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THE EFFECT OF TRANSPORTATION INVESTMENTS ON URBAN LOGISTICS: ISTANBUL SAMPLE

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Abstract:
This paper defines the term of urban logistics, describes its significance, scope, shareholders, the factors affecting it, as well as the relevant performance criteria. Herein you will also find detailed information about the COST 321, a European Action which is considered as important for the urban logistics sector. This study outlines the urban logistics sector in Turkey, including the current transportation networks of Istanbul, a metropolis which has so far been experiencing an unplanned urbanization. In addition, the article claims that due to its geographical position, industrial opportunities, ever-growing population, connections, and infrastructure, urban transportation has become more of an issue for the city. This study also analyzes endeavors of the last decade that aim to solve these above-mentioned problems, and their impacts. These impacts were analyzed based on the findings about COST 321, and possible logistics solutions were suggested within the study.

Keywords:
Urban Logistics, Transportation Investments, COST 321

1. Introduction
Urban logistics is a system which was created to minimize emerging challenges and optimize various logistics services provided by different legal entities, considering urban road infrastructure, environmental impacts of the current situation, energy efficiency etc. Istanbul is a metropolis with a daily population of 20 million, whose traffic congestion rates have been at the top of the world lists for a significant while. Today, it is unlikely that the city and its infrastructure, which are developed on an unplanned and unorganized basis, may have the capacity to respond to the current needs. The measured time spent each day by an average working citizen in Istanbul is nine hours. This number, however, was calculated as seven hours for Ankara, and six hours for Antalya, Izmir and Bursa cities. According to the list prepared by TomTom, which is a Dutch company that produces navigation systems, Istanbul has the second worst traffic congestion with 58% among 146 biggest cities of the world. It is followed by Mexico City (Mexico) as the second and Rio de Janeiro (Brazil) as the third (Sputnik, 2017)(Diken, 2015). As it is in all over the world, the most congested times of Istanbul's traffic are the daily commuting times. However, the afternoon traffic is more congested when compared to the morning time.

Considering the city's capacity and traffic congestion, solutions should be based on future plans and strategies rather than daily interventions, and both universities and public institutions should be encouraged to take part within the projects. A country where no university and academician take part in the projects, no research is made, no book and thesis is written will make no progress in solution of a social problem, but only save the day. Interventions such as prohibiting the use of heavy vehicles in specific periods of the day, building new junctions, narrowing or removing the hard shoulders are only temporary solutions that may even bring about negative impacts such as labour loss. As

the capital city of the Ottoman Empire and one of the most outstanding cities of the republican period, Istanbul has unique strategic, geopolitical, historical and touristic features and characteristics. Therefore, all commercial, sociological and cultural incidence and phenomena that emerge in this world-famous city should meticulously be evaluated by academicians and practitioners, and the human life in the city should be facilitated through joint problem-solving interventions.

To mention the projects that will possibly affect the current urban logistics sector; construction of the Yavuz Sultan Selim Bridge has been completed and the project has been opened to public use with the motorway passing through the Bridge. Although it is not yet capable of meeting the current needs, there is no doubt that the facility will have positive impacts on the urban transportation after the linking roads are completely opened, and a significant number of vehicles will start to transit between Asia and Europe sides through this bridge. As for the users, however, it seems to be a costly solution. Particularly the recent decision that obligates the use of intercity buses and the 130-km extension to the route has caused unrest among the society due to the increased costs and time spent on traffic. As a result, a decrease in time efficiency and an increase in costs have become inevitable for those who use these buses in the Izmit - Istanbul route. Due to the increase in costs of the good transportation activities from the Anatolian side to the European part of Istanbul, this route will also have negative impacts on the prices offered to the end users. The guaranteed number of vehicle passages per day for the Yavuz Sultan Selim Bridge is 135,000. Although the official authorities announced that 100,000 vehicles pass the bridge in a day as of July, 2017, some other sources claim that the number has only reached to 40,000. However, for now it is not possible to obtain any standing statistical data (BİK, 2017).

Regarding the other three controversial projects; the government's prior expectation is to have up to 20 billion USD financial income and 225 thousand new positions will be offered for recruitment in the third airport. This project will also contribute to the logistics sector, with the area it covers, its terminal building and car park, which are among the biggest ones in the world. Accordingly, a significant increase is anticipated for economic activities in logistics and warehousing branches of the industry, particularly in local and regional areas. It is also expected that developing logistics parks similar to those around the Memphis International Airport, the Beijing Capital International Airport, and the Frankfurt Airport will bring about substantial economic activities as these parks often contribute to the growth and development of new clusters after the opening of any new airport (Edam, 2016).

In addition to this, the 31-km-long Great Istanbul Tunnel project, which is planned to integrate the Trans European Motorway (TEM), the E5 Motorway and nine different subway lines, and be the first of its kind in the world containing both a motorway and a railway in a single tube, will serve for about 6,5 million passengers a day. It is anticipated that this project will lessen the traffic burden on the currently used bridges (Habertürk, 2017).

The Eurasia Tunnel, which was announced to the public in 2006, has been completed and put into service as of 2017. The project, which is 14,6 km long and shortens the travel time between Kazlıçeşme and Göztepe areas up to 10 minutes, has significantly contributed to the traffic in bridges. The authorities announced the number of vehicle passages by the end of year as 47,000, which is below the guaranteed number that's 68,000. However, other sources claim that this number is only around 34,000. Access to statistical data about this kind of projects built on the basis of the build-operate-transfer model is often a challenging duty. These projects are often controversial as it is unknown whether the necessary feasibility studies and environmental assessments have been carried out or not. Therefore, the project is regarded as open to dispute and degeneration. In the current situation, it is almost impossible to obtain concrete statistics about these projects, and the only resource is often the numbers declared by the relevant authorities.

The Channel Istanbul Project, connecting the Black Sea and the Sea of Marmara, has also been a controversial issue in many aspects of it. Its route was announced in 2018. The feasibility studies in Küçükçekmece - Başakşehir - Arnavutköy route of this new channel, which was introduced as surpassing to the Suez Canal and the Panama Canal and a remedy for the problems in Bosphorus' traffic, have already been completed. The estimated cost of the

channel is 10 billion USD, although its necessity, environmental impacts, benefits and contribution to the development process are still disputable matters. The project also brings about some other concerns, such a new but isolated city in Istanbul that may emerge as it targets a limited and specific population. However, despite the disputes, all necessary construction works are continued apace. The channel is planned to be 43-km long, 400-m wide, with 25-m depth, and the expected population of the new city to be built around this channel is 500,000. The motorway connection is anticipated to be provided with about eleven new bridges to be constructed along the channel. Because the policy according to which ships shall utilize the channel has not been introduced yet, its possible impacts on the Bosphorus' traffic poses as another uncertain issue. Certain matters such as the main reasons behind this project, its necessity and whether it is a political maneuver or a need are expected to be clarified with further explanations. Otherwise, it can be interpreted as a waste of the national wealth which depends on no reasonable ground but political ambitions and desires, temporary employment targets and/or conservation of the construction sector.

The Marmaray Project, which is considered as the new Silk Road of the railroad transportation, is one of the most significant investments of our time. Connecting the Asia and Europe continents through a rail system, this project will enable pedestrian access during daytime and serve as a significant route connecting the Far East and Asia. It is expected to be a significant step in logistics once the current construction works between Pendik and Haydarpaşa areas are completed. The sixth part of this article provides information about the aforementioned projects and many others including ports, tunnels and rail systems, and analyzes all of these projects in respect to their contribution to the urban logistics. The conclusion part of the study, on the other hand, presents the assessments.

2. Conceptual Framework

2.1 Urban Logistics

The logistics sector extends back to a long history, namely emergence of the first organized commercial activities. However, researches about this subject were initiated only in the early 1900s, in an effort to facilitate distribution of agricultural products, contribute to the land use strategies, and create a business strategy. Logistics, as a term, was initially used to describe a military mission which is "to ensure mobility of the military personnel, as well as the transportation, maintenance and regeneration of the military supplies". It is often claimed that "logistics" is originally a military term and the first practices of logistics activities were performed within military areas and combat zones. A comprehensive type of military logistics was practiced by the US Army in 1991, the Gulf War. More than half million items and 2,3 tons of equipment were transported from USA to the Gulf region, at a distance about 12,000 km, through air and sea ways respectively. Besides the military logistics, today we can encounter different kinds of this activity, such as the business logistics, production logistics, inbound logistics, transportation logistics and relatively limited other approaches within the sector. The urban logistics sector, which is also the main subject of this study, is among these limited logistics approaches (Erdir, 2013)(Lorasokkay, 2007).

According to the data of 2010, 76,2% of Turkey's population (56,2 million people) is city-dwellers, and it is anticipated to reach 82% (70 million people) by 2023. Besides the general increase in population, the growth in urban population also plays a significant role in domestic consumption trends. Therefore, it is a necessity to consider the impacts of urbanization, urban transformation and the change in lifestyles in order to anticipate the need for logistics-related activities (TUİK, 2017).

This field of research is often mentioned as "Urban Logistics" and/or "City Logistics" within the literature. Urban logistics has recently been a significant matter of opinion, considering that we live in a period of rapid and increasing urbanization. In order to achieve the sustainable development targets, urban areas should be turned into more livable spaces. Moreover, urban logistics has a significant place in the EU transportation policies. Urban logistics also entails certain planning and management activities, while urban transportation requires new strategies about safety and security, human resources and training, information and communication technologies, energy efficiency and environmental issues. Urban logistics is regarded as the optimization of logistics and transportation activities

performed by different enterprises within the same social market economy, including the traffic conditions, environmental impacts, and the energy consumption in urban areas (Docplayer, 2018). Urban traffic conditions have an impact on the cost- and time-efficiency of urban logistics. In this regard, it is necessary to ensure proper planning of the distribution centers (including the consolidation-deconsolidation processes), and regulation of the routes and operating hours, in deference to distribution and intensification areas of all kinds of small, medium and large-scale retail enterprises, transport infrastructure and distribution of the consumer population. During this planning process, the competition conditions should be taken as a principle in order to decrease the cost of urban logistics while preserving the service levels of the relevant enterprises (MUSIAD, 2014). As a result of the dominant urban life and commercial activities, a great majority of the population in each country have started live in urban areas. Urban logistics plays a critical role in these urban areas or cities, where the traffic conditions are rather complex and the pace of life is relatively higher than others. This role is particularly important to ensure the sustainable development, competitive advantage, increased quality of life and efficient worldwide supply chains. Urban logistics is also a significant matter of research, which may help us have a better understanding of the economic, social and environmental activities in urban areas, and the sector should always be up-to-date to keep up with the contemporary world. The economic stability of the cities and creation of livable spaces for human beings entail efficient and environment-friendly logistics systems.

3. Methodology

Urban logistics is regulated by public authorities or jointly by public and private enterprises, and other stakeholders within the sector. Logistics and transportation enterprises, on the other hand, should also abide by the decisions taken by the relevant public authorities. These regulation activities and decisions also lay the foundation of the order in urban life. Examples of the aforementioned decisions can be seen in the COST 321 Action, which was initiated out in 1998. COST 321 (European Cooperation in the Field of Scientific and Technical Research) is an Action regarding 'Urban Goods Transport' started by twelve European countries in 1998. These countries are Denmark, Finland, France, Germany, Greece, Italy, Spain, Sweden, Switzerland, the United Kingdom, Slovenia and the Netherlands. Parties of the COST 321 Action are also among the top twenty countries in the Logistics Performance Index (LPI), the Global Competition Index (GCI) and the Global Innovation Index (GII). The COST 321 Action aims to ensure appropriate administrative measures by optimizing the air and noise pollution, as well as the energy consumption caused by the vehicles in the urban traffic, with the use of the cutting edge technologies in logistics. All these aims were designed in consideration of the economic impacts. COST 321 also analyzes the innovative methods and practices in order to improve the environmental performance in urban logistics. At the same time, the project examines the decrease in air and noise pollution, as well as the energy consumption levels achieved by the optimization of the heavy vehicle utilization, through modern logistic devices and appropriate administrative measures. The administrative measures and methods of logistics applied in the truck fleet management activities are among the discussed subjects. Herein the project aims to explore the most useful factors regarding the efforts to decrease adverse environmental impacts. The project also examines the necessary measures and methods that may bring economic efficiency and environmental benefits, in deference to the direct and indirect impacts on the flow of traffic and the commercial centers. In this regard, the identified economic efficiency in fleet management activities and similar measures in the logistics sector show that these practices are more applicable in the private sector. The COST 321 Action also aims to initiate pilot studies in scale indication. The results are particularly relevant to the subjects and areas listed below (COST 321, 1998). The COST 321 Action is based on three main areas:

- The Economic Structure
- The Transportation Structure
- The Urban Structure

The COST 321 Action suggests that each participant country differs greatly in terms of the main areas mentioned above. The study defines these differences in various categories, namely legal, administrative, judicial, infrastructural, economic and cultural. In addition, a survey study was planned for the parties in order to achieve an in-depth analysis within the scope of the COST 321 Action. This survey was initially designed to measure three fundamental characteristics:

- The Settlement Structure (Population, Employees, Entrepreneurs)

- The Traffic Structure (Number of Motor Vehicles, Types of Vehicles and the Road Network)
- Transport/Traffic Demand Structure (Total Trip Volume, Fuel Consumption and Air Pollution)

This study was individually implemented in each city, excluding the national, regional and locational influences. Within the COST 321 Action, the Working Group A has identified eight different categories under four main subjects, which are as follow:

1- Mobility Demand
- Logistical Organizations
- Modal Choice
- Price of transport

2- Infrastructure Supply and Land Use
- Physical planning, infrastructure planning & investment
- Traffic planning & management

3- Vehicle supply
- Vehicle technology & Alternative fuels

4- Behavior
- Driving behavior
- Other measures

These studies show that a great deal of air and noise pollution caused by urban traffics is due to heavy vehicles, such as trucks. On the one hand, today's society increasingly considers the truck traffic as polluting, while it is clearly seen that these vehicles are indispensable for the transport of goods in urban areas. In parallel with the increasing awareness of environmental problems in urban areas, it was deemed as necessary to further the efforts to identify appropriate measures to reduce the negative impacts of goods transport activities in cities. Long lists of such measures had been drafted, including a wide and diversified range of possible interventions. However, the public debate made it clear that widely diverging arguments were being voiced about which specific measures are most effective to enhance the quality of urban life, without impairing that of supply and collection service in the process. Increasing the public awareness of the problems caused by urban goods traffic and promoting the international cooperation in this field are among the issues considered as a general target of the COST 321 Action. As a specific result, the final report will provide guidance to local public authorities on how to select the most suitable measures. The urban freight models developed within the action, on the other hand, contributes to a detailed planning effort regarding the implementation of the measures. The Final Report of the COST 321 Action reflects the aim in a clear way. According to this report, the aim of the Action is to ensure the development and operation of innovative measures to improve the environmental performance of freight transport in urban areas. As a result, the main objective of the action is to define general factors in relation to these measures (COST 321, 1998).

4. Urban Logistics in Istanbul

Thanks to its unique geographical position, Istanbul is one of Turkey's and the world's richest metropolitan cities in terms of transport alternatives. It is an important city which connects Asia and Europe through the sea, land, and airways. Nowadays, the city is preparing to add a new connection between these two continents, which is a railway system, the Marmaray Project between Pendik and Haydarpaşa. The most preferred mode of transport in the city is the road transport, and a majority of investments are allocated to this method. However, as a city which faces the sea with six different sides, the local administrations should focus more on the solutions that will address logistics problems caused by heavy tonnage vehicles transiting from Asia to Europe or otherwise, facilitate and promote transportation by the sea and also increase the number of railway projects. The fact that railway systems were not considered as an alternative method to enable container transportation and the lack of investments in relevant systems and methods reflect a significant deficiency and shortsightedness of the local authorities. The main reason for this problem can be explained as the passenger-oriented transportation policies. Therefore, the interventions brought about no permanent benefit but temporary reliefs to the city. This truck-oriented transport network in central areas aggravates the current traffic congestion, the fuels used by the vehicles create negative environmental impacts and the heavy working conditions make security and traffic gaps unavoidable. In this regard, it is necessary

to consult relevant non-governmental organizations and universities, consider their suggestions and complaints when planning the logistics activities. All decisions about transportation policies should be made after consultation with the aforementioned organizations and local administrations in order to ensure long-reaching and healthy solutions.
In contrary to the previous years, the national authorities have recently gained more dominance over the local administrations and the impacts of urban transformation projects, which intend to ensure an economic recovery, are more clearly seen. In addition, the newly built private hospitals, hotels and shopping malls around the main arterial roads of the central areas aggravate the traffic congestion and necessitate innovative solutions. Therefore, giving priority to subway and railway projects already planned by the Istanbul Metropolitan Municipality is highly significant for a relief in urban logistics, as these are critical for the city's transportation system.

5. Transportation Investments in Istanbul

As a mega-city hosting a significant international and intercontinental transportation network, the investment trends in Istanbul is analyzed below in deference to the current conditions, including the realized land, air, sea, transportation and railway projects, as well as the city's leading position in logistics sector (Mega Projeler, 2018).

6. Transportation Projects in Istanbul

The investments in the construction sector have been intensified within the last fifteen years, and remedial solutions to the Istanbul traffic have been drafted. A certain number of these projects have been realized, and many others, considered as "crazy" or "fantastic" projects, are being planned and implemented step by step. In this part, we will examine thirty-three different projects.

Table 1. Transportation Projects in Istanbul

New Bosphorus Bridge Project
Airport Project
Great Istanbul Tunnel Project
Ataköy Mega Yacht Marina Project
Eurasia Tunnel Project
Bebek Boat Park Project
Beykoz Marina Project
Beykoz Cable Car Line Project
Jetty and Dock Project in Bosphorus
Çamlıca Hill Access Roads Project
Çubuklu - Kanlıca Coast Road Project
Emirgan Coast Road Expansion Project
Eyüp - Sütlüce (Pierre Loti - Miniatürk) Cable Car Project
Fenerbahçe - Kalamış Marina Project
Fenerbahçe TCDD Land - Marina Project
Galataport (Istanbul Salıpazarı Cruise Port) Project
Golden Horn Metro Bridge Project
Golden Horn Underwater Tunnel Project
Port of Haydarpaşa (Haydarpaşa Port and Railroad Station Transformation) Project
İstinye Boat Park Project
Kabataş Transport Transfer Station Project
Kabataş - Üsküdar Pedestrian Tunnel Project
Channel Istanbul Project
Northern Marmara Highway Project
Marmaray Railway Project
Mecidiyeköy - Çamlıca Cable Car Line Project
Rumeli Hisarüstü - Aşiyan Coastal Cable Car Line Project
Tarabya Boat Park Project
Tuzla Havaray Project

Tuzla Marina Project
Vadistanbul Havaray Project
Yenikapı Transfer Station and Archeopark Project

7.Conclusion

Istanbul is an interwoven city with its historically authentic fabric and business areas. Therefore, the necessary measures to improve urban logistics, as well as its quality and operating speed should be planned in a way to conserve this historical structure and develop the tourism opportunities. The local authorities should be well organized to ensure this historical and touristic conservation when planning the common grounds to help producers and consumers come together. It is often significant to create effective and sustainable solutions that can help the city's economic development and improve the quality of life, modify the current perspective in favor of both service providers and customers, and adopt a high-quality and sustainable approach in logistics. As all parts of the Anatolia and the eastern frontier areas have access to Istanbul and the European continent through the current transportation network, the necessary measures and applicable rules are increasing in importance. Therefore, the solutions should be planned as long-term infrastructure plans, rather than interim remedies. Diversification and promotion of public transportation in particular will help the city control traffic congestion levels. Development, renewal and extension of the current railway systems and modes of public transportation are the other needs in this regard. The sea access of Istanbul remained underdeveloped and relatively weak compared to the others. Connections between two sides of the city should be increased in number, and the land routes should be enhanced to fill the gaps in this respect.

Istanbul has shown a marked improvement in tunnel-based transportation systems within the last few years. Particularly the transition from land routes to subway systems in central areas, rescheduling of the working hours and extension of the traffic congestion over specific periods of time have contributed to the improvement achieved in the local traffic. However, additional measures are needed to decrease the car ownership rates and encourage people to use the public transportation system. Unfortunately, the urbanization in Istanbul has been progressed in an unplanned way and the social life has become mixed up with industrial activities to a significant extent. From all these reasons given above, the main logistics points currently located in central areas of the city should be removed to peripheral areas and the life spaces around these points should be facilitated. Transportation from these points to the central areas should be organized to be performed at appropriate times and using appropriate vehicles and scientific methods. Schedules and plans should be determined in cooperation with the relevant authorities in order to create contemporary urban areas. In this way, it may be possible to observe improvement in the quality of life over the short term. The necessary logistics activities to support the human life (such as deliveries to shopping malls, grocery store chains and small-scale groceries, other chain stores, and warehouses) should be performed at pre-determined time periods, especially at nights, so that the daylight traffic can be relieved and more opportunities can be created for employment. Charging fees for daytime entries into certain points of the city, such as Taksim, Şişli, Merter, Beşiktaş, Kadıköy etc., or limiting the car access to these places can be considered as alternative methods to improve the quality of life, despite the fact that these solutions may increase the costs for end users. Investing in necessary areas and encouraging the society to use bicycles or motorcycles in certain points of the city will also bring positive environmental and social impacts. Limiting the plate numbers authorized to travel in central areas, using the newest technologies to ensure an online appointment system for the drivers to get permissions for access at limited time intervals, and doing this in cooperation with the public authorities can be mentioned among the possible solutions. Effective and efficient operation of urban logistics is dependent on specific plans to be created according to the results obtained through joint researches and analyses expected to be conducted by public authorities, academicians and leading bodies within the sector. As the executive actors of these plans, the law enforcement forces should improve their supervision capabilities, while the actors in the logistics sector rather need self-control capacities.

Advancements in information technologies (IT) have dramatically increased over the past years. The quick spread of the Internet-based technologies and progress in networking have enabled the access to the web from almost every single location. The advanced planning, programming or supply chain technologies require new software and automation solutions. The growth in logistics and urban logistics have been facilitated by the newly opened logistics

departments in independent enterprises, integration of 3PL and 4PL Logistics Companies into the sector through outsourcing activities, and therefore a need for specialization in the sector has arisen. The number of specialized, qualified, trained personnel in Turkey is not sufficient to meet the current needs. Another need arising in parallel with the growth in this sector is an automation progress required in certain areas, rather than the transfer centers (Ercüment Kömür, 2017). The need for sustainability in, especially, urban logistics and the sociological concerns require prevention of the practices that cause a considerable decrease in quality of life. Special measures and stimulus packages should be designed in order to decrease the use of old, heavy vehicles, prevent air and noise pollution, and the public authorities should be supported through specific projects. Infrastructural deficiencies of the cities such as Istanbul, which have been immigrant-receiving attraction centers due to geographical position and natural resources, pose a challenging problem that is yet to be resolved. The growing population also aggregates this problem to a certain extent. People often migrate to the cities they call as "metropolis" when they do not find sufficient food, employment, and economic opportunities, and they seek for a better education and a more comfortable life. This sociological trend has also caused a population shift towards the urban areas. Likewise, the rural people of Turkey have migrated to these cities which are "paved with golden", a phrase we all may remember from the old movies, particularly to Istanbul, Izmir, Ankara, Bursa, Konya and similar others, which are economically more advanced and have better employment opportunities than the places they live in. These immigrant-receiving cities have a variety of infrastructural problems; however, the only relevant matter discussed in this study is the challenging situation in transportation and urban logistics caused by deficiencies in infrastructures. The local authorities have already paid an effort to ease the life for the society and find interim solutions for transportation problems, which is a significant factor in economic development. However, this effort has not yet yielded the expected results. According to the data obtained in 2017, every day four million vehicles move in Istanbul's streets. Given the fact that this number was only 2 million and 261 thousand, the increase in motor vehicles involved in Istanbul's traffic can be regarded as considerably high. It means that 1 million and 739 thousand new vehicles have joined to the daily traffic in Istanbul within the period between 2005 and 2017. These vehicles currently use an 845-km network of motorways, including highways, state roads, and provincial roads. Despite the new roads and facilities, this incremental growth in the number of vehicles entails innovative solutions. Herein, I would like to suggest a new action plan which I believe would contribute to the local traffic in Istanbul in a positive way. This suggestion includes five main activities, and these activities can be explained as follow:

7.1 Flexible Working Hours

In light of the results obtained through this study, we know that people spend three hours on average during commuting times from/to home in the morning and in the afternoon. Therefore, the first possible measure to be taken is to divide the working hours into groups and extend them over specific periods of time in a day. Having been applied in Europe and many other regions in the world, the flexible working hours policy has also been tried by the foreign enterprises located in our country due to the problems employees encounter during the commuting times. These trials have yielded positive results and also increased the overall working performance. Hence, a number of enterprises arranged working hours in different periods of the days other than the conventional 09.00 - 18.00 shift, such as 07.30 - 16.30, 8.30 - 17.30, and 07.45 - 16.45. In this way, they both prevented the waste of time in traffic congestion and motivated the employees by giving them the opportunity to set aside sufficient time for themselves and their families. Another impact of this practice in favor of the employer is the increase in employees' sense of belonging to the enterprise. Besides these and the aforementioned benefits for the traffic conditions, the flexible working hours policy may also provide some externalities in social life. It is not a surprising fact that this method will also bring benefits for families. Coca-Cola, De Facto, Eczacıbaşı, Pegasus Airlines, the Sabancı Group, Turkcell, and Vodafone can be given as some outstanding examples to the enterprises which adopt the implement a working hours policy. The governmental incentives, in this regard, may encourage public and private entities to realize similar projects and create a balanced mobility management as a result. (Çemberci, 2017)

7.2 Employment in Workplaces Near to Residences

One of the relevant methods applied in twenty-nine different European countries is the employment policy which targets the nearest residences for certain business districts. Currently, there are around three million active small and medium-sized enterprises (SME) in Turkey, and almost 500 thousand of these enterprises are located in Istanbul. (TEPAV, 2017) Assuming that only three employees in each of these enterprises live in farther places to relevant

workplaces than others, it would mean that 4,5 million people continuously move from a point to another in Istanbul, using different types of vehicles. This situation is also an indicator of the fact that the current traffic conditions are based on an unplanned urbanization. Therefore, employing people in nearby places will bring a lot of benefits in both use of economic resources and sociological terms. In this regard, the government may offer incentives for employment near the places where citizens reside.

7.3 Transit Peripheral Roads

In terms of land routes, Istanbul has two different and important alternatives, namely the E-5 Motorway, which enables entries to the city in multiple points, and the TEM Motorway, which does not pass through the city center, however, gives a chance to transit passes and affects the central traffic in an indirect way. In addition to this, it is expected that a feeder transit line to the Yavuz Sultan Selim Bridge, which begins from Düzce and does not have any entry/exit until Çatalca/Istanbul will substantially facilitate the inner-city traffic, though may not affect it as much as the TEM Motorway does.

7.4 Home Office Employment

The ever-advancing technology creates new opportunities for the business life. Abolishing the need to be dependent on a specific place and time period, this approach leads up new employment methods with the use of the Internet. The positive feedbacks obtained during implementation of the flexible working hours policy has also facilitated further investigations to find out new solutions for current problems. Enterprises which allow working at home on one or more specific days of the week are more welcomed and appreciated by their employees. Both the world and Turkey have examples of this type of enterprises. This method also increases the efficiency and motivation of employees. Unilever, Henkel, Turkcell Global Bilgi, Danone, P&G, Microsoft, Pepsi, Novartis and Intel can be given as examples of these enterprises worldwide. However, not every department is suitable for home office employment and this method can only be applied in suitable units.

7.5 Bicycle and Motorcycle Incentives

As the achievement award of our childhood and an indispensable part of our life, bicycles are now both a tool for leading a healthy life and a significant mode of transportation. Particularly after the social activities and projects of bicycle producers, this mode of transportation has been supported by the public authorities by building bicycle road or lines, and many other incentives. It is also expected that using bicycles as a prior mode of transportation through future investments and awareness projects, which introduce bicycles as a way of healthy living and an indicator of an environment-friendly and modern lifestyle, will positively affect the human life and various sociological aspects. Moreover, motorcycles are also a good alternative to bicycles as they enable traveling in longer distances, solve certain problems and help the users to avoid the traffic congestion, availability of parking spaces, as well as the high motor vehicle tax. Riding motorcycle is also a part of lifestyles, a sociological phenomenon, and a cultural activity. Although this method is relatively dangerous in Turkey's current traffic conditions, the number of awareness campaigns and training programs in this field shows an ever-increasing trend.

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