and integration arrangements should be planned and applied together in order to gain maximum benefits from investments. Several modal integration arrangements can be implemented if advanced level ticket and fare integration is provided. In addition, it is important to plan these arrangements before introducing new high capacity rail modes. New systems can bring maximum benefit and serve target ridership numbers, only with providing modal integration between existing transport systems and the recently introduced system. The literature shows that all these strategies, projects and arrangements bring various benefits, but that these benefits can be maximized only if these schemes are applied together as components of a comprehensive policy package. Therefore, it is important that various public transport improvement strategies, together with TSM and TDM schemes are planned and implemented in integration, so that they can support and complement each other.

CHAPTER 3

METHODOLOGY

3.1 Aim of Study

It has been shown in the previous chapters of the study that improvement of public transport systems is considered as a fundamental component of contemporary transport planning and policy-making. It is clear that public transport can be an effective tool in helping alleviate current transport problems, such as congestion and air pollution, and in contributing to sustainable transport objectives, if it can be planned and improved as an attractive transport option. This can be made by introducing entirely new systems, such as urban rail, busways, and ferries. It also can be achieved by improving the service quality of existing public transport systems, reorganization and integration of existing and new public transport modes, and implementing various fare and pricing policies that can increase the attraction of the system, while reducing the relative advantage of other modes, and particularly the car. While each one of these strategies is important and effective, it is recognized that implementing them together in a comprehensive and integrated policy package can help increase benefits expected from each measure, and enhance the success of these pro-public-transport policies.

The main aim of this thesis is to show whether such public transport improvement policies and measures can make a difference in urban transport and traffic, and contribute to the attainment of a more sustainable transport system. In particular, it is intended to assess the role of fare and pricing policies together with modal reorganization strategies in improving public transport, and increasing its rider ship.

Izmir Metropolitan Area was chosen as the study case study since a comprehensive public transport improvement project was formulated and implemented starting in the late 1990s. First, an electronic fare collection system had been introduced in 1999 and many fare structure changes had been implemented along with comprehensive route restructuring of public transport system. A light rail system was introduced in 2000 and ferries started to be operated by the local government and were organized, and hence in better integration with the rest of the local transport systems, in 2000 May. While examining the effects of new integration approaches in Izmir is a prior aim, the study also aims at examining effects of different urban transport planning and operating approaches and methods implemented in Izmir simultaneously with the fare system changes.

3.2 Research Proposal

The hypothesis of this study is that public transport integration measures together with fare restructuring and arrangements can have significantly positive effects in increasing public transport ridership, and in providing operational, environmental and land-use benefits. The benefits of integration and fare policies are attempted to be measured with Izmir Case study in this thesis.

City of Izmir has recently gone through a series of changes starting with implementation of electronic fare system application. Changes continued with bus restructuring and fare system changes both for providing integration with maritime transport and for maximizing bus system operation efficiency. Later with introducing new light rail system, bus routes are further restructured to provide complete integration with the light rail system to existing public transport network. Hence, this case provides an example where a comprehensive and integrated package of different schemes was introduced in a city to increase the ridership and efficiency of public transport systems.

3.3 Measuring Benefits

A number of criteria had been developed for measuring the urban transportation and public transport improvements and efficiency after the integration and fare arrangements on Izmir Public Transport System. In particular, these criteria focus on public transport usage changes, advantages to user and operators, environmental and urban benefits. Several indicators are defined in order to assess changes in terms of each mentioned benefits. Since the criteria contain both quantifiable and non-quantifiable values results of the case study will be evaluated with both statistical data from public transport operators of the Greater Izmir Municipality and personal evaluations of related municipality officials and public transport users/non-users, which will be derived from interviews.

In order to be able to carry out a comprehensive analysis, a framework was developed to help analyze the effects of changes in the transport system, and to identify whether certain benefits were achieved. The benefits that should be expected from a public transport improvement scheme are identified as those shown in Table 3.1. The attainment of these benefits can be tested through the analysis of a set of indicators that can show whether an improvement exists. These indicators are also shown in the table, together with information regarding the availability of data for an in-depth analysis of these indicators.

3.4 Case Study Selection

Three largest metropolitan cities in Turkey were evaluated during case study selection: Istanbul, Ankara and Izmir.

Istanbul is a metropolitan area with over 12 millions population having a metro line, two light rail lines, three tramway lines in operation in addition to

2824 public buses, 2050 private buses, 5857 minibuses, 32 ferries, 23 ferryboats, 25 sea buses and 81 km commuter lines on two continents (http://www.ibb.gov.tr). A number of new LRT and heavy rail lines are under construction. There have been several integration improvements such as feeder bus lines to serve new rail stations when new systems were introduced. However, comprehensive integration attempts have not been done in city scale for Istanbul. The city has a unique electronic fare collection technology, Akbil operating with electronic contact. Fare collection system was introduced on light rail systems and buses, later on maritime transport and recently on commuter trains for fare payment. However, integration of modes, fare collection system and fare policy measures have yet been implemented at a limited scale and are in the early stages. Considering also the various rail construction works going on in the city in the past two years, it was decided that it was early to carry out a comprehensive integration study on Istanbul.

Ankara, the second largest city in Turkey, has a metro and light rail system in operation together with public buses and privately operated bus and minibus systems. The Greater Municipality of Ankara continues construction for three metro line extensions. The city has a magnetic fare collection system used on public buses, light rail system (Ankaray) and Metro. This outdated magnetic fare collection technology is not used on private buses, minibuses and commuter line. Fare structure allows only transfers and integration among two rail lines (Ankaray and Metro) and municipal buses. Magnetic fare collection system has various drawbacks resulting from its limited data storage capacity and inconvenience of use. Route reorganizations and integration studies are limited in magnetic fare collection systems since magnetic cards do not enable differentiating fare structures. Furthermore, ticketing system of Ankara excludes commuter train service and privately operated buses and minibuses. Furthermore, Greater Municipality of Ankara has not developed and implemented a citywide integration effort yet.

Therefore Ankara has limited ticketing/fare integration and network integration (both planning and operational stages).

Izmir, the third largest metropolitan city in Turkey, has a population of about 3 millions. The city underwent several integration studies since the beginning of “Transformation in Transportation” project in the late 1990s. In this project, the previously underused maritime transport, newly introduced light rail system and future Aliağa-Menderes Regional Railway Line are integrated with the existing bus system. Before the implementation of these route integration schemes, ticket and fare integration were implemented on existing modes. Public transport of Izmir has gained advanced integration level with this comprehensive project. This public transport improvement project, which introduced a well-integrated set of different schemes in one policy-package, is the main reason for selecting Izmir as the case study of the thesis.

In addition, having maritime transport facilities, Izmir is a good case to examine the integration of different modes and utilization of fare policies to improve public transport system and efficiency.

3.5 Data

Data was available to measure not all but some of the benefits arising from the project implementation. Passenger numbers at different modes, effect of distance based service applications, travel time variations in the day, seasonal changes, effects of transfers to usage, travel durations, revenues and cost of all transport will be examined.

The available statistical data are gathered from Transportation Department of the Municipality, ESHOT, METRO Inc., and İzdeniz Inc. In order to evaluate non-statistical values, interviews were made with executive staff of these institutions.

Table 3.1 Project Benefits and Evaluation Indicators

Benefit Areas	Benefits	Indicators	Data
Public Transport System	Increase in total Usage	- Modal Share of Transport Modes in whole Public Transport System Transport Modes Ridership figures	**Available**
	Reinforcement of Underused Maritime transport	- Usages of Maritime and Other Modes after/before the Project Piers in Operation, fleet, time schedules	
	Integration of Metro to other modes	- Usages of Metro and Other Modes after/before the Project	
	Balanced Usage among Transport Modes	- Modal Usage Sharing of Transport Modes in whole Public Transport System	
Social and Economic Benefits For Users	Equity and Cost Savings	- Fare Structure Features and Fare Levels before and after fare integration and staged fare application	
	Time savings	- Waiting and Travel Times Analysis before and after the Project	
	Improved Mobility and accessibility	-Route Lengths before and after the Project	
	Improved comfort, decreased crowding	- Passengers per route km	
	Electronic fare system facilities	- Passenger satisfaction evaluation	
Economic Benefits for Operators	Increasing system efficiency and modal effectiveness	- Average daily Vehicle Kilometer - Number of Vehicle Trips -Passenger Number per Trip - Passenger Number per Vehicle - Passenger Number per Worker	**Available**
Traffic Benefits	Decreasing Congestion	- Change in congestion levels - Change in modal share of cars	**NA**
Environmental Benefits	Energy Consumption	- Energy consumption per km of service	**Available**
	Air Quality Improvement	- Change in annual CO2 levels in Izmir	**Available**
	Noise Pollution	- Annual emission levels from modes	**Available**
Land Use Benefits	More rational spatial distribution of urban functions	- Before and after Landuse Studies	**NA**

CHAPTER 4

IZMIR PUBLIC TRANSPORTATION SYSTEM: RECENT TRANSFORMATIONS AND NEW FARE POLICIES

4.1 Background Information on Izmir

General Urban Characteristics

Izmir hosts 4.9% of Turkeys total population and 13.1% of Aegean Region population, with 3,370,865 people according TURKSTAT 2000 Census results (www.die.gov.tr) (Table 4.1, Figure 4.1)

Table-4.1 Growth of Izmir Population

Year	Population
1955	910.496
1960	1.063.490
1965	1.234.667
1970	1.427.173
1975	1.673.966
1980	1.976.763.
1985	2.317.829
1990	2.694.770
1995	3.114.859
2000	3.387.908

Source: TURKSTAT (2000)

Izmir was defined as a 6th level metropolitan center along with Ankara, Izmir, Adana and Gaziantep (while Istanbul was defined as a 7th level metropolitan center; and Bursa, Konya, Eskisehir, Samsun, Sivas, Elazığ, Diyarbakır, Trabzon were defined as the 5th level urban centers) according to a study on Turkey’s Dwelling Hierarchy conducted in the 90’s by State Planning Organization (Izmir Greater Municipality, 2006).

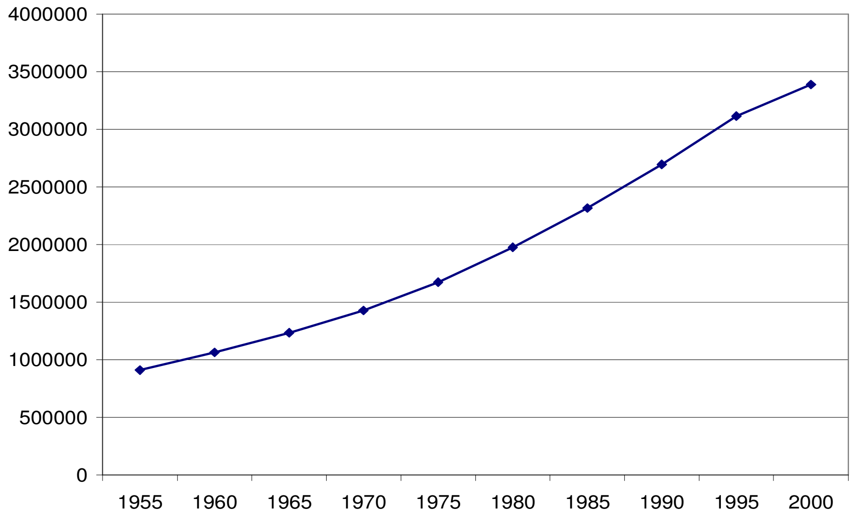


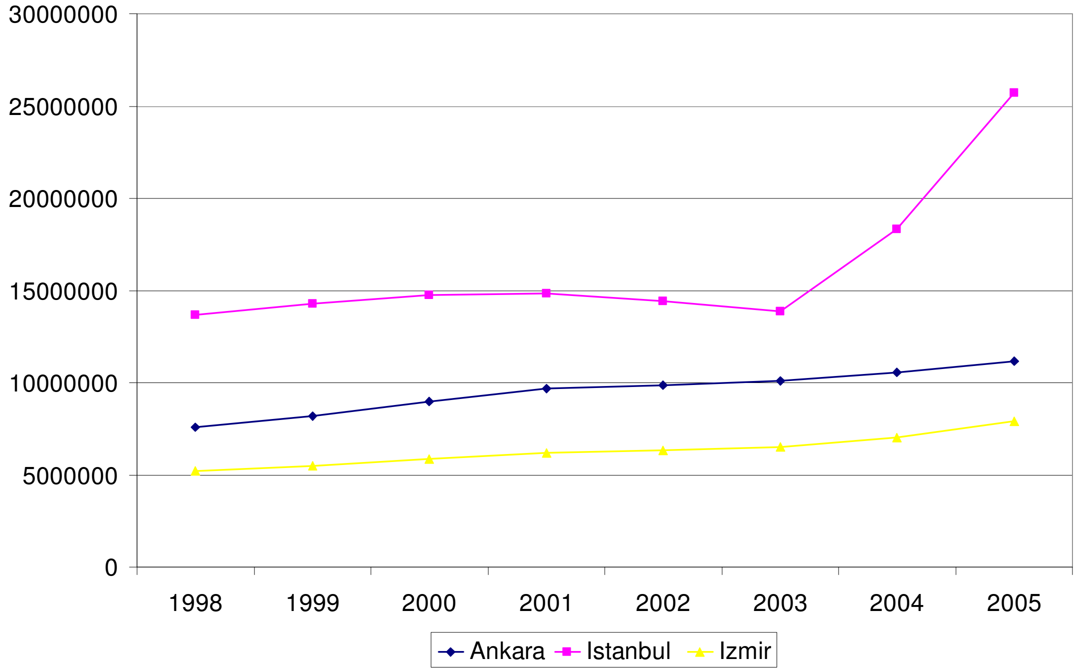
Figure 4.1 Growth of Izmir Population

Izmir is a primary commercial center and import/export door for products to and from the world; Izmir Province is responsible for 7.4% of Turkey's industrial production, 18% of Turkey's exports and 13% of Turkey's imports – all of which were delivered through the Izmir port in 2001. Izmir also accounts for 35% of all of Turkey's tourism income. The majority of Izmir’s tourism relies on Izmir as a central “hub” for key destinations such as Ephesus and Pergamum (The Louis Berger Group, 2005).

4.2 Urban Transportation Characteristics of Izmir

Vehicle Fleet

Izmir is also suffering from the effects of car ownership growth; like many cities in the world and in Turkey. Motor vehicle numbers in showed an increase of 52%, which is lower than the increase in Istanbul (105%) and slightly higher than Ankara (47%). However, it still has the smallest vehicle number among three big cities. (Figure 4.2)



Source: www.turkstat.gov.tr

Figure 4.2 Numbers of Motor Vehicles in Ankara, Istanbul and Izmir between 1998-2005

Per capita income in Izmir was 3,215 USD in year 2001, which is nearly 50% higher than the national average income of 2,146 USD (www.turkstat.gov.tr) resulting with in higher average private car ownership than the national average.

Number of registered motor vehicles per 1000 population in Izmir is 30% higher than national average. Number of registered private cars per 1000 population is 40% higher than the national average according to TURKSTAT Data (Table 4.2, Figure 4.3). However, it is still fairly low compared to industrialized countries (about 500 cars per 1000 residents in USA and European countries.) This low car ownership figure creates a high dependence and demand on public transportation services and emphasizes its importance in city life. (The Louis Berger Group, 2005)

Table 4.2 Registered Motor Vehicles and Cars in Izmir in 2005

	Motor Vehicles		Private Cars	
	Number	per 1000 population	Number	per 1000 population
Turkey	11,145,826	154.7	5,772,745	80,1
Izmir	731,995	200.6	409,397	112,2

Source: www.turkstat.gov.tr

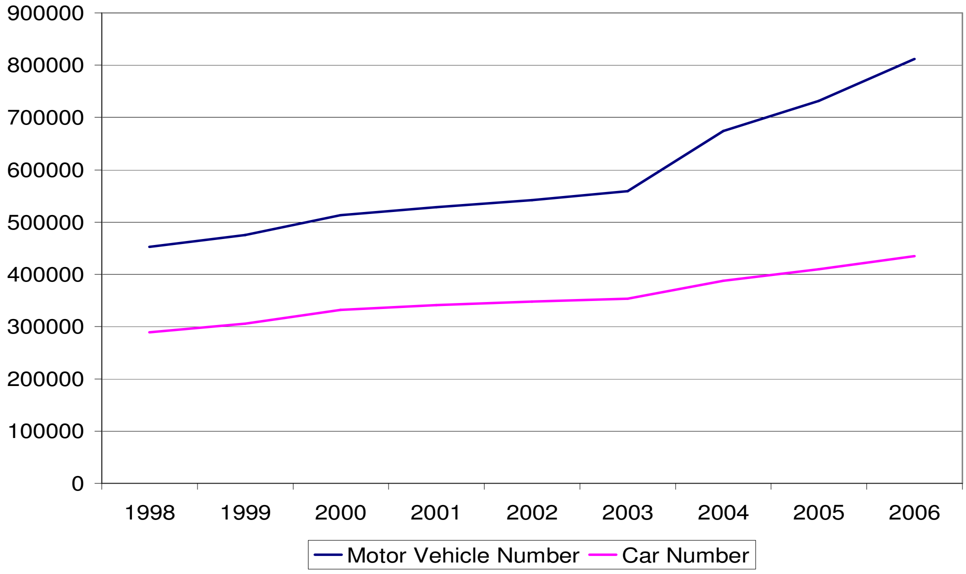


Figure 4.3 Growth of Registered Motor Vehicles and Cars in Izmir

Number of motor vehicles and cars showed a consistent modest increase between 1998 and 2003. Growth trends have been higher starting since 2003 until 2006. Increase in motor vehicles was much higher than private car registration during these years reflecting economic growth adding more commercial vehicles to the fleet (Figure 4.3).

Public Transportation Modes and Facilities

The Greater Izmir Municipality (GIM) is responsible for operating public transport services in Izmir metropolitan area. Urban passenger transport services operated or managed by the GIM consist of the following urban transport modes and facilities;

- **Municipal buses** operated by the Greater Izmir Municipality with a fleet of about 1,500 buses that transport about 680,000 daily passengers.(Figure 4.4)

- **Light Rail Transit** (LRT) (named metro) operated by Izmir Metro Inc. a private company with all shares owned by subsidiaries of the GIM. 11.6 km-long Phase-1 line between Üçyol and Bornova is operated with 45 Electric Multiple Units (EMU) and transports about 80,000 daily passengers. While this system may be characterized as "light rail" for the type of vehicles used, it operates in a grade-separated right-of-way with an electrified third rail, rather than an overhead catenary, and may therefore be referred as a "metro" system rather than "light rail". (Figure 4.5)

- **Commuter trains** operated by the TCCD (Turkish State Railway General Directorate of central government) are currently not in operation and being upgraded. The system includes the 57 km-long North Section between Aliağa and Alsancak previously serving 10,000 daily passengers and the 22 km-long South Section between Alsancak and Cumaovası. (Figure 4.6)

Figure 4.4 Municipal Buses

Figure 4.5 İzmir Metro

Figure 4.6 Commuter Trains

- **Ferries** operated by the İzdeniz (a Municipal company) with an agreement signed with the Municipality, including ferries previously operated by the TDI (Türkiye Denizcilik İşletmeleri: Turkish Maritime Administration) and sea buses operated by private operators under contract to İzdeniz. The system is composed of seven passenger ferries, three vehicle and passenger ferries, and thirteen sea buses (smaller vessels) totaling 23 vessels connecting eight ferry terminals currently serving about 40,000 passengers per day (Figure 4.7, Figure 4.8)

- **Minibuses** have a fleet of 1,100 privately operated vehicles transporting about 300,000 daily passengers. Geographic expansion of municipal boundaries with a law in 2004 expanded size of this mode within GIM boundaries.

- **Employee (and School) bus services** provided by industries, companies and schools, and operated by private operators.

- **Taxi-dolmuses**, are privately operated shared taxis with a fixed fare on a fixed route

- There are a number of inter-modal transfer facilities among bus, ferry, metro, minibus and commuter rail (with further connections in development),

- There are parking garages and lots, at downtown and at strategic locations throughout the City

Figure 4.7 Ferries at Konak Pier

Figure 4.8 Sea Bus Passengers Disembarking at Pasaport Pier

Having introduced new public transport systems, such as the Izmir Metro and locally operated ferries, The Municipality of Greater Izmir launched a project in 1999 to provide better integration between these various modes. This project, named the ”Transformation in Transportation” is presented in the following sections, which highlight conditions before and after the Integration Project of Public Transport Systems.

4.3 Public Transportation and Fare Structure before the Project

4.3.1 Historical Development of Public Transportation Systems in Izmir

Public transportation in Izmir has a long history starting from 19th century with first commuter rail operations during Ottoman period. The city had a variety of modes such as tramways and trolleybuses that served dwellers for decades and disappeared gradually from the city streets (Table 4.3).

Changes in the public transportation system have been radical and rapid since the late 1990s to cope up with the growing needs and delayed developments. Many changes were completed in a period of two years within the framework of the public transport integration project called “Transformation in Transportation”.

Prior to the integration project public transport modes were operated rather independently from each other, with each operator wanting to serve on routes with high demand, creating a system with competing modes and operators instead of complementing services for an efficient network. Information regarding the modes, operators, and operating conditions before the introduction of electronic fare system and implementation of “Transformation in Transportation Project” is presented in the sections below.

Table 4.3 Transport Chronology of Izmir

1855	Commuter railway services start on Izmir-Manisa line between Çiğli and between Basmane and Bornova
1870	Commuter railway services start on Buca line
1876	Commuter railway services start on Gaziemir-Seydiköy line
1880	First tramway line between Alsancak-Konak starts operation
1883	Ferry operations starts in Izmir Bay among 13 piers with 8 vessels
1885	Second tramway line between Konak-Güzelyalı starts operations
1928	First electric tramway operates for Goztepe
1943	Foundation of ESHOT and nationalization of private tramway companies
	First ferry operation in the Bay
1954	First trolleybus operations start in Izmir and Turkey
1992	Ending trolleybus operations
1996	Municipality starts sea bus operations with a private operator in addition to TDI ferries
1999 March	Kentkart, electronic fare card system starts operation in buses
2000 April	Phase-1 of "*Transformation in Transportation Project*" - Transfer of TDI ferries and piers to GIM - Opening new piers, new services and additional vessels - Creation of multi modal transfer centers - Introduction of Feeder Bus Services for Ferries - Bus fleet expansion - Bus route restructuring (deletion of long routes) - Bus feeder services for trunk bus lines - Introduction of staged fare structure (with 4 fare levels) - Ferries joining electronic fare card system (Kentkart)
2000 April-August	Phase-2 of "*Transformation in Transportation Project*" - Starting of metro operations - restructuring of bus lines for metro operations as feeders - Bus transfer centers opening at metro stations - Metro joining electronic fare card system (Kentkart) - Reduced fare bus feeders for metro stations - 24 hour operation on major bus routes and ferries

4.3.2 Public Transport Modes in Izmir

Public Transport Busses (ESHOT and Izulas)

Urban public bus transportation services are supplied by two operators in the Izmir Metropolitan Area: ESHOT and İzulaş. ESHOT is a component of the municipal government. It is established as a subsidiary of Great Izmir Municipality in 1943 to be responsible from municipal electricity, water, gas and public transport services. Electricity and water branches had been transferred to separate entities in time and trolleybus and city gas services were discontinued. ESHOT presently operates only urban bus transport services in Izmir metropolitan area (Figure 4.9). (http://www.eshot.gov.tr/)

The second operator İzulaş is established in 1990 as a municipal company to assist ESHOT for public bus services within the Izmir metropolitan area. It is established to enable city management to take decisions faster with more flexible decision-making procedures as a commercial company (http://www.izulas.com.tr/).

Figure 4.9 Buses at Bahribaba Terminal

Privately Operated Minibuses

Minibuses are owner operated private small buses operated on fixed routes with fixed fare structure having licenses issued by the municipality. They usually provide service in areas that are not served by the municipality. However, in some routes they offer services parallel to municipal bus routes with similar fares of municipal buses (The Louis Berger Group, 2005). (Figure 4.10)

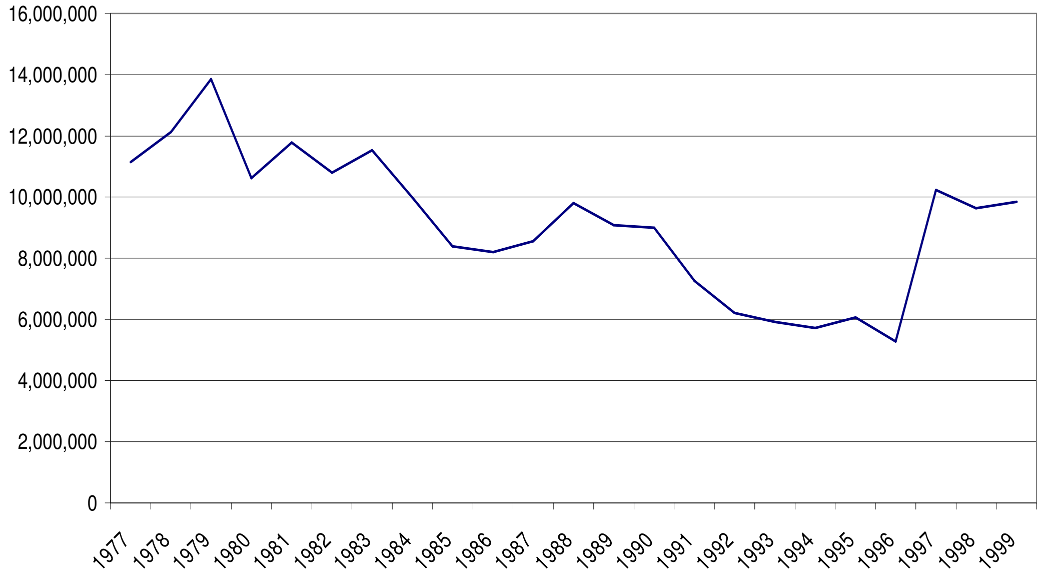
Figure 4.10 Owner Operated Urban Minibuses

Maritime Public Transport

Turkish Maritime Administration (TDI), a central government organization provided ferry services at the Izmir Bay as a monopoly until 1996 when the municipality franchised a private company (Ziya Göksel Maritime Operations) to operate “sea bus” services among new piers constructed by the municipality in addition to the TDI services (The Louis Berger Group, 2005) (Figure 4.11).

Number of ferry passengers showed a continuous decline loosing passengers to municipal buses with added competing routes and to private transportation under growing car ownership and usage. Number of annual ferry passenger dropped from 14 million in 1979 to 6 millions in 1994.

Figure 4.11 One of the Ferries Transferred from TDI



Source: UA (1997:18)

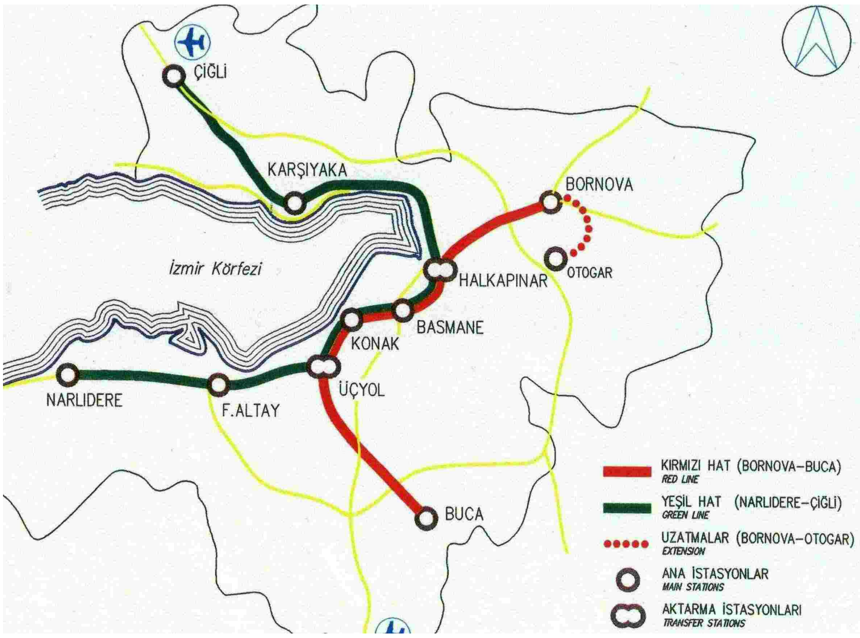
Figure 4.12 Ferry Passengers before the Project

Decline of ferry passenger stopped after introduction of privately operated sea buses, which also created some new demand for maritime transportation in addition to passengers switching from TDI ferries to sea buses (Figure 4.12). However, this growth did not continue since no arrangement was made to integrate fares, routes and services of buses and sea buses and number of maritime passengers came to a steady state shortly.

Larger ferries were owned and operated by the TDI of the central government and smaller ferries (sea buses) privately operated under municipal franchise prior to the “Transformation in Transportation Project”. The piers were simple and undeveloped without modern and comfortable facilities and there was no coordination with the bus services. The private sea buses used paper tickets and public ferries used tokens as fare payment systems. Vehicle ferries were also used by school buses and commercial vehicles in addition to carrying pedestrians and auto commuter traffic to reduce travel times and save fuel and also reducing congestion in the downtown.

Light Rail Transit (Metro)

The first studies for Izmir Metro was made in 1989 by Heusch and Bosefeldt Company. Izmir Transportation Study proposed a metro system with two lines forming an “X” shape for the year of 2010 (Figure 4.13).



Source: Heusch Beesfeldt (1992)

Figure 4.13 Proposed Rail System for 2010

Priority was given to the section with higher passenger demands between Bornova and Fahrettin Altay and the bid was announced for this part in 1992. Construction of the section between Fahrettin Altay and Üçyol stations was left to second stage after reassessment of the route in 1994. Right-of-way of Basmane-Bornova commuter line was leased from TCDD for 50 years and construction contract of current Izmir Metro line was signed in 1995. Construction works of the first section (Bornova-Üçyol) of the initial line of the proposed metro system started in 1996. (http://www.izmirmetro.com.tr)

The first stage of Izmir Metro system has 10 stations along a 11,6 km length route between Üçyol and Bornova. Four of the stations (Üçyol, Konak, Çankaya and Basmane) are underground, two are on viaduct (Hilal and Stadyum), and three stations are at ground level (Halkapınar and Industrial Area). Bornova station is located in an open tunnel (Figure 4.14). Distances between stations vary between 0,8 and 1,6 km.

Figure 4.14 Konak Metro Station

4.3.3 Fare Structure and Fare Collection System before the Project

Two types of paper tickets and monthly coupons (student and full fare) were used on public transport buses of ESHOT and Izulas before 1999. In addition to these to paper cards and tickets, free public transport travel paper cards were made available to persons entitled persons with the legal framework.

Paper tickets were sold before travel on ticket kiosks at ferry terminals and main bus stops as full fare paper tickets and student/teacher fare paper tickets. Student/teacher fare paper tickets were sold to persons presenting student/teacher identity cards. These paper tickets were for a single use and no fare advantage was provided in case of bulk sales. Counterfeiting was the most important disadvantage for operators. Another disadvantage of the paper tickets was limitations to implement distance based fare structure and transfer fare arrangements enabling passengers to make transfers among modes and operators without paying two full fares.

Coupons were sold as full and student/teacher fare types during first days of each month. Cards gave unlimited travel opportunity to users within a month. Coupons were embedded on an identity card, which was showed to bus driver on boarding in order to travel.

Free Paper Cards, were in use besides paper tickets and coupons. They were issued by the municipality to the citizens entitled to use public transport services free with the legal framework. These cards were issued for many groups including retired public servants, some senior citizens over 60 and 65, current and previous provincial parliamentarians, workers and officials of the municipality, handicapped, war veterans, families of killed-in-action, students of Turkic Republics, and immigrants from Bosnia Herzegovina. Personalized cards with photos were used by showing the card to driver on boarding before introduction of electronic fare system and during early years of the electronic system.

Maritime transport was provided by the Turkish Maritime Operations Administration's (TDI) ferries with fare payment on piers. Passengers used token operated turnstiles using single trip tokens sold at piers before boarding. Municipality licensed private sea bus operator joining the system in 1996 used single ride paper tickets. Private operators' fare levels were slightly higher than TDI's fares. Both the token system and paper tickets did not allow transfers and collection of usage data.

Paper tickets, monthly coupons, free paper cards and tokens did not allow information collection about transport usage and user characteristics required for planning and management of operations. These traditional ticketing technologies used by different modes and operators did not permit implementing variable fare (distance based, time-of-day pricing, service quality variations, etc.) structures and transfer fare reductions.

Another actor of Izmir urban public transport, privately operated minibuses uses **cash** for fare payment. Each passenger pays the cash fare to driver and driver turns the change. This payment system has several disadvantages. This method had security and traffic safety disadvantages, stemming from the cash changing process during the travel. This method also cannot provide any passenger data or travel statistics creating a deficiency for public transport system planning. In addition, paying cash fares also do not allow any integration or any transfers with other modes.

4.3.4 Shortcomings and Problems of the System before the "Transformation in Transportation" Project

Network and operation of public transport systems and fare structure and ticketing technologies caused various problems hindering the effective functioning of urban transport in Izmir. These are summarized as follows: (Acar et.al., 2003)

- Public buses and private cars were the most heavily used modes in the city where other alternatives such as ferries and railroads were under-utilized. Unbalanced distribution of passengers to highway based modes created serious pressures on the highway network resulting with widespread congestion. Priority needed to be given to rail and maritime public transport modes with integration of modes and operators allowing easy transfers and restructuring of the bus network to reduce competition with rail and ferries.

- A number of private and public (local and national level) operators that supplied services in Izmir before 1999 were independent from each other. Their network and operations planning focused on carrying more passengers without any consideration of improving performance of the public transport system as a whole. Their actions for improving their performance resulted with passenger reductions in other public transport operations instead of attracting passengers from private cars. Planning and operations decisions were not performed by a single authority evaluating positive and negative effects of a decision for whole of the city and the transportation system rather than a single operator. Operations should be assessed, needs should be identified and statistical data should be analyzed by each operator and also by an coordination authority for the whole urban transport network to achieve an integrated public transport system,

- Public transport modes and operators in Izmir did not have a uniform and compatible fare system and ticketing technology. Buses had electronic fare technology, ferries used tokens, metro was designed with a magnetic fare card system, commuter railroad used different paper tickets, and minibuses used cash for fare payment all having their own fare structure. Public transport system should have a uniform, rational, and equitable fare system for all public transport services to enable implementing operational decisions made at the management level.

- Bus system network and operations were deformed with extremely long and devious routes, competing long and single fare routes around the Izmir Bay attracting potential ferry passengers to road network. Bus system had extensive number of bus lines on very close and parallel corridors with low passenger traffic on most of them. Passengers had forced the bus network to operate on long lines to give almost a door-to-door service to get most out of the existing flat fare structure.

- The bus network with many long routes got less equitable with a flat fare system where growing number of long trip makers were subsidized by short trip makers as number of long lines increased with deformation of the network.

- Flat fare supported expansion of the urban settlement area with bus services reaching to villages that are 30-50 km away from the city center.

4.4 The Transformation in Transportation Project

An electronic fare collection system was introduced for bus operations of ESHOT and İzulaş before local elections of 1999. This new system was considered as an important tool for improving the performance of the public transportation system by the newly elected local government management after elections.

Izmir Greater Municipality prepared a reformation project named "The Transformation in Transportation Project" to integrate bus, maritime, commuter rail and metro systems, which entered into full operation after four months of the first phase of the project. The project included physical improvements, restructuring of routes, services, and fare systems of all public transport modes in order to improve system performance.

"Transformation in Transportation Project of the Greater Izmir Municipality aimed to establish an integrated public transport system with a plan consisting of three phases. The first phase started after the introduction of electronic fare collection system Kentkart to buses and expanded its usage to ferry system with other required physical and operational precautions for achieving bus and ferry integration. The second phase included introduction of the metro system and the restructuring of bus systems to complement metro and fully integrate metro, buses and ferries. Third phase involved developments, which will be implemented after the opening of the second section of the metro between Üçkuyular and Üçyol.

4.4.1 First Phase

Introduction of the electronic fare system enabled many improvements on public transport network and operations. On the first phase bus and ferry routes were restructured to complement each other. Integration of different modes was improved with fare structure changes. The First Phase started on 2 April 2000 with a campaign and a catch phrase of *'Ferries at your neighborhood, buses at the Bay"* emphasizing interchangeability of buses and ferries after integration (Figure 4.15).

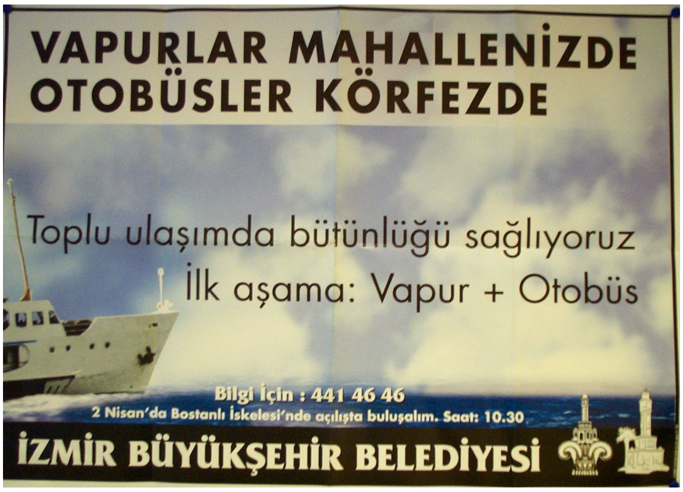


Figure 4.15 One of the Billboards used at the First Phase Launching

Measures implemented at the First Phase did not need long term studies and preparations. They were easily implemented and provided improvements in public transportation and reductions in traffic levels within a short period. Components of the First Phase are summarized below.

Development of a New Fare Policy and Fare Collection System

- **Electronic Fare Cards**: Electronic fare collection system, Kentkart was introduced on two bus companies (ESHOT and İzulaş) in March 1999 in addition to the old paper tickets. The project planned to widen electronic fare card usage to other modes including metro, maritime transport system (İzdeniz) in the short term and on commuter railways at the longer term (Figure 4.16, Figure 4.17).
-

Figure 4.16 Kentkart Validators on Buses

Kentkart provides safe, secure, simple and fast fare collection on public transport vehicles with proximity cards and other hardware. The system collects information on transactions related with transport activities in addition to fare collection. This information is transmitted to the fare system control center for processing and reporting to related units for planning and programming activities and financial transactions. Kentkart system was installed to ferry piers to allow passengers to use the same fare media used in buses as a part of the integration plan.

Figure 4.17 Turnstiles with Kentkart Validators on Ferry Piers

The Project aimed at using the same ticketing technology with a common pricing structure on integrated routes and schedules on all modes and operators of the public transport network.

- **Expanding Coverage of the New Fare Media**: After introduction of the electronic fare media on buses in 1999, usage of paper tickets began to decrease significantly with the fare reductions applied to trips made using the new media. Various promotional measures were implemented to shift passengers from traditional fare technologies used in buses (paper tickets) and ferries (tokens) to Kentkart. Short trips on buses and all ferry trips were made considerably cheaper for electronic card users after implementing distance based fare structure on buses.

- **Increasing Availability of the New Fare Media**: Number of sellers and rechargers of the new electronic fare media drastically increased in both number and coverage. New portable selling and recharging points were added to the increasing number of seller kiosks and other commercial points widely distributed in the city (Figure 4.18, Figure 4.19).

Figure 4.18 One of the Kentkart Selling and Recharging Points

Figure 4.19 Portable Kentkart Selling and Recharging Point

- **Reducing Use of Monthly Cards**: Monthly cards used on buses and ferries enabled the card owner unlimited number of trips during validity period. These personalized cards were used by more than one person due to lack of control and enforcement. These cards were used by companies for daily commuting and business trips of their employees.

This usage was considered as a leakage since the number of trips made using this card was much higher in reality with the employees using it for business (delivery and couriers) than the number calculated for the low income workers monthly commuting trips. After public transport network and route restructuring according to staged fare structure, number of monthly trips determining monthly card cost was increased to reflect shortened bus lines and increased transfers. Use of monthly cards reduced continuously as intended with the promotional fare levels applied to electronic card use and keeping prices of the coupons relatively higher. Use of monthly cards finally discontinued in 2002.

- **Terminating Paper Ticket Use**: Use of paper tickets on buses was abandoned completely in year of 2004. The usage of paper tickets decreased with the incentives supporting electronic card usage. However, electronic fare cards sold at the cost of four full fare level deposit price before any value loaded for travel was not a valid solution for occasional travelers and people coming from other settlements. Paper tickets in spite of many disadvantages such as fraud and insecurity provided an easy and low cost solution to needs of single trip makers.

- Drivercards was developed as an alternative solution for needs of single trip makers. Bus drivers would use a specially designed electronic driver card to validate trips of passenger after being paid by cash and giving change in return if needed. Paper tickets discontinued after July 2004 with practice of single trip passengers paying a higher fare to the driver with driver cards at boarding. However, this driver card application created other problems such as giving a new duty of cash handling to drivers and reducing overall commercial speeds and reducing safety in traffic.

- **Replacement of All Personalized Cards:** Paper cards personalized with a photo used by eligible persons for free travel on public transportation system could not be tracked with the electronic system and no statistics were available for these users. Replacement of free paper cards with electronic cards started in 2000 and a total 130.000 free travel cards were issued by 2002 ending the data gap for these users in travel data and fare statistics.

- **Distance Based Fares on Buses**: Before the "Transformation in Transportation Project", flat fare structure was used by the bus systems. This fare structure led deformation of bus lines and network. In the absence of reduced transfer fares and distance based fares, users made pressures for longer routes, increase number of lines, and deviating alignments to connect their origins and destinations with only one trip, paying a single flat fare ride. The integration project aiming to restructure and simplify the network intended to promote transfers between public transport modes, operators and services. Bus lines and routes were rearranged and flat fare structure was changed to a distance based staged fare system.

The new system introduced a distanced based four staged bus lines and fare structure. Number of bus lines were reduced from 475 to 350 and classified into four categories. Longer bus lines (defined with number 3 on the windshield) were lines with round trip distance over 40 km's. Medium distance bus lines had a round trip distance of about 15-40 km's (represented with number 2) and short bus lines (numbered 1) were those with a trip distance shorter than 15 km's. In addition to these three categories, Feeder Lines with notification of B in front of the buses *(Besleme hatlari)* had the lowest fare level without any consideration of the length of the line (Figure 4.20). Feeder lines were designed to carry passengers to existing and newly developed transfer centers and ferry piers without serving any other trip attraction points and sub-centers. Ferry lines were also considered within the feeder category. Bus routes from Halkapınar Metro Station to Ege University Campus Area, Gıda

Shopping Mall and from Bahribaba to 9 Eylül University Campus Area were assigned as free fare routes in order to attract passengers to metro.

Figure 4.20 A Feeder Bus with B Sign on Windshield

Restructuring of the bus network and fare system with four different tiers enabled a more equitable fare system (lower fares for shorter trips) and reduced complexity of the network. Low feeder fares (B) increased feeder bus usage, transfers to ferries and ferry usage. These measures increased electronic card usage and decreased circulation of paper tickets and tokens since passengers could benefit from these promotions if they used electronic cards.

Public Transport Buses (ESHOT and İzulaş)

- **Restructuring of Bus Network:** The routes and schedules of these two bus companies are determined in collaboration with the municipal transport planning bodies and ESHOT. Routes and schedules are shared between the two operators. Joint bus services start from five major transport centers namely; Konak, Teleferik, Karşıyaka, Bornova and Buca.

- **Restructuring Long Bus Lines**: Long and deviating bus routes had been canceled and extensively long bus routes around the bay had been divided into parts terminating at ferry terminals enabling transfers to ferry system, hence shifting trips from the road network. Feeder bus routes are created to attract passengers to ferries and enlarge ferry catchment areas. Feeder bus routes are categorized as the lowest fare stage. Trips are directed from bus lines previously traveling around the bay to ferries with transfers from feeder bus lines. Therefore, ferry use increased with increased quality of travel, reduced travel and waiting times and money savings.

- **Improving Multi Modal Integration**: Integration of bus and sea transport services were achieved at 2nd April 2000 and integration of bus and metro was provided at 26th August 2000 within the First Phase of "Transformation in Transportation Project". New transfer centers were constructed at Bostanli Pier (bus-ferry), Bahribaba Park (bus-ferry-metro), Halkapınar Metro (bus-metro-commuter in future), and Bornova Metro stations (bus-metro) for inter-modal integration.

- **Improving Service Periods**: Public transport services ended before midnight before of year 2000. Bus service periods in regular days were 18 hours during the day and this was extended to 20 hours when Izmir International Fair was open. The Project also extended service hours of public transportation system to 24 hours on major routes with the introduction of night services (called "owl services") in May 2000.

Maritime Transportation

- Operation of ferries and piers were transferred from TDI (Turkish Maritime Operations Administration) to İzdeniz in year 2000. Izdeniz is a municipal company established within the framework of Municipality Act numbered 3030. Eleven ferries were taken over from the TDI. Eight of them are passenger ships and three carries both vehicles and pedestrians. In addition to these ferries, ten more passenger ferries (sea buses) were hired to support ferry system on the Bay. İzdeniz continues to give sea transport service with 24 vehicles across the Izmir Bay. (http://www.Izmir.bel.tr)

- Maritime services given by İzdeniz became advantageous with line/route and fare restructuring measures implemented within the framework of "Transformation in Transportation Project". On the other hand the private operator, which entered the market in 1996 did not want to integrate in to rest of the the public transport system and continued to give service on self-determined schedules with higher fares. The company discontinued its services in short time loosing passengers to the integrated operations.

- **Ferry Terminal Improvements**: Ferries were operated from six piers, Bostanli, Karşıyaka, Alsancak, Pasaport, Konak and Üçkuyular before İzulas takeover of sea transport. Two new piers, Göztepe and Bayraklı were constructed and opened to service by the Izmir Greater Municipality in addition to the piers transferred from TDI. Presently eight piers are in regular services at Izmir Bay.

- **Improvements of Transfer Facilities**: Bostanlı and Üçkuyular piers were rearranged creating transfer centers for buses carrying passengers to ferries. Feeder bus routes were directed to piers enabling more passengers benefiting from ferry transport (Figure 4.21, Figure 4.22, Figure 4.23, and Figure 4.24). (Izmir Greater Municipality, 2001)

- **Park-and-ride Facilities at Ferry Terminals:** Aim of this phase was not only to give better transport service to existing transport users but also attracting daily car users to public transport. For this reason, park and ride facilities were created at main piers like Bostanlı and Üçkuyular where land was available at the two ends of the Bay.

4.4.2 Second Phase of the Project

Second Phase of "Transformation in Transportation Project" started in May 2000 with bus, metro and ferry integration with the slogan '*We are waiting for you, we don't let you wait*'. Bus network needed to be restructured again with the start of the metro operation. This phase focused on measures that integrated the metro to the other modes and services of the system.

This phase included reorganization of operation schedules of different modes (bus, metro and ferry) to improve modal integration. Considering the short (12 km) first section of the metro line between Bornova and Üçyol, the aim was to attract more passengers to the metro and increase its utilization, which might have been limited without the measures implemented at this stage.

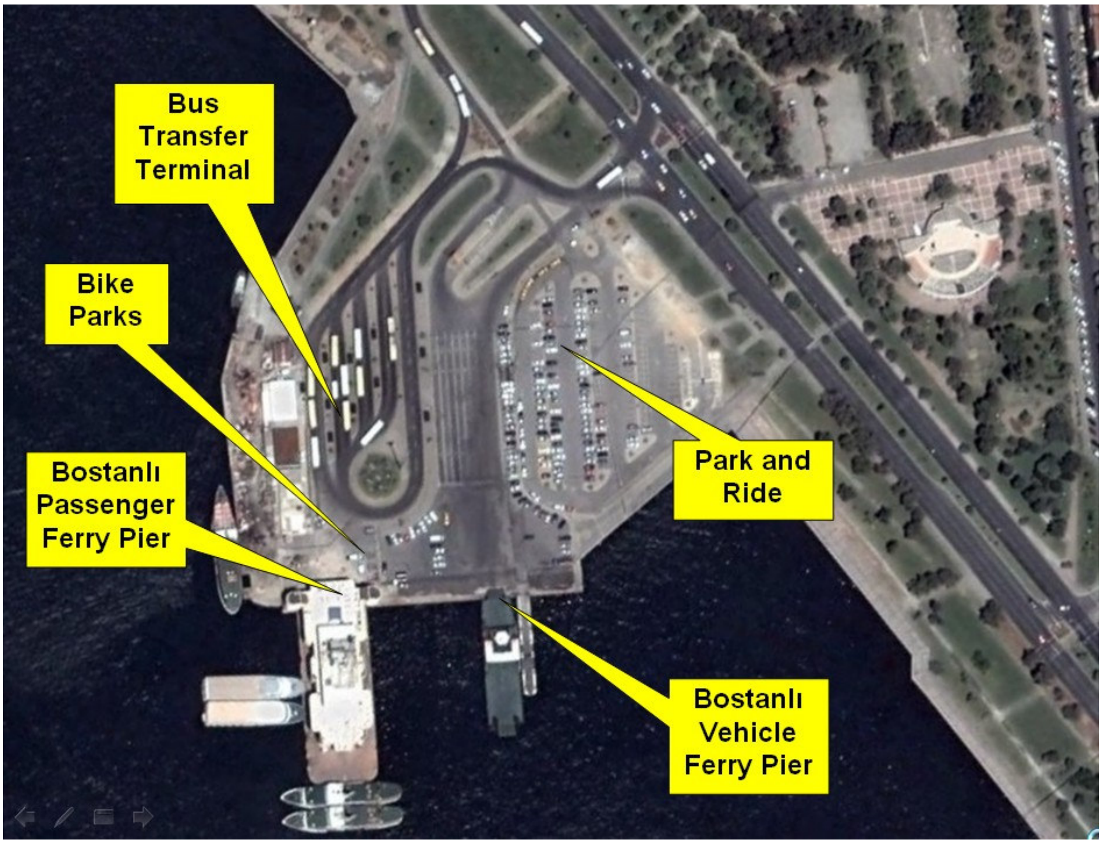


Figure 4.21 Bostanli Ferry Terminal Layout

Figure 4.22 Bostanli Ferry Terminal

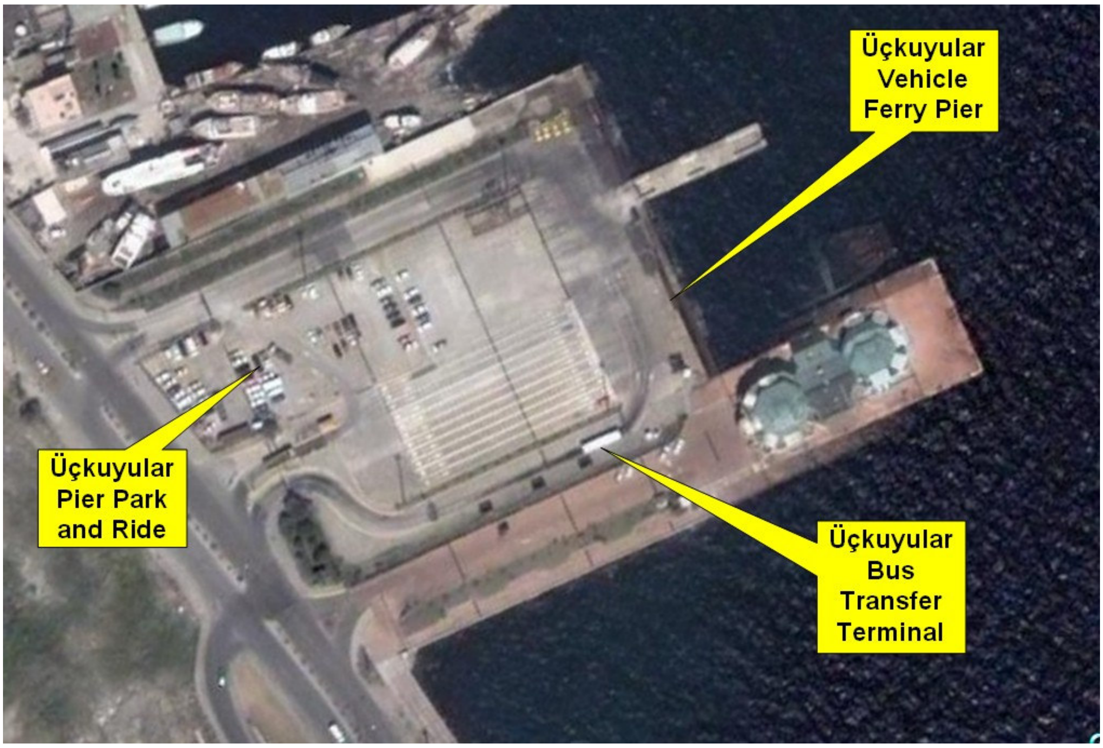


Figure 4.23 Üçkuyular Ferry Terminal Layout

Figure 4.24 Üçkuyular Ferry Terminal

Opening of the Metro

The Izmir Metro began promotional operations with peak period services on 22nd May 2000. After four months, it began all day commercial operations between Bornova and Üçyol with Kentkart electronic payment system.

Metro terminal station at Bornova was not located at a walking distance of Bornova district center, University and University Hospital. Thus various measures, such as parking areas for transfer from cars and feeder bus services were needed be arranged in order to provide integration the terminal station to local activity centers (Figure 4.20, Figure 4.21).

Restructuring of Buses

Bus services were restructured considering metro operations. Long and competing lines in the metro corridor were changed to operate as feeder lines for metro stations. New feeder bus services were put to service terminating at metro stations. Bus schedules were revised considering metro operation schedules. Two new bus and metro transfer terminal was constructed at Halkapınar and Konak stations to connect bus passengers to metro, ferry (Konak pier at Bahribaba) and railroad (at Halkapınar) (Figure 4.20, Figure 4.21, Figure 4.22, Figure 4.23, Figure 4.24, Figure 4.25, Figure 4. 5).

Fare Policy Development and Fare Collection System

Electronic fare payment system Kentkart was used after the opening of the metro. The metro was originally contracted with a separate magnetic fare card system not compatible with Kentkart. Ticketing system was changed to Kentkart before opening it to service with an additional contract to allow full integration with other modes.

Figure 4.25 Bornova Metro Station Bus Transfer Center Layout

Figure 4.26 Bornova Metro Station Bus Transfer Center

Figure 4.27 Bahribaba Bus Transfer Center Layout at Konak

Figure 4.28 Bahribaba Bus Transfer Center Layout at Konak

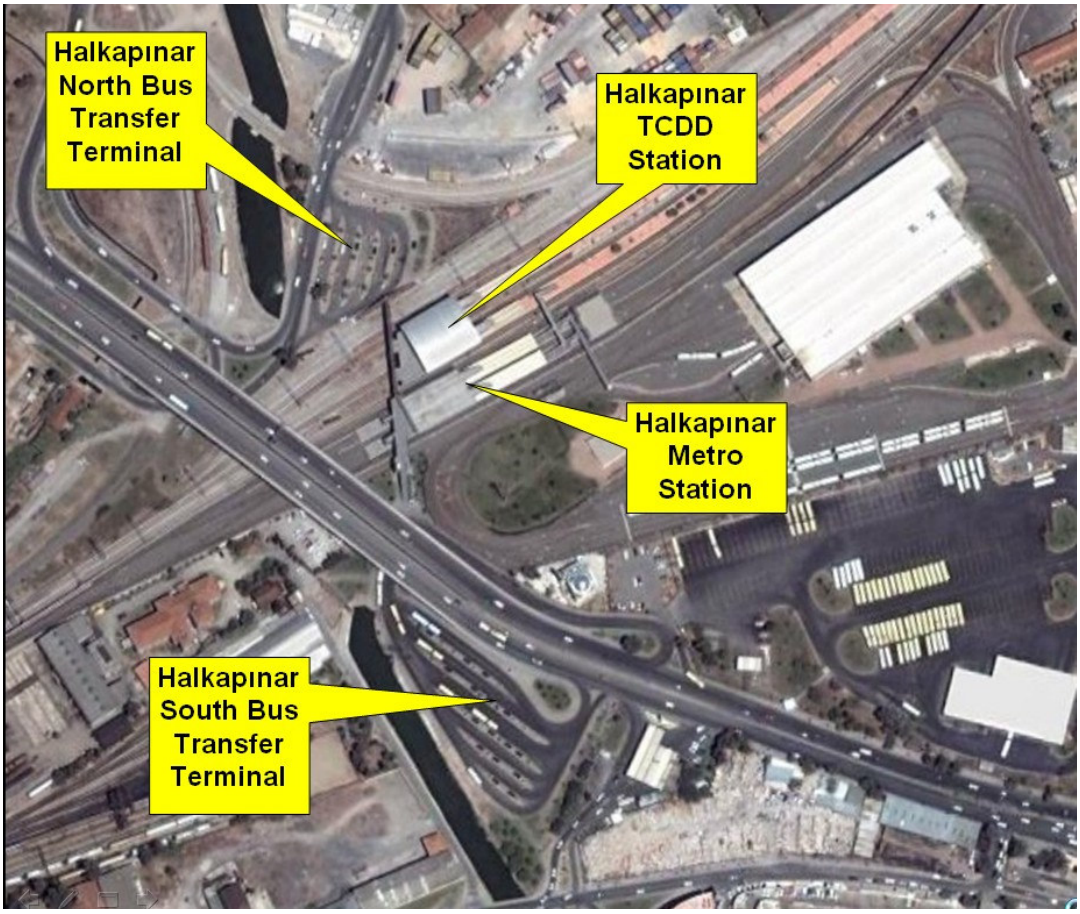


Figure 4.29 Halkapınar Bus Transfer Center Layout

Figure 4.30 Halkapınar Bus Transfer Center

The lowest feeder fare level, like ferries, was also used for metro trips. Tokens were used for single trips in addition to the electronic cards. Most of the passengers used Kentkart to get benefits of transfer reductions and promotions given and flexibility of usage on all modes.

Maritime Transport

Service periods were expanded on ferries like buses. Owl services, operating during late night hours assured 24-hour service on ferries also.

4.4.3 Third Phase- Future Developments Proposed by the Project

No definitive target year was set for ending the Second Phase and starting the Third Phase of the Transformation in Transportation Project. All projects and proposals not scheduled in the short term were considered in this stage, which included medium and long-term projects. Even though these projects are planned to operate in the medium and long term, design and construction of these projects have already started in the earlier phases.

Metro

Second stage of Metro system is composed of Üçyol-Üçkuyular section. This part is 5 km in length and will have five stations; Bahçelievler, Hakimevleri, Göztepe, Poligon, F. Altay; on it. At the end of second stage, construction metro will give service on 17 km length route with 15 stations.

Extension of the existing metro line from Üçyol to Fahrettin Altay is considered to be a major component of the urban rail system. Metro line will be expand 4.8 km and will operate with additional five stations. This section will allow integration of the high density of urban backbone between Üçyol to Üçkuyular to the rest of the public transport system more effectively.

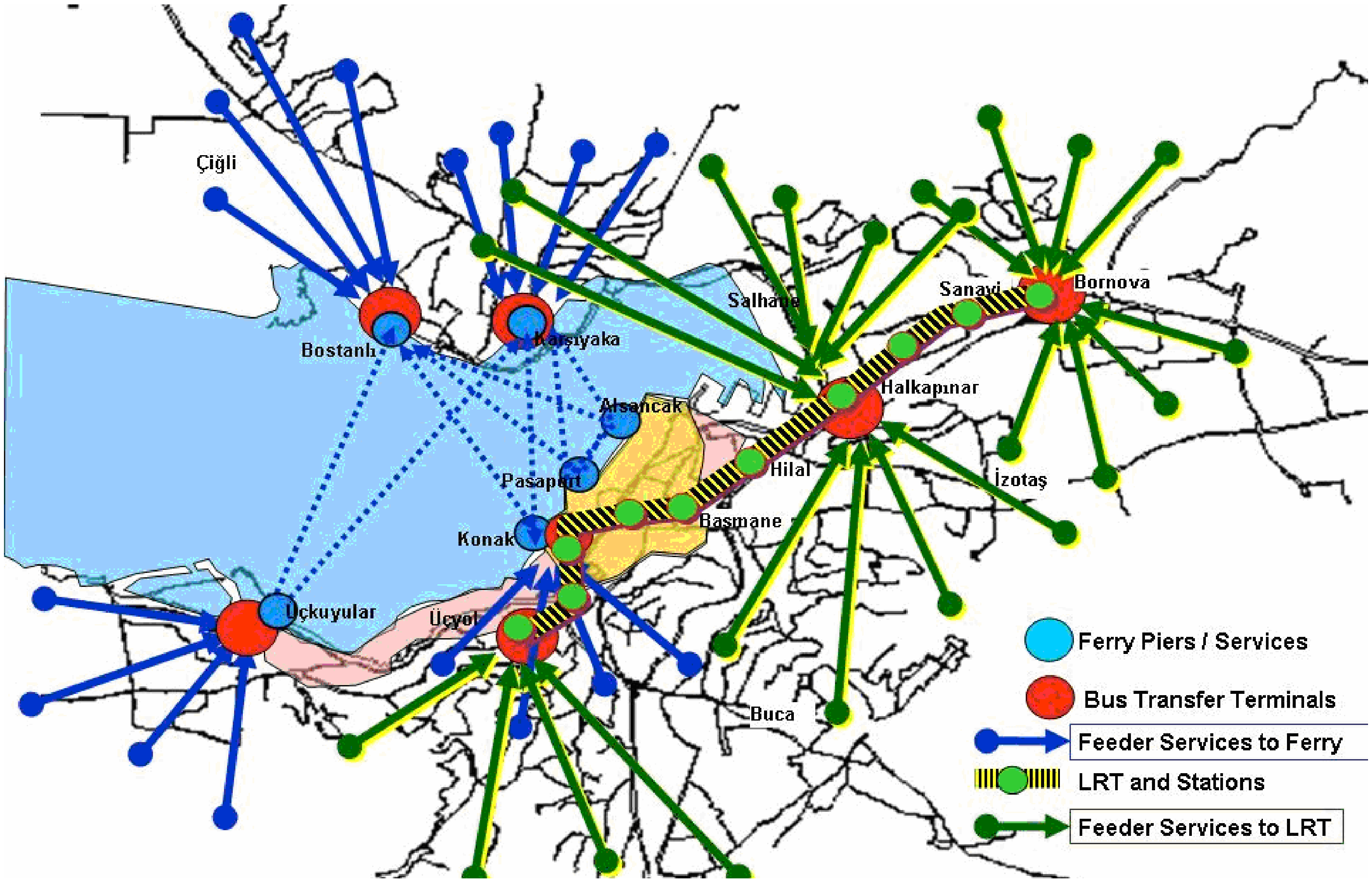


Figure 4.31 Integration Principals of "Transformation in Transportation" Project

Commuter Rail System

TCDD implemented a project to upgrade single-track line to double track line standards between Aliağa and Menderes and to electrify and signalize this. The Greater Izmir Municipality proposed TCDD to cooperate on a joint rail development project between Aliağa and Menderes.

The project is based on the cooperation where TCDD to own and operate infrastructure, main line passenger and freight trains, manage train operations and GIM to build new stations with transfer points, including two underground stations and tunnels, construct grade-separated crossings, buy new rolling stock and operate urban rail services.

The 80 km line between Aliağa and Menderes will have 30 stations fully integrated with local bus lines enabling passenger transfers with Kentkart. Fare system of commuter railway system will be using existing electronic fare collection system. Passenger will be able to transfer among new commuter rail, metro, bus and ferries. Bus transfer centers will be constructed on railway stations to enable transfers between public transport modes. These transfer centers will also include park &ride for car users and bike& ride facilities for bicyclist to leave their vehicles and use railway services.

The line will connect Aliağa Industrial Area, Çiğli Atatürk Organized Industrial Area to residential areas of Karşıyaka, city center Alsancak to Gaziemir international Airport and Menderes industrial area (Figure 4.32). The modal share of Aliağa-Menderes rail system along its corridor is expected to increase from 0.3% to 25% in medium term (The Louis Berger Group, 2005) (Table 4.4).

Fare Policy Development and Fare Collection System

Kentkart coverage will be expanded with introduction of new lines to urban public transport network. Electronic fare system will be used at metro and railway system including new 5 metro stations and 30 commuter railway stations. Electronic Fare collection planed to be used at car parks on all public and private operated car parks in the city. Planned park and ride facilities at main transfer stations on metro and commuter rail will widen use of fare cars and attract more passengers to public transportation system.

Commuter rail will be serving on a 80 km length line. A distance based fare structure is planned for implementation on the commuter railway line to enable a fair and equitable fare system.

Source: Izmir Greater Municipality (2004, 76)

Figure 4.32 Aliağa-Menderes Railway Project

Time of day pricing is planned to decrease demand levels at peak hours to increase comfort for commuting passengers with lower fares at off-peaks in addition to distance based fare structure on public transport modes.

Quality based pricing is also planned in future with introduction of high quality services to attract people from their private cars to public transport. These high quality services having higher standards such as all seated passenger, seats with reservations, air-conditioned seats with audio and video entertainment will be charged with higher fares with quality based pricing approach.

Table 4.4 Existing and Targeted Modal Shares in Medium Term

Mode	Existing Share	Target Share	Operator
City Bus	40 %	25 %	Greater Izmir Municipality
Minibus	18 %	12 %	Private Operators
Employee Bus	10 %	10 %	Industry & Private Operators
Commuter Rail	0.3 %	25 %	Greater Izmir Municipality
Sea Buses	4 %	3 %	Private Operators
Ferries			Greater Izmir Municipality
Auto	16 %	13 %	Private
LRT	10 %	12 %	Greater Izmir Municipality

Source: The Louis Berger Group (2005: 182)

CHAPTER 5

ASSESSING THE BENEFITS OF FARE SYSTEM CHANGES AND INTEGRATION SCHEMES IN IZMIR

5.1. Introduction

It has been described in the previous chapter that the “Transformation in Transportation” Project in Izmir introduced various radical changes in the urban transport system, with the underlying aim of improving public transport services and consequently increasing public transport usage. In this chapter, it is intended to analyze the effects of this project and its various components; and investigate whether the project yielded the expected benefits.

It will be remembered from the previous chapter that the Transformation in Transportation Project comprised the following major changes in the urban transport system, which are also the focus of the analysis presented below:

o Introduction of electronic fare technology for bus system	1999
o Bus route restructuring	2000 April
o Implementation of distance based fares on buses	2000 April
o Transfer of ferries to GIM	2000 April
o Introduction of electronic fare technology for ferries	2000 April
o LRT system	2000 August
o Introduction of electronic fare technology for LRT	2000 August
o Restructuring buses for LRT system	2000 August

The primary objective of the Transformation in Transportation Project was to increase the usage of public transport; and in particular the usage of urban rail and ferry systems, which were believed to help relieve the pressure on buses and on the road system. Hence, an important part of the analysis below focuses on the usage of public transport systems; and benefits in terms of increases in public transport ridership are investigated. However, impact analysis on changes in urban transport systems are generally carried out by considering a set of other possible benefits, as described earlier in Chapter 3 under the methodology. These other possible benefits include social and economic benefits for users; financial benefits for the operators; traffic benefits; environmental benefits; and land-use benefits. In this research, a framework was developed (as described in Chapter 3) to analyze these possible benefits. Indicators determined to measure these benefits are presented in the table below (Table 5.1).

It was not possible to measure all benefits of the Project since some effects are multi dimensional, widespread, complex, interrelated and some occur in the long-term. In addition to these characteristics, there exists very limited data for the "before" situation. With implementation of electronic fare system, modal usage changes are examined in detail through Kentkart Usage and card purchase information. However, there are limited data and operational statistics on line basis for maritime and bus operations. Thus, operational analyses were done within this available data. In addition, a comprehensive and in-depth study is necessary to be performed in the field in order to measure all land-use, traffic and social impacts. Since this was not possible within the scope of the thesis, mostly due to the time span needed to carry out such studies, these impacts are evaluated according to interviews, which were carried out with municipal officers.

Table 5.1 Project Benefits and Policy Measure Relationship

	Electronic fare collection system	Line/ route /time arrangement among Metro, Maritime, Bus systems	Maritime Transport Improvement and Integration	Fare integration among PT modes	New piers on ferry system	Consolidation of unproductive bus lines/ routes	Distance based staged fare structure	Renewed bus fleet	Metro system introduction	Transfer centers	Private car usage decrease
Increase in total Usage	X	X	X	X	X	X	X	X	X	X	
Improving underused public transport modes (ferry)	X	X	X	X	X		X			X	
Integration Metro to public Transport Network	X	X	X	X			X		X	X	
Balanced Usage among Transport Modes		X	X		X	X			X	X	
Equity and Cost Savings	X	X					X				
Time savings	X	X	X	X		X	X	X	X	X	X
Improved Mobility and accessibility		X	X		X	X	X	X	X	X	
Improved Comfort and Decreased crowding	X		X	X		X	X	X	X		
Electronic fare system facilities	X						X				
Increasing system efficiency and modal efficiency	X	X	X	X	X	X	X	X	X	X	
Decreasing Congestion and Travel Times		X	X	X			X	X	X	X	
Energy Consumption			X		X	X	X		X		X
Air Quality Improvement Pollution Reduction									X		X
Noise Pollution									X		X

5.2 Benefits for the Public Transport System: Measuring Ridership Levels and Trends

5.2.1 Overview of Public Transport Usage

Izmir public transport patronage figures are analyzed between 1996 and 2005 to evaluate the effects of the project. It is seen in Figure 5.1 that pubic transport usage experienced a significant decrease of 23 million passengers between 1996 and 1997. Passenger numbers remained constant in 1998 with another crucial decrease of 8 million passengers in 1999. This decrease in public transport was described by the municipality officers during interviews to be due to operation of public transport modes independent from each other and hence having a hidden competition, paper ticket counterfeiter, deterioration, and duplication of network and services of these independent operators.

Introduction of electronic fare payment system has not created any increase in March 1999 since it was not actually a restructuring of fare system but only a change in technology for fare collection. The actual fare system restructuring, with its many components, such as integrated tickets, staged fare system and promotion fares, on the other hand, resulted in a significant increase of 17 million public transport passengers in year 2000 (Figure 5.1).

Within the framework of Transformation of Transportation Project, first bus lines and routes were rearranged to provide integration with maritime transport. Then distance based staged fare system was implemented in order to support transfers between ferries and buses with introduction of feeder bus services.

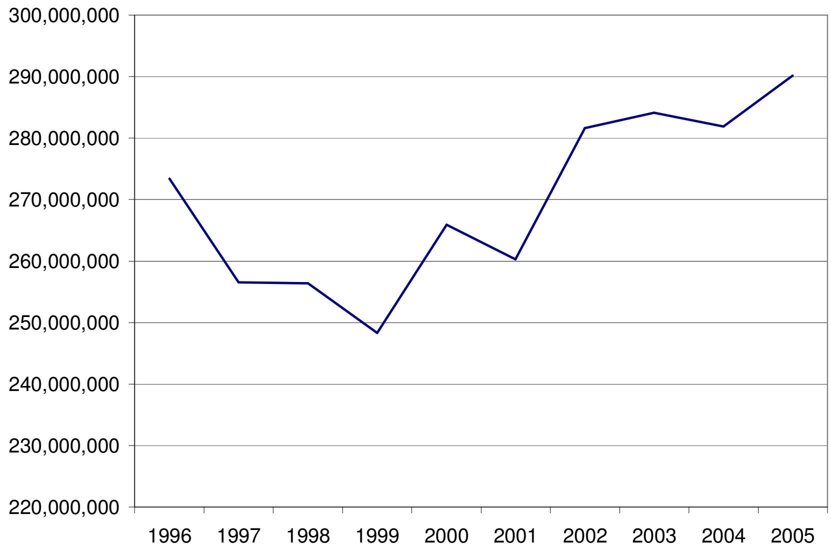
A decrease in total public transport patronage figures is seen from 2000 to 2001. It is believed that this decrease is due to the initial effect of bus route restructuring, which is a common immediate effect of radical changes in bus routes. Bus lines and routes were restructured during this period to provide complementary bus services to create full integration of the metro with bus system. Bus lines parallel to the metro corridor were discontinued, new feeder buses with lower fare levels were put into service and new bus transfer centers were created at metro stations to serve passengers with better interchange facilities.

The number of public transport passengers showed an increase of 14% (36 million passengers) with completion of measures to integrate the modes and after passengers' acceptance of the changes until 2003. Total transport usage continued to grow further in 2005 after a small decrease in 2004. Results and effects of the implemented measures are discussed in the following subsections with special analysis on development of patronage by modes, fare structure and fare media before evaluating general benefits for urban transport in Izmir.

Most significant patronage changes were seen on bus services when public transport usage is examined by mode. (Figure 5.2) Bus system had the largest passenger share among all modes but with a decreasing trend before the integration project, loosing passengers to private cars. The figure shows that the fall in total public transport usage in 2001 (immediately after the project) was indeed due to the decrease in bus usage. The figure also shows that ferry usage has been moderately but steadily increasing since 2000; and that metro usage increased significantly after the first year of operation, reaching a stable level afterwards.

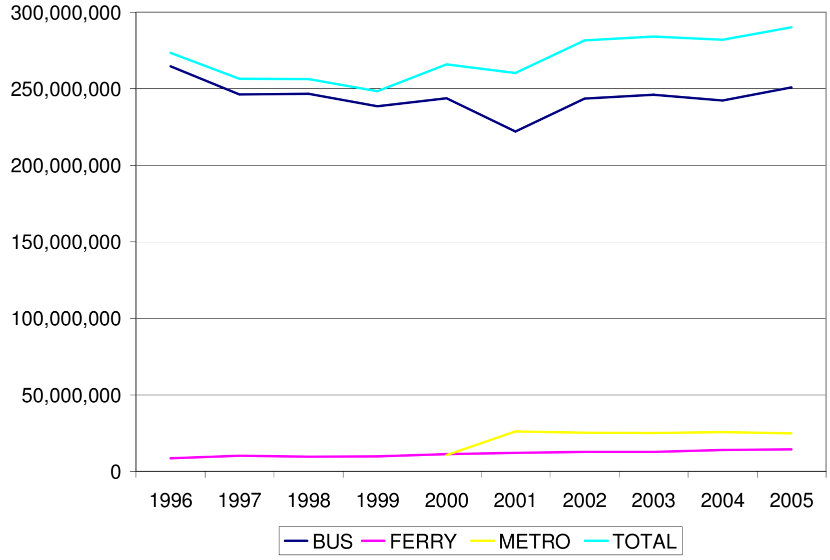
Decreasing the demand for bus services, hence shifting bus passengers to metro and ferries was also one of the objectives of the Project. Figure 5.2 shows that this has been achieved, although to a limited extent: Patronage figures increased in maritime and metro services beginning from the year of 2000; while bus patronage remained at levels similar to those in the late

1990s. Hence, it is clear that the increase in total public transport usage since 2001 has been due to increasing metro and ferry usage and not bus usage. However, the fact that the decreasing patronage trend in buses was reversed after the project is also an important and positive outcome.



Source: ESHOT, Izdeniz, Metro Inc (2007)

Figure 5.1 Total Public Transport Usages in Izmir between 1995 and 2005.



Source: ESHOT, Izdeniz, Metro Inc (2007)

Figure 5.2 Modal Split of Total Public Transport Usage in Izmir between 1995 and 2005

5.2.2 Fare Structure and Technology Improvements

Fare Collection Technology

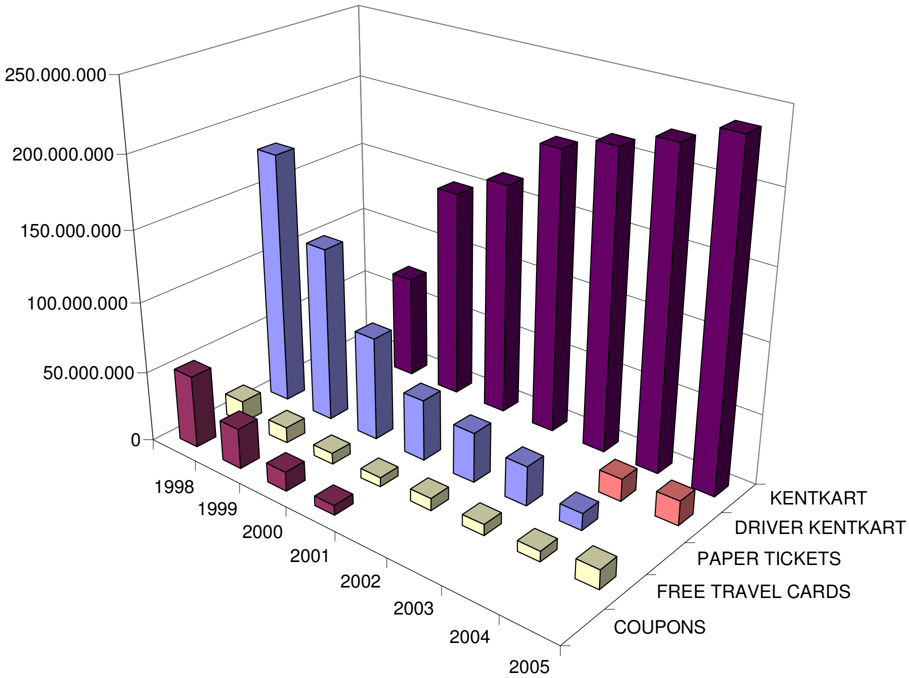
Single trip paper tickets, monthly-unlimited ride fare cards and free ride cards issued by ESHOT according to legal regulations were used as public transport fare media in Izmir until electronic fare cards were first introduced for buses in 1999. Usage of traditional fare payment methods was reduced by 42% in the first year and by 41% in the following year.

Reducing usage of traditional fare media was a major objective for public transport managers due to its advantages for obtaining reliable statistics, which can then be used effectively for transport planning. Fare levels had been determined so as to attract passengers to electronic card usage by keeping paper ticket fare levels higher than the electronically paid rides after the Project. Restructuring bus lines according to their length and having staged fares differentiated on these lines had a further impact on diverting passengers from traditional fare methods to electronic media since distance related reductions were available to only electronic fare card users.

Advantages of monthly-unlimited ride cards had been reduced by keeping the cost of these cards higher than electronic payment alternatives until 2001 when this fare media was completely abandoned. A similar approach was also used for single trip paper tickets until their use was totally discontinued and driver cards were introduced for single trip makers in 2004. Numbers of free travel cards issued by ESHOT for eligible persons and their usage have not changed after they were converted to electronic personal cards to enable statistical data collection.

Fare Structure Changes

Different flat fares were used for all public transport modes (bus, ferry, commuter rail) before the Project. The Transformation in Transportation Project introduced distance based fare structure for buses in Izmir which was composed of four fare levels; B (Besleme: Feeder), Stage-1, Stage-2, Stage-3. Bus lines serving only to transfer centers, ferry piers and metro stations but not to any other trip attraction were defined as bus feeder lines. Fares of feeder bus services were defined as the lowest category since passengers had to make a transfer and pay another fare at the second mode. In order to direct travels to alternative modes, feeder bus services were determined as the cheapest fare category among all transport services to promote transfers between modes, services and lines. Other fare levels of the new fare structure were categorized in three fare groups in relation to the length of the lines (short, medium and long lines). Initially fare structure was defined with the basic relation to keep a single transfer trip cost (B+1) to be equal to or lower than Stage-2 fare level to support transfer trips. This principal was changed shortly having total basic transfer cost to be equal to or lower than Stage-3 fare level. This basic principal was totally neglected in the following years.

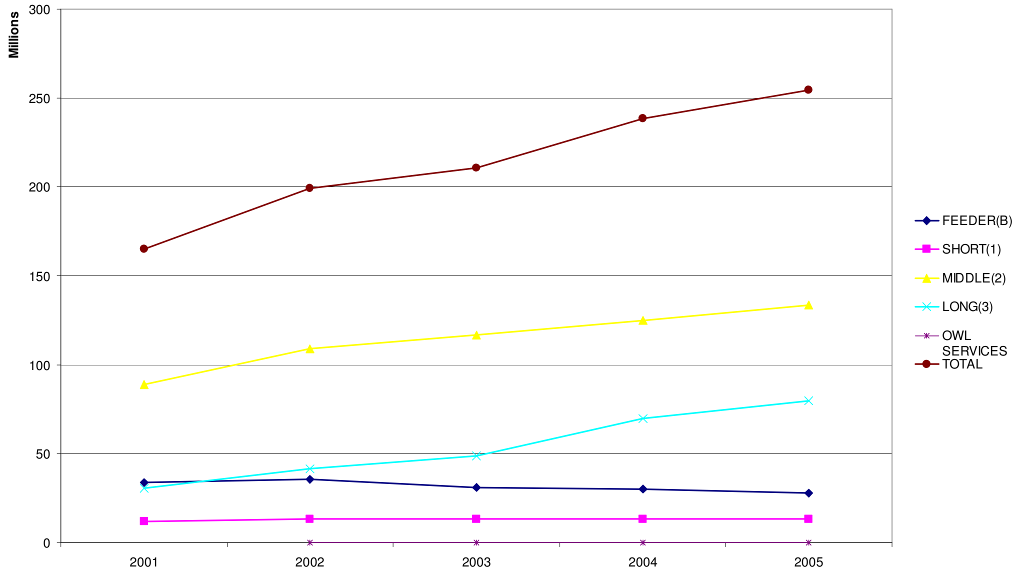


Source: ESHOT (2007)

Figure 5.3 Usage Changes of Passenger Fare Media

Usage of short distance (Stage 1) bus lines were rather stable in years as seen in the Figure 5.4 in contrast with growing patronage on medium and long lines. This trend may be explained by various factors. Short lines were located at the areas close to city center or sub centers where density is stable and saturated thus growth is not expected through the years. However, the longer lines were reaching to outskirts of the city, where higher population and mobility growths have been experienced.

Different growth trends of passengers using four fare categories may also be explained by the fact that fare structure promoting transfer trips at the beginning were distorted in years which led to passengers to use longer lines, instead of making two trips with a transfer since fare advantages disappeared.



Source: ESHOT (2007)

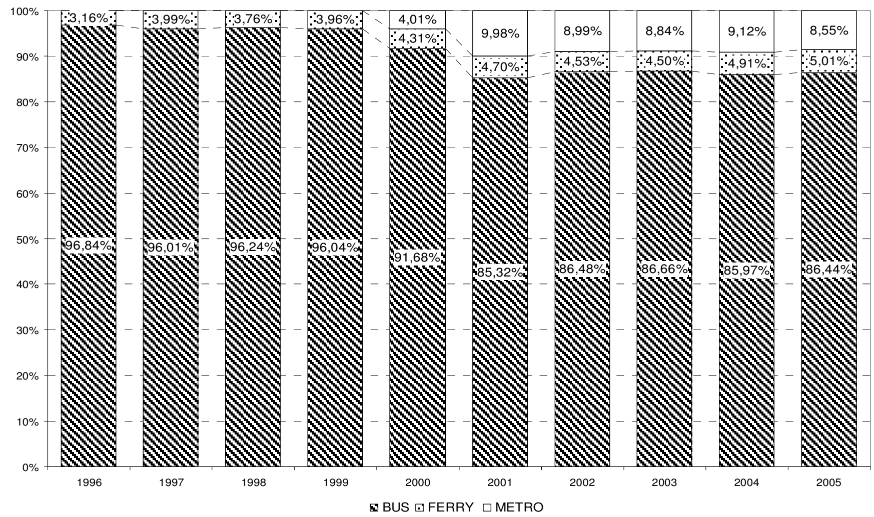
Figure 5.4 Numbers of Annual Passengers Using Different Distance Fares

High growth of Stage-2 and Stage-3 fare level bus passengers are consistent with the expansion of the city toward outskirts having high level of development with shopping malls and mass housing at the outer areas.

5.2.3 Public Transport Usage by Mode

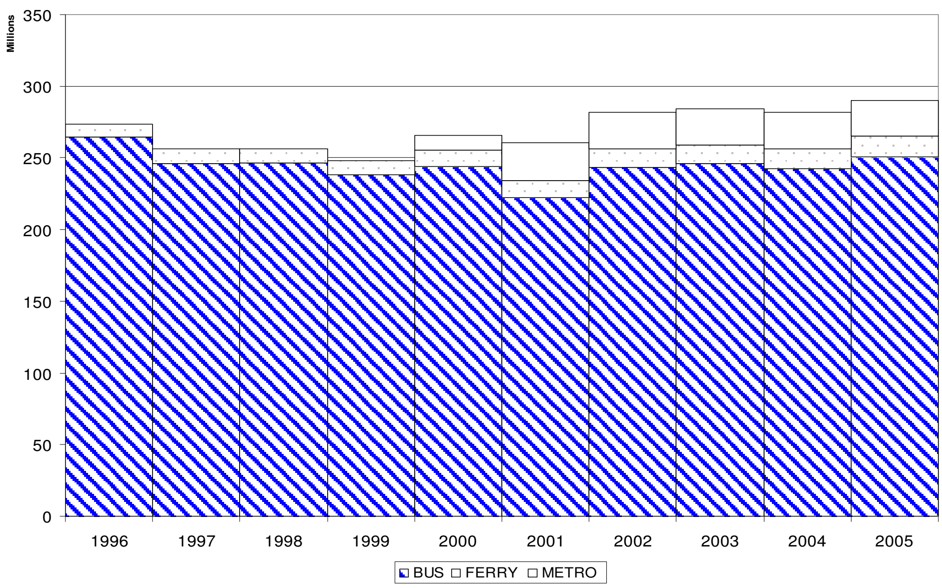
Bus System Usage

Decrease in the number of bus passengers from 1996 to 1999 is a result of both the general decrease in public transport usage and increase in car usage, as experienced in many cities worldwide as well as the metropolitan cities in Turkey. In addition, it is possible that gradual increase in bus line lengths and numbers due to extended and deviated bus routes resulted in longer journeys and hence low service quality, making bus journeys a less attractive option. Decrease in the number of bus passengers may also be a sign of increasing number of fare evasions and forfeit. It is also a reflection of expanding usage of monthly passes allowing unlimited number of trips per passenger in a month.



Source: ESHOT, Izdeniz, Metro Inc (2007)

Figure 5.5 Annual Passengers of Public Transport Modes



Source: ESHOT, Izdeniz, Metro Inc (2007)

Figure 5.6 Annual Public Transport and Bus Passenger Numbers

Introduction of electronic fare system (Kentkart) in 1999 and increasing usage of electronic cards had eliminated fare evasions and forfeit capturing greater number of passengers into legal payment system and into formal statistics.

Transformation in Transportation Project starting in April 2000 had restructured bus lines reducing total number of lines from 475 to 350, deleting lines with deviating routes and having infrequent services. After the restructuring, long distance bus lines around the Izmir Bay that competed with ferries were discontinued and passengers were directed to ferries using new transfer centers and feeder routes created. Passengers in the new metro corridor were also captured by this new mode with similar transfer facilities and feeder bus services.

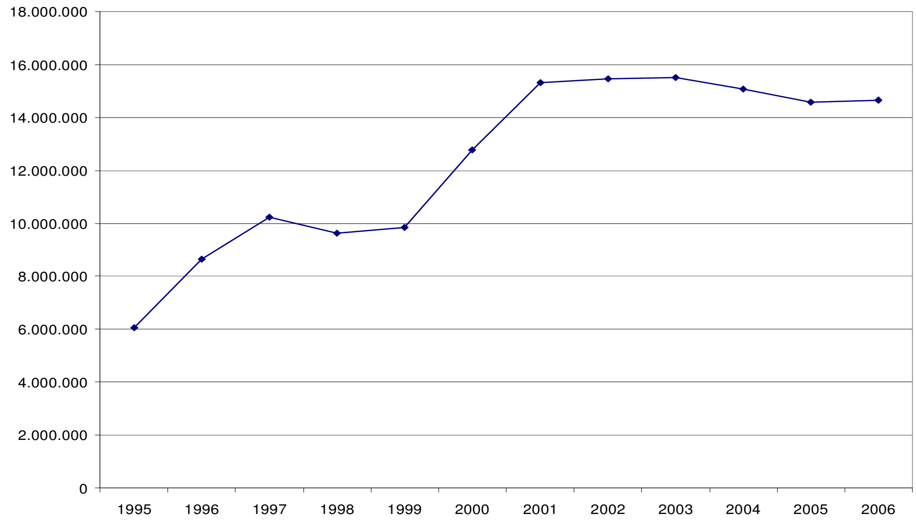
All of these measures implemented starting from year 2000 changed the decreasing trend of public transport passenger numbers and bus usage entered into a new period of growth. Ferry and metro modes helped to create a more sustainable transport system, reducing the burden on over loaded bus services and increasing the number of metro and ferry passengers. Even though reduction in the modal share of buses in total public transport may be considered as an adverse development from a bus operator's perspective, it must be considered as an important development toward a more efficient multi-modal public transportation system with a better distribution of loads among various modes, reducing loads on limited capacity bus operations and increasing passengers on modes with higher capacities and with smaller adverse environmental effects, such as the metro and ferries. (Figure 5.5 and Figure 5.6)

Ferry Usage

Passengers of maritime transportation experienced a dramatic increase of 56 percent after integration with buses in 2000. Various measures were planned and implemented to transfer passengers from highway based public transport modes (buses) to water based modes. These included keeping fares of ferry trips low at the level of feeder bus fares, expanding ferry catchment areas with feeder bus services, adding new piers and vessels to increase accessibility, availability and frequency of ferry services. (Figure 5.7)

Numbers of ferry passengers became rather constant after year 2001 without any further improvement. That is probably because of loosing the advantage of basic transfer fare with the deteriorating basic transfer fare approach. According to the Greater Izmir Municipality Report in 2001, 4.5% to 5% of daily public transport passengers and vehicles on road traffic were taken by maritime transport relieving pressures on highway network.

İzdeniz also carried motor vehicles across the bay with vehicle ferries along with passengers. The measures implemented with the project increased average daily vehicles carried from 175 to 1400 by increasing ferry trips and decreasing waiting times and fares. (İzdeniz Performance Report; http://www.Izmir.bel.tr)



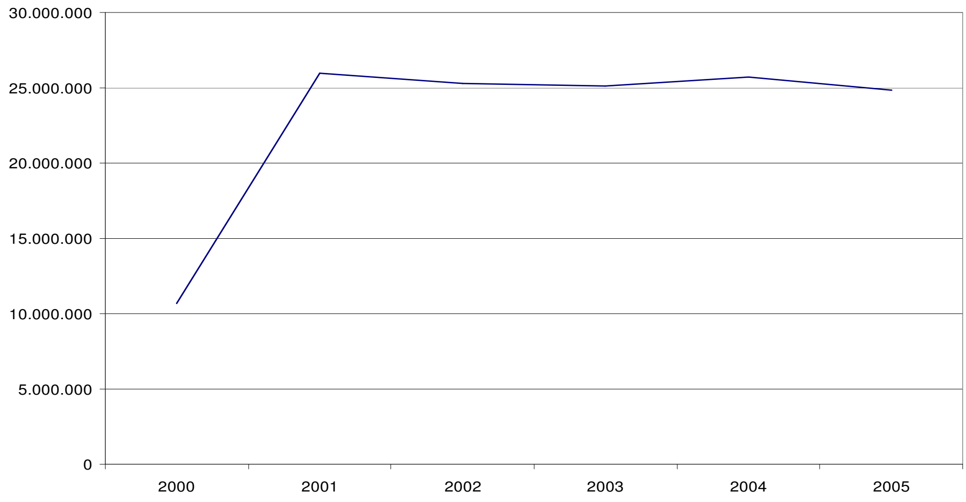
Source: UA (1997), Izdeniz (2007)

Figure 5.7 Maritime Transport Usages between 1995 and 2006

Metro Usage

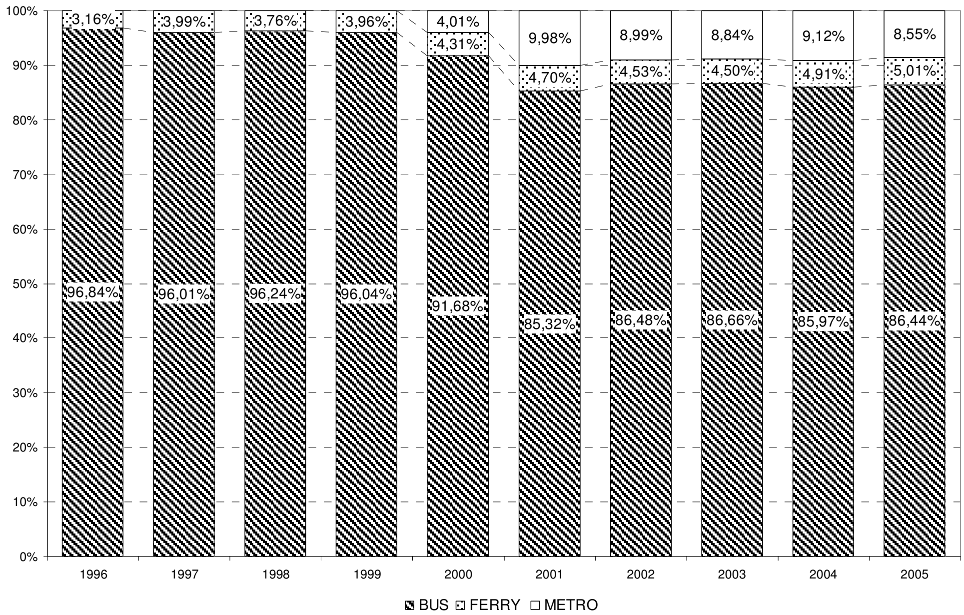
The Metro, which was supported with bus feeder services, fare restructuring and new transfer areas at stations, attracted significant number of passengers at the start of the commercial operations. Passengers of the Metro line became stable at the end of the first twelve months of operations without any significant change in the following years. The number of passengers did not increase since the line was not extended and catchment area of the line was not expanded through any additional feeder systems. (Figure 5.8 and Figure 5.9)

Although there is no significant increase in Metro ridership since the opening, this stable trend should also be seen as an achievement. That is because in most cities in the world, new urban rail systems that are introduced in increasingly road- and car-oriented urban areas have difficulty in sustaining their ridership levels. New rail systems generally attract passengers in their initial years, but then experience a fall in their ridership in time due to the increase in car ownership and usage over the years. This has also been the case in Ankara, where both the light rail and the metro system experienced a steady decline in their passenger numbers after the rise in initial years of operation. While the ridership in the metro system recently started to increase again in Ankara due to intense urban development taking place along this system, the light rail system which serves the inner city still experiences a decline in its ridership. From this perspective, the steady ridership level in the Izmir light rail system should be seen as a rather positive outcome.



Source: Metro Inc (2007)

Figure 5.8 Metro Usages between 2000 and 2005



Source: Metro Inc (2007)

Figure 5.9 Metro Usage in overall Public Transport Use

Metro attracted an average of 80.000 daily passengers when it started operations in mid 2000. Even though most of the metro passengers were previous bus passengers, it also created new trips and an increase took place in total public transport passenger number. Bus passenger numbers also increased in addition to patronage growth of the newly introduced modes, i.e. metro and improved maritime transport. Therefore, arrangements in metro, maritime and bus systems led to an increase in overall transit use.

Metro Passenger Survey (2001) Evaluation

Izmir Metro Inc., the municipal metro operating company has made a passenger survey on weekdays and on weekends between 03.12.2001-09.12.2001 after passenger travel patterns have settled. Passenger survey covered 7500 metro passengers to represent 1% of total metro passengers. The aim of preparing survey questions was to collect data that can help to carry out a metro passenger analysis (Izmir Metro Inc., 2002). Passengers were surveyed at the entries and exits of metro stations between 06:00 and

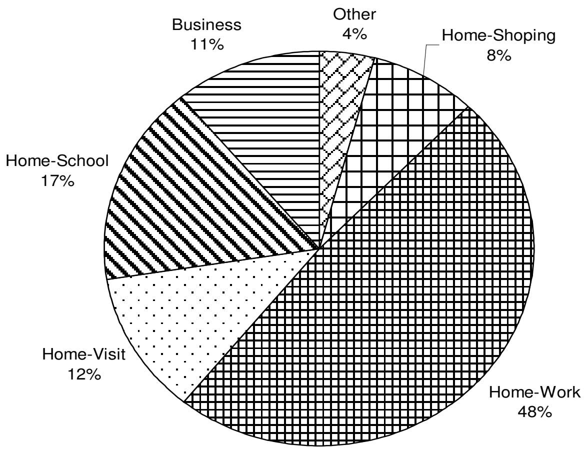
24:00 in every hour. Major findings of the survey and evaluations of the survey results are discussed below.

Trip Purposes on Metro

Trip purposes of metro passengers were categorized under six groups on the passenger survey. Home-to-work trips had the biggest portion with 48%, while home-to-school trips had the second largest share with 17% as expected. These figures indicate that compulsory trips had 65% share among all trip purposes, which shows that metro has a vital role in daily lives of the citizens (**Figure 5.10**). Furthermore, the metro system served to irregular trips such as shopping and visiting.

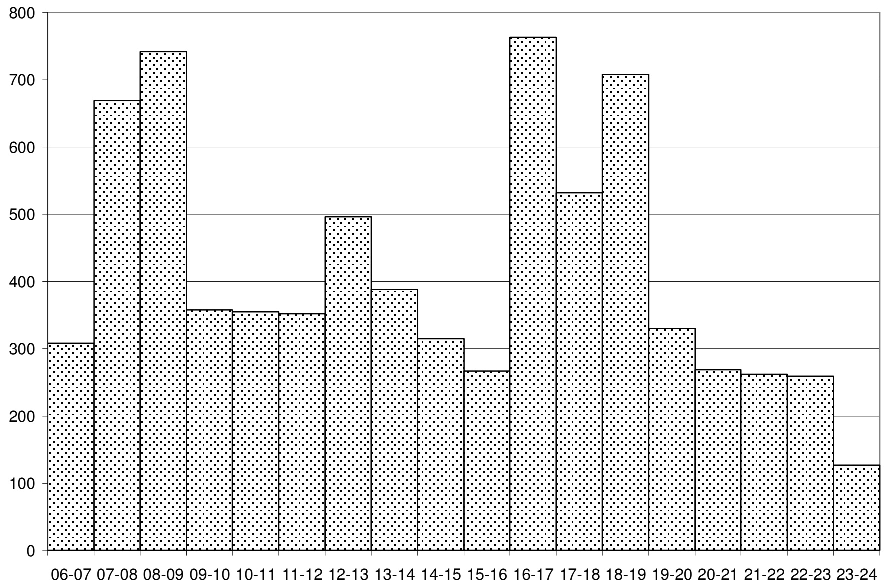
Hourly Distribution of Metro Trips

Hourly distribution of metro trips showed that trips had a morning peak between 07.00 and 09.00 and an evening peak between 16.00 and 19.00 hours. Number of the surveyed passengers changed parallel with the overall passenger numbers reaching to 750 on peak hours. Daily variation of the passengers showed a small peaking during mid-day in addition to morning and evening peaks. Number of the surveyed passengers remained under 400 during off-peak hours (**Figure 5.11).**



Source: Metro Inc (2001)

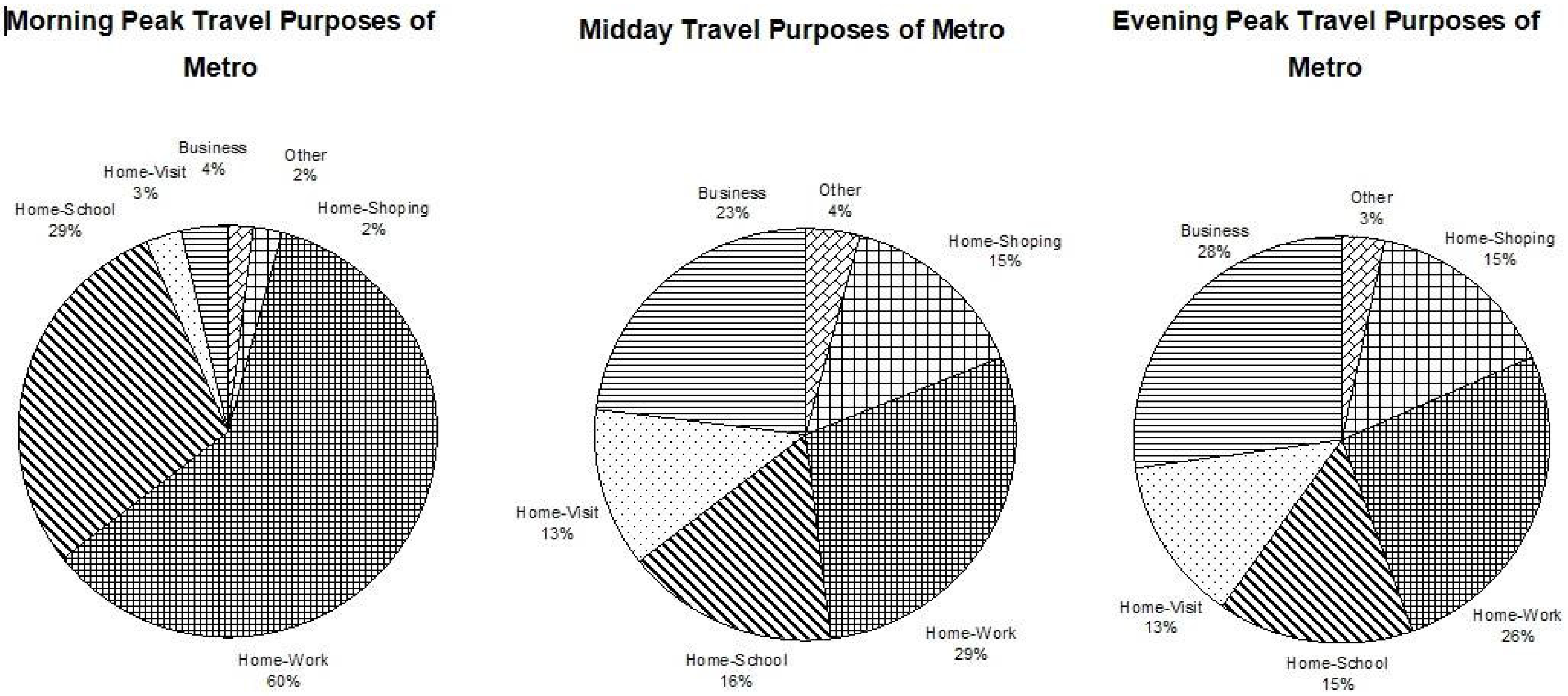
Figure 5.10 Travel Purposes on Metro



Source: Metro Inc (2001)

Figure 5.11 Hourly Distributions of Metro Trips

Trip purposes of metro passengers changed during the day (**Figure 5.12**). Analysis of trip purposes during different times of the day gives evidence to the possibility of managing the demand and reducing excessive peaking by operational and fare measures. The largest fraction of morning peak trips is composed of school and work trips (89%), which are daily regular and compulsory travels. This is an acceptable travel purpose composition for a morning peak hour. Share of these commuting trips decline to 45% and portion of non-compulsory trips increase to 55% on midday reflecting passengers avoiding the morning congestion. Share of daily regular compulsory travels decline to 31% in the evening while non-compulsory trips increase to 69%. This composition is a result of overlapping returning passengers from the morning peak and mid-day trips (shopping and visiting trips). Implementation of lower fares on midday can decrease this density on evening peak by attracting non-compulsory and returning trips within the mid-day period. Validity of free travel fare card may be limited on peak hours to decrease existing demand during peak hours.



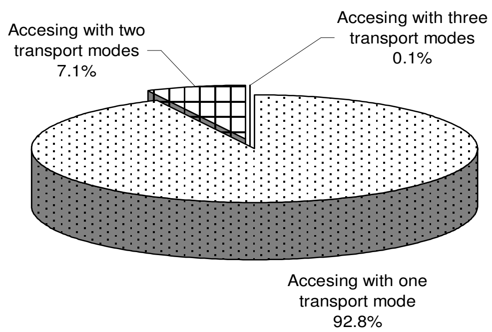
Source: Metro Inc (2001)

Figure 5.12 Compositions of Metro Trip Purposes during Peaks and Off-Peaks

Transport Modes Used Before and After Metro Trips

Metro survey has indicated that 92.8 % of passengers accessed to a metro station using a single mode (this includes walking) while 7.1 % used two modes and only 0.1 % used three or more modes (**Figure 5.13**).

Figure 5.13 shows that among the passengers that accessed to a metro station using a single mode (92.8% of all), the majority were those who walked to the station (60 %). Feeder buses were the second important mode (18.9 %) for passengers reaching metro stations with a single mode. This share indicates that feeder buses had increased metro passengers at a level of 20% but that the majority of metro users are those that are within walking distance to a station.



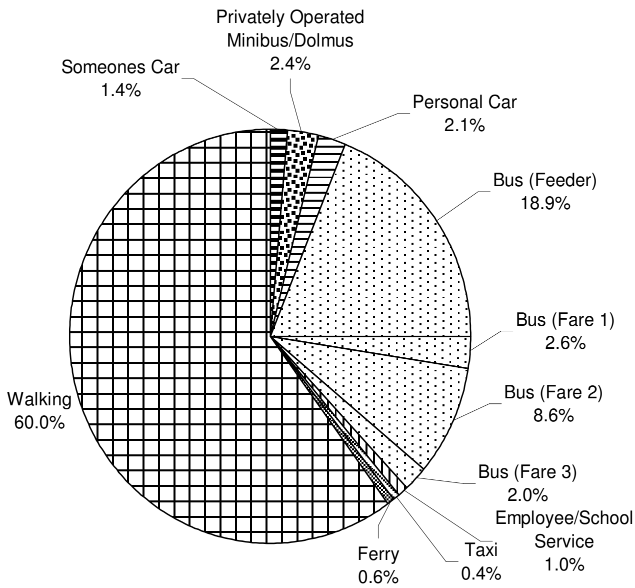
Source: Metro Inc (2001)

Figure 5.13 Single Modes Used before Metro

When these walking trips are omitted and the analysis is focused on vehicle trips in accessing the metro (Figure 5.14), it is seen that bus feeder services has the largest proportion (47%) of transport mode choice for accessing the metro. This high percentage indicates that feeders services give response to travel demands from near surrounding areas, thus metro catchment area was widened. Altogether, with all distance stages and feeders, bus system was the most preferred (80%) transport mode choice for accessing metro.

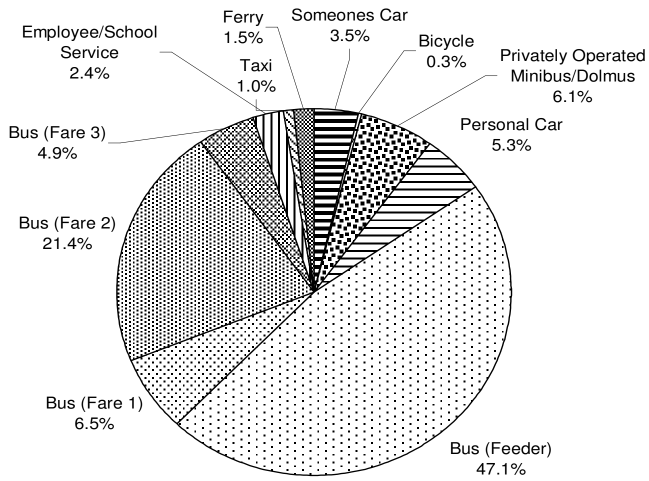
Maritime transport has limited transfer access to metro because the piers are located at a distance from the metro stations. Hence, the share of ferry passengers in accessing metro is rather low. (Figure 5.15)

8.8 percent of metro passengers that used a vehicle to access the metro used their own private car or were given a ride by someone else. There may be a potential to increase “park and ride” by creating new parking areas, particularly after the extension of the metro towards the outer parts of the city attracting private car users from daily traffic.



Source: Metro Inc (2001)

Figure 5.14 Transport mode choices for accessing Metro



Source: Metro Inc (2001)

Figure 5.15 Vehicle Choices for Accessing Metro

5.3 Social and Economic Benefits for Users

Any inter-modal integration project supported with fare structure changes would be expected to result in user benefits on many different aspects. These can be cost savings and timesavings; comfort and convenience due to better integration; and a more equitable and fair system in terms of the distance traveled and payment made.

Unfortunately, no data could be achieved from the Greater Izmir Municipality to measure these possible benefits. During interviews with planning experts in the municipality, it was stated that the most concrete results of the project were on economic benefits derived from distance based fare structure with the restructured bus network and other integration measures. Social benefits were also important in addition to the economic benefits. It was stated that having a more balanced distribution of demand on different modes provided more comfortable travel conditions with decreasing excessive passenger loadings on buses. In addition, it was stated that waiting and travel time savings were achieved. Accessibility to public transport modes and mobility of citizens had increased with consolidation of bus routes and lines.

Furthermore, time savings were provided on boardings to transport modes and on fare media purchasing before the trips through electronic fare system facilities, which are also believed to have increased average bus operation speeds.

Although it is not possible to demonstrate most of these stated effects by statistics, these aspects that were discussed during interviews are briefly summarized below.

5.3.1 Cost Savings

Users began to pay proportionally to the services they used after the restructuring of bus lines with distance-based fares. Long distance transport passengers were subsidized by short distance travel passengers on previous flat fare structure. Many short trip travelers had to pay longest trip fare. A more equitable fare system was established among public transport users by the new fare structure.

Economic advantages were provided within the framework of integration project for target modes of ferries and metro since fares of these services decreased to shortest bus trip fare level. Public transport passengers were shifted to a certain extent to these modes, relieving pressures on buses since ferry and metro usage increased considerably.

5.3.2 Time Savings and Improving Comfort on Bus Services

Short distance traveling passengers boarded on the first arriving bus service going through their destination before the restructuring of lines. Thus, buses operating on long distance lines were excessively crowded with the short distance-traveling passengers that would embark shortly and cause the buses continue half-full until the final destination. This led to the longest lines to have most frequent services to enable all passengers to board at the center and continue to the destination half-full. This travel pattern also resulted with long journey times as well as excessive waiting times for long distance traveling passengers when required number of buses was not available.

After restructuring of bus lines according to distance, bus fleet was allocated to different distance services according to demand levels of those services. This led to a more efficient utilization of the fleet as well as a reduction in passenger waiting times and decreased crowding on different services.

5.3.3 Improved Mobility

Ferries of TDI and sea buses of the private operator were operated in competition with each other and both had excess capacity before the project. Potential maritime passengers were carried by competing buses offering a single flat fare ride with slower trip on congested roads and longer travel time. After the project, passengers were able to make a faster, shorter trip with a transfer by using two modes, cheaper total fare and improved physical and operational integration encouraged with travel information and publicity campaigns.

Mobility of citizens was improved with frequent bus services on consolidated bus lines, new bus feeder services, metro and ferries operating with short headways. After introduction of metro system transport service quality increased on this high demand corridor on which formerly buses were in operation as public transport service.

5.3.4 *Electronic Fare System*

Both users and operators benefit from fare technology improvements. Passengers can buy the fare media and recharge it easily from many sales points distributed throughout the urban area. There are 330 Kentkart recharge stations in the municipal area. Most of these sell new cards as well as recharge existing cards. Approximately 85 (about 25 %) of these sales points are municipally owned and operated, with the remainder privately owned and operated. Approximately 75 of the recharge stations are open seven days per week, 24 hours per day (The Louis Berger Group, 2005) which shows effectiveness of the system.

Public transport usage has become very convenient from the point of users and fare collection with the smooth and simple operations of the electronic fare cards. Concession given to electronic card users have been accepted widely and number of electronic cards in circulation has grown higher than the daily public transport users.

5.4 Financial and Economic Benefits for the Operators

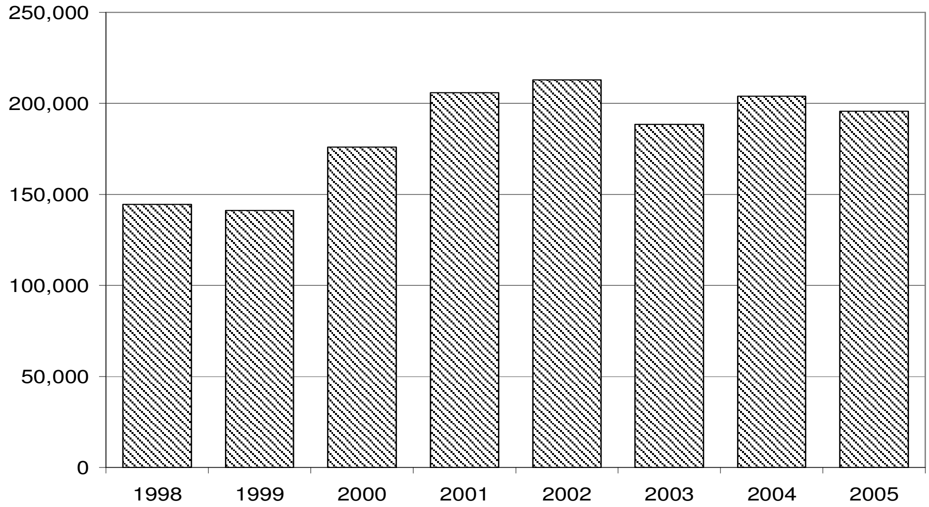
Effects of the project on financial profitability and efficiency of the operators can be measured with various performance criteria related with revenues and costs of public transport operations. This evaluation requires financial data, balance sheets, incomes and costs of operators. However, only one of the two bus operators (ESHOT) provided some of this data while İzulaş data was not accessible. The available data from ESHOT is used for evaluations assuming that similar trends and results would be applicable to the second municipal operator also. Since metro system is a relatively newer organization than bus and maritime, statistical data was gathered regularly and were obtained from Metro Inc. Izmir Maritime Operations Company did not provide any financial performance data.

Several parameters were used for assessment of financial and economic efficiency and profitability since some parameters being meaningful for one operations would not be applicable to others having different system features. Parameters like average vehicle kilometer per day, vehicle trip number, passenger numbers per vehicle kilometers, passenger numbers per trip, passenger number per staff were used for both metro and bus operations. Parameters like annual average occupancy ratio, cost recovery ratio was used for evaluation of metro operation.

5.4.1 Average Daily Vehicle Kilometers

Bus System

After the project, it was possible to make more vehicle kilometers with the same fleet on the consolidated and simplified network. Growth of the vehicle kilometers was also achievable with new buses added to the fleet. At the beginning of the project implementation in 2000, frequent services were planned to be introduced to attract passengers to the new services without knowing the real demand and requirements. After the changes have settled and passengers' travel behaviors were stabilized in the following years, some reductions were made on the services with excess capacities (Figure 5.16).

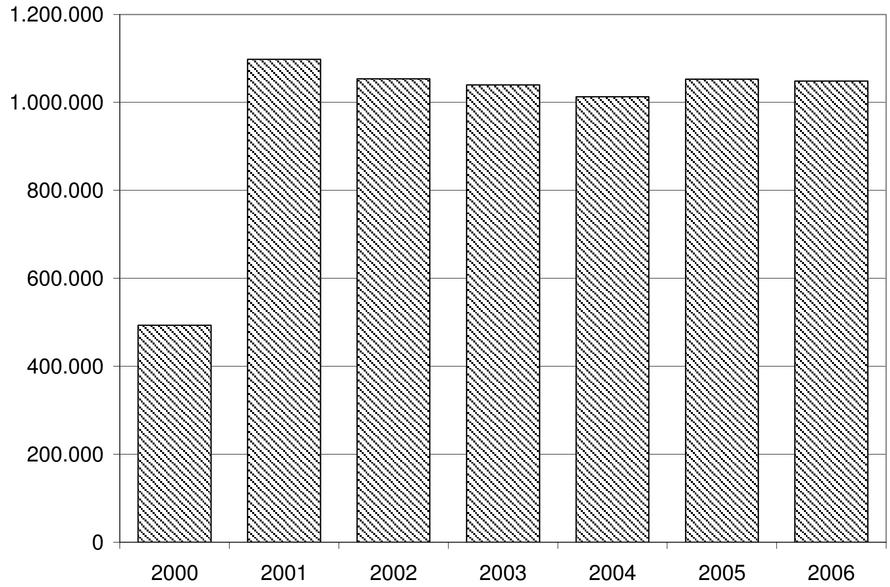


Source: ESHOT (2007)

Figure 5.16 Average Daily Bus Kilometers

Metro

Frequencies of metro services were also adjusted after the first year of operation considering actual demand levels and variation of the demand during the day. Metro vehicle kilometers showed a small decrease after first year of operation and stayed approximately at the same level during the following years (Figure 5.17).



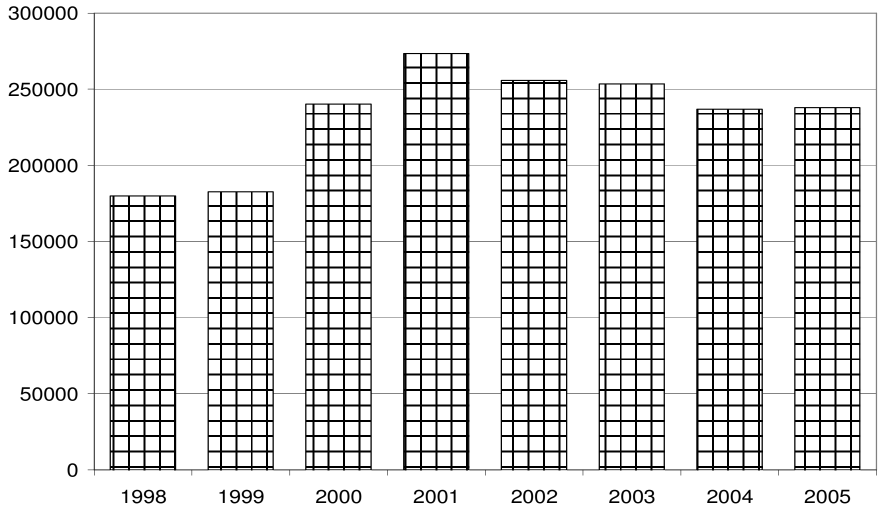
Source: Metro Inc (2007)

Figure 5.17 Annual Vehicle Kilometers on Metro

5.4.2 Number of Vehicle Trips

Bus System

A similar trend with performed vehicle kilometers is seen for the number of vehicle trips provided by the operator. Number of bus vehicle trips showed an increase of 32% in 2000 with the project implementation and a further increase of 14% in 2001. After the stabilization of the demand, excess services were reduced during the following years (Figure 5.18).



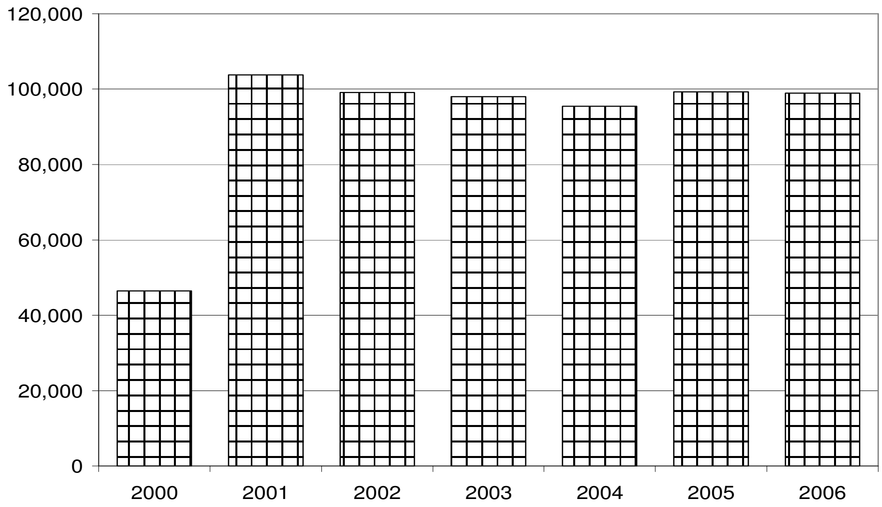
Source: ESHOT (2007)

Figure 5.18 Number of Bus Trips

Metro System

Number of annual metro vehicle trips almost doubled in year 2001 after metro started operations in April 2000. Since 2001 was the first full year of operation, this is an expected increase. The number of metro vehicle trips was stabilized during the following years when the demand patterns became steady. (Figure 5.19)

The figures given above showed the provision of service in public transport. Being able to increase service levels and frequency (which result in an increase in vehicle kilometers) is an important service improvement from both users' and operators' point of view. However, more important for the operators is the extent to which their services are being utilized. The three following sub-sections provide an analysis on service utilization.



Source: Metro Inc (2007)

Figure 5.19 Number of Metro Vehicle Trips

5.4.3 Service Utilization: Passengers per Vehicle Kilometers

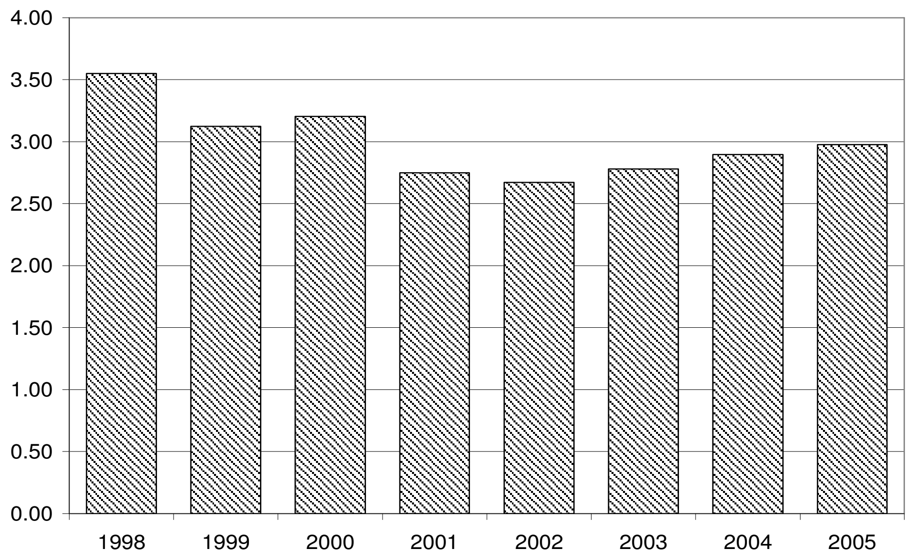
Bus System

A clear decrease in passenger number per bus vehicle kilometer is seen from the beginning of "Transformation in Transportation" Project. This decrease can be assessed negatively from the point of view of bus operators. On the other hand, the project's primary aim was to shift some of the demand for bus public transport to urban rail and ferries. Hence, such a decrease may be an expected outcome for this project. Furthermore, this decrease may show that passengers per vehicle kilometer decreased to normal service levels from overcrowded service levels.

Pressure on highway network was reduced after transfer of excessive passenger loadings from bus system to modes like ferry and metro with excess capacity. Passengers per vehicle kilometer decreased for buses while passenger numbers on maritime and metro modes grew.

After restructuring the route and line network with the project, there was a period of transition where bus services were planned with high frequencies under the absence of travel demand data for the new conditions. Service frequencies were initially kept higher than the expected demand levels during this transition period to reduce complaints of the passengers adjusting to new conditions, especially for those making trips with additional transfer. In a year's period service headways were continuously adjusted with "trial and error" approach considering actual demand levels under actual conditions. This practice reflected as ineffectiveness in some performance criteria in the first year of implementation but re-adjusted in a year to the improved conditions.

Bus passengers per vehicle kilometer began to increase starting from 2002 through attraction of new passengers and further adjustments on service headways and lines. This increase was parallel to the growth in total passenger numbers on the total public transport (Figure 5.20).



Source: ESHOT (2007)

Figure 5.20 Bus Passengers per Bus kilometer

Metro

Since the metro system has restricted system features (route, line, operation times) it had stable operation kilometers throughout the years. (Figure 5.21) Considering that passenger numbers were also rather steady for this system, there has not been any significant change in terms of passengers per vehicle kilometer. In addition, as expected from a metro system, service utilization levels are much higher than those of the bus system, due to the high capacity provided.

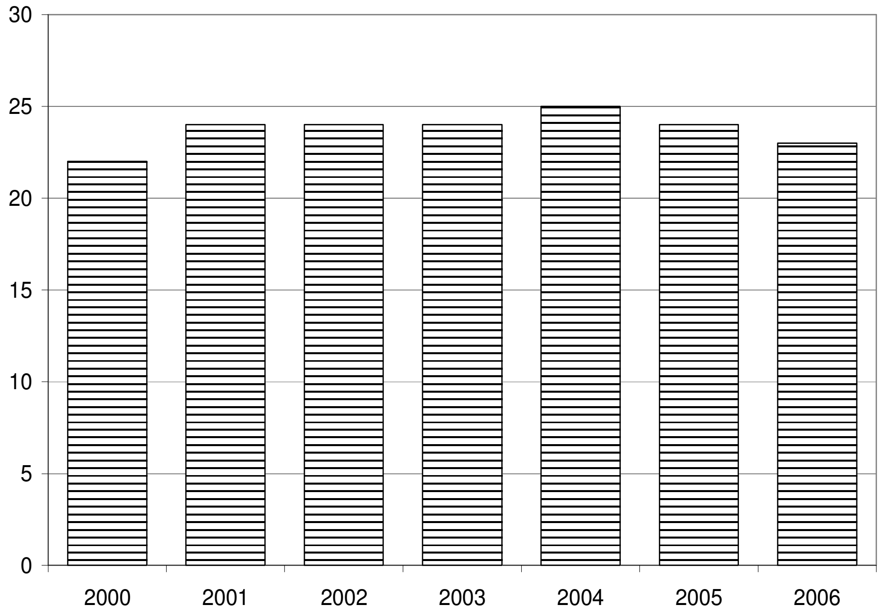


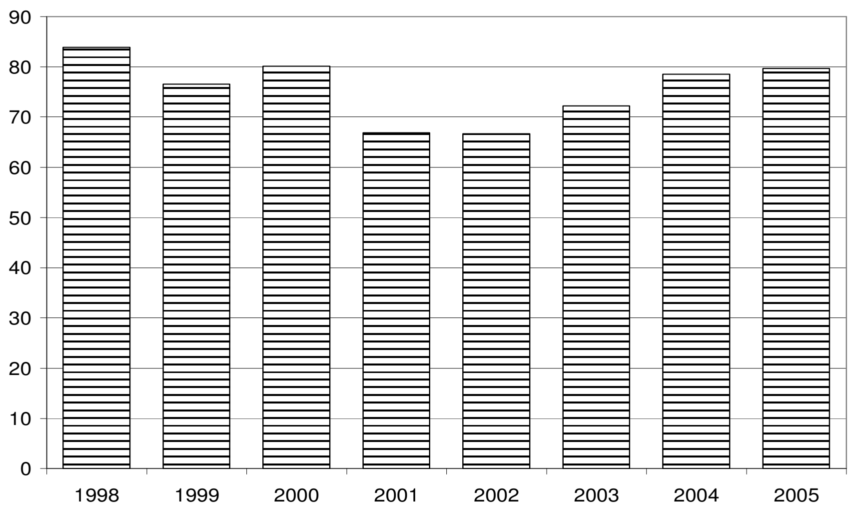
Figure 5.21 Passenger Numbers per Vehicle km on Metro

5.4.4 Service Utilization: Passengers per Vehicle Trip

Bus System

Passengers per vehicle trip showed a trend similar to that in passengers per vehicle km. Number of passengers on deviating bus lines was on average over 80 passengers before the year of 2000. Long and unproductive bus lines were discontinued and network was simplified with short lines and higher frequencies on main corridors.

In the first year of implementation, passengers per vehicle trip increased as a result of the new services offered. Passengers per vehicle trip decreased in 2001 after passengers adjusted their trip patterns to the new system with full time metro operations and improved ferry services. Number of passengers per vehicle trip began to increase steadily after 2002 with further adjustments in the operation practices and schedules (Figure 5.22).

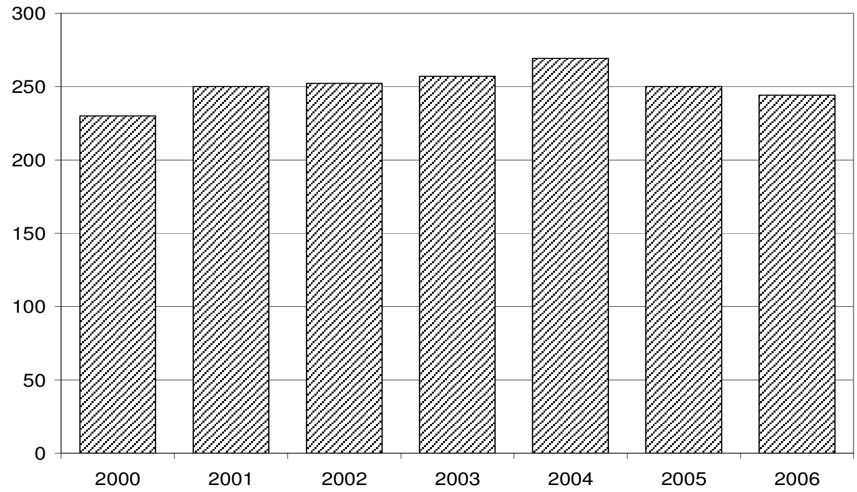


Source: Metro Inc (2007)

Figure 5.22 Passenger Number per Trip on Buses

Metro System

Similar to the above indicator of service utilization, passengers per vehicle trip on the metro have been stable over the years with higher capacities offered (Figure 5.23). Metro figures are very sensitive to bus services offered along the LRT corridor and to the feeder lines serving metro stations.



Source: Metro Inc (2007)

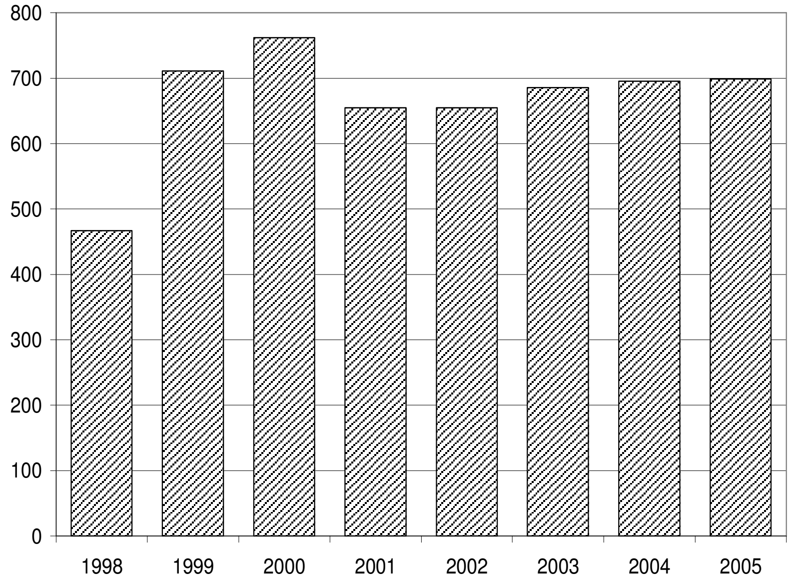
Figure 5.23 Passenger Number per Vehicle Trip on Metro

5.4.5 Service Utilization: Passengers per Vehicle

Bus System

Users made very long trips with one boarding on the bus system before the project. This pattern changed after restructuring the bus network; long distance trips required transfers. It also enforced short trip making passengers to board on the most suitable bus line according to their trip length to reduce cost of their trips instead of the other long distance buses serving in the same corridor.

This performance measure showed a similar behavior with an initial increase at the project start in 2000, then a reduction resulting from passengers switching to the new metro and improved ferry service; and finally ending with a steady increase by adjustment of offered services and users making their final decision on their trip patterns (Figure 5.24).



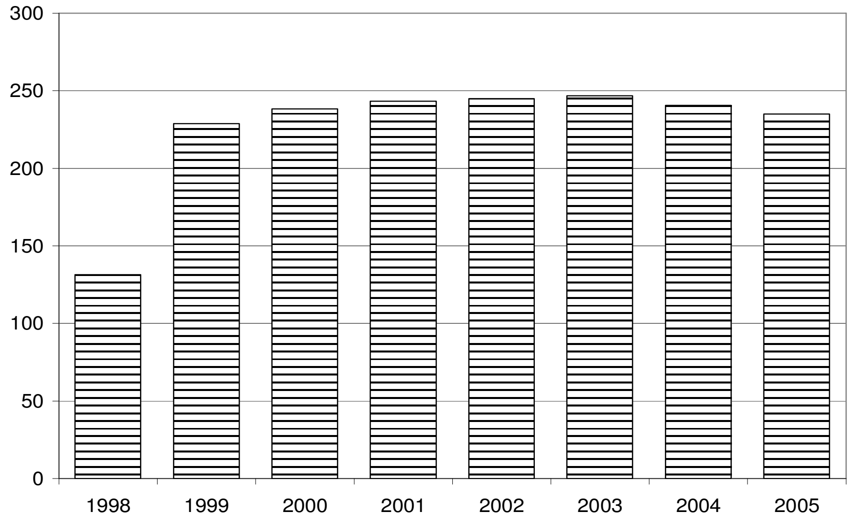
Source: ESHOT (2007)

Figure 5.24 Daily Passengers per Bus

5.4.6 Performed Km per Vehicle

Bus System

The project had a striking effect on the vehicle productivity resulting with an almost two-fold increase in average daily vehicle kilometers per bus (Figure 5.25). This increase shows that after restructuring bus network and services each bus doubled its performance making twice as mileage each day to reach and serve passengers. In spite of abandoning many long and indirect lines and creation of new short lines, increase in average distance traveled per bus is a reflection of improved services on reduced network. This situation is a direct reflection of shorter headways and better service on consolidated network. The figure shows that performed km per bus increased slightly after 2000.



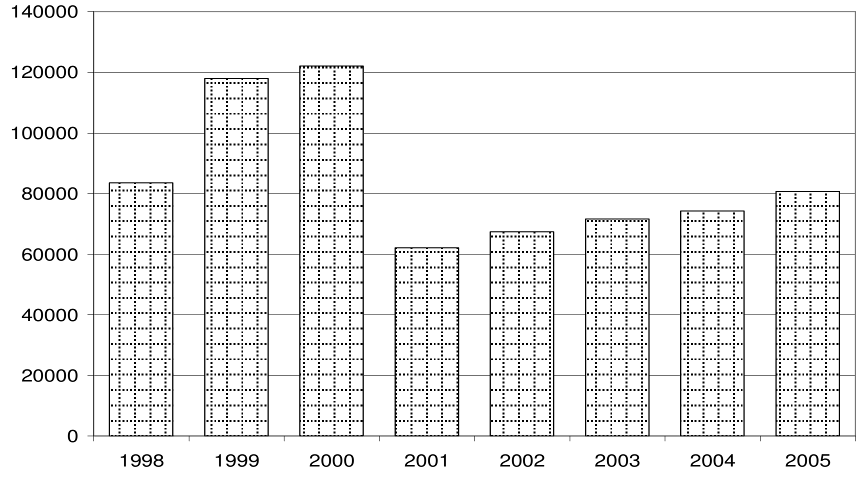
Source: ESHOT (2007)

Figure 5.25 Average Daily Kilometers per Bus

5.4.7 Staff Productivity: Passengers per Employee

Bus System

The project included many aspects requiring additional resources. Shorter headways reduced crowding and improved comfort on buses and continuous 24-hour operation expanded staffing needs. This quality and service improvements reflected as a reduction in staff productivity compared to before situation (Figure 5.26). The services were adjusted with fine-tuning in the following years to improve staff productivity.

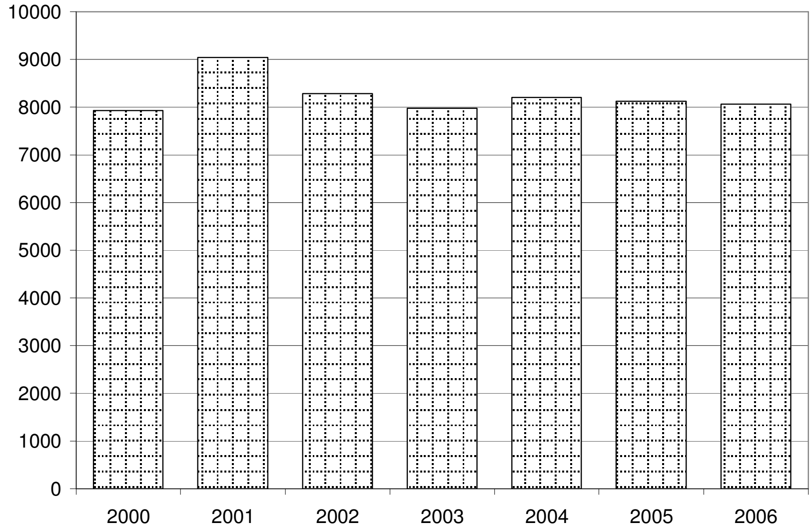


Source: ESHOT (2007)

Figure 5.26 Passengers Carried per Bus Employee

Metro System

Metro has a stable figure of passengers per employee over the years (Figure 5.27). The figures are lower than the bus system or other urban rail systems since only 12 km line is in operation in spite of the full staff hired defined for a much larger network, on central services such as centralized traffic control, workshops, depots and management. Staff productivity would be expected to increase in the future as the LRT network expands.



Source: Metro Inc (2007)

Figure 5.27 Passengers Carried per Metro Employee

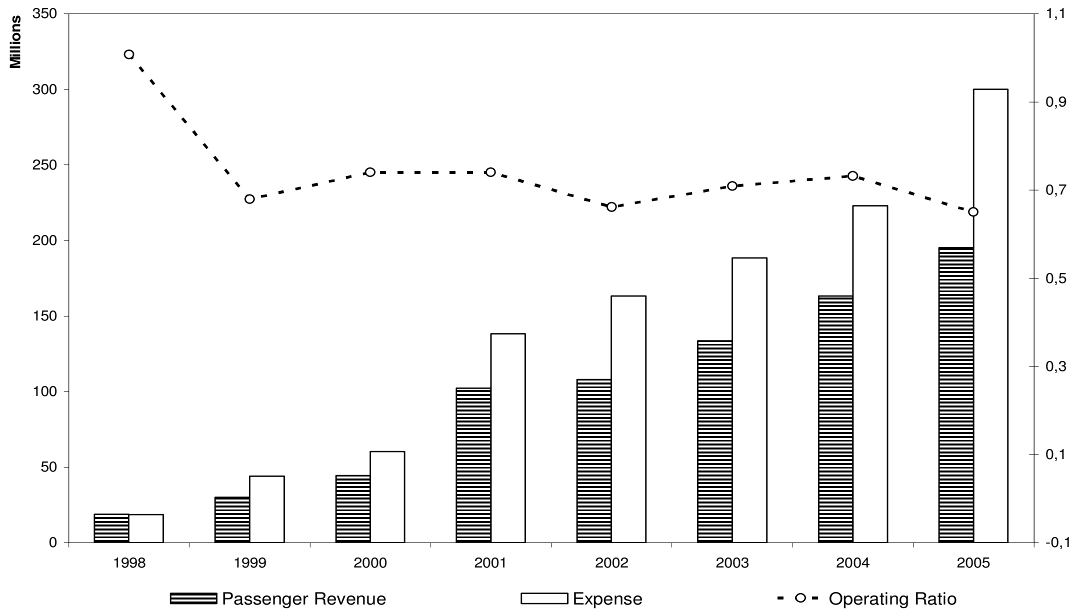
5.4.8 Cost Recovery Ratio

Cost recovery (or operating) ratios are not a measure fully representing economic and financial efficiency of operators, modes or transportation system as a whole due to many reasons. The first reason is aims of a public transport operator not being totally quantifiable at financial grounds. Many of the benefits cannot be measured with quantitative methods as revenue. Secondly, public transport operators operate in an imperfect market where fare levels are artificially defined by politicians with political and social considerations rather than economic and financial criteria. City managers evaluate transportation as a social service and intentionally keep fares low which worsens financial sustainability of the services without subsidies.

External inputs effecting cost and revenues of the public transport system and operators are not controllable and may be defined subjectively such as fare increases of public transport or labor agreements at the end of the contract period. These factors would limit a meaningful economic evaluation and comparison of operations among each other and in time. For example, a fare increase yielding additional revenues may actually belong to the previous year delayed with political considerations. However, this delay in the fare and revenue increase makes previous year “unprofitable” and the following year more profitable. Similarly, delayed costs also distort the evaluation. Analysis of revenues and costs (expenses) of public transport operations on the annual basis may not reflect true economic and financial performance of the operator for that specific year.

Bus System

Bus operation revenues have been lower than expenses with the exception of year 1998 when revenues were slightly higher than the expenses. Operating ratio varied around 0.7 between 1999 and 2005 (Figure 5.28). Only in 1998, cost recovery ratio was about 1.0 and several external inputs may have caused this performance. If 1998 values are not taken into consideration, bus systems have a performance where revenues are lower than expenses. Even though this ratio is lower than expected for commercial operations, it may be considered as satisfactory for a public transport system. Public transport is subsidized by governments considering social and equity aspects for low income citizens since public transport is accepted as a public service not a commercial operation.



Source: ESHOT (2007)

Figure 5.28 Revenue and Expense of Bus Operations

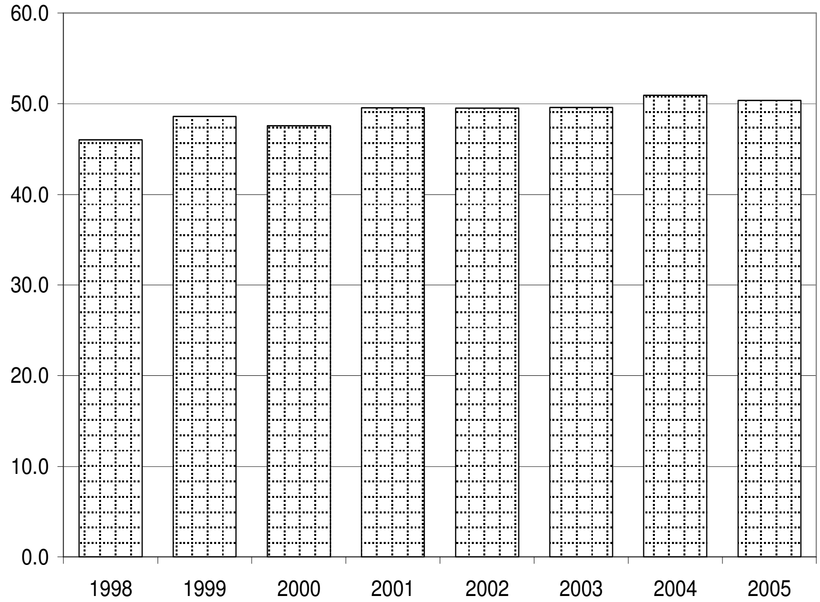
5.5 Environmental Benefits

5.5.1 Energy Consumption

Changes in energy consumption of a motorized vehicle on roads can result from various factors. It is in relation with technological levels of vehicles in operation, traffic congestion levels on roads, accidents on roads and weather conditions. On the other hand, rails systems are not affected from external factors with reserved right-of-ways. Changes in energy consumption can result from system upgrades or malfunctions.

Bus System

Considerable changes did not occur in bus operations' fuel consumption between the year 1998 and 2005 (Figure 5.29). Buses consumed on average between 46 and 50 liters of fuel for 100 km's. Small decrease in fuel consumption during early years can be assessed as positive effects of the Transformation in Transportation Project. However, this trend did not continue probably due to increase in private car numbers during following years, causing traffic congestion and conditions that result in more fuel usage.

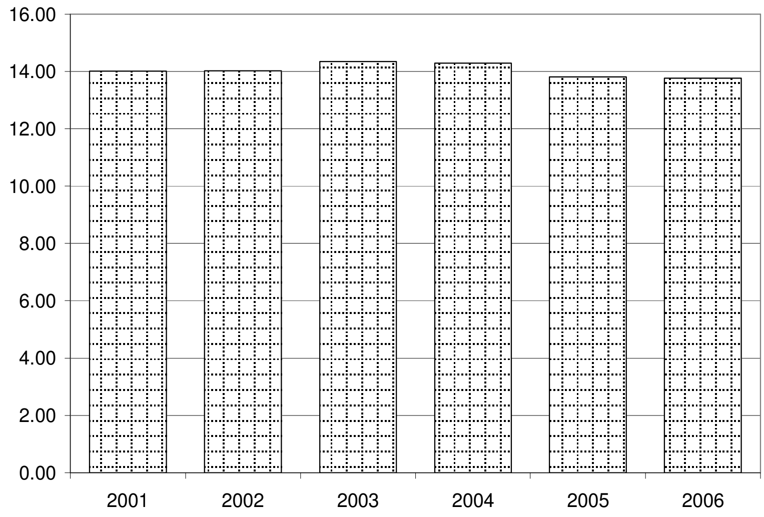


Source: ESHOT (2007)

Figure 5.29 Fuel Consumption of Buses (liters per 100 km.)

Metro System

Consumed electric energy by metro system per kilometer has been about 14 KWh beginning from the opening year. Minor changes occurred between operation years. Stability of energy consumption is related with technological characteristics of metro system not been effected from external factors such as congestion.



Source: Metro Inc (2007)

Figure 5.31 Energy Used (KWh) by Metro per Unit km. (Metro Inc., 2007)

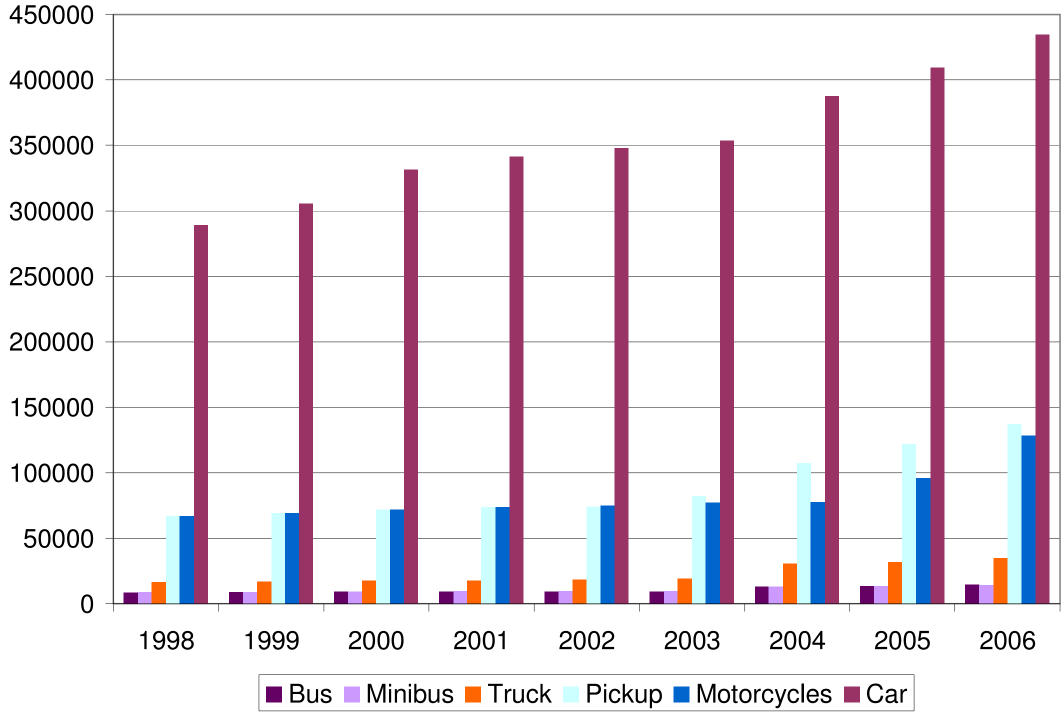
5.5.2 Air Quality and Pollution

Number of private cars in Izmir had a constantly increasing trend as a result of population increase and general increase of motorized vehicle number in Izmir. With increasing number of motorized vehicles, urban transport creates crucial air pollution in the city center. Annual emission values of motorized vehicles in Izmir found with a study completed in 1992 by Izmir Provincial Environment and Forestry Directorate are given below (Table 5.2). Automobiles have the greatest CO_2 emission levels among all motorized vehicles. If present development trends of motorized vehicles and private cars (Figure 5.32 and Figure 5.33) in Izmir continue, crucial threat for air quality is inescapable. Measures should be taken in order to diminish private car use and motor vehicles in general.

Table 5.2 Annual Emissions of Transport Modes in Izmir

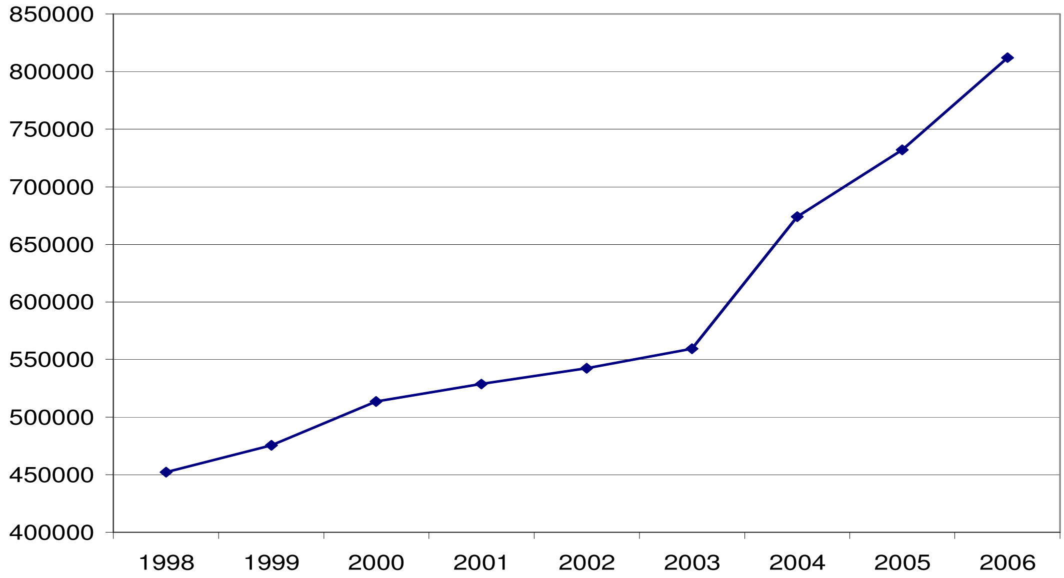
Vehicle	CO_2	No_x	VOC	PM
Minibus	223	153	39	45
Bus	823	1810	344	136
Truck	1510	4854	557	329
Automobile	15906	1266	2448	
Total	18462	7930	3387	510

Source: Izmir Province Environment and Forestry Directorate (2004: 56)



Source: www.turkstat.gov.tr

Figure 5.32 Motorized Vehicle types in Izmir between 1998 and 2006 (



Source: www.turkstat.gov.tr

Figure 5.33 Number of Motor Vehicles in Izmir between 1998-2006

There isn't any study specially carried for measuring emission effects of the project. Emission levels can only be decreased by traffic reductions and this reduction is examined at section 5.6

5.5.3 Noise Pollution

Main sources of noise pollution are transport, industrial activities, and construction areas. It is revealed in relation with technological improvements in developed countries. Despite being one of most crucial pollution types, it is the least known pollution type in our country (Izmir Provincial Environment and Forestry Directorate, 2004). It can affect hearing and recognizing features negatively and can result in performance decreases, distortion of physical and physiological balance.

5.6 Traffic Benefits

It is not possible to carry out an analysis to measure changes in traffic congestion levels in the absence of proper before and after data. However, it is expressed by municipality officers during the interviews that congestion decreased after the project implementation especially on the Altınyol Corridor connecting two sides of the Izmir Bay. This corridor was under excessive bus congestion before the project with many bus lines connecting two sides of the Bay and all lines from northern residential quarters reaching to the central area. Bus numbers on this corridor decreased dramatically with the cancellation of most of these long lines and directing them to ferry piers instead of the central area.

The increase in the ferry passengers and the passengers of the new metro line are direct reflection of the reduced congestion levels on the highway network. New daily ferry passengers of about 20,000 and metro passengers of about 80,000 are signs of reduced congestion levels on the highway system if induced demand is not considered.

Transformation in Transportation project did not cover all transport modes but included only improvements for public transport services. Permanent decrease in congestion levels cannot be achieved without implementation of supportive projects for restricting car usage. Even though congestion levels were lowered with reduced number of buses resulting from bus passengers transferring to metro and ferries and possibly some passengers leaving their cars and using improved public transport services, the available road capacity is believed to be soon filled by new cars since no disincentives were implemented for private transportation.

5.7 Land-Use Benefits

A comprehensive analysis could not be performed within the limits of this thesis since land-use effects are seen in long term and not easily measurable. However, interviews were beneficial in order to gain a general perception about land use effects.

In principal, distance based fare structure discourages long distance trips and helps to create more compact settlements. Flat fare structure that has been implemented in Izmir for decades encouraged long trips with hidden subsidy from short trip makers. Flat fare not reflecting the true cost of the trip to the users may have contributed to the expansion of Izmir urban area along major corridors. Dwellers without any cost awareness for public transportation trips had selected residential locations at the outskirts of the present settlement areas where rents and property values were lower. Public transport dependants' residential location selection supplemented and strengthened with new sub-centers that led to more people living at outskirts with more demand for public and private transport. The sprawl was also spurred by large shopping centers and low-density housing development.

In spite of all these, it is not possible to evaluate land use effects of the project since long bus routes with flat fare is only one of the many factors affecting long term land-use and urban structure changes.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

Izmir public transport underwent a series of comprehensive changes in public transport during the “Transformation in Transportation Project”. This integration project can be evaluated as first wide-scale comprehensive urban public transport integration and restructuring in Turkey. The important changes and schemes within the project include implementation and expansion of electronic fare system, reorganization of maritime operations together with bus line restructuring, distance based fare structure and the introduction of a light rail system with bus transfer centers. The case provides a good example of a comprehensive policy-package that incorporates various different but complementary transport schemes.

The emphasis of the “Transformation in Transportation” project was that public transport patterns should be handled with a holistic manner in a metropolitan city. Advanced level of integration arrangements are needed to be adopted in order to have good working public transport network, which consist of various sized transport modes.

The effects of these changes are summarized below. In addition, shortcomings and problems are defined and recommendations are provided for further steps for integration in Izmir in the light of the former theoretical framework

6.1 Summary of Case Study Findings

The analysis revealed the following outcomes of the Transformation of Transportation Project in Izmir:

- Public transport ridership was significantly decreasing before the implementation of "Transformation in Transportation Project".

- Total public transport ridership trend was changed with the Project with a clear increase in ridership especially on ferries and the newly introduced metro.

- Although bus transport ridership was decreasing on the first years of the "Transformation of Transportation" project, this was probably due to the radical reorganization of bus routes, since it showed an increase in the following years. This is an extremely positive development since in most cities that introduced a new urban rail system; bus ridership has experienced a steady decline. It appears that this did not happen in Izmir and that all other elements of the public transport improvement project had an overall effect of ridership increase in all public transport modes, including the buses.

- Nevertheless, after the project the share of buses in total public transport trips remained lower than that before the project. However, this is considered to be a positive outcome too, since it indicates a more balanced mode distribution in public transport usage, which was one of the primary aims of the project.

- Reducing pressures of motor traffic on highways was another important aim of the project. This was achieved locally on some corridors at the end of the project, since metro and ferry system had limited service area due to their restricted route and system characteristics.

- There has been a noteworthy increase in maritime transport usage, showing that fare and route integration can have significant effects on public transport usage, and that these strategies are particularly important for multi modal public transport systems.

- Metro continues to serve with a stable ridership. Both the Metro usage and usage of other public transport systems increased in Izmir while many cities in the world experience decreases in their urban rail ridership and overall public transport usage after a certain period following the introduction of a new urban rail system. The experience in many cities, including also Ankara, shows that a new urban rail system, metro or LRT, initially attracts passengers; however, after a while ridership starts falling due to the general increase in car usage. It is extremely important for the Izmir case that neither the Metro nor other public transport systems experienced a significant decrease in their ridership. This can be considered as an outcome of the Integration project..

- Walking has the largest share among passengers accessing to the Metro. This is an interesting and probably not a welcome result of the project aiming integration. Accessibility of metro can be further increased by extending the metro line and providing park and ride facilities, both of which can expand the catchment area.

- Service utilization and staff productivity indicators showed an increase in system efficiency. However, this efficiency increase cannot be attributed directly to the project, since operational data is not available before the project and level of changes in some areas are not significant. Metro system indicators point to a higher level of efficiency as would be expected from an advanced technological mode. Some of the bus system indicators had fallen in first years of integration project due to reorganization efforts; however, these indicators improved after a short period.

- It was not possible to evaluate effects of the project with financial performance indicators of the public transport operations since segregated and detailed data was not available for this analysis. Metro operators did not provide detailed data but interviews revealed that operating costs exceeded revenues. This is also the case for the bus system, where the operating costs remained higher than revenues throughout the project implementation period. It is possible to suggest, based on these findings, that public transport operation generally requires subsidy and that measures to improve public transport service and increase ridership (including fare and pricing policies) may not have important effects on financial performance or profitability.

- However, it is also important to remember that this project did not include any pricing schemes on car usage (such as congestion charging) or car parking, which could not only help improve public transport ridership but also create additional revenues and hence opportunities for cross-subsidy. Therefore, it would be misleading to conclude, based on this case study, that fare and pricing policies have limited positive impact on financial performance of transport operators.

- Available data do not give a clear indication of energy consumption effects of the project although it is known that the metro and ferries, which experienced increases in their passenger patronage and modal shares after the project, are more energy efficient modes compared to buses and cars where passengers were captured from.

- Air quality and traffic reduction effects of the project were not evaluated clearly at the absence of before and after measurements. Municipality officers remarked that integration project diminished traffic levels on many corridors. This was due to bus system restructuring, introduction of the metro line, maritime system improvements; fare integration among modes attracting new passengers from cars to public transport although no statistical data exists to measure the amount of shift from private car to public transport. Transformation in Transportation Project focused on public transportation improvements and excluded other traffic components such as private car usage. Since the project did not include any disincentives to restrict car usage, it is estimated that positive outcomes, such as reducing vehicle traffic levels on the road network lost its effects with rise of private car ownership and usage in time.

6.2 Shortcomings and Recommendations

In spite of the general success of the project, there have been a number of problems and limitations at the planning and design, implementation, and development stages of the project. These are described below:

- **Management Structure:** Main tasks of Transportation Coordination Center (UKOME) are defined as conducting all types of land and maritime transport services. However, this general definition does not include planning or coordination among operators, and municipality does not have any other unit to fulfill this function. In addition, transport-planning studies do not have continuity in time because of elected municipality management changes.

  "Transformation in Transportation" project handled urban transport components in a holistic manner. Municipality management was changed during the third stage of the project. After that change only large-scale investments continued, while other low-cost and soft measures, such as modal integration, lost importance. Route planning studies and distance based fare structure, which were within the context of integration, were also abolished by the following local managers. Components of public transport services are handled individually again.

Operational data and passenger numbers before and after the project were derived from all operations individually, since transport coordination center of Greater Municipality did not have this transport data. In addition some statistical data, further transfer information and documents of the project were gathered from former municipality staff involved with the project. Being the third largest city of Turkey, Izmir case indicates deficiencies in urban transport management, which is a direct outcome of the municipality structure.

- **Limited data:** Very limited data and operational statistics segregated at line basis existed at the time of the planning in spite of electronic fare collection system. Only daily aggregated patronage figures were available without any breakdown for lines, origin / destinations or hourly changes. All of the above changes during the project were carried out in the absence of detailed operational data. Special analysis were done in some cases by going back to raw original electronic fare collection data with lengthy processing and extraction procedures.

- **Fare structure distortion:** Fare structure was initially defined to support transfers, keeping feeder, metro, and ferry fare at low levels. Main consideration was to have basic transfer trips (feeder+line1, feeder+metro, feeder+ferry) cheaper than long bus trips (line-2 and line-3). This relative advantage given at the initial stages of the implementation has been distorted very soon as transfer trip costs became higher then long bus trips (line 2 and line3). This distortion became even more apparent at the end of the analysis period, resulting in almost a double fare at the transfers (Figure-6.1). This fare structure distortion has blurred aims of the project and started pressures for putting back long bus lines.

- Limitations of Fare Restructuring: The available electronic fare system technology used at the buses before the project was not capable of recording passengers' trip history and implementing "transfer fare reductions" at the transfers. The new public transportation integration scheme developed and known by the public as "the system with transfers" (*aktarmalı sistem*) was not able to implement "transfer fares" and transfer fare reductions to passengers due to limitations of the available electronic fare technology. This led the project to be designed on multiple "distance based fares" on transfers. The fare structure implemented at various modes and bus lines were designed at beginning to make transfers more attractive and cheap. When this advantage had disappeared shortly after the implementation of the project, transfers created additional costs to passengers at the absence of a transfer fare reduction system. As a result, it is possible to claim that the metro and ferry ridership levels could have been much higher today, had the initial transfer-fare approach been completely implemented.

- **Coverage of Integration:** Although major transport modes operated by the municipality had been integrated to electronic fare collection system, other modes operated by private sector are not part of the integrated system yet. Minibuses, employee buses, taxi dolmuses are not yet using electronic fare system and their services are not part of the integrated network. In order to make accurate evaluations and give proper decisions for existing transport system, a holistic transport planning approach, including all public transport stakeholders, should have been adopted.

- Lack of disincentives for private car usage: It was mentioned before that the Transformation in Transportation Project did not include any measures to make it less advantageous to drive the private cars. The project introduced various schemes together in one policy/project package; however, these were all measure to improve public transport and make it more attractive (in cost and convenience terms) to use. Measures to discourage car usage, such as congestion charging, increasing car parking charges in central areas, limiting available car parking spaces in the centre, and creating car-free zones that can be best accessed with public transport, did not feature in this policy package, although they could have significantly enhanced the success of the project, by increasing public transport ridership and possibly reducing car usage.

6.3 Policy Suggestions and Recommendations for Izmir case

In this section, recommendations are given to improve implementation of Izmir case considering future developments in Izmir and pricing/fare applications, which are afore mentioned in literature review.

- Transformation in Transportation Project handled all components of public transportation together and implemented several integrated policies. These comprehensive policies that started with the project in Izmir need to be continued even after the end of the project. Therefore, an operational planning and management unit responsible for continuation and consistency of day-to-day implementation of policies should be created for orchestration of all of the public transport operations.

- The main reason of having limited and unsustainable positive effects of the project is found to be the missing strategy components and implementation measures for restricting private car use. A more efficient and sustainable urban transport system can be achieved with measures implemented for two ends of the problem; improving public transportation and limiting private car usage at the same time. The missing component of the project, measures for restricting car usage need to be implemented either by limiting entrance of cars to the city center or with implementing pricing measures.

- Public transport system integration in Izmir, including electronic fare collection system should cover all operators of urban public transport without leaving any of them outside. Only with inclusion of privately operated minibuses, dolmuses and taxis to electronic fare collection system, seamless public transportation integration can be provided with support of fare policies.

- Integration of car parking fee collection to existing fare collection system is required both for supporting transfers from cars to public transport and for statistical data collection about car/parking use. This statistical data will give wider insight of car use and provide opportunity for urban transport planning.

- After Aliağa - Menderes Commuter Rail System starts operation, incentives should be implemented in order to encourage riders to choose railway. "Park and ride" facilities should be created at rail stations for attracting private car users to public transportation system and pricing / fare incentives should be implemented for promoting transfers from private cars.

- After Aliağa - Menderes rail line starts operation, public transport services, both municipal bus lines and privately operated minibus lines, need to be reorganized as feeder to railway line. Fare facilities should be implemented in a way that does not punish public transport users with duplicated fares.

6.4 Concluding Remarks

Private car ownership and usage is increasing in urban areas and resulting with high levels of traffic congestion and time lost in major Turkish cities. Many city governments have the mis-perception of giving priority to private cars and continuing with road infrastructure investments.

Public transport planning and improving approaches of local governments are limited to rail system building in many cities in spite of high costs. Urban transport and public transport in specific are tried to be solved without considering interrelations of various components, and without considering the benefits of Travel Demand Management and Transport System Management measures.

It is acknowledged today that the most effective solution to contemporary urban transport problem is improvement of public transport systems. These solutions may certainly include high-cost new public transport investments; however, it is extremely important to support such investments with complementary measures, such as public transport route reorganization, full modal integration, and fare and pricing policies. It is recognized in the world that public transport can become an effective alternative and help create a more sustainable transport system only with the implementation of such comprehensive policy packages that comprise various integrated schemes. In this perspective, the Transformation in Transportation Project in Izmir is a leading and possibly a unique example in Turkey, where many cities still implement car-oriented policies and road programs and investments. The Izmir case provides clear evidence that implementing a comprehensive public transport improvement strategy, consisting of management and pricing measures can have very positive returns in creating a more sustainable transport system that can rely on public transport.

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APPENDICES

APPENDIX A: Public Transport Passenger Numbers

Table 1 Annual Passenger Number of Public transport Modes in Izmir

	BUS (ESHOT+IZULAS)	MARITIME(IZDENIZ)	METRO	TOTAL
1995	218838601	6066264		224904865
1996	264770477	8651730		273422207
1997	246304530	10224739		256529269
1998	246771617	9634025		256405642
1999	238452846	9839608		248292454
2000	243764860	11453710	10660818	265879388
2001	222107022	12234431	25970398	260311851
2002	243544670	12753033	25315235	281612938
2003	246209424	12791553	25124668	284125645
2004	242358572	13835185	25704018	281897775
2005	250785088	14521115	24820225	290126428

* 1995 Maritime passenger data includes both TDI and municipal lines

Table 2 Passenger Number of TDI between 1977 and 1996

1977	11.139.985
1978	12.122.271
1979	13.859.476
1980	10.624.122
1981	11.787.892
1982	10.802.226
1983	11.533.928
1984	9.972.555
1985	8.387.394
1986	8.202.989
1987	8.550.708
1988	9.800.000
1989	9.082.939
1990	8.997.340
1991	7.256.100
1992	6.202.700
1993	5.922.700
1994	5.718.860
1995	6.063.263
1996	5.271.419

Source: UA (1997:18)

Table 3 Bus Passenger Boardings According to Distance Categories

YEAR / UNIT	2001	2002	2003	2004	2005
BESLEME(4)	17.087.641	**15.912.977**	**14.239.561**	14.920.719	8.870.027
KISA(1)	3.760.100	**4.716.994**	**5.144.123**	5.596.816	5.739.069
ORTA(2)	21.047.777	**22.216.137**	**23.215.400**	25.529.776	31.543.782
UZUN(3)	7.600.786	**9.858.137**	**11.650.388**	18.495.790	25.189.863
TOPLAM	**49.496.304**	**52.704.245**	**54.249.472**	**64.543.101**	**71.342.741**
FEEDER(4)	16.452.293	**19.828.217**	**16.905.695**	15.221.581	18.759.503
SHORT(1)	8.044.539	**8.497.282**	**8.296.073**	7.623.891	7.685.013
MIDDLE(2)	68.079.685	**86.661.636**	**93.575.877**	99.621.250	102.016.594
LONG(3)	22.764.044	**31.515.093**	**37.277.349**	51.272.176	54.652.941
OWL		**26.728**	**139.678**	162.098	174.057
TOTAL	**115.340.561**	**146.528.956**	**156.194.672**	**173.900.996**	**183.288.108**

Source: ESHOT (200/)

APPENDIX B: Operational Data of Public Transport Modes

Bus System

Table 4 Operational Statistics of Bus System

	1998	1999	2000	2001	2002	2003	2004	2005
Performed Bus Trip Number	179730	182537	240194	273509	255946	253619	236969	238058
Servicing Vehicle Number	4676	4046	5448	6635	5946	6260	6299	6197
Daily-Performed Vehicle Kilometer	144.531	141.135	175.876	205.744	212.774	188.370	203.814	195.637
Staff Number	2953	2021	1997	3579	3616	3436	3263	3108
Passenger Number per Bus Service Kilometer	3,55	3,12	3,20	2,75	2,67	2,78	2,90	2,98
Passenger Number per Performed Trip	84	77	80	67	67	72	79	80
Fuel Consumption per Hundred Kilometer	46,0	48,6	47,6	49,5	49,5	49,6	50,9	50,4
Performed Bus Kilometer per Staff	2953	2021	1997	3579	3616	3436	3263	3108
Passenger Number per worker	83559	117988	122060	62054	67354	71665	74279	80688

Source: ESHOT (200/

Metro System

Table 5 Operational Statistics of Metro System

	Energy Consumption per Kilometer	Enegy Consumption per Passenger	Tottal Energy Consumption	Passenger Number per Performed Vehicle Kilometer	Passenger Number per Staff	Passenger Number per Trip	Performed Vehicle Kilometer	Performed Trip Number
2000				22	7924	230	493.542	46.500
2001	14,01	0,60	15.479.016	24	9040	250	1.097.622	103.728
2002	14,02	0,60	14.962.744	24	8288	252	1.053.879	99.040
2003	14,35	0,60	15.084.684	24	7974	257	1.039.649	97.976
2004	14,29	0,57	14.629.772	25	8199	269	1.012.903	95.496
2005	13,81	0,59	14.687.358	24	8119	250	1.052.425	99.261
2006	13,77	0,60	14.595.435	23	8062	244	1.048.241	98.942

APPENDIX C: FARE SYSTEM

Table 6 Izmir Public Transport System Fare Levels

		Old Media						New Media														
		Full			Reduced			Full						Reduced						Driver Card		
		Bus	Ferry	Metro	Bus	Ferry	Metro	Bus (F)	Bus (1)	Bus (2)	Bus (3)	Metro	Ferry	Bus (F)	Bus (1)	Bus (2)	Bus (3)	Metro	Ferry	Bus	Ferry	Metro
	1	125			75						90						55					
	2	200			75						150						100					
	3	200			125						170						120					
1999	4	200			125						170						120					
	1	260			160						225						150					
	2	260	260		160	160		100	175	225	250		100	75	120	140	150		75			
	3	300	300	300	200	300	300	100	225	275	290	150	150	75	150	175	190	125	125			
2000	4	300	300	300	200	300	300	100	225	275	290	150	150	75	150	175	190	125	125			
	1	350	350	350	250	250	250	150	275	325	340	200	200	125	175	200	225	150	150			
	2	450	450	450	325	325	325	200	375	400	425	300	250	150	250	275	300	225	175			
	3	500	500	500	375	375	375	250	425	450	475	350	300	200	300	325	340	250	225			
2001	4	600	600	600	450	450	450	300	525	550	575	400	350	250	375	400	425	300	275			
	1	600	600	600	450	450	450	300	525	550	575	400	350	250	375	400	425	300	275			
	2	600	600	600	450	450	450	300	525	550	575	400	400	250	375	400	425	300	300			
	3	750	750	750	600	600	600	400	550	650	700	450	450	325	400	475	500	325	325			
2002	4	750	750	750	600	600	600	400	550	650	700	450	450	325	400	475	500	325	325			
	1	750	750	750	600	600	600	500	600	700	725	500	500	400	450	525	550	400	400			
	2	1000	1000	1000	800	1000	1000	600	700	800	850	600	600	450	550	625	650	450	450			
	3	1000	1000	1000	800	1000	1000	600	700	800	850	600	600	450	550	625	650	450	450			
2003	4	1000	1000	1000	800	1000	1000	600	700	800	850	600	600	450	550	625	650	450	450			
	1	1000	1000	1000	800	1000	1000	600	700	800	850	600	600	450	550	625	650	450	450			
	2	1000	1000	1000	800	1000	1000	600	700	800	850	600	600	300	350	400	425	300	300			
	3							650	750	850	900	650	650	325	375	425	450	325	325	1000	1000	1000
2004	4							750	850	950	1000	750	750	375	425	475	500	375	375	1500	1000	1000
	1							750	850	950	1000	750	750	380	430	480	500	380	380	1500	1000	1000
	2							750	850	950	1000	750	750	380	430	480	500	380	380	1500	1000	1000
	3							900	1000	1100	1150	900	900	530	580	630	650	530	530	1500	1250	12500
2005	4							900	1000	1100	1150	900	900	530	580	630	650	530	530	1500	1250	12500

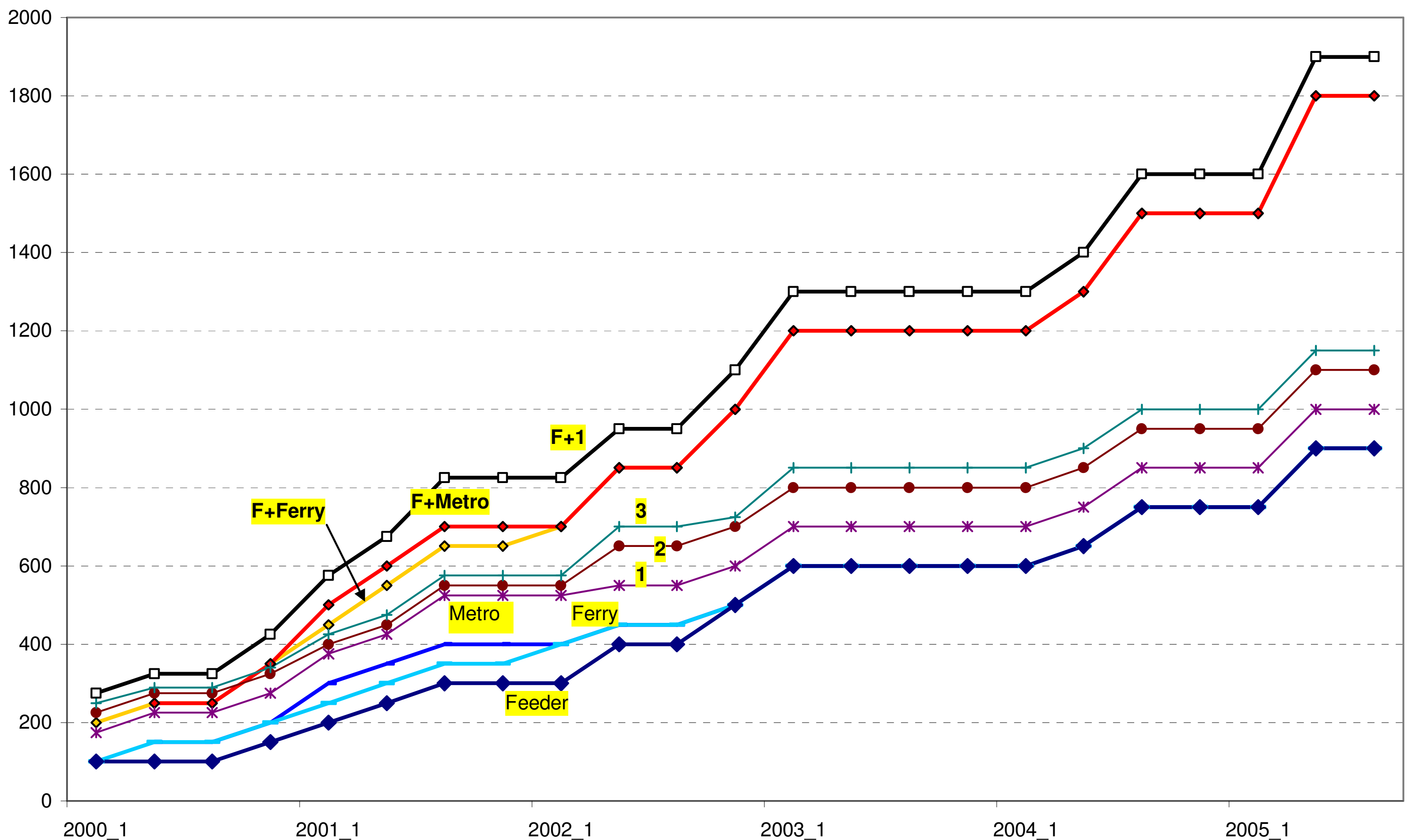


Figure 1 Changes in Different Fare Types

Table 7 Concessional Fare Categories

ÜCRETSİZ ve İNDİRİMLİ BİNİŞLER ve KARTLAR

YASA, YÖNETMELİK, GENELGE, İBŞB MECLİS KARARI ile ÜCRETSİZ BİNİŞLER

	Dayanak	*Biniş Şekli*	*Geçerlilik*
Basın Kartları	*28.02.1964 tarih ve 6/2760 sayılı Bakanlar Kurulu Kararı*	*Basın Yayın Genel Müdürlüğü, Sarı + Şeref Basın Kartı ibrazi ile*	ESHOT + İZULAŞ + İZMETRO + İZDENİZ
	26.02.1970 tarih ve 350/551 sayılı Başbakanlık Yazısı	*Basın Yayın Genel Müdürlüğü, Mavi Basın Kartı ibrazi ile*	
	10.09.1986 tarih ve 1947 sayılı Yönetmelik	*Basın Yayın Enformasyon Genel Müdürlüğü Basın Kart ibrazi ile*	
P.T.T. Çalışanları	*04.03.1950 tarih ve 5584 sayılı 'Posta Kanunu'*	*Resmi kıyafet, şapka ve çanta ile*	
	21.02.1940 tarih ve 406 sayılı 'Telefon-Telgraf Kanunu'		
Gazi Kartları	*24.02.1968 tarih ve 1005 sayılı 'İstiklal Madalyası Sahipleri Kanunu'*	*MSB'ınca verilen Gazi Kartları ibrazı ile*	
	30.04.1976 tarih ve 1985 sayılı 'Kore Gazileri Kanunu'		
	11.11.1983 tarih ve 2943 sayılı 'Kıbrıs Gazileri Kanunu'		
	17.02.2000 tarih ve 23967 sayılı Resmi Gazete'de yayınlanan Yönetmelik	*Emekli Sandığı'nın verdiği Kartların ibrazı ile*	
Şehit Ailesi Kartları	*12.04.1991 tarih ve 3713 sayılı Yasa*	*İBŞB tarafından verilen YILLIK Toplu Ulaşım Kartı ibrazı ile*	
	17.02.2000 tarih ve 23967 sayılı Resmi Gazete'de yayınlanan Yönetmelik		
Resmi Kurum Kartları	*10.02.1954 tarih ve 6245 sayılı Yasa*	*İBŞB tarafından verilen YILLIK Toplu Ulaşım Kartı ibrazı ile*	
Zabıta Memuru Kartları	*11.06.1957 tarih ve 9630 sayılı Resmi Gazete'de yayımlanan İdare Teşkilat ve Vazifeleri Talimatnamesi*	*Zabıta Memur Kimlik Kartı ibrazı ile*	
Emniyet Mensupları Kartları	*11.06.1957 tarih ve 9630 sayılı Resmi Gazete'de yayımlanan İdare Teşkilat ve Vazifeleri Talimatnamesi*	*Emniyet Genel Müdürlüğü Kimlik Kartı ibrazı ile*	
Özürlü Kartları	*25.03.1997 tarih ve 571 sayılı Kanun Hükmünde Kararname*	*İBŞB tarafından verilen YILLIK Toplu Ulaşım Kartı ibrazı ile*	
	13.08.1998 tarih ve 23432 sayılı resmi Gazete'de yayımlanan Yönetmelik		
60 yaş Kartı	*15.02.1999 tarih ve 99/110 sayılı Devlet Bakanlığı Genelgesi + 10.03.1999 tarih ve 05/86 sayılı İBŞB Meclis Kararı + 05.07.1999 tarih ve 05/177 sayılı İBŞB Meclis Kararı*	*İBŞB tarafından verilen YILLIK Toplu Ulaşım Kartı ibrazı ile*	
ESHOT Kimlik Kartı	*11.06.1957 tarih ve 9630 sayılı Resmi Gazete'de yayımlanan İdare Teşkilat ve Vazifeleri Talimatnamesi*	*İBŞB tarafından verilen YILLIK Toplu Ulaşım Kartı ibrazı ile*	

YASA, YÖNETMELİK, GENELGE, İBŞB MECLİS KARARI ile İNDİRİMLİ BİNİŞLER

	Dayanak	*Biniş Şekli*	*Geçerlilik*
Öğrenciler	*1924 yılı 14920 sayılı Resmi Gazetede yayımlanan + 11.06.1957 tarih ve 9630 sayılı Resmi Gazete'de yayımlanan İdare Teşkilat ve Vazifeleri Talimatnamesi*	*ESHOT tarafından verilen Öğrenci Kartları + Üniversite Öğrenci Kimlik Kartı ibrazı ile*	ESHOT + İZULAŞ + İZMETRO* + İZDENİZ* (*İZMETRO ve İZDENİZ'de sadece KENTKART'ta geçerli)
Öğretmen	*İBŞB Meclis Kararı*	*İBŞB tarafından verilen YILLIK Toplu Ulaşım Kartı ibrazı ile*	
Dul - Yetim			
Emekli			

İBŞB MECLİSİ / UKOME KARARI ile	*Tanım*	*Biniş Şekli*	*Geçerlilik*
Aylık Kartlar *(Her ay kupon yapıştırılarak)*	Tam Aylık Kartı	*İBŞB tarafından verilen AYLIK Toplu Ulaşım Kartı ibrazı ile*	ESHOT + İZULAŞ
	Öğrenci Aylık Kartı		
	Öğretmen Aylık Kartı		
	İşçi Kartı		
Yıllık Kartlar *(**KENTKART** olarak - Şubat sonu)*	Huzurevi Kartları	*İBŞB tarafından verilen YILLIK Toplu Ulaşım Kartı ibrazı ile*	ESHOT + İZULAŞ + İZMETRO + İZDENİZ
	65 yaş Onur Kartı		
	Hakim ve Savcı Kartları		
	Büyükşehir Emekli Kartı		
	ESHOT Emekli Kartı		
	İZSU Emekli Kartı		
	İlçe Belediyeleri Emekli Kartı		
	Belediye Memur Kartı		
	Türk Devletleri Öğrenci Kartı		
	Yetiştirme Yurdu Öğrenci Kartı		
	Bosna - Hersek Kartı		
	Eski ve Yeni İl Meclis Üyeleri		
	Eski ve Yeni İBŞB Meclis Üyeleri		
	Muhtarlar		

Ücretsiz indirimli tanım/2001 25.12.2000

APPENDIX D: INFORMATION LEAFLETS OF TRANSFORMATION OF TRANSPORTATION PROJECT

ULAŞIMDA DÖNÜŞÜM PROJESİ
3. AŞAMASI BAŞLIYOR
İzmir ulaşımında tarihi günler yaşanıyor. İzmir ulaşım sistemi yapısal değişiklikler geçiriyor. Artık otomobillere değil; insanlara, toplu ulaşıma ve yayalara öncelik veriliyor. "Ulaşımda Dönüşüm Projesi"nin 3. Aşaması 26 Ağustos'ta *Metronun tam gün hizmet vermesi ile* birlikte başlıyor.

ULAŞIMDA DÖNÜŞÜM PROJESİ NEDİR?
İzmir'de insana, İzmir'liye, toplutaşıma ve yayalara öncelik veren bir yaklaşımın sonucu olarak planlanan "Ulaşımda Dönüşüm Projesi" kentin ulaşım sisteminde yeni bir yapılanma getiriyor.

2 NİSAN'DA BAŞLATILAN 1. AŞAMA İLE:
- Belediyeye devredilen deniz ulaşımının canlandırılması için Bostanlı ve Üçkuyular iskeleleri yeniden düzenlenerek, yeni vapur hatları açıldı, seferler arttırıldı.
- Getirilen yeni teknelerle sık seferler yapılmaya başlandı.
- İzmirlilerin tek bir kartla tüm toplu ulaşım araçlarını kullanması sağlandı, Kentkart vapurda ve otobüste geçerli oldu.
- Vapur iskelelerine bağlantılı olarak açılan besleyici otobüs hatlarıyla sık ve ucuz otobüs seferleri kondu.
- Aktarma yolculuklarda indirimli fiyat uygulamasına başlandı.
- Oluşturulan otobüs ve deniz aktarma merkezlerine ucuz ve sık otobüs seferleri sağlandı.
- Yolculuklarda herkesin yolculuk mesafesine göre hakkaniyetli ücret ödemesini sağlayan *kademeli fiyat tarifesi* uygulamasına başlandı.
- Otobüs hat ve seferlerinde daha verimli ve konforlu hizmet verilmesini sağlayacak yeni hat düzenlemeleri yapıldı.

İzmirli çağdaş ulaşım sistemi ile tanıştı...

22 MAYIS'TA BAŞLATILAN 2. AŞAMA İLE;
- Metro tanıtım seferleri başlatıldı,
- Metro bağlantılı Bornova Aktarma Merkezi işletmeye alındı,
- Daha çok sayıda İzmirlinin Metroya erişimini sağlamak için Metro bağlantılı besleme hatları açıldı, ucuz ve sık seferler kondu.

İzmir'in ulaşım sistemi geleceğe bir adım daha yaklaştı...

VE NİHAYET 26 AĞUSTOS'TA BAŞLAYAN 3. AŞAMA İLE;
- Metro artık tüm gün hizmete girerek İzmir'liye ulaşımda çağdaş olanakları kesintisiz olarak sunuyor,
- İzmirlileri metro istasyonlarına taşıyacak yeni açılan besleme hatlarıyla ucuz ve sık seferlerle hızlı, güvenli, konforlu hizmetler başlatılıyor,
- Metro istasyonları ile bağlantılı olarak Halkapınar'da inşa edilen yeni "Toplutaşım Aktarma Merkezi" hizmete alınarak İzmir ulaşım sistemindeki sıkışıklıkları azaltacak, hızlı erişim sağlayacak yapılanma bir adım daha ilerliyor,
- İzmirlilerin metroyu kullanabilmeleri için otobüs hatlarında yapılan yeni düzenlemelerle kentliler trafik sıkışıklıklarından etkilenmeden, metro ile daha hızlı ve konforlu yolculuk olanakları sağlanıyor,
- Kent merkezine giren otobüslerin sayısının azalmasıyla birlikte trafik sıkışıklıkları azalıyor, rahatlamalar oluşuyor,

Ancak İzmir'li için yapılan bu projeler yetmez... Gelişmeler devam edecek...

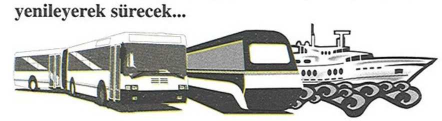
İzmir'de artık sadece karayolu değil denizyolu ve metro da var.

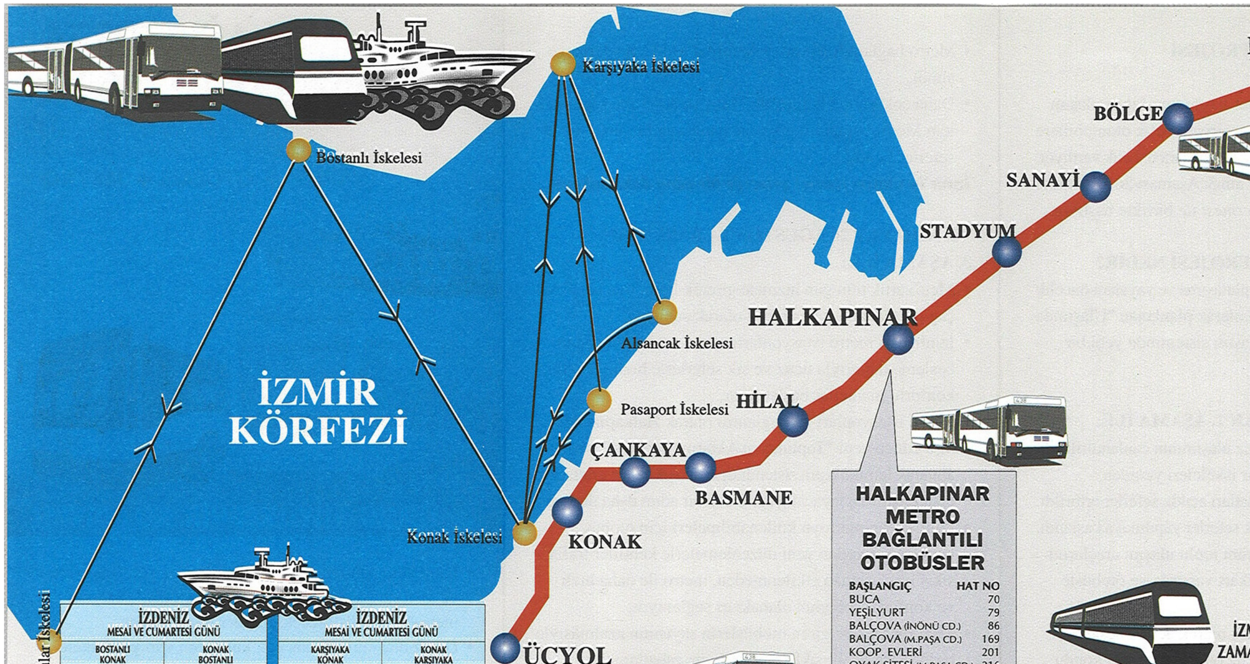
Geleceği planlıyoruz, İzmirliye geleceği yaşatmaya çalışıyoruz...
Kentlimizi "yollar"daki tıkanıklıklardan kurtarıp, raylı sistemlere ve deniz ulaşımına yönlendirmek için projeler devam edecek...

- İzmir'deki banliyö demiryolu hatlarını çok az maliyetle ve kısa sürede 80 kilometre uzunluğunda "yüzeysel metro"ya dönüştürecek projeler hazırlanıyor,
- Deniz ulaşımının daha çok kullanımı için yeni iskele ve hat çalışmaları sürüyor,
- Otobüs filosunu gençleştiren ve modernleştiren yeni otobüsler kısa sürede hizmete girecek,
- Yollardaki trafik akışkanlığını arttıracak kavşak ve yol düzenlemelerine devam edilecek,
- Halen projeleri hazırlanmakta olan metronun 2. aşama Üçyol-Üçkuyular arası kısmının inşaatına başlanacak...

Yeni projelerle gelişme devam edecek,

"Ulaşımda Dönüşüm Projesi" bitmeyecek, kendini yenileyerek sürecek...





İZDENİZ
MESAİ VE CUMARTESİ GÜNÜ

BOSTANLI KONAK		KONAK BOSTANLI	
06.30	14.30	06.55	15.00
07.00	14.50	07.30	15.20
07.20	15.10	07.50	15.40
07.40	15.30	08.10	16.00
08.00	15.50	08.25	16.20
08.15	16.10	08.40	16.40
08.30	16.30	08.55	17.00
08.45	16.50	09.10	17.20
09.00	17.05	09.25	17.30
09.15	17.20	09.40	17.45
09.30	17.35	09.55	18.00
09.50	17.50	10.20	18.15
10.10	18.05	10.40	18.30
10.30	18.20	11.00	18.45
10.50	18.40	11.20	19.10
11.10	19.00	11.40	19.30
11.30	19.20	12.00	19.50
11.50	19.40	12.20	20.10
12.10	20.30 *	12.40	20.40
12.30	21.00 *	13.00	21.10
12.50	21.30 *	13.20	21.40
13.10	22.00 *	13.40	22.10
13.30	22.30 *	14.00	22.40
13.50	23.00 *	14.20	23.10
14.10		14.40	23.40
	* Önce Karşıyaka'ya uğrar.		

İZDENİZ
MESAİ VE CUMARTESİ GÜNÜ

KARŞIYAKA KONAK		KONAK KARŞIYAKA	
06.40	14.40	07.05	15.10
07.10	15.00	07.40	15.30
07.30	15.20	08.00	15.50
07.50	15.40	08.20	16.10
08.10	16.00	08.35	16.30
08.25	16.20	08.50	16.50
08.40	16.40	09.05	17.10
08.55	17.00	09.20	17.25
09.10	17.15	09.35	17.40
09.25	17.30	09.50	17.55
09.40	17.45	10.05	18.10
10.00	18.00	10.30	18.25
10.20	18.15	10.50	18.40
10.40	18.30	11.10	18.55
11.00	18.50	11.30	19.20
11.20	19.10	11.50	19.40
11.40	19.30	12.10	20.00
12.00	19.50	12.30	20.10 *
12.20	20.10	12.50	20.20
12.40	20.45	13.10	20.40
13.00	21.15	13.30	20.40 *
13.20	21.45	13.50	21.10 *
13.40	22.15	14.10	21.40 *
14.00	22.45	14.30	22.10 *
14.20	23.15	14.50	22.40 *
			* Önce Bostanlı'ya uğrar.

ÜÇYOL METRO BAĞLANTILI OTOBÜSLER

BAŞLANGIÇ	HAT NO
ESENDERE	95
AKEVLER	507
KOOP. EVLERİ	520
UZUNDERE	523
Yzb. ŞERAFETTİN	524
GÜNALTAY	550
ÇAMLIK	556
LİMONTEPE	587
YEŞİLYURT	579
BALÇOVA	586
YENİ ÇAMLIK	588
OTOGAR (YENİŞEHİR)	630

HALKAPINAR METRO BAĞLANTILI OTOBÜSLER

BAŞLANGIÇ	HAT NO
BUCA	70
YEŞİLYURT	79
BALÇOVA (İNÖNÜ CD.)	86
BALÇOVA (M.PAŞA CD.)	169
KOOP. EVLERİ	201
OYAK SİTESİ (M.PAŞA CD.)	216
OYAK SİTESİ (İNÖNÜ CD.)	217
BAHRİYE ÜÇOK	261
BALATCIK	395
KONAK (MONTRÖ)	401
KONAK (T.PAŞA CD.)	402
KONAK (Y. ŞEHİR)	405
KONAK (KAHRAMANLAR)	406
MAVİŞEHİR	420
ÇİÇEK	501
CENGİZ HAN	502
GAZİEMİR	530
BUCA (TINAZTEPE KAMP.)	535
SARNIÇ	553
OTOGAR	555
ALTINDAĞ	557
KANDERE	558
KARACAOĞLAN	559
PINARBAŞI	560
E.Ü. KAMPÜSÜ (M.KUYU)	563
AYAKKABICILAR SİTESİ	564
TAŞKENT	566
SALHANE	573
ADLİYE SARAYI	583
FUAT EDİP BAKSI	597
ÇAY MAH.	598
BORSA OKULU	599

BORNOVA METRO BAĞLANTILI OTOBÜSLER

BAŞLANGIÇ	HAT NO
GÜMRÜK (BULVAR)	62
PINARBAŞI	67
NALDÖKEN	111
KARŞIYAKA BOSTANLI İSK.	130
EGEKENT	242
EVKA-2	244
PINARBAŞI	267
DOĞANLAR	268
EVKA-3	314
KAVAKLIDERE	317
KONAK	363
İZYUVA	450
OTOGAR	505
E.Ü. KAMPÜS	525
EVKA-4	565
EVKA-4 (OSMAN GAZİ)	568
TEKSİF-ATATÜRK MAH.	585

İZMİR METRO A.Ş. TİCARİ İŞLETME ZAMAN ÇİZELGESİ (26 Ağustos 2000)

Pazartesi ve Cumartesi günleri

Çalışma Saatleri	Sefer Sıklıkları (Dakika)
06.00 - 07.00	10
07.00 - 10.00	5
10.00 - 16.00	10
16.00 - 20.00	5
20.00 - 22.00	10
22.00 - 24.00	20

Pazar günleri

Çalışma Saatleri	Sefer Sıklıkları (Dakika)
06.00 - 07.00	20
07.00 - 09.00	15
09.00 - 22.00	10
22.00 - 24.00	20

Not: Talebe göre sefer sıklıkları ayarlanacaktır.

Bilgi İçin Başvuracağınız Telefonlar: HİM: 0.232.441 46 46 • ESHOT: 0.232.285 58 31 • 224 98 21


İzmir
kentkart
INTEC
Bilgi için: 441 46 46
İZMİR BÜYÜKŞEHİR BELEDİYESİ
İZMİR
TOPLU ULAŞIM SİSTEMİNİN BÜTÜNLEŞTİRİLMESİ
VE OTOBÜS HAT YAPILANMASI
ESHOT
İZMİR BÜYÜKŞEHİR BELEDİYESİ

Ulaşımda Dönüşüm Projesi- 1

Sevgili Hemşehrilerim,

Belediye Başkanınız olarak sizlere hizmet vermeye talip olduğumuzda, İzmir için yapmak istediklerimizi, İzmir'i çağdaş bir dünya kenti yapmaya yönelik yaklaşımlarımızı açıklamış ve projeleri-mizi ayrıntılı olarak sıralamıştık. Sizler de görüşlerimizi benimsediniz, desteklediniz ve bu projeleri gerçekleştirmek üzere bizlere görev verdiniz.

Göreve geldiğimizden bu yana kentimizi ve sizleri ilgilendiren her konuda söz verdiğimiz projelerin bir yandan hazırlıklarını yaparken, diğer yandan da bu projeleri adım adım uygulamaya koymaya başladık.

Özellikle yıllardır sürdürülen yaklaşımlar ve uygulamalar sonucunda İzmir'de en önemli problem haline gelmiş ulaşım ve trafik sorunlarının azaltılması, tıkanıklıkların çözümü için sürdürdüğümüz ciddi ve kapsamlı çalışmaları artık hayata geçiriyoruz.

Şimdi, önce haksız yere unuttuğumuz ve ihmal ettiğimiz, sonra da yıllardır barışma hayali kurduğumuz denizi ve Körfez'i yeniden keşfediyoruz. İzmir ve İzmirliler artık Körfez'e arkalarını dönmekten vazgeçip, Körfez'le birleşiyor, Körfez'de birleşiyor.

Aylardır sürdürülen hazırlık çalışmalarının ardından İzmir için öngördüğümüz "Ulaşımda Dönüşüm Projeleri"nin ilk aşamasını uygulamaya koyuyoruz. Bu küçük broşürde özetle açıklandığı gibi, "Ulaşımda Dönüşüm Projeleri", kapsamlı ve farklı boyutları içeren ve adım adım uygulamaya geçilecek projeler demetinden oluşuyor. Ancak bütün bu farklı projelerin tek bir amacı var; İzmirlilere daha iyi bir kent yaşantısı sunmak, İzmir'in giderek kaybolan değerlerini yakalayıp yeniden öne çıkarmak ve geliştirmek.

Sizler için, sizlerin desteğiyle ve sizlere yakışan bir İzmir için bu adımları sürdüreceğiz.

Sevgi ve saygılarımla,

Ahmet Piriştina
İzmir Büyükşehir Belediye Başkanı

İzmir Ulaşımında Nereden Nereye Gelindi....

Eski İzmir, tramvayları, banliyö trenleri, Körfez vapurları ile ulaşımda örnek bir kent durumundaydı... Bu görüntülerle bezenen İzmir, uzaklara gönderilen kartpostallarda kenti buram buram sıladaki İzmirlilere taşırdı ... Aradan yıllar geçti, İzmir büyüdü ve değişti. Kentin nüfusu, ekonomisi, kapladığı alan kat kat arttı. Gelişmeyle kaybedilen eski değerlerin kıymeti, değerler elden gidince daha çok anlaşılır oldu.

İzmir'liler artık sabah yola çıkarken saatlerce sürecek bir yolculuk sırasında otomobillerinin burnunu yan şeritteki boşluğa sokmak için kavga etmeye hazırlar.
Dakikalarca otobüs bekledikten sonra hergünkü mücadeleyle, itişe kakışa girilen bir otobüste omuz omuza yapılan uzun bir yolculuğun ardından yorucu olacak bir güne zaten yorulmuş bir şekilde başlamaya alıştılar ve kabullendiler.

Artık Bu Olumsuz Gidişe Son Vermenin Zamanı Geldi...

Zamanı geri döndüremeyiz, eski değerleri geri getiremeyiz. Ama bugünkü olumsuz koşulları iyileştirip, "Eski İzmir"i anımsatan, ondaki değerleri ve özellikleri çağdaş bir yaklaşımla bugüne taşıyan, yeni bir anlayışla günümüzde yaşatan 'Yeni İzmir'i yaratabiliriz.
İzmir, 2000'li yıllara ulaşımda yapılacak bir dizi önemli değişim projeleri ile giriyor.
"Ulaşımda Dönüşüm Projesi" ; adım adım uygulanacak, taşıtlara değil kente ve kentliye öncelik verecektir. Bu projeler dizisi kısa dönemdeki sıkışıklıkları azaltan acil önlemlerle gelişirken, bir yandan da ileride doğabilecek sorunları çözecek olan uzun vadeli projelerle kentin ulaşımını ve geleceğini değiştirecektir. Umutlar gerçek oluyor ve "Yeni İzmir"in ulaşım sistemini yaratmadaki ilk adım 2 Nisan tarihinde uygulamaya konuyor.

"Ulaşımda Dönüşüm Projesi" Nedir?

Bu projeler dizisi ile toplu ulaşım iyileştiriliyor ve geliştiriliyor...
Artık toplu ulaşım araçları ve hizmetleri birbirinden bağımsız ve birbiriyle rekabet eden işletmeler halinde olmayacak, tek bir şemsiye altında toplanacak, işletilecek ve geliştirilecek.

Ulaşımda Bütünleşme (Entegrasyon) Nedir?

- Şebeke Bütünleşmesi: toplu ulaşım hizmetlerinin (otobüs, vapur, yakında metro, ileride banliyö treni) hatları ve güzergahlarının birbirlerini tamamlar hale gelmesi,
- Tarife Bütünleşmesi: farklı toplu ulaşım araçlarının sefer tarifelerinin birbirlerini tamamlar şekilde düzenlenmesi,
- Bilet Bütünleşmesi: tek bir ödeme biçimiyle (Kentkart'la) tüm toplu ulaşım araçlarına binilebilmesi,
- Kademeli ve Aktarmalı Fiyatlandırma: hat, sefer ve aktarma düzenlemeleriyle aktarmalı yolculukların ve deniz ulaşımının özendirilmesi ve desteklenmesi.

Artık kısa yolculuk yapanlar, uzun yolculuk yapanlar kadar para ödemeyecek, herkes yaptığı yolculuğun uzunluğu oranında bedel ödeyecektir.

Otobüs Sisteminin İyileştirilmesi Kapsamında:

Belediye otobüsleri bugüne dek kentin ulaşım sisteminde en büyük payı üstlenmiştir ve gelecekte de bu önemini koruyacaktır. Bu projeyle otobüs sistemindeki sorunların giderilerek sistemin daha verimli hale getirilmesi gerekmektedir.
Bu amaçla;

- 105 yeni körüklü otobüs alımı ihalesi sonuçlandı. Otobüsler Ağustos 2000'den itibaren hizmete girecek.
- Aktarma noktalarına yakın yerleşim birimlerindeki toplu ulaşım hizmetinde (besleme hat) ve İzmir'in eğimli bölgelerindeki konut alanlarına ulaşımda kullanılmak üzere otobüs filosuna 50 midibüs katılmıştır.
- Otobüs işletmeciliğinde varolan sorunları azaltmak ve özel kesimin kaynaklarından daha iyi yararlanmak amacıyla ESHOT / İZULAŞ dışındaki işleticilerden hizmet alımına başlanmıştır ve bu uygulama kısa sürede yaygınlaştırılacaktır.

Otobüs şebekesi ve hizmetlerinin yeniden yapılanması çerçevesinde

- Verimsiz olan uzun hatlar kesilip, buna karşın sık seferli aktarmalı hatlar oluşturulacaktır.
- Hat, güzergah ve hizmet kalitesine tüm hatlarda ulaşılması hedeflenmektedir.
- Yolculuk taleplerine ve işletme kalitesine uyacak şekilde hat, güzergah ve seferler yeniden düzenlenecektir.
- Yolculuk uzunluğuna uyumlu olarak uzun/kısa hatlar ve ana hat/besleyici hatlar oluşturulup verimlilik arttırılacaktır.
- Deniz ulaşımı, metro ve otobüs hatlarını destekleyecek besleyici hatlar oluşturulacaktır.
- Otobüs hatlarında hat uzunluğuna bağlı olarak kademeli fiyatlandırma uygulanacaktır.

"Toplu Ulaşım Tarife Bütünleşmesi" Ne Sağlayacak?

Toplu ulaşım hizmeti veren çeşitli ulaşım araçlarında hizmet bütünleşmesini sağlamak için sefer-zaman tarifelerinin birbirleriyle uyumlu olarak düzenlenmesi gerekmektedir.
Bunun için İzmir'deki tüm toplu ulaşım işletmelerinde aşamalı olarak tarifeli işletmeye geçilecektir.
Tarifeli ulaşım, sefer aralıkları açık olan hatlarda (örneğin 15 dakikadan daha seyrek sefer olan hatlarda) önceden belirlenmiş, yolculara duyurulmuş ve duraklara asılmış bir zaman tarifesine göre hizmet verilecektir.
Sık seferle hizmet verilen kısa hatlarda ise (örneğin, sabah 5 dakikada bir,öğlen 10 dakikada bir gibi) yine önceden belirlenmiş zaman tarifesine göre hizmet verilecektir.

Özellikle vapur ve metro aktarma noktalarına iç bölgelerden yolcu taşıyan besleyici hatlarda yolcuların en az bekleme süresi ile aktarma yapmalarının sağlanması için tarifeli ulaşım zorunlu hale gelmektedir. Besleyici hatlardan başlanarak tarifeli ulaşıma geçilecektir.

"Tek Bilet"in (Toplu Ulaşım Bilet Bütünleşmesinin) Yararları Nelerdir?

Bugün İzmir'deki toplu ulaşım araçlarında tek yolculuk için farklı ödeme biçimleri (kağıt ve karton biletler ile jeton, serbest ve aylık kartlar, elektronik kart) uygulanmaktadır.
Sonuçta otobüse, vapura, deniz otobüsüne, trene binmek için kentliler ceplerinde çeşitli ödeme araçlarını bulundurmak zorunda kalmaktadırlar.
Çağdaş bir ödeme biçimi olan 'Kentkartın, gelecekteki temel ödeme aracı olarak seçilmiş ve tüm ulaşım türlerinde geçerli olması planlanmıştır. Kentkart, 2 Nisan'dan itibaren otobüs ve vapurlarda, 19 Mayıs'tan itibaren metroda, ileride banliyö trenlerinde ve otoparklarda geçerli olacaktır.
Tüm toplu ulaşım araçlarından, indirimli olarak yararlanan İzmirli için Kentkart, toplu ulaşım sisteminin tüm kapılarını açan tek anahtar olacaktır.
Elektronik ödemenin ve Kentkart kullanımının artmasıyla birlikte;

- Yolcular ceplerinde taşıdıkları "tek bilet"le her türlü toplu ulaşım aracına binebilecek,
- Kentkart kullananlar aktarma ve kısa mesafe indirimlerinden yararlanabilecek,
- Bilette sahtecilik ortadan kalkacak,
- Gelir kaçakları azalacak,
- Para ve bilet taşıma ve işlemesindeki güvenlik sorunları ortadan kalkacak,
- Yolcuların araçlara binişleri sırasındaki zaman kayıpları azalacağı için hizmetler hızlanacak,
- Yolcu ve yolculuk özelliklerine ait bilgiler (öğrenci, tam, uzun ve kısa mesafeli yolculuklar) ve bu tür özelliklerin bedeline göre bir ulaşım hizmeti planlanacaktır.

"Kademeli Fiyatlandırma" İle Ne Amaçlanıyor?

İzmir'deki otobüs hatlarının uzunluğu 4 ile 80 km arasında değişmektedir. Buna karşılık her hatta ve mesafede aynı yolculuk bedeli ödenmektedir. Bu uygulama ile, kısa yolculuk yapan kentlilerden fazla ücret alınırken, uzun yolculuk yapanların maliyetlerinin bir bölümünü kısa yolculuk yapanlar ödemektedir.

"Kademeli fiyatlandırma"da kısa mesafe yolculuk yapanlardan az, uzun yolculuk yapanlardan daha fazla yolculuk bedeli alınacak, böylece yolcular arasında maliyet açısından bir eşitlik yaratılacaktır. Otobüslerde yolculuk bedelinin, yolculuk uzunluğuna uyumlu olarak düzenlenmesi için, otobüs hatları kısa, orta ve uzun hatlar olarak gruplandırılmış, her hat grubunda uygulanacak kademeli bir yolculuk bedeli belirlenmiştir.

Halen uzun hatlarda uygulanan bilet bedeli, uzun hat bilet bedeli olarak kabul edilecek, orta ve kısa hatlarda indirim uygulanacaktır.

Ayrıca aktarmalı sistemin bir parçası olarak düşünülen besleyici hatlardaki otobüsler, daha da düşük bir bedelle hizmet sunacaktır. Besleyici hatları kullanan yolcular, aktarma yaptıkları ikinci araca (vapur veya otobüs) bir bedel daha ödeyecekleri için besleyici hatlardaki yolculuk bedeli kısa hatlardakinden daha az tutulmuştur.

"Aktarma Fiyatlandırması" Nasıl İşleyecek?

Kentte, yolculukların yoğunlaştığı ana hat ve yolculuk düzeylerinin düştüğü tali hatlar yer almaktadır. Bu iki hat arasında hizmet sıklığını birbiriyle uyumlu hale getirmek için düzenleme yapılmış ve hatlar ana hat ve besleyici hat olmak üzere ikiye ayrılmıştır.

İzmir'de deniz ulaşımından daha etkin yararlanılabilmek için iskelelerin yürüme mesafesi dışında kalan alanlarla iskeleler arasındaki ulaşımı sağlayacak besleme hatları konulmaktadır. Besleme hatlarıyla vapurlara ulaşacak yolcular, vapurda ikinci bir bedel ödeyeceği için, bu hatlarda bir aktarma indirimi uygulanacaktır.

Aktarma fiyatlandırma yöntemi elektronik ödeme kapsamında olacaktır. Kentkart sisteminin programlarında yapılacak bir değişiklikle bir noktadan besleme hattına binen yolcular örneğin 60 dakikada yapacakları tüm yolculuklarda aktarma indirimine tabi olacak, ya da bu yolcukların bazılarını bedelsiz yapacaklardır.

Kentkart programlarında değişiklik yapılana kadar ilk aşamada aktarma indirimi, besleme hatlarındaki yolculuk bedelinin düşük tutulması yoluyla sağlanacaktır. Böylece besleme hattında ödenen yolculuk bedeli ile aktarma yapılan ikinci yolculuğun (vapur ya da otobüs hattı) bedelinin toplamı, bir uzun hat toplamından düşük tutularak aktarma yapan yolculara bir mali fayda sağlanmaktadır.

Bunlar Hangi Aşamalarla ve Projelerle Uygulanacak?

Ulaşımda Değişim Projesi hem kısa vadeli düzenlemeleri ve hem de uzun dönemli yatırım projelerini içeren bir bütündür.

"Ulaşımda Değişim" otobüs, vapur, metro, banliyö treni gibi çeşitli ulaşım türlerini, ulaşım sisteminin yatırım, işletme, yönetim, fiyatlandırma gibi farklı boyutlarını kapsamaktadır. "Ulaşımda Değişim Projesi"nin kilometre taşlarını oluşturan önemli adımlar aşağıda sıralanmıştır:

1999 Yılı (Yapılanlar)

- Aliağa-Menemen-Basmane ve Alsancak-Buca-Cumaovası demiryolu hatlarında Banliyö Demiryolu Sisteminin geliştirilmesi ve işletmeciliğinin Belediye'ye devri için TCDD ile "Ön Protokol" imzalanması,
- Metro'nun 2. Aşamasının Proje ve Kontrolluk ihalesinin yapılması,
- Otobüslerde hizmet alımı deneme uygulaması,

2000 Yılı (Yapılanlar)

- Otobüs hatlarında ilk düzenlemeler (verimsiz 35 hattın kaldırılarak alternatif hatlarla desteklenmesi),
- Banliyö Demiryolu Sisteminin Yüzeysel Metroya dönüştürülmesi konusunda proje ihalesinin yapılması,
- 50 midibüsün otobüs filosuna eklenmesi,
- 105 körüklü otobüs ihalesinin yapılması,
- Körfez vapurlarının Belediye'ye devri ve ücretsiz tanıtım taşımacılığının başlaması.

2000 Yılında Yapılacaklar

- 2 Nisan - Ulaşımda Değişim Projesi"nin 1. Aşamasının Başlatılması
  . Otobüslerde yeni hat yapısının başlatılması
  . Otobüslerde besleyici / ana hat uygulamasının başlatılması
  . Vapurlara besleyici otobüs hatlarının işletmeye konması
  . Kentkart'ın otobüse ilave olarak vapurlarda da geçerli olması
  . Otobüs hatlarında kademeli fiyatlandırmaya geçilmesi
  . İlave Deniz Otobüslerinin hizmete girmesi
- 19 Mayıs - Metro 1. Aşamasında deneme seferlerinin başlaması
- Kordon Projesi'nin inşaatının tamamlanarak hizmete açılması
- 26 Ağustos - Metro 1. Aşamasında ticari seferlerin başlaması ve Metro'ya yönelik besleyici otobüs hatlarının devreye girmesi
- Metro 2. Aşama Proje çalışmalarının tamamlanması ve inşaat ihalesi
- Geliştirilmiş Banliyö (yüzeysel metro) proje çalışmalarının tamamlanması ve inşaat ihalesi
- Kentkart programlarının geliştirilip elektronik aktarma indiriminin uygulanmaya konulması
- Kentkart'ın otoparklarda kullanılmaya başlanılması
- "Ulaşım Etüdü ve Ulaşım Ana Planı" çalışmalarının başlatılması

2000 Yılı sonrası

- Ulaşım Ana Planı sonuçlarına göre
  . Metro'nun 3. ve 4. Aşama çalışmalarının başlatılması
  . Otobüs yollarının planlanması ve uygulanması, geliştirilmiş banliyönün hizmete alınması
- Metronun 2. Aşamasının hizmete açılması

Kim Ne Yarar Sağlayacak?

Kente, Çevreye ve Ekonomiye.....

- Toplu ulaşıma sağlanan avantajlar sonucunda kentte toplu ulaşımın payı artacak ve buna bağlı olarak ulaşımın yarattığı hava ve gürültü kirliliği ile trafik sıkışıklığının azalmasında olumlu gelişmeler olacak,
- Ulaşımda tüketilen akaryakıt, zaman kaybı gibi unsurlarda iyileşmeler sağlanacak,
- Özellikle Körfez geçişinde yaşanan tıkanıklık sorunu toplu ulaşımla ortadan kalkacak,
- Mevcut ulaşım altyapısından daha iyi yararlanılması ilkesine uygun olarak az yatırımla, demiryolu ve deniz ulaşımı daha etkin bir şekilde kullanılacaktır.

Yolculara.....

- Ulaşımda maliyet ve kaybedilen zaman azalacak,
- Tek bir kartla tüm ulaşım türlerinin kullanılması mümkün olacak,
- Kısa yolculuk yapanlar daha ucuza taşınacak,
- Aktarma yapanlara indirimler sağlanacak,
- Yolculara daha yüksek düzeyde hizmet sunulması sağlanacaktır.

İşleticilere......

- Ulaşım bir bütün olarak planlanıp işletileceği için para ve insan gücü daha iyi kullanılacak,
- İşletme verimliliği ve etkinliği artacak,
- Görev dağılımı ve ortak hareketle hizmet tekrarları ortadan kalkacaktır.

Nasıl ve Hangi Bedelle Yolculuk Yapılacak?

İlk aşamada Kentkart kullanımı ile uygulanacak kademeli fiyatlandırma yolculuk bedellerini aşağıya çekecektir.

Kentkart'la TÜM KAPILAR AÇIK...

- Şimdilik otobüs, vapur ve Fuar'da, yakında metro ve otoparklarda, geliştirilmiş banliyöde,

Kentkart'la TÜM YOLCULUKLAR KOLAY...

- Otobüste, vapurda ve deniz otobüsünde, bilet ve aylık kart, kupon satın alma derdine son.
- Tek bir kartla, hızlı, kolayca tüm toplu ulaşım araçlarından yaralanma.

Kentkart'la TÜM YOLCULUKLAR UCUZ...

- Hem otobüs hem de vapurda yapılan tüm yolculuklarda Kentkart kullandığınızda yolculuklar çok daha ucuz,
- Üstelik yeni kademeli fiyatlandırmada ve aktarma yolculuklarında Kentkart kullandığınızda indirim üstüne indirim.

Kentkart'la AKTARMALI YOLCULUKLAR EKONOMİK...

- Konulan sık tarifeli, hızlı, özel "Besleyici Otobüs Hatları" ile Bostanlı ve Karşıyaka'ya (diğer yakadaysanız Üçkuyular'a) sadece 100 bin lira ödeyerek ulaşıyorsunuz, artık daha sık kalkan vapurlara 100 bin lira ödeyerek keyifli bir yolculuk yapıyorsunuz.
- Toplam 200 bin liraya Alsancak, Pasaport, Konak veya Üçkuyular'a (diğer yakadaysanız Karşıyaka veya Bostanlı'ya) erişiyorsunuz.
- Gitmek istediğiniz yer eğer bu iskelelerden yürüme mesafesinde değilse, ucuz otobüs servisleri ile Alsancak Gar, Lozan, Montrö gibi tüm merkez alanlara ulaşmanız çok kolay.

Artık ulaşımda tıkanmalar azalıyor, hareket var...
İzmir'de ulaşım çağdaş yaşamın hızına uyacak, üstelik ekonomik olarak.

APPENDIX E: NEWS PAPER CLIPS ABOUT THE TRANSFORMATION OF TRANSPORTATION PROJECT

İzmir ulaşımda örnek

İZMİR'in toplu ulaşım sistemi tüm Türkiye'ye örnek olacak. Deniz ulaşımının kapasitesini artırıp, metro ve otobüs hatlarıyla entegre sağlayan sistemi yakın takibe alan ve yerinde görmek isteyen Karayolları Trafik Güvenliği Kurulu, Şubat ayı toplantısını İzmir'de gerçekleştirdi.

TRAFİKLE ilgili tüm kamu ve özel kuruluşlarla üniversite temsilcilerinden oluşan kurulun başkanı Emniyet Genel Müdür Yardımcısı Dr. Nihat Kurtiç, Büyükşehir Belediye Meclisi Salonu'nda yapılan toplantıda, "İzmir'deki entgerasyon örneğini tüm kentlere yayacağız" dedi.

KURTİÇ, karayolu güvenliğinin deniz, hava ve metro kapasitesinin artırılmasıyla sağlanacağını kaydetti, "İzmir örneğinin unutulmaması için toplantıyı burada yaptık. Kazaları en aza indirmek için çözüm bu sistemdir" dedi.

■ Utku BOLULU / İZMİR, (DHA)

Ankara dışında ilk kez İzmir'de toplanan Karayolları Trafik Güvenliği Kurulu Üyeleri, entegre ulaşımı yerinde inceledi. Trafik Himetleri Başkanı Dr. Nihat Kurtiç, İzmir'in ulaşımda örnek il olduğunu belirtti.

Toplantıya kimler katıldı

TRAFİK Güvenliği Kurul Toplantısı'na Vali Alaaddin Yüksel, Büyükşehir Belediye Başkanı Ahmet Piriştina, Trafik Hizmetleri Bakanı Nihat Kurtiç, metropol ilçe belediye başkanları, Maliye, Adalet, Milli Eğitim, Sağlık, Ulaştırma, Çevre Bakanlıkları temsilcileri, DPT Müsteşarlığı, Jandarma Genel Komutanlığı, TSE, üniversiteler, Sivil Savunma Genel Müdürlüğü ve ilgili sivil toplum örgütleri temsilcileri katıldı.

GURUR DUYDUM

BÜYÜKŞEHİR Belediye Başkanı Ahmet Piriştina, bugüne kadar ulaşımda gerçekleştirdikleri dönüşümün hedeflerinin son aşaması olmadığını söyledi, "Henüz işin başındayız. Bu aşamada bile beğeni kazanmamız gurur verici" dedi.

VALİ Alaaddin Yüksel de, trafik kazalarını önlemekte cezaları artırmanın hiçbir faydası olmadığının anlaşıldığını belirtti, "Emniyet kemeri mantığından kurtularak ulaşımda yeni alternatifler aranmaya başladı. Ulaşımda karayoluna bağlı kalınamayacağı anlaşıldı. İzmir, trafikte çağdaş modları kullanan ilk kent oldu. Denizde taşınan 50 bin kişi bile trafikteki değişim için yeterli bir örnek" dedi.

YENİ ASIR, 03/02/2001

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İzmir'i dünya izliyor

Bu sözler, İzmir'de toplanan Türkiye Karayolları Trafik Güvenliği Kurulu'nun Başkanı Kurtiç'e ait

ENTEGRE BAŞARI

TÜRKİYE Karayolları Trafik Güvenliği Kurulu'nun ilk kez Ankara dışında yapılan 44'üncü toplantısı, İzmir'de başladı. Toplantının İzmir'de yapılmasının nedeni; toplu ulaşımda uygulanan entegrasyon projesinde sağlanan başarı ile tüm Türkiye'ye örnek durumuna gelmesi olarak açıklandı.

YAKINDAN İZLENİYOR

TOPLU ulaşımda uygulanan entegrasyondaki başarı nedeniyle, tüm dünyanın İzmir'i yakından izlediğini belirten Türkiye Karayolları Trafik Güvenliği Kurulu'nun Başkanı Nihat Kurtiç "Bu kurulu tesadüf eseri İzmir'de toplamadık. Bu şehrimizdeki gelişmeleri yakından takip ediyoruz" dedi. 7'DE

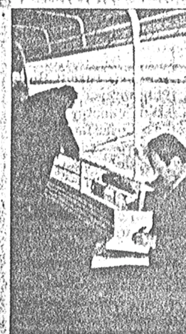
BRİFİNG VERİLDİ Türkiye Karayolları Trafik Güvenliği Genel Kurulu, Ankara dışındaki ilk toplantısını İzmir'de yapıyor. İzmir'in ulaşım kurmaylarının verdiği brifingi dikkatle izleyen kurul üyeleri, yakalanan başarının Türkiye'ye örnek olacağını söyledi.

Otobüs, metro ve denizyolunu birleştiren sistem büyük övgü aldı

Ulaşımda Dönüşüm Türkiye'ye model

Türkiye Karayolu Trafik Güvenliği Kurulu, İzmir'de uygulanan otobüs, metro ve deniz ulaşımının birbirini tamamlamasına yönelik çalışmaları desteklemek amacıyla İzmir'de toplandı

Tarihinde ilk kez Ankara dışında bir kentte, İzmir'de biraraya gelen kurul, entegre ulaşımda en başarılı kent olarak İzmir'i gösterdi ve diğer kentlerdeki uygulamalar için model alınmasını kararlaştırdı



Otobüs, metro ve vapurda

Devlet kuruluşlarının üst düzey bürokratlarından oluşan Karayolu ve Trafik Güvenliği Kurulu üyelerine İzmir'deki deniz, metro ve otobüsle ulaşım sisteminin birbirine nasıl entegre edildiği gösterildi.
(Fotoğraf: CEM ÖKSÜZ)

İzmir Büyükşehir Belediyesi'nin otobüs, metro ve deniz ulaşımını birbirine tamamlayan "Ulaşımda Dönüşüm Projesi" Türkiye'ye örnek oluyor. Karayolu Trafik Güvenliği Kurulu, deniz, kara ve demiryolunda örnek entegrasyon sağlayan Büyükşehir Belediyesi'nin çalışmalarını desteklemek üzere İzmir'de toplandı. Kurulduğu günden bu yana ilk kez Ankara dışında toplanan kurul, entegre ulaşımda en başarılı kent gösterdiği İzmir'in model alınmasına karar verdi.

Toplantıda İzmir Valisi Alaaddin Yüksel, Büyükşehir Belediye Başkanı Ahmet Piriştina, Emniyet Müdürü Hasan Yücesan ve ilçe belediye başkanları da bulundu. Toplantıda, "Ulaşımda Dönüşüm Projesi" tartışıldı. Deniz, demir ve kara yolları işbirliği ile trafik sıkışıklığının azaltılacağı görüşü dile getirildi. Kurul üyeleri, entegrasyonun sağlanmasıyla ulaşımın rahat, hızlı ve güvenli hale getirileceği görüşünde birleşti.

Toplantının ardından Büyükşehir Belediyesi bürokratları ile İzmir gezisine çıkan kurul üyeleri için 1 saatlik Körfez turu düzenlendi. Otobüsle Bornova Metro İstasyonu'na giden kurul üyeleri, Üçyol'a kadar seyahat etti. Çalışmalardan çok etkilendiklerini belirten kurul üyeleri, trafik kazalarının yoğun olarak yaşandığı Antalya'da, Vali ve Belediye Başkanı ile görüşeceklerini, İzmir'i örnek göstereceklerini söyledi. Trafikle ilgili tüm bakanlıklara konuyu yazacaklarını belirten üyeler, İzmir'deki "Ulaşımda Dönüşüm Projesi"nin diğer illerde de uygulanmasını isteyeceklerini söyledi. (MELTEM SEYİS)

"Türkiye'ye yayılmalı"

Emniyet Genel Müdürlüğü Trafik Hizmetleri Başkanı Nihat Kurtiç de incelemelerinden sonra "Kurulan iskeleler ve yeni seferlerle deniz ulaşımı geliştirilmiş. Raylı sistem ve yollarda düzenlemeler, önemli kolaylıklar getirmiş. Bu çalışmalar Türkiye'nin pek çok kentine örnek olabilir. Mesela Türkiye'de en çok kaza, Antalya ile Alanya arasında oluyor. Çünkü deniz ulaşımı yok. Karadeniz için de bu geçerli" diye konuştu.

"İzmir Avrupalı gibi davrandı"

Büyükşehir Belediyesi Ulaşımdan Sorumlu Genel Sekreter Yardımcısı İsmail Hakkı Acar, Türkiye'nin Avrupa Kentsel Şartı'nı kabul ettiğini hatırlatarak, buna uygun davranması gerektiğini söyledi. Acar, yollar ve ulaşım konusundaki TSE standartlarına da birebir uymaya çalıştıklarını söyledi.

80 kilometrelik metro

Büyükşehir Belediyesi Ulaşım Danışmanı Erhan Öncü de, kurul üyelerine bilgi verdi. Toplu taşımada bütünleşmeyi ve İzmir'deki aşamalarını anlatan Öncü, "Kent merkezini geçilebilecek bir yer değil, kolayca ulaşılabilecek bir yer yapmayı amaçlıyoruz. Bundan sonra metronun ikinci aşaması olan Üçyol-Fahrettin Altay bölümünü hayata geçirmek hedefimiz. Banliyö Demiryolu projesi de gerçekleşince, 80 kilometreye ulaşan bir yüzeysel metro oluşacak" diye konuştu.

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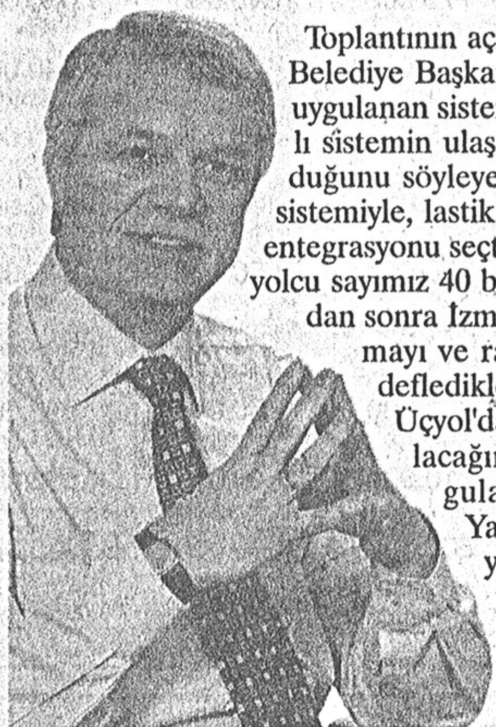
"Daha da gelişecek"



Toplantının açılışında konuşan Büyükşehir Belediye Başkanı Ahmet Piriştina, İzmir'de uygulanan sistem hakkında bilgi verdi. Raylı sistemin ulaşımda en güvenli yöntem olduğunu söyleyen Piriştina, "Deniziyle raylı sistemiyle, lastik tekerlekli taşımacılığıyla bu entegrasyonu seçtik. Deniz ulaşımında günlük yolcu sayımız 40 bini aştı" dedi. Piriştina, bundan sonra İzmir Körfezi'ni daha iyi kullanmayı ve raylı sistemi geliştirmeyi hedeflediklerini anlattı. Metro hattının Üçyol'dan Üçkuyular'a kadar uzatılacağını hatırlatan Piriştina, "Uygulama projeleri tamamlandı. Yasal prosedürü de tamamlayıp ihale yapacağız. Proje bitince, Aliağa'dan Cumaovası'na kadar metro standardında demiryolumuz olacak" dedi.

Metroya destek istedi

İzmir Valisi Alaaddin Yüksel de trafik ve güvenlik konularına değindi ve İzmir'in ulaşımı farklı bir il olduğunu söyledi. Deniz ulaşımında yolcu sayısının günde 5-7 binden 40 bine ulaşmasının büyük başarı olduğunu vurgulayan Yüksel, DPT uzmanlarından İzmir'deki metronun geliştirilmesine destek vermelerini istedi.

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Türkiye'ye örnek

Kurul üyeleri, toplantının ardından metro ve iskeleleleri inceledi, otobüsle şehir turu attı.

İzmir Büyükşehir Belediyesi'nin "Ulaşımda Dönüşüm Projesi" ülkenin en iyi modeli olarak seçildi

Türkiye Karayolu Trafik Güvenliği Kurulu, otobüs, vapur ve metro arasında geçiş sağlayan İzmir Büyükşehir Belediyesi'nin çalışmalarını desteklemek üzere İzmir'de toplandı. Kurulduğu günden bu yana ilk kez Ankara dışında bir kentte toplantı yapan Kurul, bağlantılı ulaşımda en başarılı kent olarak gösterdiği İzmir'in model alınması için, ilgili kurumları harekete geçirme kararı verdi. **5'TE**

Ankara çıkarması

İZMİR'in toplu ulaşım sorununu çözmesi planlanan Aliağa-Menderes demiryolu hattının metro standardına çıkarılması projesinin kaderi için geri sayım 5 Şubat 2001 Pazartesi günü başlayacak. Büyükşehir Belediye Başkanı Ahmet Piriştina, projeyi Devlet Planlama Teşkilatı'na bizzat götürecek.

DAHA önce projeye olumlu görüş veren Başbakan Bülent Ecevit, Yardımcıları Mesut Yılmaz, Devlet Bahçeli ve Hüsamettin Özkan, Ulaştırma Bakanı Enis Öksüz, Hazine'den Sorumlu Devlet Bakanı Recep Önal, Sanayi ve Ticaret Bakanı Kenan Tanrıkulu ile Maliye Bakanı Sümer Oral'a da proje özeti sunulacak.

DPT ve Yüksek Planlama Kurulu'nun projeyi onaylayacağına inandığını söyleyen Başkan Piriştina, İzmirli bakanlar Tanrıkulu ve Oral'ın da çaba göstereceğini söyledi, "600 milyon dolara malolan 11.2 kilometrelik Bornova-Üçyol hattıyla karşılaştırıldığında büyük bir tasarruf projesi olduğu anlaşıldı" dedi. Bu arada İzmir heyeti Başbakan Yardımcısı Hüsamettin Özkan'a Opel'in kapatılmasıyla ilgili gelişmeleri aktarıp destek isteyecek.

İzmir değişecek

ALİAĞA-Menderes arası demiryolunun metro standardına çıkarılması projesinin, onayın ardından 2002 yılında başlayıp, 2005 yılında tamamlanması öngörülüyor. TCDD'nin elektrifikasyon ve sinyalizasyonu üstlendiği projede 33 istasyon, 11 trafik alt-üst geçiti, 50 yaya geçiti yapılacak. Buca'da 2.5, Karşıyaka'da 3 kilometre, Bayraklı'da ise 5 kilometre uzunluğunda tünel gerçekleştirilecek. İşletme 2005 yılında 238 vagonla başlayacak.

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Bak, İzmirli nasıl yapmış

Türkiye Karayolu Trafik Güvenliği Kurulu Toplantısı Büyükşehir Belediye Meclisi Salonu'nda yapıldı. Kent içi ulaşım ele alındı.

Şehiriçi ulaşımdaki otobüs, vapur, metro entegrasyonu Türkiye'ye örnek oldu

HANZADE ÜNUZ İzmir

Türkiye Karayolu Trafik Güvenliği Kurulu Toplantısı, ilk kez Ankara dışında, İzmir'de yapıldı. Trafikten Sorumlu Emniyet Genel Müdür Yardımcısı Nihat Kurtiç, Büyükşehir Belediyesi'nin otobüs, vapur ve metro ulaşım araçları kullanımını bütünleştiren çalışmasındaki başarısına dikkat çekmek için kurulun İzmir'e geldiğini açıkladı. Büyükşehir Belediye Meclis Salonu'nda düzenlenen toplantıda konuşan Kurtiç, "Entegre ulaşımda İzmir'i örnek kent seçtik. İzmir dünyanın izlediği eşsiz illerden biri. Deniz ve karayolu toplu taşımacılığını birleştiren İzmir'in başarısını duyurmak, özendirmek istiyoruz" dedi.

Vali Alaaddin Yüksel de, "İzmir'de gerçekleştirilen deniz, karayolu, metro ve demiryolu bütünleşmesinin bir tesadüf değildir. Trafik kavramını farklı boyuta taşıyan Büyükşehir Belediye Başkanı Ahmet Piriştina'ya teşekkür ediyorum" dedi. Piriştina da, İzmir'de kent içi ulaşımın önünün açık olduğunu, Üçyol - F.Altay metro hattı ve Aliağa - Cumaovası demiryolu hattının tamamlanmasıyla trafik konusunun çözüme ulaşacağını belirtti.

MİLLİYET 03/02/2001