

Centered establishment quantitative analysis of administrative uses on metropolitan area traffic (Case Study: Babol City)

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Abstract: - Urban land uses Because of the nature of urban system are continuous communication and interactions. Through the communication network and traffic flows and therefore has considered as important tools in urban development and formulation to its environment. Babol city include central range that is a busy area, high traffic and traffic problems are the main causes of these disorders absorbing uses of travel (administrative uses) on the one hand and the position of this area in the direction path Tehran - Mashhad is the other. Methodology has been descriptive-analytical based on field observation. This study presents quantitative analysis of user centered absorbing journey (administrative user) on the central area of Babol. The technique used in this study is the use of the software is AIMSUN that with its application has analyzed confounding influence factors rate (administrative username and transition trips) on traffic in the study area.

Keywords: - *centralized establishment, administrative use, transportation, urban congestion, Babol.*

I. INTRODUCTION

Today, the problems associated with affairs of transportation into new cities and towns of the industrialized world, have publicly and show off openly with the everyday life of most citizens. Although these problems are not new, however, along with population growth of cities, and faster increase rather than car ownership and its use during the past twenty-five years, now have more determinative aspects. In this period, while has been used of all types of vehicles entirely, also were taken steps to alleviate this problem that has brought in the total development of the transportation planning process (Ghasemi: 2012; 52). What decade ago to improve urban transport in cities to adopt a policy or program is generally based on personal preferences and knowledge of the relevant entries have been done without the least specialized studies and academic and so urban planning and transportation in like two twin and two components are inseparable from each other and actually redirected to the citizens in conflict with the new problems imposed. (Intra-city Transportation and traffic system improvement projects within the city of Babol city, 2005).

1.1. Problem definition

Today, Metropolises of the world face many challenges, one of the biggest problems, especially in developing countries, has been transportation traffic problems caused by urban land unevenly distribution. (Transportation and Traffic Studies of Tehran metropolitan, 2008). A large amount of trips will be to the central area of the city of Babol that can be the main reason for the high volume of trips focusing on business administrative uses (Education and Up bring Department, Crescent office, department, the Government, the municipality, of Youth and Sports Department of Justice) as well as pass trips through this area due to lack of proper belt as in Babol city. In addition, current area has range of other problems such as the limited capacity of some passages of the width of streets, high population density, lack of good public transport system, lack of adequate parking for the cars to stop, not a pedestrian overpass crossing the dam the sidewalk. These problems can be sought cost lot of time and money for both the people and the city manager. Present problem needed Comprehensive planning to address these issues, using appropriate administrative and management strategies based on factual information accounting office uses to transport and traffic in the area to be covered. This

research has tried to work each office uses located in this area to quantify the analysis. This quantitative analysis can to help manage user and administrative Babol city in organizing transportation issues in the area.

1.2. Goals

This study seeks to achieve the goals that are as follows:

- 1 - Check the status condition of daily reference rates to the administrative uses of communication network connected to intended range.
- 2 - Quantitative analysis of each of the administrative uses on traffic in the intended range.
- 3 - Provide a new way to measure the impact of urban land use on the city traffic.

1.3 Methodology

Research Methodology is descriptive - analytical study is based on field observations. In order to analyze the data collected in this study, previous studies reviewed, then considering the current situation administration uses and trails connected to the central area of Babol, and finally by software AIMSUN, is analyze the impact of each of the scenarios intervention on study area traffic.

II. LITERATURE

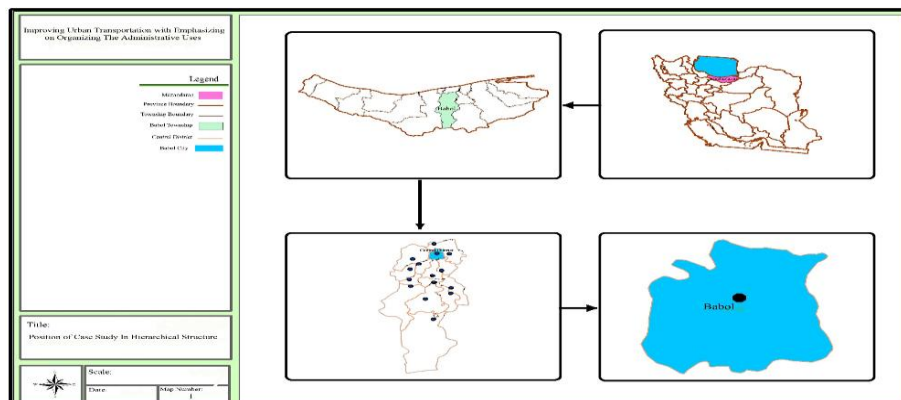
After doing research on the research studies we find that it has been associated with that is as follows:

- 1 - Ebrahimi, A. and M. Shahriar Afandi in his article entitled " presents a methodology to determine the absorption rate of travel for urban applications " have tried to compare the transport parameters (absorption, or a trip) , and land use indicators (floor area, land surface or condensation) to reach conclusions regarding the relationship between these two categories so that presented the most suitable location for the construction of various applications. This paper presents a method that does not actually influence each of the two categories (land use and transportation) clearly indicate on each other (Ebrahimi , 2007).
- 2 - Shoar, K. and A. Javadi an article entitled "Study of the interactions impact between urban transport and development policies and land use" presented that results can be decentralization of large cities, involving land price effect on the determination or modification anticipated uses of land, cost of transport and urban development, urban level to develop and coordinate the provision of urban transport and urban development policies noted (Shoar, 2007).
- 3 - Regional Planning Association Strafford in 2003 an article entitled how to communication and transportation - land use plan has done. In this article, three strategies "node - Zoning development," "community walk" and "Management access " expressed as the three major strategies for efficient communication between land use and urban transport.
- 4 - Certero survey conducted in 1989 showed that about 57 activity centers in a suburban business that was home its employees and working in the vicinity each other, in contrast, business center without residential houses near work group concluded that 3 to 5 percent of daily trips by walking, ride a bike will be done to public transportation (Certero, 1989, 429).

III. STUDIED AREA

The core of the first millennium before Islam reached Babol, about emerging Babol taking the first typing the name "Barforoosh" is named. Geographically, $52^{\circ}44' 20''E$, and $36^{\circ}34'15''N$ geographically located in north of Iran and its area is 1431 square kilometers (Tabari, 2000). The average amount of annual average precipitation 7/738 mm is (www.mazandaran.met.ir). The city's population according to the 2012 census, 200,303 people will have a growth rate of /16 (Census of Population and Housing, 1390).

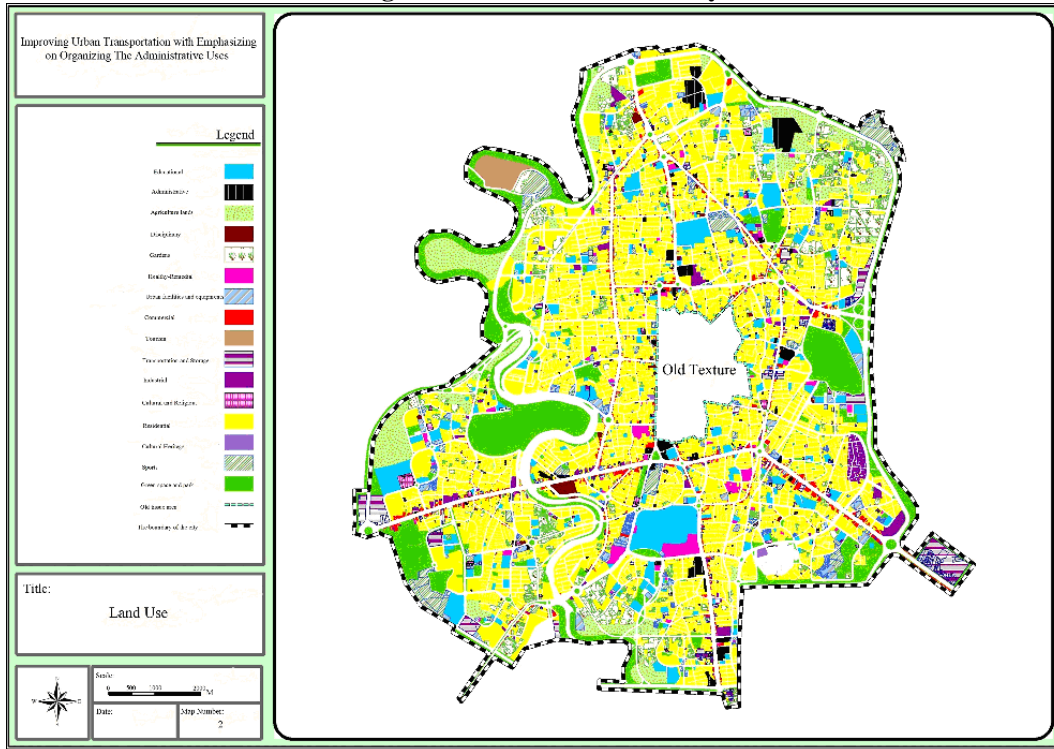
Figure 1. Study area position in hierarchical structure



IV. LAND USE IN BABOL

Map 2 shows the status of land use in the city of Babol. State land use (area, percent and per capita) is obtained in the city of Babol in Table 1.

Figure 2. Land use of Babol city



Source: (Author)

Table 1. Matrix of trip hour's distribution (all time) according to riding in the desired ranged

Land use	Area(hectare)	percent	Per capita(m ²)
residential	1033/1275	34/88	51/57
commercial	41/9426	1/44	2/09
agriculture	131/6269	4/44	6/57
gardens	166/0999	5/60	8/29
sanitary	33/3290	1/12	1/66
educational	180/7122	6/10	9/02
Religious-cultural	19/1445	/64	/95
administrative	38/8960	1/31	1/94
industrial	36/8632	1/24	1/84
transportation	61/8813	2/08	3/08
disciplinary	8/067	/27	/04
Urban Facility and equipment	44/8360	1/51	2/23
tourism	16/8879	/57	/8
sports	61/9278	2/09	3/09
Park and green space	345/7462	11/67	17/26
Streets Network	740/2718	24/99	36/95

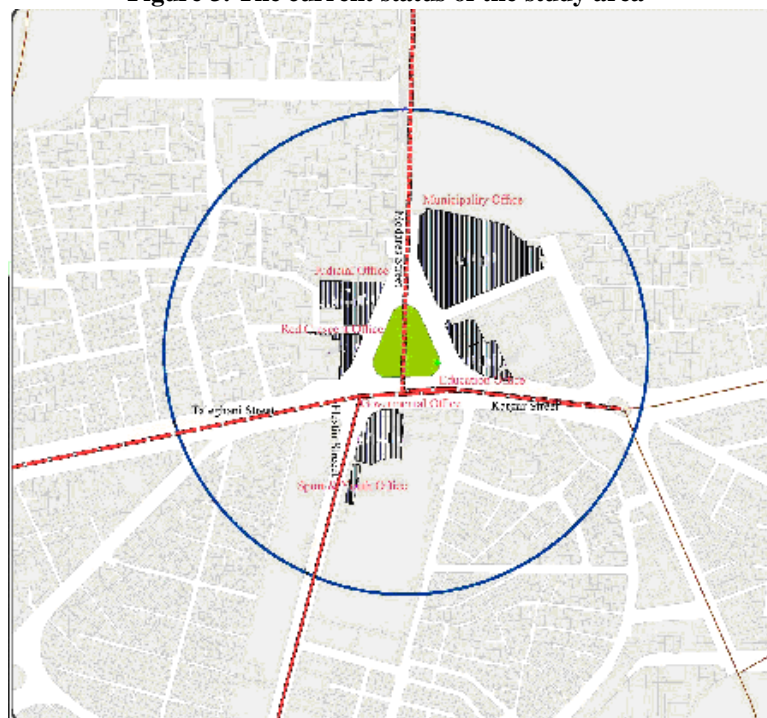
Source: (Author)

4.1. Current situation description of the central area of Babol city

Babylon, is like most cities have a busy area the central area. Studies show that the large amounts of the absorber land and trip generator uses (including important part administrative uses of the city) is located in this area. citizens and villagers who have traveled to the city to conduct their affairs, often to meet the social, economic, health and education and are forced to travel in this area due to special attractions this area has

always insisted development activities in this area, and there is pressure on the most requests for administrative and financial affairs directed to this area of the city.

Figure 3. The current status of the study area



V. LAND USE AND TRANSPORTATION EFFECTS

Land use on the one hand, are influenced transport and the other hand effects on transportation. Major impact on the land use affects transportation includes:

- Overuse of marginal land areas.
- Changes in the climate system.
- Creation of contaminated land used as a burial place of old cars.
- Loss of green space and agricultural land -use for the benefit of other uses.
- Effects result in disorder of environmental balance.
- Urban regions creep into the natural habitats.
- Problems caused by air pollution in cities and reduce visibility.
- Creation of incompatible land uses in the city (Jahanshahi , 2009, 33).

VI. THE IMPACT OF LAND USE ON TRANSPORT DEMAND

The impact of land use on transport demand is considered from three perspectives.

- 1 – Spatial discipline: through the physical design of micro and macro scale location and style arrangement of major activity centers to support specific practices to be transported.
- 2 – Land use density (density zoning) compression and land use density also reduces cost of all services provided by the server.
- 3 - Urban Design (neighborhood scale)

Through optimal design aesthetic the station and surrounding area, sidewalks and connecting it to the streets, the kind of neighborhood units and guiding it towards the station, and generally creating an environment pleasant it to encourage the impact of transit (Vatankhah, 2008).

VII. FINDING

7.1 - Effect analysis of referrals on a range of traffic

Effect analysis of referrals on a range of traffic based on the number of referrals into riding a different route has calculated and this calculation to be done that referred to any office referred to the total divided to referred total into number offices within to be located and obtained result amount is multiplied in the number of cars on various lines and obtained result amount show in the effect of the number of visits to each department based on the ride (each way) on within traffic area.

Table 2 the number of referrals to offices

Education and bringing up	municipality	government	Crescent office	judiciary	Sports and youth office	Total average
2000	1283	170	297	1234	19	5003

Source: (Author)

Table 3. Number of cars in each direction

Felestin	Taleghani	Kargar	Modares
8074	7350	8776	4457

Source: (Author)

$(Pcu / Veh) = (T / \sum T \times C)$ equal rides visits to the office, where T equals the number of trips or attending a specific route; $\sum T$ total travel; C is the number of cars in each direction.

Table 4. Converting the number of visits to a number of cars in a day's work

Option	Taleghani	Kargar	Felestin	Modares
Education and bringing up	3508	2938	1781	3227
municipality	2250	1884	1143	2071
government	298	249	151	274
Crescent office	521	436	265	479
judiciary	2164	1813	1099	1991
Sports and youth office	33	28	17	37

Source: (Author)

7-2 - trip distribution matrix

Trip distribution matrix 10×10 in this range based on an average journey time of one hour (12 to 1) 6 offices (respectively are Municipal, Education and Bringing up Office, Government, Office of Sports and Youth, Crescent office and Justice office) and 4-path, make up 10 pillars the matrix. Reciprocating has considered trips in the matrix. We make to converting daily trips to the office hours, the number of trips divided by 8 (the amount of work time) and we pass to travel into the area of travel based on hours, multiple total travel times in ratio 1/0 (ratio of peak hour trips) said.

Table 5. Distribution matrix according of rides in study area

Go \ Back	Municipality	Education	government	Sports and youth	Crescent	judiciary	A	B	C	D	Total(rides)	The Total return
1	0	0	0	0	0	0	281	236	338	143	997	
2	0	0	8	0	0	4	439	367	403	223	1444	
3	0	3/8	0	0	0	0	37	31	34	19	122	
4	0	0	0	0	0	0	4	4	5	2	15	
5	0	0	0	0	0	0	65	55	60	33	213	
6	0	0	0	0	0	0	271	227	137	249	883	
A	281	439	37	4	65	271	0	501	376	247	2226	
B	236	367	31	4	55	227	595	0	533	0	2046	
C	238	403	34	5	60	137	342	304	0	0	1624	
D	143	223	19	2	33	249	0	367	253	0	893	
Total(cars)	997	1436	130	14	213	888	2034	2090	1886	916	0	10604
Total number											10462	

Source: (Author)

7-3 - Combine uses data for production of access options

Production options in this step are done using AIMSUN software. Present software is including two-dimensional and three-dimensional simulation software that applications in urban traffic as well as traffic that is

used in non-urban traffic in the countries which are advanced in the field of traffic is considered one of the requirements for approval of projects. This software can be used in all cases before the state (status quo) and the state (after the change) compared with each other. The software consists of an input matrix travel distribution (Table 3). This software is based on available data for each option calculate 6 parameters options time delay, number of vehicles per hour, the average speed of vehicles in the network, the total distance traveled by vehicle according to km/h of travel time, The total travel time of all vehicles and average total vehicle, which defines each of them in the Appendix. Based on the above three options to be considered. first option that dedicated 6options, is relating to the elimination of any office land uses (absorbing journey centers), and its impact on network traffic or other two alternatives, will be one of the other transit travel deleting remove all the land (for office use) and its impact on traffic in the area is. It is important to note explaining that values obtained for each component based on the elimination of factors influencing traffic within a small improvement on the desired component gives.

Table6. Compares the various alternatives based on six components of the traffic

Scenarios	Scenario	The time delay	Number of Vehicles	Average vehicle speed	Total distance traveled	Total travel time	Average travel time
		(Seconds/Km)	(Veh/h)	(Km/h)	(Km)	(Hours)	(Seconds/Km)
A	Elimination of municipality	373/47	5009	16/92	2724/60	355/84	455/52
	Elimination of Educational office	83/57	6911	31/5	4171/66	189/67	160/52
	Elimination of Government	691/37	4271	10/15	2340/77	509/48	769
	Elimination of Sports and youth	750/03	4060	10/11	2160/73	505/7	827/4
A	Elimination of Crescent	673/34	4166	9/85	2282/30	480/54	750/49
	Elimination of Judiciary	722/6	4057	9/98	2132/91	473/15	799/69
B	Elimination of transit demand	541/8	4112	13/21	2149/88	392/85	62/8
C	Elimination of absorb centers	10/11	3555	42/62	2168/24	52/36	86/6
Status quo		715/79	4146	10/26	2257/18	507/1	793/45

7-4 - percentage of traffic each option

Comparison the mentioned options based on travel volume indicated that option B (removal of transit demand) at a rate of 41.62% is involved in the traffic reduction Velayat Square. Also the displacement or land uses concentrations that are associated with each other (municipalities, government, and judiciary) to 23.26% play role in the amount of square traffic. It is necessary to note that rate of trip volume concern to each option, is obtained from the total travel trip matrix.

Table (7) percent of the different options traffic loads for improving transportation within the city of Babol.

Scenarios	Scenario	Trip volume	Traffic load percentage
Scenario A	Elimination of Educational office	1994	9/46%
	Elimination of municipality	2880	13/67%
	Elimination of Government	252	1/19%
	Elimination of Sports and youth	28	0/13%
Scenario A	Elimination of Crescent	426	2/02%
	Elimination of Judiciary	1771	8/40%
Scenario B	Elimination of transit demand(Taleghani-Kargar ax)	8768	41/62%
Scenario C	Elimination of absorb centers(administrative uses)	7351	34/90%

Source: (Author)

VIII. CONCLUSIONS

Organized and efficient design uses a coordinated transportation appropriate with transportation system cause increases the number of non- motorized travel and public transportation systems in day trips are citizens.

This case addition to help reducing air pollution and congestion in cities can make manage demand reducing the number and length of trips by private vehicles and during the trips. The duty of a good transportation include system creation of linking between the major land uses of the trip generators (residential areas) and areas of trip attraction (shopping, industrial, administrative centers). Garlic thought to achieve research results that are based on steps that start from codification research general principles and eventually leads to a conclusion. In the present study, a new approach for linking between urban transport network the categories of office trips (number of trips to the administrative uses on a working day) and consider effects on establishment of on the land uses the area under study of traffic .

The results show that the purpose of this study was to determination of quantities effective ratio bit about each of the factors influencing has been made (for office use located in the study area and the passing travel) on traffic the study area. In this section, the research questions will be answered.

First question: what method will be suitable for quantitative analysis of establishment each of the office land uses on traffic in the area of the city of Babol (central area of Babol)?

Re: The way to achieve these results need to method which is able to use their influence to give in form quantity. Thus, one of the most accurate methods to achieve this was to use the software AIMSUN able to answer the research questions.

The second question is how to improve traffic handling administrative user metropolitan area contributes to Babylon?

The results show that eliminating all administrative land uses that is involved attractive places to travel in this area are based on the amount of traffic to the 34.90 % in traffic volume reduction range of study area in the study. Also play role concentration and urban office displacement as well as government and the judiciary are correlated to the amount of 23.26 % of the traffic study area.

epilogue: there is a status quo in the area impossible of mobility of land uses due to constraints of costs and lack of suitable land, thus it can decreased by operation procedures such as work time changes of lookup office, manage parking, creation park ride, necessitate offices worker making a trip to the march and ...negative effects of centralized establishments on the traffic study area.

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