TRANSPORTATION SYSTEMS; THE MAIN FACTORS OF URBAN MACRO FORMS DEVELOPMENTS

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ABSTRACT

Urban macro forms developments depend very on Transportation Systems changes. This systems have a triple effects on congestion; styles and degrees of urban extension; social and morphological points and problems of it .There are at least four social – technical periods according to dominant transportation modes as the linear model of transportation: walking city ; tram city ; tracked city and rubber city . each of these periods have their special and unique features and affect the size and form of the cities according to their range or ability to increase the distance from origin to destination .The purpose of this article is evaluation of different transportation periods as the linear model of transportation according to their role in urban macro forms developments and offers that it is better for cities to use this model in the opposite direction. This research method is descriptive - analytical study based on a library and resource world and the result was that cities should attend more to transportation patterns of the past such as walking and cycling and also network rail transportations and attend to construction of dense urban neighborhoods and groups which reduce the need for transportation and handling.

Key words: *Transportation Systems, Urban macro forms, dense urban neighborhoods, mixed of land uses*

ULAŞTIRMA SİSTEMLERİ; KENTSEL MAKRO TEMEL FAKTÖRLERİN GELİŞİM FORMLARI

ÖZ

Kentsel makro form gelişmeler Ulaşım Sistemleri değişikliklere çok bağlıdır. Bu sistem tıkanıklık üçlü etkilere sahiptir; stilleri ve kentsel uzatma derece; en az dört sosyal .Orada sosyal ve morfolojik noktaları ve bunun sorunları - ulaşım doğrusal model olarak baskın ulaşım modlarına göre teknik dönemleri: yürüyüş şehir; Tramvay şehir; paletli şehir ve kauçuk şehir. Bu dönemlerin her biri kendi aralığında veya bu makalenin hedef hayranlarıyla amacına kökenli mesafeyi artırmak için yeteneğine göre kendi özel ve benzersiz özelliklere sahip ve şehirlerin büyüklüğü ve formu etkileyen lineer modeli gibi farklı ulaşım sürelerinin değerlendirilmesi ulaşım, kentsel makro form gelişmeler rollerine göre ve şehirler ters yönde bu modeli kullanmak için daha iyi olduğunu sunmaktadır. Bir kütüphane ve kaynak dünyasına dayalı analitik çalışma ve sonuç şehirler gibi yürüyüş ve bisiklet gibi geçmişin ulaşım modellerine daha fazla katılmak ve aynı zamanda demiryolu nakliyatı ağ ve yoğun kentsel mahallelerde ve grupların inşaat katılmalı oldu - Bu araştırma yöntemi açıklayıcı hangi ulaşım ve taşıma ihtiyacını azaltır.

Anahtar kelimeler: *Ulaşım Sistemleri, karışık arazi kullanımlarının Kentsel makro formları, yoğun kentsel mahalleler*

INTRODUCTION

Four thousand years before Christ, the Sumerians who first used the wheel for ease in their work, didn't assume this invention of human can be source of major economic, social, cultural and physical change and become a the basis of economic exchange. Transportation is one of the major issues in

contemporary society that plays a fundamental role in the life. In other words, can be acknowledged that transportation is one of the essential components of today life. If the transportation eliminate, the modern life will deprive from one of the essential organs [2]. On the other hand the increasing growth of urban traffic, environmental pollution, increasing the cost of transport and ... all such are issues that are looking for the emergence of new transportation systems, especially personal vehicles have been developed. Today's cities have turned into places for passing vehicle every day make people more and more dependent on private vehicles [3]. On the other hand, car plays a key role in undermining social cohesion of cities. Not only car has destroyed the quality of public space in cities, it has caused to uneven countryside sp countryside uneven spreading. As the lifts made existence of skyscrapers possible, the cars also caused the possibility of life far from the downtown . In fact, urban macro form has been expanded by expanding and development of vehicles from pedestrians and bicycles to the subway and personal vehicles and the possibility of distance communication has increased. [4] It is necessary first to review developments in the field of transportation and its effect on expanding urban macro forms, then analyze, and make recommendations for more efficiency of transportation systems.

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It is better to consider a linear patter for investigating transportation changes. This pattern will determine four social – technical periods based on the way of dominant transportation. The element of this pattern respectively is walking city; tram city; tracked city and rubber city. These courses only have much general chronological order and generated forms are stable and strong through clotting. Travelling times remain relatively constant but mileage at least change from one to ten This is the rule of speed change in being away from downtown and is the result of expansion [1]

Figure 1: Microform of transportation, Metropolis samples of the East Coast of the

WALKING CITY: Walking city links with the central parts of the current agglomeration. They are often limited to a range from home – work that one person could walk normally [1] the radius of densely and built-up area of large cities at the beginning of the nineteenth century was rarely exceed one to two kilometers. Thus, the specified scope, more or less adopted with historical centers of current large cities such as : Grand, Milan, Frankfurt or Bordeaux protected zones. Paris and London had exceptionally wide levels. The farthest neighborhoods were located about three to four kilometers from the center. Until the mid nineteenth century, the spread of cities from these centers continued in compact and slim routes. Urban forms produced in this period, especially in European cities still remains and are still very efficient in third world cities. However, in American cities except in a few historic center is almost gone. [5]

Tram city: This city the epitome of urban development with cohesion context and are like more or less linear suburbs, especially in the "new world". Cities of United States of America in the years 1830-1840 are compressed and Business and residential spaces are merged. Their extension with the period of industrial cities of 1840- 1880 and first begins with small and large horse carriage (Speed of six to eight kilometers per hour).

Electronic Tram decisive role in the expansion of the city and the separation between economic activity and residential areas because it was quieter, faster and with greater capacity and lower cost. The device quickly became popular from 1888 in America and Australia and provided cars suburbs

street building popularity[6]. In the case of the subway network should be said that they established long in urban compact context except a few large cities like New York to join to each other in networks of Manhattan, Brooklyn and the Bronx do not have such a case. Air subway (elevated built after the 1904) increases agglomeration linear growth. [7]

Tracked- city: Public transportation in the city was started with rail lines. The main function of railway was linking intercity transportation or towns and ports and played marginal role in house-work displacement. In spite, the daily commuting between home - work quickly developed among the affluent classes and railways had decisive effect on the structure of cities, even before the tram. Urban contexts and as a result micro-forms were stretched and sliced. [8] Railway boom began in US in 1830-1840 and provided long of suburban areas to a distance of 20 to 25 kilometers like long paw ways with the order of beads (Chicago Figure 2). Current skeleton of Los Angeles, more than anything owe to light railway that five lines was built between the years 1860- 1910 and renamed from Pueblo to downtown. The same situation arose for major Australian cities after 1880. Spread of Urban tentacles to around, owes efforts which were conducted by tram networks. Suburban development is delayed in Europe even in Great Britain surrounding the core of the of train stations of old villages, the city- markets or temporary accommodation (recreational beaches) were formed. [1]

Figure 2: Chicago, a century urban expansion 1871-1967

RUBBER CITY:

Rapid production of motor vehicles, from the early twentieth century, especially with the incredible growth of the automobile industry after 1945 make the transportation from now through the streets and roads using private cars that previously was possible through urban canals, railways and in public way. This process expanded social and economic cohesion among the towns and quickly eliminated the barriers and linked urban systems through networks to each other in time and space. [9] Car has crucial role in the process of rapid expansion of urban sprawl the last forty years. Personal

displacement is dealing with identity of the urban scope and is filling the gaps located between the axes or claw shaped artery (Breakdown of land, equipment, commercial centers, etc.). [10] If want to demonstrate the above content into a model, a pattern in the form of the following will obtain that is called linear transportation pattern.

Figure 3: linear pattern of Transportation

Based on the above discussions cars is the most interesting mode of transportation in recent years, although each year data losses in this device delivers, man is still dependent on the device In the mid-twentieth century the world's population was 2,5 billion people with 50 million cars; the world's population has doubled in the last 50 years, while the number of cars is ten times more. In twenty-five future years, the number of cars around the world are estimated about one billion. As a result a massive and wide motorizing is ahead and the situation is occupying cities of the world. [12] Car provides user segregation and activity zones, including administrative offices, shops and homes. As towns become more widespread, development of the public transportation systems will be less affordable and citizens will be more dependent on cars. Today, towns around the world are organized in such ways that facilitate the use of cars while car has the highlighter role than industry to make air pollution. The pollution that urban residents trying to escape to the suburbs. [13] Automobile exhaust create two trillion cubic meters of toxic gas per year and it is estimated that the number of cars will increase to double by 2030. However, individualism point of view, cars is the full request tech products in a century which provide greatest freedom for people. It is cheap because of mass production and subsidies awarded to it. On the other hand it is very functional, because essentially the structure of cities are not based on the public transportation, and it is an inevitable cultural index that can be considered as an indicative of the prestige and social status. [14] Logistics studies show very well how increasing the number of private cars will bring losses. First of all, the street that was once the playground area and a place for social interaction, has been turned into parking. The area required based on standard for any car to park is twenty square meters. Assuming that one out of every five residents has car, a city of ten million people (roughly the population of the City of London) will require an area roughly more than ten times the area of the City of London just for parking cars. As two million cars start to move, the city to quickly will be crushed under pollution and traffic resulting from it. Pollution and congestion that frequently attacked civilians and caused the separation [15] As long as urban transportation vehicles displacement becomes essential and inseparable part of the urbanization, Inevitably streets, intersections, forms and levels of public spaces, all defined in the interests of cavalry. Finally the whole city, from the form of new buildings to the design of sidewalks, lights and fences is planned and designed based on this single factor (car). The development of The automobile industry is supported by public and private sector and prediction of car astronomical leap in the future, forcing urban planners to design towns on terms and conditions set forth for road infrastructure. Something that is very real and tangible in such a way will lead to increase the use of cars. [16] A survey conducted in San Francisco, compared the streets of several different neighborhoods to assess the traffic impact on the sense of neighborhood residents. For this purpose, moving the pedestrians between houses on the busy and quiet streets in different neighborhoods were evaluated. The results indicate the strange fact, but it was predictable :level of social interaction between neighbors in a street inversely related to the number of cars that crossing the street. This study introduced urban traffic as a key factor of alienation and disorientation for citizens and considered it as the key phenomenon in decline and collapse of the concept of citizenship. Fortunately, the actual cost of urban pattern that divides the city into an area is known. In the United States, the economic costs of traffic in terms of waste of energy and time to citizens, is about a hundred and fifty billion dollars per year, that's equal to the GDP of Denmark. However, this figure does not cover social costs such as health and safety standards that the World Resources Institute recently estimated three hundred billion dollars.

Figure 4: amount of interactions among individuals in a neighborhood in terms of traffic

[4] Requisite for creating a dense and modern city, is avoiding single performance development and confronting the domination of cars. The question is how should we design the cities that neighborhoods where growth in and mobility and vitality get increased. How we design the cities for commuting citizens without cars be allowed to undermine collective life. How we design the cities that facilitate use of the public transportation systems or other clean engine systems and put the streets to pedestrian and the human community. The dense city is involved with the issues and puts them into consideration, such that grow around the center of social and commercial activities are located at the confluence of public transportation. These centers create centers center that neighborhoods will grow their surroundings. In fact , dense city is a networks which create from combine of these neighborhood, in such a way that each of the neighborhoods with its parks and public spaces , accommodate a range of public and private activities . [17] In the metropolises, the massive public transportation system, linked the neighborhood centers to each other and make rapid mobility of citizens in the city possible and bring tracks and local roads to the local systems . This method reduces volume and the impact of traffic, particularly around the neighborhood centers and can control and adjust it. The local trams will be light rail transportation system and electric bus will be more effective. movement by bicycle and walking will be pleasant as well. Thus traffic jams and pollution extremely will decrease. In addition, a sense of security and peaceful coexistence in public spaces increases. [18]

Figure 5 - pattern of dense cities and their effect on transportation,

Pattern of dense cities was conducted from decades ago in Europe and America. It is possible to reduce need to the use of cars and thereby the road as much as 60 percent through plans based on user mixing and emphasis on public transportation systems. In fact, the balance between single performance street and multi-purpose public space could disrupt to the benefit of public space. As a result, a network of walking-oriented streets, bicycle paths and local market developed and space to create big free parks were created. The purpose of establishing a network of public spaces, was allowing cultural and democratic activities in the city. This network was carefully braided to the network of public transportation create a network of public space and unique movement that started in front of door and finally ends through the parking lot, buses and tram to the central station and the airport. As a result flexible hierarchy from various transportation systems, from the implementation of safe ways to express trains and airplanes, provides the possibility of displacement without interruption for citizens.

Figure 6: Sample of a compact city, Louzyasoy district in China

[4] So far, the transportation systems in all kinds and the advantages and disadvantages of each were introduced. The main objective of this article is about the emphasis on non-motorized transportation systems, especially rail transportation and bicycle. The history of rail and functional transportation examined. Type of transportation that had effect on the development of urban macro forms in detail. It is necessary a little bit to be familiar with the bike and its benefits.

BICYCLE TRANSPORTAION

Programs based on car supporting of European cities in the 1950s and 1960s led to a reduction in trips by bike and walk. From the 1970s onwards, programs based on public and bicycle transportation was formed by increasing pollution and other problems that arose by car [19]

Figure 7: change of use the street before and after the amendments a ridge in Fribourg in Germany

Especially from 2000 onwards European countries and North America, although they didn't have culture of using bicycle for the daily works ,they significantly raised the level of bicycle use. They invite people to use their bikes by creating the appropriate infrastructure and many incentive programs. In such a way that the use of bicycles before and after these amendments and programs had significant differences. [20] It seems that European countries and American found bike benefits such as :its role in improving health of the person, lack air pollution, better use of street spaces and the role that plays in creating habitable communities and they would have taken great strides in the direction. It can be spoken a lot about the benefits of bike and actions that countries have done about ,but But it is better to consider this issue in our country. number of Bike houses in Tehran in 2011, collectively was equal to 109 houses, the number of available bicycles 3996 and the available path for bycycling 172km. A 15 years program has been proposed for the construction of bike paths from 2006. In this program, Regions 2, 4, 8, 11, 12 and 14 are the first priority, districts 5, 6, 7, 15, 16 and 18 the second priority and regions 9, 10, 13, 17, 19, 20 and 22 are considered as the third priority . The aim of this studies was responding to travel less than 5 km and these trips were 10% of all trips in Tehran according to company models' studies . 368 kilometers of bicycle paths is proposed in the comprehensive plan as a continuous network [21]. As mentioned, attention to bicycles in Europe and North America began from the 1970s. But these programs received great interest from 2000 onwards, in a way as nowadays there are specific paths in most of European cities for bicycles . If we take 2000 as the year of the rebirth of bicycles in European countries, over about 13 years now, European countries have been partly achieved satisfactory programs. If we know 2006 as the date of bicycles re- birth in Iran, we can achieve to a desirable programs by a gap of about two or three decades in order to make bicycle more efficient. In fact, when looked t at the pattern of linear transportation at the beginning of this article, we draw it as a sequence diagram. Here it is necessary to correct or ina better way complete the pattern.

Figure 8: transportation completed and proposed pattern

It is better transportation system that their dominant mode is based on private car move back this time and reach to the railway transportation and then to the walking and bycycle –based transportation from the pattern on car transportation. The following figure illustrates above subjects. It is better to use all forms of transportation in appropriate and timely way in a plan which is presented in the case of mixing uses. In fact, it can be extremely have efficient use of the transportation system by mixing different uses and transportation problems such as traffic and air pollution will be managed better. if government investmen guided from private transportation - cars - towards public transportation and green transportation including bicycles, citizens would have the opportunity to replace the public open spaces by highways and save them from noise of cars by allocation of streets to pedestrians. It is better to create green paths for pedestrians and cyclists by plant trees throughout the city. All these spaces will again belong to residents of the city and will operate as external living place(outside the house)for citizens. These goals projects can be accomplished through the implementation of a series of medium-term and long-term. In Iran also considering a plan that began in 2006 and considering the differences of the development process in developed countries and developing countries. It is about two to three decades hope that Iran will also achieve to the considered plans in field of transportation especially green transportation like bicycle during 20-30 years in future.

CONCLUSION

Based on the above discussion, it seems the economic, social and cultural structure of Iranian society due to the inefficiency of other solutions is ready to accept the concept of the development of public and green transportation as the mainstream of urban life. Based on the above, findings are as follows :

1. Transportation systems are the main urban macro forms. This system plays a major role in expanding cities physics by creating a range that provides from source to destination
2. It seems the cities must use linear patterns of transportation on the time priority of walking and bicycling, railway ,car-oriented transportation on the contrary pattern. It means regarding disadvantages of car, they must pay their attention to railway and then green transportation which includes walking and bicycling.
3. Development of public transportation is with uses mixing and the priority of walking and the public transportation as well following reduction of inter urban trips and reduction of using personal car as well and the losses.
4. The main idea of the relationship between public transportation and land use patterns is to put more points of departure and destination of walking from transit station.
5. Designing roads that reduce motor vehicle traffic speed and improve connections will replace appropriate methods and improve walking and cycling conditions. It also decrease car traffic and encourage the use of alternative modes.
6. Most governments focus on public transportation and green transportation to private transportation will cause people green routes and open spaces and create a more friendly society .
7. while compact and multi-functional directions at the same time that reduces the displacement and movement, it provides an ability to move on foot and by bicycle and at the same time creates dynamic sustainable neighborhoods.
8. Amendments based on Bike-based plans in 2000 was considered by European countries and North America and then have seen significant trend of daily trips by bike, by creating infrastructure and facilities.
9. It is hoped to observe fundamental developing situation and ongoing projects based on bikes in Iran during a period of 20 to 30 years

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