DE-CONGESTING THE CITY

PUBLIC TRANSPORTATION INVESTMENTS: A KEY FACTOR FOR URBAN ECONOMIC GROWTH

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Abstract
Today's cities are growing rapidly and the increasing population creates a number of new challenges. High traffic congestion is a major obstacle for the growth of the cities today. The main object of the thesis is to show that public transportation investments can decrease the congestion levels and ensure the urban economic growth. Under-investing in transit operations hurts the economy of the city, however when sufficient investments towards the public transit improvements are made, the significant growth in all economic sectors can be generated.

The theoretical background was based on the study on the topic (Public Transportation and Nation's Economy, The Quantitative Analysis of Public Transportation's Economic Impact) as well as other literature concerning transit investments and transit's economic impacts. Secondary data collected was mainly representing the public transportation situation in cities such New York and London. Annual reports of the transit agencies and their transit plans worked as valuable source of current information as well. Due to an increasing interest towards global issues, such as global warming and oil prices, the most significant and current studies and publications on the topic have been completed during the past few years.

The results prove that traffic congestion decreases the economic efficiency. Decreased amount of jobs is created and businesses experience losses in business revenue. Congestion decreases the productivity and mobility within the city costing us time and money. When investing in public transportation and developing the service the congestion can be decreased. Public transit investments and developed transit network boost the region's economy and generate growth in each economic sector. More jobs will be created and the income level and business revenue increases. Government's fiscal position improves as well as the GRP level of the region.

Keywords
Public transportation, urban economic growth, traffic congestion, transportation investments

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Tiivistelmä
Nykypäivän kaupungit kasvavat nopeasti ja lisääntyvä väestö lisää haasteiden määrää kaupungeissa. Liikenteen ruuhkautuminen on yksi suurimmista esteistä tämän päivän kaupunkien kehitykselle. Opinnäytetyön päätavoite on todistaa kuinka joukkoliikenteen investoinnin voivat vähentää kaupunkien ruuhkautumista ja taata urbaanin alueen talouskehityksen. Liian suppeat julkisen liikenteen investoinnit vahingoittavat kaupungin talouskehitystä, mutta joukkoliikenteen vahva tukeminen voi luoda kasvua jokaisella talouden osa-alueella.

Opinnäytetyön teoriaosa perustuu aihealueen aikaisempaan tutkimukseen (Public Transportation and Nation's Economy, The Quantitative Analysis of Public Transportation's Economic Impact), sekä muihin tutkimuksiin joukkoliikenteen investoinneista ja niiden vaikutuksesta alueen talouteen. New Yorkin ja Lontoon joukkoliikenteen tilanne toimii pääasiallisena lähdemateriaalina työhön. Vuosittaiset eri kaupunkien joukkoliikenneraportit ja suunnitelmat ovat myös tärkeitä tiedon lähteitä työtä ajatellen. Viime vuosina globaalit kysymykset, kuten ilmaston lämpeneminen ja raakaöljyn hinta ovat nousseet hyvin tärkeiksi ja siitä syystä myös joukkoliikenteen tärkeys ja tutkimukset aiheen ympärillä ovat lisääntyneet huomattavasti.

Tutkimustulokset osoittavat, että lisääntyvät liikenneruuhkat voivat vaikuttaa alueen talouteen negatiivisesti ja heikentää kaupungin talouskasvua. Ne vähentävät työpaikkojen syntyä ja alentavat yritysten tuloja. Ruuhkautuminen vähentää alueen tehokkuutta ja mahdollisuutta liikkuvuuteen, millä on ajallisesti ja rahallisesti negatiiviset seuraukset. Joukkoliikenteeseen investoitaessa liikenteen ruuhkautumista voidaan vähentää. Kasvavat investoinnit ja kehittynyt julkinen liikenne luovat talouskasvua jokaiselle talouden alueelle. Työpaikkojen määrä lisääntyy, tulotaso paranee ja yritysten kannattavuus nousee. Kunnan tai valtion rahatilanne paranee ja alueen yleinen talouskehitys lähtee nousuun.

Avainsanat (asiasanat)
Joukkoliikenne, urbaani talouskasvu, liikenneruuhka, joukkoliikenteen investoinnit

Muut tiedot

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1 INTRODUCTION

According to the United Nations, nearly 3.3 billion people are going to be living in urban areas by the end of the year 2008 (UN Population Fund Report 2007). For the first time in history, the number is more than one half of the world's population and it is projected to grow tremendously by the year 2030, when approximately 5 billion people will be living in metropolitan areas. This rapid urban growth forces cities to seek new solutions to the operational burdens created by the increasing population and their ever growing needs.

The necessity of travelling has seen the largest growth during the past decades, especially in the world's biggest cities. For example, in New York City, 3.6 million people travel in the central zone of Manhattan everyday (Partnership for New York, 2006, Growth or Gridlock). In the U.S. alone, people spend approximately 38 hours a year in urban traffic jams. In addition to the wasted hours, a great amount of fuel is wasted which significantly increases the cost of congested driving (Texas Transportation Institute, 2007 Report).

Due to today's demanding society, the necessity of travelling rapidly and efficiently increases every day and cities are using all their resources in order to manage the increasing traffic. The economic well being of citizens, businesses and the physical well being of the environment are under a severe threat due to the affects of highly congested travelling routes. The transportation infrastructure in most cities and in high capacity travelling areas has not developed enough to meet the amount of motor vehicles, which has caused high congestion rates in most of the central areas. Poorly working metropolises and their undeveloped public transit system is the number one cause to the traffic congestion. The congestion creates a huge threat for tomorrow's urban economies and is a major obstacle to the essential economic growth required for cities to flourish.

In order to lower increasing traffic congestion we need to look for more sustainable solutions to maintain the growth of the cities. Metropolitan areas will keep expanding and the task to support an increasing number of motor

vehicles within the city limits will become very difficult. Other solutions need to be taken into consideration in order to enable cities' daily operations and to maintain their growth. As public transportation gains more popularity due to high gasoline prices and environmental awareness, it has also become the most important tool to decrease the traffic congestion in the urban areas. It is essential that the cities invest and develop urban transit networks to be up to date, effective and convenient for the maximum number of people. The outcomes of these investments will all support urban economic growth and will allow cities to work to their full potential. In the best possible outcome, investments towards public transportation generate growth in several different parts of the economy. Positive results boost local businesses, create new jobs in the city, increase the property values and create new communities near stations and rehabilitate struggling neighborhoods.

1.2 OBJECTIVE OF THE RESEARCH AND RESEARCH QUESTIONS

The purpose of the thesis is to show the importance of public transportation investments for urban economic growth. The research also proves that under-investing in transit operations hurts the economy of the city and substantially diminishes economic growth. The study was conducted to show the importance of a well-functioning public transit network and how it plays a significant part in the economic growth of urban areas.

Main objectives of the study:

- To prove that highly congested cities do not operate with economic efficiency
- To prove that investing in public transit is the only way to lower the congestion in cities and sustain urban economic growth

- To prove that public transportation investments create economic growth in several different parts of the economy: households, businesses and governmental sector

I see the research topic as an urgent matter in today's cities and it is an issue that cannot be ignored any further. Downtown areas in the world's biggest cities have reached the point where they have met their limits and where an increasing number of vehicles and people are slowing down the economic development rather than helping the city grow. Highly congested cities cannot operate with economic efficiency and many economic opportunities will be lost due to the problems created by high traffic congestion.

Well-working public transportation system should be seen as a common solution to this urgent congestion problem and investing in its development considered as a common practice to meet the urban circumstances today and tomorrow. A developed public transit system impacts on several parts of the economy and growth will follow in every economic sector when sufficient investments are made.

Research questions of the thesis can be pointed out as follows:

1. What is the magnitude of the negative impacts that the traffic congestion has on different urban economic sectors?

2. In cities that have invested aggressively in public transportation, what is the impact that these investments have had directly on traffic congestion?

3. In cities that have invested aggressively in public transportation, what are impacts that these investments have had indirectly on the growth of different urban economic sectors (households, businesses and government)?

4. Where can cities look for new sources of public transportation funding?

1.3 THEORETICAL BASIS OF THE RESEARCH

The study is based on the importance of public transportation investing and developing. The thesis demonstrates how the public transit investments create change in several economic sectors and how the changes have a positive impact on the variables that are used to measure the economic wealth of the region.

Throughout the thesis I prove my research problem true based on previous studies and theories and especially on real life experiences from major cities. The thesis studies the background of a couple of recent experiences where the transportation funding became, or would have become, a key success factor in the future development of the city and especially in the growth of the urban economy.

The main theoretical base (See Figure 1. page 10) is modified from the research; Public Transportation and Nation's Economy-The Quantitative Analysis of Public Transportation's Economic Impact, implemented by Cambridge Systematic Inc., in 1999. The transportation impact theory states that transit related economic growth is created mainly through two different types of changes*;* changes in travel behaviour and changes in construction and building activity. In addition to that, economic growth can be generated through other various changes in social and environmental sectors, most importantly through land use re-organization**.** Due to public transit investments, households and businesses change their travel behaviour which will then impact on several variables that are used to measure the economic wealth of the urban economy. As the theory states, the variables are affected positively and thus creates growth in all sectors of the economy. In the thesis we will study more closely how each economic sector benefits and what the most important outcomes are that the transit investments create in the urban economy.

The content of the thesis covers some of the major cities that have quantitative data of recent public transit projects and the effects of their public transit strategies on the economy. I also underline the negative results that

under-investing in public transit may create for the urban economy. The traffic congestion in the thesis proves to be the biggest threat for the urban economy and the factor that slows down the economic growth the most. I see the failures of the public transit strategies as important examples of alarming situations. They should work as a motivator for us to avoid unbeneficial situations where the traffic congestion has created very negative results in the economy. Impacts of high congestion rates are given out mainly in numbers, for instance the number of jobs lost due to high traffic congestion or the loss in business revenue due to congestion.

After concentrating on the effects of public transit failures and congestion, it is also essential to state the positive outcomes that sufficient public transit investments can, in the best possible situation, create. In the thesis I back up these impacts with ideas from previous transit studies and with the quantitative data from major cities including sufficient references and examples of real life cases. Although I only concentrate on the four major variables that are used to measure the economic wealth of the region, there are several other smaller sub-impacts that are created through public transit funding. According to the theory used in the thesis, (Cambridge Systematic, Inc., 1999, Public Transportation and the Nation's Economy) the public transit investments, increased transit usage and lower congestion rates can create the following outcomes which are the variables that can be measured to define the economic wealth of the region:

1. *Increase in Gross Regional Product (GRP)*
2. *Increase in Household Income Level*
3. *Increase in Business Profit*
4. *Improved Government Fiscal Position*

Later in the study we will look into each impact more closely and identify whether or not it proves to be true for different economic sectors and what the other following results are.

1.4 RESEARCH DATA COLLECTING METHODS AND RESEARCH AREA

This thesis is a research focused thesis and based on previous experiences and observations, mainly using the secondary data. The main goal is to solve a problem that could further help individuals, businesses and governments (Hirsjärvi, Remes, Sajavaara 1997 & 2005.) My thesis was not developed specifically for any organization or a company, however if it was to be studied further its results could serve many sectors.

I used previous studies on the subject, real-life experiences and current news articles as secondary data sources. Due to two major global issues, global warming and oil prices, the past few years, there has been a lot of discussion on the importance of public transportation. Environmental awareness and concerns about the future of the globe did not exist as broadly and significantly as they do today. The most significant and current studies and publications on the topic have been completed during the past few years and they are most commonly to be published on the internet which increased the number of my web sources. The literature I familiarized myself with in the library rather worked as an inspiration to define the subject of the study rather than a dependable source of information. The most up to date and valuable data was found from online publications, since for instance most of the transit agencies publish their annual transportation reports online and the internet is the easiest access to them. Not much literature directly on the topic exists yet, however there are several studies, research projects and currents reports online that can be used as reliable references. In addition to that, my research subject can be easily impacted by the changes in the environment and the society, which quickly makes information obsolete. The most recent data holds the most valuable information.

Real life public transit cases work as a major focus throughout the study. The cities of London and New York, among a few others, are the main cities that are included in the study, representing sample situations. These cities struggle with the traffic congestion everyday and continuously search for new strategies to reduce it in order to sustain growth. What makes the data valuable is that the cities have gone through major transit changes or they

have a detailed plan to do so, therefore the impacts on the economy can be identified very specifically. In addition to that, I also use the Massachusetts Bay Transportation Authority (the MBTA) as an example of a city that has faced a failure due to under-investing in public transportation and the outcomes created have been very negative. The MBTA operates in the city of Boston and its region, and having lived there for the past year and using the public transit, I was able to collect first hand data and see the problems the MBTA and the region deals with everyday.

The two cities, New York and London, both big economic players in the world market, play a key part in the study. Even though they are two of the most important cities in the world, their public transit situations and strategies are still quite far apart from each other. London has made major changes in the public transit sector and invested a great amount in its operations, therefore able to generate positive outcomes. Due to a new regulation it has been able to decrease the congestion significantly in the city. In addition to that, an improved public transit system operates efficiently and attracts a great number of new public transit users everyday. Several public transit projects have had major positive impact on the London's economy.

New York City, on the other hand, is still hesitating to take the step and go through some major transit improvements. It is still losing great amounts of money due the high congestion in the city. The city of New York however is a very strong candidate for extensive public transportation projects in the near future, with one of these potential implementations being the congestion charge. The data found in the New York case is mainly concentrated on the cost of the congestion for the city, especially for its economic sectors. The information is based on the research conducted by several transportation departments and officials and backed up with their calculations and assumptions. PlaNYC 2008, is the main source of the information. It is a very detailed study about the impacts of the transit to the city environment but is also a plan about the New York's potential transit future.

The New York case gives very valuable data in the sense of discovering the benefits of an effective transit network as well as the negative results that the

lack of transit funding can create. The importance of the transportation projects is justified by the negative results and alarming findings that the traffic congestion currently causes to the economy of New York. Research done in the New York case underlines the benefits that public transit developments could create in the region and sees the transit funding basically as an only option to this matter. Despite the fact that many resources back up the importance of public transit developments and regulations such as the congestion fee, New York has not yet implemented any transit projects that would completely change its economic situation.

London on the other hand, has gone through major transportation projects during the past years which have caused major changes in the region and especially in its economy. The most important change has been the implementation of the congestion charge that has significantly decreased the traffic within its central zone, brought money to the development of the transit system and increased attraction of public transit among the citizens. The London data can be studied without any consideration since it accurately summarizes real life economic outcomes generated by transit development projects. The research made around London's situation gives the thesis valuable material and is very dependable. The main data in the London case comes from the agency of the Transportation of London that conducts annually a report of its mass transportation situation and especially concentrates on the economic development after the launch of the congestion fee.

I see it necessary to include current experiences and findings from a few different cities to gain multi-faceted data. Although all cities differ from each other in the character wise, I see that all of them have very much in common as well. They all consider a well-functioning public transit system as a tool to decrease traffic congestion and thus maintain and enhance the growth of the cities and support it in every economic sector.

2 TRANSIT INVESTMENTS LEAD TO AN IMPROVED REGIONAL ECONOMY

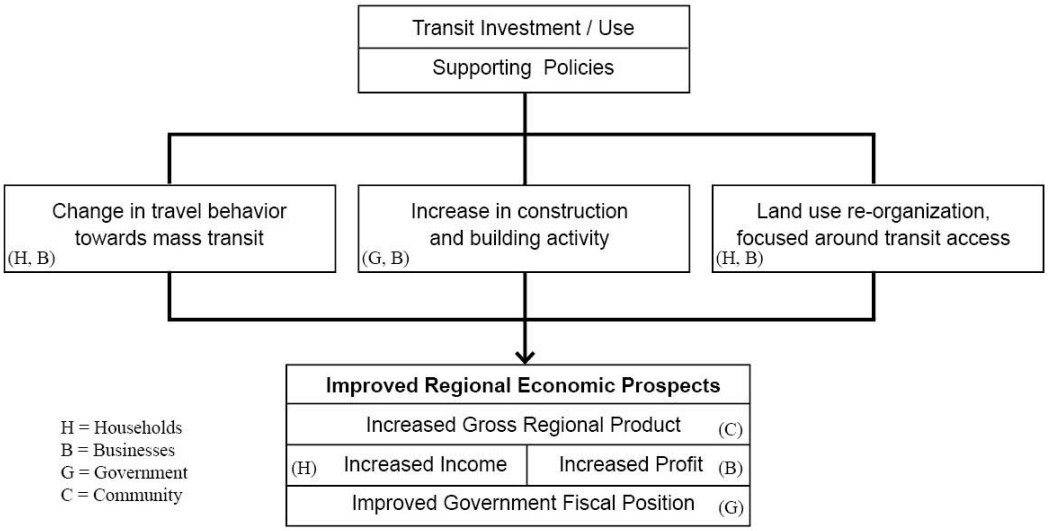


FIGURE 1. Economic Impacts of Public Transit Investments. Modified from the Study of Cambridge Systematics, Inc. (1999).

2.1 CHANGES CREATED BY TRANSIT INVESTMENTS AND SUPPORTING POLICIES

As mentioned earlier in the introduction, the theory of the thesis states that transit related economic growth is created through two different types of changes; changes in travel behaviour and changes in the construction and building activity. In addition to that, economic growth can be generated through other various changes in the social and environmental sides, most importantly through land use re-organization. The diagram shown in Figure 1 describes the main theory of the thesis (Cambridge Systematic, Inc. 1999 Public Transportation and the Nation's Economy).

Investing in public transit changes the travel behaviour of households and businesses since their daily activities depend on the convenience of travel and moving from place a to place b. Due to improved public transit services the households and businesses will change their method for travelling or will travel more frequently than before. In addition to changes in travel behaviour, the public transit investments and supporting policies will promote construction and building activity by businesses in and around public transit developments. Service line expansions, new transit stations and other related construction processes require significant resources from the construction and design firms, as well as from the governmental sector in order to carry public transit projects through. Not only will public transit investments create construction and building activity directly related to the transit projects, they will also promote residential and commercial building in many of the areas linked to the mass transit.

In addition to changes mentioned earlier, also households and business will experience changes in environmental and social sector. The land around the transit stations will be used differently and the developed public transit will overall improve the environment in urban areas. The value of the land will experience change depending on where it is located, compared to the transit stations and transit access. Redesigned transit cities will change the whole urban environment and the how the land is used for businesses and households in the city.

2.1.1 Changes in Travel Behaviour

When investing in public transit by improving and developing services people will gradually change their travel behaviour and change their attitudes positively and more favourably towards the public transit. Public transportation becomes more attractive for everyone and the number of users will increase. Travellers will switch from their personal motor vehicles to public transit. Due to the convenient and less money consuming travel method, the users will save a great amount in travel expenses and the travel time decreases

significantly. The productivity and reliability of the businesses increases since travelling inside the city is made less congested, easier and less time consuming. As stated in the graph this behaviour will create the biggest changes in the residential and business sectors since these are the economic groups most dependent on personal and business travelling.

2.1.2 Increase in Construction and Building Activity

Due to the public transit investments and supporting policies, the amount of new transit related construction projects will increase rapidly. The expansions of service lines, building of new transit stations and their surroundings and improvements in existing transit stations will create a significant change in the construction activity for the firms such as construction companies and design firms, and there will be a huge demand for their services. This generates thousands of new jobs in construction, maintenance and new transit agency positions and also increases the profit of the firms working in the field or in related business. The governmental sector plays an essential part in public transit projects since they are usually the main financer and thus give the huge support to public transit projects. Their spending habits change as the pubic transit gets more support and they direct more of their money towards building new transit stations, service lines and improving the area nearby transit stations. Businesses and the governmental sector are the ones that experiences biggest changes in their construction and building activity when the public transit investment increase.

2.1.3 Land Use Re-Organization

Public transit investments also create changes in social and environmental factors due to new types of land use. Due to new transit investments, businesses and residential housing are now more likely to situate near convenient transit stations because the city can now offer improved convenient transportation than before. Re-designing and planning the whole

urban city to be favourable for the public transit, will make the land more attractive and valuable. Major businesses and increasing number of residents will want to locate themselves in the area due to mobility and accessibility. They will bring along the development, which will increase spending in the city. Due to an improved land use and decreased traffic congestion and increase in the public transit usage, cities will become more pleasant to live in. The real estate market will boom due to an increase in property values and attraction of the land. Environmental effects will be significant since the air quality will improve and the whole city environment remains cleaner. The most major changes will be experienced by households and businesses.

2.2 VARIABLES TO MEASURE ECONOMIC BENEFITS

After exploring the changes in the region's travel behaviour, construction and building activity and land use organization, the major causes can be identified. As people start travelling differently, the construction and building activity in the transit sector increases and the land becomes more developed, and thus cities will experience direct changes in their regional economy. There are four different variables we can use to measure wealth of the regional economy. All of these variables have been impacted by the changes in activity in the region. By measuring the variables we will know whether or not the region's economy has benefited positively from the transit investments. The group of variables consists of the Gross Regional Product, the household income level, the business profit and the governmental fiscal position. As the chart states, through public transit investments all of the variables will experience an increase in the level of activity. Increased public transit investments and supporting policies create positive growth in all sectors.

2.3 ECONOMIC CHANGES GENERATED THROUGH TRAVEL BEHAVIOUR

As stated in the framework for analysing the economic impact of transit investments, through the investments in public transit the travel behaviour of the households and businesses changes significantly. The major impact for households is the increase in income level due to the improved public transit, which gives them better access to available jobs and their travel costs decrease. The businesses experience increase in their business profit due to the increased level of productivity and reliability of travelling.

2.3.1 Households - Increase in Income Level

Public transportation developments will have a great effect on region's households and especially on the level of the personal income and the amount of available jobs. Improved and dependable transportation system offers less time consuming and less expensive option for personal travel and people are able to be more productive in all sectors of life. Due the improved transportation networks households' savings are significant since the 10 to 15 percent of household expenditure is created by travelling related processes (The National Business Coalition for Rapid Transit, 2003, The Economic Importance of Public Transit). Using public transit instead of your own car will in the long run become a lot less expensive.

Due to an expanded transit network more jobs are reachable and available by public transit for every willing worker. In addition to current job availability the transit construction and expansion will itself create an increasing number of new jobs in the construction and design. Maintenance of new service facilities and expansion of the transportation system create thousands of new jobs for many years ahead in the field of transportation service.

Due to the improved transit network, the personal income is better secured and people in general are able to earn more money. Decrease in travel cost,

and a better accessibility to available jobs are two main factors that cause the increase in the personal income.

2.3.2 Businesses - Increase in Profit Through Productivity and Reliability

Productivity of businesses increases since travelling within the city becomes more reliable and less time consuming due to an improved public transit system and lower congestion rate. Well-working transportation network ensures employees get to work on time, they spend more hours actually working on the job and they can overall be more productive. Firms such as delivery companies are able to improve their performance significantly since their business mainly depends on how fast they are able to travel through the city and deliver the product on time. Due to popularity of public transit, the traffic congestion decreases and delivery firms are able to deliver a higher number of packages in an hour. In general, the cost of doing business decreases since the firms are able to produce higher quantities in a lesser time compared to the situation before. Their expenses will remain the same however their productivity increases which will then generate higher business profit.

2.4 ECONOMIC CHANGES GENERATED THROUGH THE CONSTRCUTION AND BUILDING ACTIVITY

Due to increased public transit investments the construction and building activity of the businesses and governmental sector changes significantly. Companies working in the field of construction and design are able to increase their level of activity and will experience an increased in their business profit due to increased demand for their skills and services. The governmental sector as a major financer for the public transit projects will be able to improve its fiscal position through the several public transit construction projects and expansions where it is involved and successfully carries them out.

2.4.1 Businesses - Increase in Business Profit Through Building and Construction Activity

New transit related projects create a huge demand for the services of construction, building and design companies and other firms working in the same field. New transportation projects, such as construction of new transit stations and expansions of service lines, create a huge demand for skilled and willing workforce for the many years ahead. Firms that work in the field are able to experience a significant increase in their revenue compared the earlier years when the public transit was still waiting for its improvements.

In addition to actual transit construction jobs, new transit stations and expansion of service lines create the attractive environment for other businesses, such as retail, restaurant and offices, to locate themselves. Being located in the nearby areas of the transit stations the accessibility and mobility of the businesses increases. Building new public transit creates lively centers where a growing number of businesses see many opportunities and an increasing number of jobs will be created year after year.

2.4.2 Government- Improved Governmental Fiscal Position

As Government being the financer in the comprehensive public transit building projects it will be the sector most benefited from the success of the transit projects and increase of the public transit usage. After the completion of transit projects, the impacts of improved transit network start to show as people favour the public transit as their primary transit method and businesses see new opportunities in the areas that are now surrounding the transit stations.

Benefits of public transit investments lead to more spending and activity in all economic sectors which in turn generate more tax revenues for the government. Due to its improved fiscal position the government has more chances to re-invest in transit and other operations in the region and develop the urban environment further. The government has a possibility to lower tax

rates or provide more programs and initiatives for the people of the region and therefore again improve economical situations of the households and business, and generate more spending within the region.

2.5 ECONOMIC CHANGES GENERATED THROUGH RE-ORGANIZATION OF LAND USE

Public transit investments create change in the land use of neighbourhoods. How the land or property is valued near the transit stations changes and the areas located nearest the transit stations become the most favourable locations to live and do business.

2.5.1 Households and Businesses- Increase in the Competitiveness and Attractiveness of the Land

Developed transit services and networks and decreased congestion level increase the value of the land and property and create an attractive urban environment. People's chance for a great mobility and accessibility in everyday life generates a well-functioning urban city.

An increase of property value can be significant due to new transit related investments and projects. Through public transit funding, transit stations become more accessible and work as a linkage between willing workers and employers needing the workforce. Areas near stations or areas with a great public transportation access become attractive places to operate and live. Business and housing will locate themselves in the area because of the mobility, accessibility and especially the opportunity the public transit stations offer. Property values increase near the transit stations since an increasing number of people will want to locate themselves near these transportation points.

3 TRANSIT FUNDING

3.1 SOURCES OF PUBLIC TRANSIT FUNDING

The return on dollars invested in public transportation is far greater than the cost. Under different scenarios, the overall economic benefits of public transportation may exceed costs by as much as nine to one. (Cambridge Systematics, Inc.,1999, Public Transportation and the Nation's Economy).

Every dollar tax payers invest in public transportation generates up to $6 in economic returns, which translates into higher revenues for cities and states. For every $10 million invested, over $15 million is saved in transportation costs to both highway and transit users. These costs include operating costs, fuel costs and congestion costs. (APTA Transit News, 2005, Business Group Calls on Congress to Pass Transportation Funding Bill).

TABLE 1. MBTA Fiscal Year 2007 Revenues. Source; MBTA Advisory Board Finance Committee (2008).

Massachusetts Bay Transportation Authority (MBTA) 2007 Fiscal Year Revenues

Operating Revenues	$ 424,728,975
Non-Operating Revenues	$ 45,885,772
Assessments from Local Governments	$ 139,427,540
Sales Tax Trust Revenues	$ 733,963,311
Total Revenues	**$ 1,344,005,598**

In 2007, the MBTA's budgeted expenses were $1,348,739,971. Its annual expenses exceeded its fiscal revenue which would further increase its deficit.

The Massachusetts Bay Transportation Agency (MBTA) is an alarming example of the transit agency that has for several decades struggled with its set budget and been unable stay within the fiscal limits. According to its fiscal budget for the year 2007, in fact the expenses are higher than budgeted

revenues (MBTA Advisory Board Finance Committee 2007 MBTA Fiscal Year 2008 Budget Request). This creates a great risk since the agency is trying to pay off its increasing deficit although still unable to make any profit within the set budget. In order overcome its debt and begin to make profit the MBTA would require both high capacity funding and a completely new strategy to direct more money towards its operations.

According to the MBTA FY 2008 budget, the main sources for transit investment are the subsidies from local and federal governments and a certain percentage of revenues from the state sale tax trust funds. If the economy is declining and the sales tax revenues are in their lowest point the transit agency will also receive the decreasing amount of funding towards their operations. This is how the majority of transit agencies in most of the cases collect the sufficient funding to operate. In the MBTA case the fare revenues have stayed as a minor source and have not been able to reach the level of governmental subsidies. Therefore, the funding from the governmental direction is very vital and investment decisions they make can have a long lasting effects on the economic state of the transit agency.

The lack of proper funding and the increasing demand of public transit have created a great problem for many transit agencies. There is no money available to modernize the stations, extend the service lines or overall improve the service quality. In other words, current pubic transit resources are not able fill out the increasing demand successfully. In addition to current investment strategies, new sources of funding need to be developed or else we miss the vital opportunity that public transit can offer the urban economies.

3.2 CONGESTION CHARGE AS AN ALTERNATIVE FUNDING SOURCE

Due to insufficient public transit subsidies from the governmental sector, the transit agencies are forced to look for other solutions to fund their operations and increasing demand for improvements and development. One of the most successful strategies has been the congestion charge regulation. The main idea of the fee is to set an area within the city, usually in the most congested

central zone and limit motor vehicle access to it by using a daily fee. Between the busiest business hours the vehicles entering into the zone are to pay a certain amount in order to drive and operate in the area. The vehicles forced to drive will pay the charge, however others with an option to choose an alternative travelling method most likely choose the public transportation.

The regulation decreases the amount of vehicles within the central zone, the area becomes more pleasant and traffic flows more easily. The revenue collected from charging the congestion fee is in the majority of cases directed towards the public transit developments and projects which improve the transit system in the city and decrease the congestion level. Many major metropolises, such as London, have discovered the regulation a very efficient tool in managing the increasing congestion. (Transport for London, 2007, Central London Congestion Charging, Impacts Monitoring Fifth Annual Report).

4 TODAY'S TRANSPORTATION CITIES AND THEIR ECONOMICAL STATE

The city of London, with the population of 7.5 million is the most populated municipality in the European Union. In addition to that, London is the 6th largest city economy in the world (UK Economic Outlook 2007.) It is projected that by the year 2020 London will have reached the point where it will overtake economies of Paris and Chicago and move up to be the 4th biggest city economy in the world. The city of New York on the other hand, is the most populated city in the U.S. with the population of 18,650,000. The central business district of Manhattan is the engine of a $901 billion regional economy which qualifies the city to be the 2nd biggest economy city in the world (Partnership for New York, 2006, Growth or Gridlock.)

For both of these cities, investment in the public transit can become an essential success factor considering their economic growth today and in the future. Well-functioning public transit networks and their constant

development will create a favourable environment for the cities to grow and ensure their position among the world leading economies. However, without sufficient public transit investments the outcomes can prove to be very negative as well. London and New York are to decide themselves what their transit future will hold.

4.1 IMPACTS OF THE TRAFFIC CONGESTION TO NEW YORK CITY

Every weekday 3.6 million people travel into Manhattan south of 60th Street, a third of them in vehicles. Only half of them, or 1.8 million, are commuters going to work. According to the Partnership of New York report, the traffic congestion affects the cost of living and doing business in the entire region. Traffic delays increase logistical, inventory and personnel costs annually by $1.9 billion, and $4.6 billion will be lost due to unrealized business revenue. Delays generated by commuters, workers and other travellers cost annually $5 billion to $6.5 billion in lost time and productivity. In addition to that, approximately $2 billion is lost in wasted fuel and other vehicle operating costs. The report also states that due to high congestion, the loss in regional economic output is at least $3.2 billion to $4 billion annually. When combining the business costs, lost revenues and lost productivity, the report finds that there are 37,000 to 52,000 fewer jobs created in the New York Metro Region every year than there could be if the congestion was lower. (Partnership for New York, 2006, Growth or Gridlock.)

The negative impacts of the traffic congestion are seen in all business sectors but the sectors most affected are manufacturing, wholesale trade and construction, states the report. As their business is slowing the impacts will be passed along to other economic sectors as well. Businesses that are the most affected are usually very dependent on the ease of access and mobility, such as moving employees and delivering goods and services. Excess congestion can cost these New York businesses $2.4 billion in lost revenue, $1.1 billion in increased operating costs and the loss of 12,000 jobs annually. (Partnership for New York, 2006, Growth or Gridlock.)

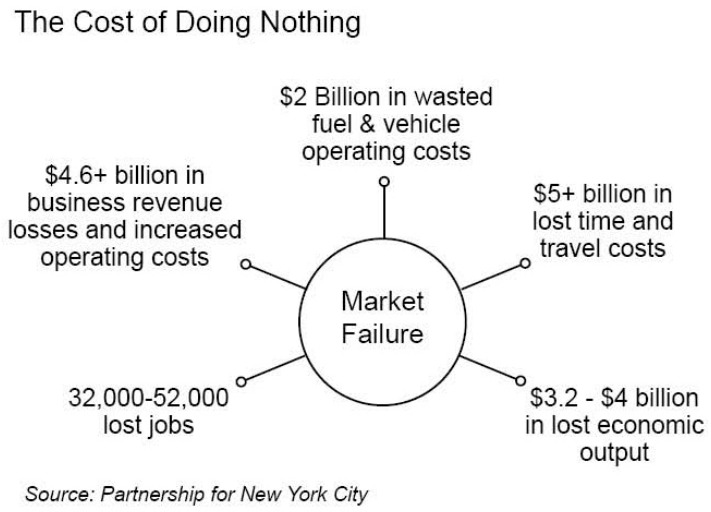


FIGURE 2. Cost of Traffic Congestion to the New York City. Modified from the Partnership for New York Report (2006).

In order to decrease the congestion in the city and maintain the economically efficient traffic flow, the city is forced to look for additional funding sources to support its public transit. One of the major solutions that it has considered is the congesting pricing that would allow the government collect the fees in highly congested areas especially during the peak hours when the traffic is the worst. This would make motor vehicles avoid congested downtown areas which would then improve the air quality, decrease the traffic and generate bearable environment for other methods of transportation. It would increase the public transportation usage and assist in the economic growth of the city. Drivers, who still, regardless the charge, must drive through the congesting pricing zone would pay the fee and all revenues would be directed towards public transit projects, expansion and improvements. Hence, even without the sufficient governmental funding, the public transportation could get its required resources. (The city of New York, Mayor M. Bloomberg, 2008, The PlaNYC.)

If New York was to charge $8 for entering its central zone its annual revenue from the charge could be as much as $400 million in the first year and $900

million by 2030 (Transportation Alternatives, 2008, Congestion Pricing).These revenues could be directed into development of existing public transit service and new transit projects. After implementing the congestion charge, people would start preferring other methods travelling such as public transit, walk or bike. According to the Traffic Congestion Commission (2008) that was created to evaluate the approaches to reducing congestion in New York, the vehicle miles travelled within the congestion zone would reduce by 6.8 percent and $491 million could be raised for transit investments annually. During the peak-hours the benefits would be even more significant when 11 percent decrease in traffic would lead to 20-40 reduction in time loss and traffic delays.

4.2 LONDON AND THE CONGESTION CHARGE REGULATION

The city of London had suffered from the negative impacts of the congestion and increasing traffic in downtown area for a long time. Before the major transit improvements, including the launch of the congestion fee, the city had the worst traffic congestion in the U.K., with the average traffic speed down to 15 kilometres per hour in its central zone. London's public transportation needed major updates but was lacking sufficient funding and losing its image of a well functioning transit city. A new strategy was needed in order to manage the increasing congestion and collect the sufficient funds for essential improvements of its public transit network. (Publication of Center for Transportation Studies at University of Virginia, 2004, Effects of Light Rail Transit on Traffic Congestion.).

In 2003, London Mayor Ken Livingston introduced the London Plan to make significant improvements to London's transportation. Perhaps the most important part of the plan was the launch of the congestion charge. His main goals pointed out in the strategy were the reduction of the congestion, radical improvements to the bus service, and improvements of the journey time reliability. All these objectives were to be direct outcomes of the congestion pricing which was essential part of the plan. With the revenue collected from congestion fees, the city was finally able to invest sufficient amounts of money

towards its public transit services and generate the improvements that were so essential to the well-being of the city and its citizens. (Transport for London, 2007, Central London Congestion Charging, Impacts Monitoring Fifth Annual Report).

Since February 2003, private automobiles were to pay a fee of £8 (equals $12,50 and 9,80e, November 11, 2008) when travelling on weekdays through central business district in London between 7 a.m. and 6 p.m. Payments can be made in selected retail outlets, payment machines, by internet or by sending a text message. There are video cameras set around the zone to record license plates and then match them to the records of payments. According to the Fifth Annul Report of Transport for London conducted in July 2007 there are approximately 110,000 motorists per day paying the congestion fee. Throughout the fiscal year 2006- 2007 the revenue of £123 million (equals $192.45 million, November 11, 2008) was raised through the charging and all directed towards the public transportation improvements. (Litman T., 2006, Victoria Transportation Policy Institute, London Congestion Pricing, Implications for Other Cities.)

TABLE 2. Predicted Costs and Revenues of the London Congestion Charging. Modified from the research of Victoria Transportation Policy Institute (2006).

Congestion Charging Costs and Revenues 2000-2008

Start up costs	(2000-2003)	£180 M
Operating costs	(2003-2008)	£320 M
Total Costs		**£500 M**

Charge Revenues	£500 M
Operating costs	£110 M
Total Revenues	**£610 M**

Total revenue of £610 during the eight years equals to 1.2 billion U.S. dollars.

Since the launch of the congestion charge in 2003 major improvements can be identified. Most importantly the traffic congestion in London has decreased significantly. During the two first months automobile traffic declined 20 percent which equals to 20,000 vehicles per day. Fewer vehicles in the city centre improved bus and taxi service in the matter reliability, productivity and reliability. According to the findings in the report of London congestion Pricing (T. Litman 2006 Victoria Transportation Policy Institute, London Congestion Pricing. Implications for Other Cities), since the launch of the congestion fee the taxi travel costs have declined by 20-40 percent due reduced delays. The vehicles as taxis and firms such as delivery companies are able to cover more kilometres per hour than before. The survey conducted for over 200 companies in London proves that bus delays in the London region have reduced by nearly half (T. Litman 2006 Victoria Transportation Policy Institute London Congestion Pricing. Implications for Other Cities). Congestion fee has generated substantial revenues, improved the public transportation a great amount and its public acceptance has grown.

4.3 URBAN ECONOMIES EXPERIENCING CHANGES IN TRAVEL BEHAVIOUR

New York is a great example of the city that is very dependent on the ease of travel and the effects of congestion is judged to be higher to New York than any other major metropolitan region in North America. The city is full of headquarters operations that require constant travel demands. Its high real estate values make delays unwanted since they will increase the inventory storage costs. Its major industries are financial services, professional services and media, all sectors where the competition is high and there is no time for unnecessary delays. In addition to that, the importance of truck deliveries to New York is very vital, since the city does not have the freight rail system. On time deliveries are particularly important for retail and manufacturing sectors, where traffic delays and unreliability can generate huge losses for businesses and then also increase the consumer purchase prices. (Partnership for New York, 2006, Growth or Gridlock.)

Since New York is a city that is very dependent on well-functioning traffic, it is vital that the traffic congestion can be decreased to the level where it is not harmful for the urban economy. In addition to that, New York's public transit network needs to be developed, reliable and effective. Accessibility to the transit stations needs to be improved and the Metropolitan Transportation Agency (MTA) needs to works as a convenient travelling method for everyone. New York has not yet implemented the congestion charge regulation as the city of London has done. In London the congestion fee has worked as an efficient tool in the fight of the decreasing traffic congestion and significantly decreased the number of motor vehicles in the city's central zone. Alarming examples of the impacts of congestion to the New York's economy should now work as motivators for deciders in New York when finding new investments strategies for public transit in the city. (The City of New York. Mayor M. Bloomberg, 2008, The PlaNYC.)

Increased investments in public transit can generate significant economic benefits and help the urban city sustain and improve its economic growth. It has been studied that if New York would implement the congestion pricing regulation within its central zone the impacts could be very positive. Due to the new regulation the traffic within the charging zone would decrease by 6.3 percent and lower congestion would increase travelling speeds by 7.2 percent. Everyone who drives in Manhattan would experience the benefits reduced traffic and higher speeds, says the report. The 4.6 percent of New York citizens who live within the zone and drive to work would have lower commuting times than earlier. (The City of New York, Mayor M. Bloomberg, 2008, The PlaNYC.)

Approximately one third of our daily travelling is done in congested conditions. If we were able to, through proper public transit investments, reduce the amount of vehicles in traffic, the positive consequences for the economy could be significant. According to the NYPTA report, reduction of 60 cars from traffic amounts to a full bus, 200 cars a full commuter rail and one single subway line can carry up to 30,000 passengers. (NYPTA, 2008, Executive Budget

Proposal for Transit.) With the changes in travel behaviour we can create significant changes for the whole urban environment.

> *If our transit system were to suddenly stop, our metropolitan transportation operation would grind to a halt. This would make it impossible for employees to get to work and for businesses to receive and ship goods. The metropolitan economy would eventually grind to a halt as well. (A. Lee Blitch, President CEO, San Francisco Chamber of Commerce.)*

(The national business coalition for rapid transit, 2003, The economic importance of public transit.)

4.3.1 Households- Increase in Income Level

Households will experience major benefits due to changes in travel behaviour. Due to the availability of new jobs the personal income level increases. According to the PlaNYC (2008), the decreased traffic congestion within the central zone of New York would greatly benefit workers whose income depends on providing services and being productive. The PlaNYC (2008) report provides an example of a plumber whose one third of a day is spent by sitting in traffic travelling from site to site. Due to decreased congestion he would be able to travel within the city faster than before and his income would increase significantly. The report also mentions a taxi driver who is able to be a lot more productive during his day since he is able to serve a bigger number of customers than he did before.

The developed public transit services create a better access to available jobs and all jobs are easier to reach through an expanded transit network. For many New Yorkers, such as elderly, young, disabled and the poor, the public transit is an only mobility option (The New York Public Transit Association, 2008, Executive Budget Proposal for Transit). When the city provides an affordable transportation, it also ensures that as many people as possible has an access to jobs and has a chance to do work. According to the report

findings by the New York Public Transit Association (2008), 94 percent of public assistance recipients do not own a car and rely on the public transit. Hence it is vital that through the public transit network they have an opportunity for the mobility and they are able to be part of the workforce and urban economy.

London's Economic benefits after major public transit improvements, including the congestion charge, have been very positive for the city and its economy. Economic growth has remained positive in most of the sectors and a great number of new jobs have been created. According to the Transport for London, the financial and business service sector is the biggest employer in the London central zone accounting approximately 50 percent of all jobs in the area. The employment growth in the sector as well as the growth of the business units has been positive after the congestion fee. After the launch of the charge the business sector has been significantly stronger in performance than during the two years prior to 2003. Investments towards public transit have created an attractive environment for the businesses to operate and their success has created more jobs for potential employees. (Transport for London 2007 the Fifth Annual Impacts Monitoring Report.)

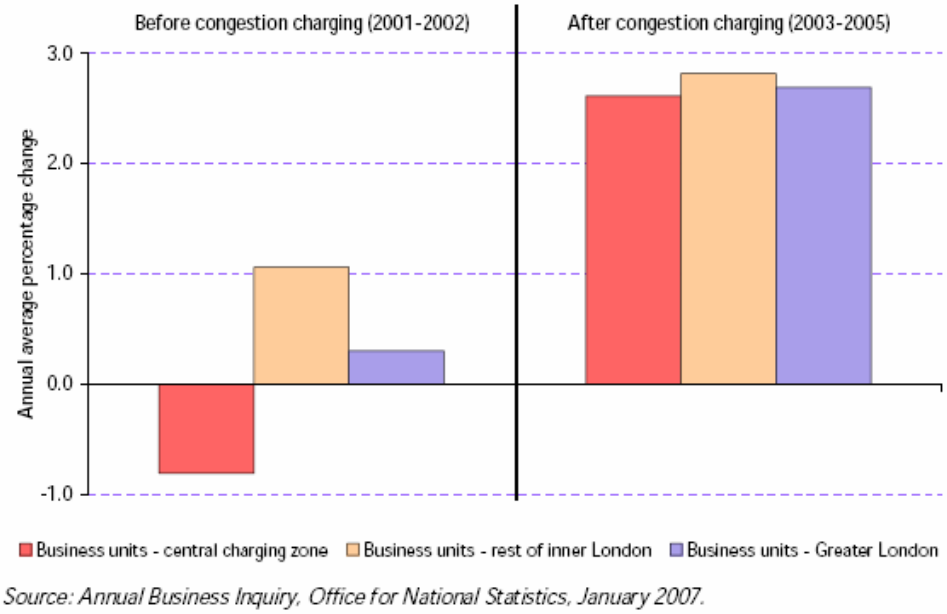


FIGURE 3. Financial and Business Service Sector Jobs, Before and After Congestion Charging. Source; Transportation for London (2007).

Savings for the households in travelling costs are also significant when switching your personal vehicle to the mass transit. A great amount of money is saved in travel expenses when travelling is done by using the public transit rather than owning your own car and paying for all the included expenses. Due to the improved transportation networks, households' savings are significant since the 10 to 15 percent of household expenditure is created by travelling related processes (The National Business Coalition for Rapid Transit, 2003, The Economic Importance of Public Transit). Due to increase in the gasoline prices it has become impossible for some people use their personal vehicle on a daily basis anymore. According to the recent research by the American Transportation Association, the public transit is now on its highest point in 50 years (APTA 2008). In the United States people took 2.6 billion public transit trips more within the three first months of 2008 than they did during the same period of time in 2007 (NBC News, 2008, Jam Packed Transit Systems Running on Fumes). Taking the public transit instead your own car, is a great way to save in personal expenses since driving has become too expensive for many.

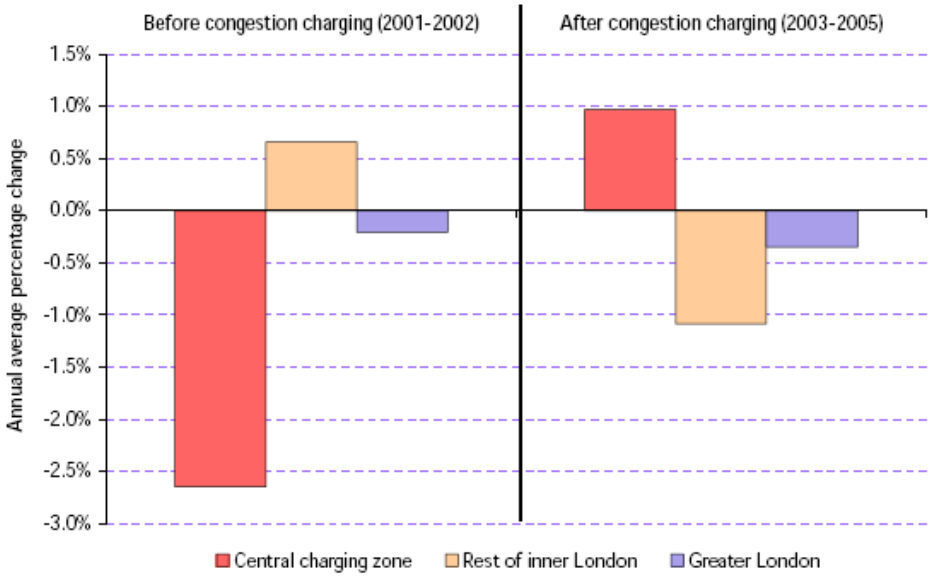
4.3.2 Businesses- Increase in Profit Through Productivity and Reliability

Due to improved public transit network and decreased congestion level, the businesses who mainly work in the central zone of the city become more productive since their commuting time decreases and they are able to get more work done during the normal business hours. According to the study, 70 percent of all public transit trips in New York City are taking residents to and from work (New York Public Transit Association, 2008, Executive Budget Proposal for Transit 2007-2008). This makes the reliable transit network even more vital for local businesses and to their success. In addition to employees' effectiveness, many delivery firms and their business depends on reliable and on-time deliveries. Every minute wasted means less money in the long-run. Due to public transit investments and lower traffic congestion, the overall costs of doing business in the city would decrease and work would become more beneficial to all business sectors.

The transit projects in London and especially the congestion charge regulation have created a favourable environment for both business and personal travelling. Due to decreased congestion, two-thirds of the London firms reported faster journeys to work and fewer delays (Transportation for London, 2007, Fifth Annual Impact Monitoring Report.) Therefore the London central zone has become even more attractive for businesses to locate their operations in since the commute is no longer too time-consuming and reliability to get to the work in time is much higher. Investments towards public transportation and its development have created reliable and convenient network for Londoners commuting and travelling inbound and outbound of the city. Offices and professional organizations have continued to back up the charging since they have seen major changes in the environment and travelling within the zone has become easier. According to the Transportation of London report (2007), 67 percent of London firms say that there are substantial improvements in business travels after the launch of the congestion charge.

After the public transit developments in London and especially after the launch of the congestion fee, it was London's retail sector that was the most concerned about the negative impacts of the congestion fee to the retail sales in the central London. The retail sector is the fourth largest employer in the central London and very vital for the economy of the city as well. According to the Transportation for London report (2007), the biggest fear was that people would not do their shopping in the central zone anymore due to the charge and thus the limited access. The common concern was that the drivers who would drive into the city would now avoid the central zone and others who pay the charge would have less to spend within the zone. However, the findings of the Report for the Transportation for London (2007) show that the amount of shoppers that access to central London by car has been relatively small both before and after the congestion fee and therefore the impacts of the charging are less significant on the retail sector. Before the launch of the fee shoppers already used other methods to have an access to the central retail stores, or already were located nearby the stores so the travelling other than using the public transit, walk or bike, was not necessary.

The studies conducted in 2003, during the congestion charging trial in Stockholm, prove that due the congestion fee the economy of Stockholm actually improved. Other research made according to the same subject, showed that when people simply walk or cycle to the office from the bus stop or train stations they are more exposed to the city, its services and especially to its shops. Therefore these studies were able to disprove the assumptions that the retail sector would be the one that suffers from congestion fee. (D. Yassky New York City Council 2007 Congestion Pricing and its Effects on Small Business.)



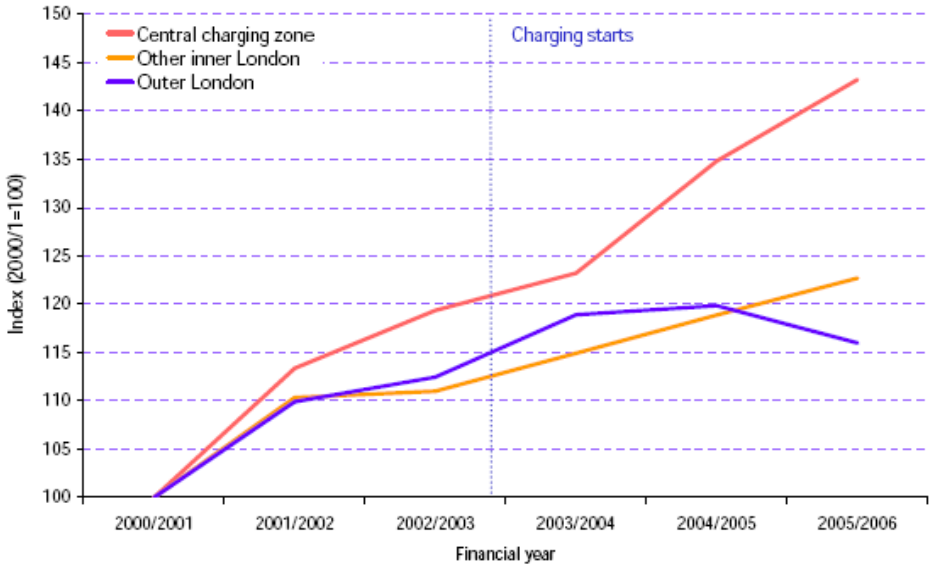
Source: Annual Business Inquiry, Office for National Statistics, January 2007.

FIGURE 4 Business Units in the London Retail Sector, Before and After Congestion Charging. Source; Transportation for London (2007).

Even though congestion charging created concerns, especially in the retail sector of the London central zone, the increase in retail business units post-2003 can be noticed in the figure 4. The less congested central zone created a favourable environment for the retail to do business and locate their operations near by new transit stations. The zone itself still attracts customers due to an easier access by bus or subway. In fact the rest of inner London and

a greater London seem to suffer the biggest economic losses since their ability to provide more jobs decreases significantly whereas the central charging zone turns its employment growth into an increase.

The reduction of the congestion lowers the cost for city centre businesses and makes them more competitive and profitable. The hotel and restaurant sector is one of the major job providers in the central London and thus affected by the congestion charging. The data collected by the Transportation for London Report (2007) shows that profitability and the growth of the sector has been stronger after launch of the charge in 2003. When compared to the other locations in London we can see the difference in sales and that the central charging zone is out-performing the other London locations.



Source: Dun & Bradstreet Ltd.

FIGURE 5 Index of Sales in the Hotel and Restaurant Sector, in the London Congestion Charge Zone Compared to Other London Locations. Source; Transportation for London (2007).

According to the findings in the report about London congestion pricing, the London First (a business group whose members account for 22 percent of the city's GRP) feels positive about the congestion fee regulation. One forth of the

members says that the congestion charge has had a positive impact of their business profit. Cert Logistics, a major delivery firm in London that delivers to restaurants and hotels reported that its delivery times were cut by 50%. According to the findings, the congestion charge pays back in approximately 17 minute travel time savings for people who earn average London wage. (Victoria Transportation Policy Institute, 2006, London congestion pricing, Implications for other cities.)

Evaluation of the Stockholm pilot congestion charging program found out that the companies dependent on vehicles were able to find parking space more easily within the charging zone and that their overall travel time decreased by about 20 percent. In addition to that, the study states that delivery companies reported that the access to Stockholm centre during the midday congestion hours was significantly easier than it had been before. One of the key findings according to the study and the evaluation of the program was the increased productivity for drivers due to the fact they were able to deliver five packages per hour within the zone compared to four deliveries per hour outside the congestion zone. According to the study and as earlier mentioned in the evaluation of the congestion program, Stockholm courier companies reported that they were able to increase their productivity by 10 percent due to a more efficient city environment. (Yassky D., New York City Council, 2007, Congestion Pricing and its Effects on Small business.)

4.4 URBAN ECONOMIES EXPERIENCING INCREASE IN THE CONSTRUCTION AND BUILDING

4.4.1 Government - Improved Fiscal Position

Due to the increasing number of successfully implemented transit, business, and residential projects in new developed areas, the money that the government has invested in the transit projects will start to have a positive return and the fiscal position of the government will improve.

The government offers services for people and with the better fiscal position more services can be provided. Due to the improved fiscal position the Government may be able to lower taxes and thus offer a better chance for people to improve their income level and have more money to spend. The government's improved fiscal position is basically an outcome of all the causes that the public transit investments create in the different sectors of economy. The wealth of the government can keep generating the growth in the area and further improve the whole urban economy.

4.4.2 Business- Increase in Business Revenue Through Construction and Building Activity

Transportation creates jobs both through new construction, maintenance and operation, and also through the development that happens as a result of new or improved transportation system. Building of new public transit supports the transit oriented development, that creates a vibrant environment for people and businesses to live, work, shop and use the public transportation as a convenient transit method.

It has been studied that every $1.25 billion spent on new public transportation projects generates approximately 51,300 new jobs (Web article, 2008, Transit Creates Jobs and Enhances Local Economies, See references). By contrast, only 43,200 people are employed when the same amount of money is invested in new road and bridge projects. The article (2008) also proves that based on current findings the public transportation projects create 19 percent more jobs than construction projects that build new roads and bridges.

The public transportation system in Washington DC, has generated nearly $15 billion in surrounding private development in the area. Between 1980 and 1990, approximately 40 percent of the region's retail and office space was built within the walking distance of the Metro station. This has created many lively areas with full of restaurants, shops, offices and residences. (Business Coalition for Rapid Transit, 2003, the Economic Importance of Public Transit.)

It has been studied that every $10 million invested in public transit creates 314 new jobs and generates $30 million gain in business sales. In addition that that, 570 jobs area created in the short run for each $10 million invested. Transit system construction leads to a great level of short-term job creation, and once the transit projects are finished, a long-term source of high-quality jobs. The study proves that of the 350,000 people who are directly employed by the public transportation agency, more than 50 percent are operators and conductors. Other 10,000 to 20,000 employees work directly to the public transportation systems or are employed by companies and government offices that support the public transit systems. In addition to theses jobs there are numerous other jobs in the public transit services that employ people in the field of engineering, manufacturing, construction and retail. (Cambridge Systematic, Inc, 1999, Public Transportation and Nation's Economy)

In New York City, transportation is one of the main job creators, together with the water quality, water network and energy initiatives (The City of New York, Mayor M. Bloomberg, 2008, The PlaNYC Progress Report). According to the Progress Report of the PlaNYC (2008), the implementation of the whole plan would create hundreds of thousands new jobs in the region. The PlaNYC includes detailed plans to improve and develop city's urban environment in five key dimensions of the city; land, water, energy, air and most importantly the transportation. The Progress Report (2008) states, that if all of the initiatives were implemented as the plan states, the job creation in the area could be significant. The capital plans and construction phase for all the PlaNYC projects are expected to support 422,000 direct jobs (in person-years), and indirectly through the spending the total of 865,000 jobs are created. After the completion of the projects, annual operations and maintenance could support directly support 7,000 permanent jobs and after the multiplier effect the total job support annually is expected to be 12,000. The Progress report predicts that the amount of capital jobs will be 88,300 by the year 2011. As the capital projects are completed there will be demand for the additional workforce in order to maintain the new infrastructure and deliver services. While capital projects are still in progress the amount of the capital jobs is far greater than the amount of the operational jobs. However after the

completion of the capital projects in 2017, the operations jobs could increase significantly and potentially peak up to the level of 12,000 annual permanent jobs by 2025. According to the PlaNYC progress report, in addition to the traditional construction jobs, the New York's increasing public transportation usage will also require additional bus drivers and subway operators.

4.5 URBAN ECONOMIES EXPERIENCING LAND USE RE-ORGANIZATION

4.5.1 Households and Businesses - Increase in the Property Values and Attractiveness of the Land

Improved transit system and decreased congestion in the city has a positive impact on the urban economy since it creates an attractive urban environment for cities to develop. An easy access to transit stations and their convenient locations create wealth around the stations and nearby areas. In New York City, average residential home prices decline by approximately $2,300 for every 100 feet further away from the station (The Effect of Rail Transit on Property Values, 2001, NEORail II). The value of the property increases as we get closer to transit stations. The most valuable residences are situated in the location with the highest accessibility and mobility.

Every dollar tax payers invest in public transit generates $6 or more in economic returns (American Public Transit Agency, 2005, Business Group Calls on Congress to Pass Transportation Funding Bill). According to the APTA (2005), business leaders and the government have now realized that the urban areas cannot operate effectively and attract business investments without a good public transit network. It has also been studied that 77 percent of new companies rated the access to the public transit an extremely important factor when selecting corporate locations since they have noticed that the businesses situated near the public transit access have proved to be more successful and perform better (Partnership for New York, 2006, Growth or Gridlock.)

Studies conducted for the London public transportation indicate the importance of the public transit station for the property values. According to the study (S. Gibbons and S. Machin, 2003 , Rail Access and House Prices), one kilometer reduction in the distance to London Underground or Light Rail Stations add 1.5 percent onto property values. According to the same study by Gibbons and Machin (2003), service frequency improvements by one more train per hour increase property values by 0.2 percent. An independent study carried for the Transportation for London estimated that between the years 1992-2002, several new stations build for the Jubilee line extension, Underground line in London, increased the land value nearby stations significantly. The project and building activity rose up the land value by $4.9 billion during the years and part of the project itself could have been financed with the revenue from the increased property values. (Wetzel D., 2006, Innovative Methods of Financing Public Transportation, Global Urban Development Magazine.)

The world's most northern subway system has been built in Helsinki. The Helsinki Metro has run since the year 1982 and is continuously facing a demand for expansions of service lines. The most current plan of an expansion is the project of building a new metro line to Espoo which is a city on the west side of Helsinki. Espoo is the second largest city in Finland, and due to a heavy daily commuting from Espoo to Helsinki, the traffic on the highway between these two major cities is often very congested. After the completion of the Espoo service line, the number of vehicles on this highly congested route would lower significantly, and travelling time to Helsinki decrease. The new metro line offers an environmental friendly and less time consuming option commuting to Helsinki which can then benefit the whole economy in the long run. (Official website of Länsimetro, 2008, www.lansimetro.fi.)

The building of new Länsimetro, translated ino English as West Metro, is scheduled to start by the end of year 2009. It will take over ten years until the new service line and all of its seven stations have been completed. Although the finalizing of the project is still several years away the plan itself has

increased property values in Espoo, especially in the areas that are closest to planned metro stops. According to an interview of Carmen Hass-Klau in Helsingin Sanomat (Salonen, J., 2008, Tutkija: Länsimetro nostaa asuntojen arvoa Espoossa, Helsingin Sanomat web article 29.5.2008.), the 25 percent increase in the property value is very common among the estates that are located nearby future transportation stations. She gives an example of the new railway station in St. Pancras in London, where surrounding property values have increased even 25 percent after the building of the new station. Carmen Hass-Klau, a Professor in Civil Engineering, Transport and Public Transport Systems in Europe at the University of Wuppertal, Germany, has founded a research organization of environmental and transport planning.

Hass-Klau (2008) also emphasizes the importance of the planning of transit stations and their surroundings. Espoo has a great chance to increase its the property values in the area, however without well planned transit station facilities and areas near stations it cannot reach these goals. According to Hass-Klau, the biggest mistake when designing the areas nearby the stations is to build parking lots around them. This keeps businesses and housing from locating themselves near the stations and creates unnecessary congestion in the area. Transit stations should be left as car-free to maintain their harmony and the economic success, she states. The transit stations should be made as tempting and lively as possible in order attract people over. In the best possible situation people would come, even though it would not be necessary for them to commute through the station.

According to sales manager Leena Kari from Huoneistokeskus, one of the biggest real estate firms in Finland, the new metro line to Espoo has already been a great interest among the property buyers in Espoo. Most of the buyers looking for a new home are interested in the location of new metro stations and how they are situated compared to the location of an apartment. Property buyers see the new metro line especially as a positive attribute and sales people as an opportunity and sales tool against competing locations. (Salonen, J., 2008, Asuntonäytöissä metrosta kysellään jo nyt, Helsingin Sanomat web article 29.5.2008.)

5 CONCLUSION

5.1 RESULTS OF THE STUDY

Today's cities are growing rapidly and the increasing population creates a number of new challenges and struggles to face. How to manage with the traffic increase, especially in the biggest metropolises, has become a question that so many major cities are desperate to find an answer for. The growth of the urban population has been tremendous for the past 100 of years. In the beginning of the 1900 only ten percent of the world's population lived in cities. Today the same number has climbed up to 50 percent and the urban population is predicted to grow significantly within the next 50 years. It is projected that by the year 2050 as many as 75 percent of world's population will be concentrated in urban areas. (Inside the Mega-Megalopolis, 2008, The New York Times Magazine.)

Most importantly, I point out in my thesis the significance of public transit investments and how the improved public transit network can create major and life-changing results for the cities. I emphasize the long-lasting economic benefits that the public transit supports and usage generates, on top of the many short term benefits. I stress how essential the public transit projects can prove to be for the cities and how without the proper investments the economies will suffer and experience huge losses in their growth and development. The thesis supports the idea that the urban economy is unable to grow without a well-functioning transit network and that every major city, both today and in the future, will need to invest in their public transportation as a high priority initiative.

Traffic congestion creates very negative impacts to the economy and is a major obstacle for economic growth. In the New York case, the number of lost jobs and business revenue present very big numbers that prove the severe consequences that the high congestion creates. Results show that there are 37,000 to 52,000 fewer jobs created in the New York Metro Region every year than there could be if the congestion was lower. (Partnership for New York, 2006, Growth or Gridlock). High congestion in the New York case could be

solved with the congestion charge if the city was to approve the regulation. I see it very essential to New York to decide about the issue within the next 10 years, since based on the results presented throughout the thesis the city's economy will suffer a great amount unless new transit improvements are implemented soon.

New York however has several transit improvement plans approved and are only waiting for the launch of the projects. It is understandable for a city as big as New York, that the planning and implementing takes a huge amount of resources, especially financing of the project, which is often the most difficult task. Despite high start-up costs, the public transit investments and improvements will pay for themselves in the long-run and the benefits for the New York economy can be greater than ever imagined. As the London congestion charge regulation has proved, the start-up cost for the congestion zone charging has remained lower than the revenue that the city has gained after the launch of the regulation. The start up and operation cost for the congestion zone was £500 million, however during the 8 years of operation in London the revenues collected from the congestion charge climbed up to £610 million. The revenue collected from the congestion charge was directed towards the public transit projects and improvements. As results show, the congestion charge can work as an alternative and valuable funding source for the public transit system and should be highly considered by many transit cities.

There are always a great portion of the vehicles that are not willing to pay the congestion charge, and these travellers would rather switch over to public transit. Without realizing, these people generate two positive outcomes that will further benefit the transportation in the city. As they take the public transit instead of driving, they financially support the travelling method. In addition to that, by removing their own vehicle from the central traffic, the traffic congestion decreases and travelling within the zone becomes more efficient for everyone. During the two first months of the London congestion charge regulation automobile traffic declined 20 percent which equals to 20,000 vehicles per day (T. Litman 2006 Victoria Transportation Policy Institute,

London Congestion Pricing, Implications for Other Cities). Especially businesses benefit from the changes in the travelling behaviour, since every wasted minute generates losses in the business revenue. Major corporations locating their offices in the city wish for an efficiently working city, where the major traffic jams cannot harm their business. If the image of the city is rather negative in the sense of transportation, major global firms are more likely to find a location somewhere in a more developed city and the success they would generate in the area will not benefit the urban economy anymore.

As public transit becomes more user-friendly and convenient due to a high impact investing, it can be predicted that the transportation method will attract an increasing number of new transit users. The public transit network can reach places that otherwise have been inaccessible and therefore offer economic opportunities for everyone, despite the income level or the social background. Most importantly, public transit gives people a better chance to be part of the economy, make their living by working in the city and saving money on their daily transportation costs. People's jobs are rarely located within a walking distance from their home and thus through a public transit network available jobs can be more reachable. The cost of having a car today is very expensive, and savings generated when using the public transit can be very significant for many households. As the income level increases and people are able to save in their daily travel expenses, they end up with more money in their hands to spend. The whole economy benefits due to the increase in the employment rates and increased household spending.

As proved in the thesis, in addition to households, businesses are one economic sector that greatly benefits from the new mobility that the decreased traffic congestion and well-working transit network offers. After the launch of the congestion charge, a majority of businesses in central London experienced faster travelling times within the central zones and were able to be more productive and increase their business revenue. Businesses and people are two factors that move the city and make its appearance significant. Their ease of access and mobility throughout the city needs to be secured so that they can work to their full potential and benefit the whole economy due to

their operations. After the launch of the London congestion fee two-thirds of the London firms reported faster journeys to work and fewer delays (Transportation for London, 2007, Fifth Annual Impact Monitoring Report).

Cities improving their transit services are simultaneously creating thousands of new jobs in the region. All big construction projects involve several firms from various different fields, and offer work for both companies and their employees. Transit projects do not only generate jobs for the period of time they are under construction, but also after the finalizing the project. New transit stations attract businesses to locate themselves in surrounding areas, expansion of the service line increase the number of the transit agency staff and services such as the maintenance will employ hundreds of new people. Results of the thesis show that every $1.25 billion spent on new public transportation projects generates approximately 51,300 new jobs (Web article, 2008, Transit Creates Jobs and Enhances Local Economies, See references). The impact of the transit project can last indefinitely and will continuously promote the development the surrounding area.

Struggling areas that are being isolated due to a location or the poor economic situation are able to experience a rapid boost and recovery if the transit stations are successfully located in the area. As mentioned in the thesis, lively neighbourhoods and shopping centres are created near new transit stations. The same rule applies when new transit stations are built in an area that is in the economic decline. New transit stations are able to attract new businesses and rehabilitate struggling areas by expanding the transit service in the part of the city. Public transit stations nearby the residential areas increases the property values. According to the results, for example in New York City, average residential home prices decline by approximately $2,300 for every 100 feet further away from the station (The Effect of Rail Transit on Property Values, 2001, NEORail II).

It is essential for major transit cities that the investments towards their transit networks are sufficient and that their operations are profitable in order to develop and invest more in improvements of the transit system. In several recent cases the transit systems have lacked proper investments and the

public transit networks have suffered from it, hurting the whole urban economy. Transit agencies should consider optional investments sources other than just governmental and revenues from the sales tax. In case the economy is experiencing a slow down, it is for certain that the transit agency will not receive the sufficient resources to operate and develop either. However, when the times are tough people are more likely to take the public transit since it is the least expensive method for travelling. During the past year especially, we have seen significant increases in the public transit usage due to the rapid increase in the gasoline price and the economic decline. Despite the positive outcome of the increased public transit usage, several transit agencies are now struggling with crowed trains and busses and unable to carry the increasing number of passengers. The Lack of public transit investments throughout the years has generated huge deficits for many transit agencies and they have not been able to improve their service to meet today's demand. It is vital for the transit agencies to develop a system that ensures them collect the sufficient funds for their operations and not to exceed their fiscal budget.

As the theory of the thesis states, the wealth of the regional economy can be measured by using four different variables; GRP, the income level, the business profit and the Government's fiscal position. As the Government is in majority of cases the main investor of the public transit projects it will be greatly benefited if the transit projects are successfully implemented. However, without the input of the businesses and households, which most often equals the workforce, the public transit projects will never be implemented or carried through. In case the projects are not carried through the regional economy will suffer and the GRP will level remain low. As all of the variables seem to be dependent on each other it is to happen that all of them will be impacted positively when the transit projects are processed successfully.

The income level increase in thesis was explained through the increase in available jobs and easy access to all of them. Despite the comprehensive research on the topic, it was rather difficult to find information about how much

the income level increase has been for the private households since there can be many different factors involved. However, the regional job increase due to a better transit access, lower transit costs and several new transit related jobs, has a direct impact on the personal income level in the region. The person previously unemployed or receiving a low income, will now due to a huge demand in workforce have a job that increases his or hers income level significantly.

After comprehensive public transit improvements businesses become more productive and profitable since the environment they do business in is working more efficiently. The companies have access to more projects and a skilled workforce, and the delays hurting their business will diminish. Several different sources of data were used proving that the businesses were the economic sector, benefiting the most from transit investments, even more than the private households did. Since the processes that the businesses are involved in can generate more revenue, in most of the cases the businesses are also able to make a significantly higher profit. The strength of the business sector is vital to the whole economy.

Throughout the thesis I am looking at the urban economy from various points of views that all represent a certain economic sector. I am proving how different economic sectors such as households and businesses benefit from the transit investments and how through a new and improved transit network both businesses and individuals are able to increase their profits and income level. In addition to an increased business profit and personal income, the fiscal position of the government improves. When public transit projects are implemented and carried out successfully the revenues gained will overcome the start-up costs and the process will become profitable. Government being the major investor in the transit projects will begin to make a profit as the projects are finalized and the developments start pay off. As the government's fiscal position improves it is able to make improvements throughout the whole economy and re-invest in public transportation or in initiatives that will require more government subsidies. All of these affects of public transportation investments have a significant impact on the health of the Gross Regional

Product, which defines the market value of goods and services that are produced in the metropolitan area in a certain period of time. The GRP is the largest variable that measures the economic health of the region and as proved in the thesis, due to a number of new transit related projects the GRP will experience a significant increase.

In addition to major economic benefits that are created in all economic sectors, improved public transit and decreased level of traffic congestion promotes the creation of a cleaner urban environment. Today, cities produce 75 to 80 percent of the world's greenhouse gas emissions (Megan Rowling, 2008, Life Greener in Cities that in the Country side, Reuters Blogs). As cities seek solution to reverse global warming they will undoubtedly look towards public transportation as a key solution. Not only offering solutions to sustain the growth of the urban areas, the public transportation also enhances the state of the whole urban environment and improves the quality of life for all of the citizens.

5.2 EVALUATION OF THE WORK PROCESS

For the topic of my thesis I wanted to choose an area that highly interest me and that I see important to pay attention to in the world today. The idea of writing about the importance public transportation was in my mind for some time, however narrowing down to the final topic of the thesis took lots of researching and considering of different options. I believe that the hardest part of the whole thesis process was the defining the research area and then sticking to it completely. The idea of thesis was not to include everything possible under the subject, but just the findings that were relevant in the sense of discovering the results.

The findings of the thesis, and especially if the study was to be developed further, could have a practical use for many cities, the transportation agencies and decision makers of the city. Similar studies could be conducted annually in order to improve the economical and environmental state of the transit cities and define a plan for their transportation future. Although most of the biggest

cities in the world have already implemented similar works, the importance of staying updated of their transportation situation needs to be one of their major targets. Today, there are an increasing number of professionals that are specialized in the field of transportation and the knowledge they can provide is much greater than it was a few decades ago. As the information regarding the subject increases, the transportation studies and projects can be more easily implemented and there are people who are able to do the work successfully. Throughout the thesis process I have come to realize how urgent it is to further research the topic and how possible break-troughs in the field of public transportation studies could have world changing effects.

Results of the thesis are reliable and there can be no assumptions that they would mislead the reader. The data sources were recently updated and the all the information collected was mostly from the sources of a couple of years old, at most. I think it was vital to collect information that represents the most current situation as possible, since conditions are able to change significantly within a couple of years and the research results for that reason could vary significantly.

Although, I was able to present valuable data of the changes in different economic sectors, the results of the transportation investments can end up being different in different kinds of economic environments. Throughout the thesis a common assumption is that in every case public transit investments create the growth for the urban economy and we do have data to support that argument. However, it is impossible to say if the results are always identical or how much urban economies really benefit when the transportation investments are taken somewhere else, other than New York or London for instance. Despite the negative argument, the thesis highly supports the objection that the public transit investments, in every situation, generate economic growth in the city. However, if this study was to be developed further, it would be very important to process a detailed study of the city that is being studied, considering all its sectors other than its economic, before the implementation of the study. We need to keep in mind that city environments are different and the results that can be created in them can vary significantly.

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