

## A STUDY ON THE RELATIONSHIP BETWEEN COMMERCIAL LAND USE AND INCREASE OF URBAN TRAVELS (CASE STUDY: CITY CENTER OF URMIA)

Mehran Mirzaee Gheshlagh<sup>1\*</sup>, Akbar Kiani<sup>2</sup>

<sup>1</sup>M.A. student; Geography and urban planning, the University of Zabol, Zabol, Iran

<sup>2</sup>Ph.D, Geography and urban planning, the University of Zabol, Zabol, Iran

Corresponding authors: (Email: [mehran\\_mirzaee88@yahoo.com](mailto:mehran_mirzaee88@yahoo.com))

### ABSTRACT

Urban land use is one of the important elements in urban systems, which is mutually, directly related to transport system through connectional networks and traffic currents. In fact, transport and urban land use form a system together in which decisions made about every one affects the other as well. As a metropolis, Urmia is exposed to many traffic problems due to its monopole nature, traditional context, overconcentration of land use in downtown and high vehicle capitation. This study tries to clarify the negative effects of unsuitable (commercial) land use distribution on urban traffic. It's an applicable, extensive study with a descriptive-analytic method in which the data have been gathered by documents, questionnaires, and directly adopted information from surveys. The data analysis was conducted by statistical software programs like Arc GIS. The results showed that about 51.66% of all urban travels headed towards trade centers, which implies that these centers play a basic role in urban traffic compared to other land uses.

**KEY WORDS:** *Land use, Transportation, Urban traffic, Downtown, Urmia city*

### Introduction

One of the main issues in urban planning field is the land use design. The main subject is how to devote land to different usages and harmonizing them together. Transport planning is a method through which the purpose is mainly to build a transportation system by which a safe and economic transport of people and goods is guaranteed. It's a dynamic method, by which we mean that it should be able to respond well and meet the requirements of land use changes, economic condition and travel patterns (Rassafi, 2009). In urban planning, the process of land designation in one hand and the transport system as a connection between land uses in the other one are two linked elements in urban space body; due to their bilateral effects, they need more attention (Ziyari, 2010). Urmia as a metropolis with a personal vehicle capitation of 0.18 (120000 vehicles) in 2006 has a per capita equal to Tehran's. This leads to unsuitable status of traffic, transportation, environmental damages and increase of fuel consumption by increasing urban travels of personal vehicles. However, due to monopole and traditional context of Urmia, radial development and non-professional design, most of the roads in central core are in bad condition in performance levels. Lack of a regular performing hierarchy in connecting framework of the city, inconsistency of physical features and peripheral usages, in addition to imbalance in performance of roads compared with what was defined for them

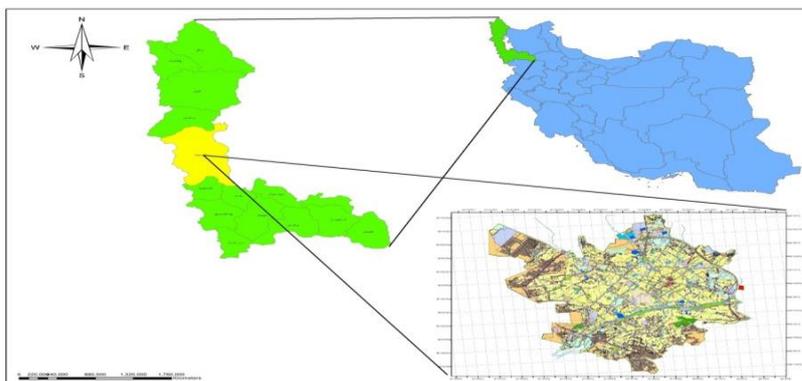
at first designing plan, all lead to problems like decrease of safety level, downfall of performance indexes, driver's confusion, imbalance in offer-request cycle, unsuitable velocity of cars and so on (counselor engineers of 7<sup>th</sup> design: 2010).

### Review of Literature

Asadi, Rahnama and Lagziyan (2012) in their research "A study on mutual relationship between management of land use and urban transportation and traffic status; case study: Almase Shargh trade center, Mashhad" evaluated the subject using a classic 4-level model. Their results showed that building the center in the fringe, out of the central core, proper administration of the strategy and policies related to land use management, all together caused it to reach its purpose successfully. Zhao P. (2010) in his research "*sustainable expansion and transportation in growing megacity: consequences of urban sprawl on the urban fringe of Beijing*" showed that sprawled urban expansion in Beijing's fringes has had low congestion. This increases the distance for automobiles traveling in urban fringes. So, to have sustainable expansion, management of urban expansion should consider the control of territorial and local expansion in fringes along with sustainable development of transportation facilities. Teguh aditijandra, Paulus (2013) in his research "The impact of urban development patterns on travel behavior: Lessons learned from a British metropolitan region using macro-analysis and micro-analysis in addressing the sustainability agenda" has studied some parts of megacity in Britain. His analyses were conducted using the data gathered from 2 major studies in 10 neighborhoods, both in north eastern England. The general results showed that different forms of land use affect only a small part of travel behavior; on the other hand, however, more detailed evaluations suggest that the attitude of citizens are more effective on travel patterns than the local indexes.

### Geographical coordinates of the studied zone

Urmia is one of the fourteen cities in Azerbaijan-e Qarbi (western Azerbaijan) province; it's located in the middle part of the province; it's adjacent to Salmas, Naqade and Mahabad, Urmia Lake and Turkish and Iraqi border respectively from north, south, east and west. This city covers an area of  $5251\text{k}^2$ , about 14% of the whole province. According to the state divisions, it includes 5 counties, 20 country sides, 5 towns and 615 villages. It's the capital of the province, 18 kilometers away from the Urmia Lake; with its Longitude=45-4' and Latitude=37-33', Urmia is located in a flat plain with a length of 70k and width of 30k. Due to its important geopolitical location which joints the area to Caucasus, Armenia, Iraq, Turkey and North-to-South part of the well-known Silk road, Urmia has been attacked many times through the history by different invaders and suffered from several destructions; however, this special location has led to cultural diversity and precious historical legacy; nowadays, people of several races such as Turk, Kurd, Christian, Ashuri and Armenian live here, mostly Turks and Kurds (Geographical organization of Iranian Armed Forces, 2000).



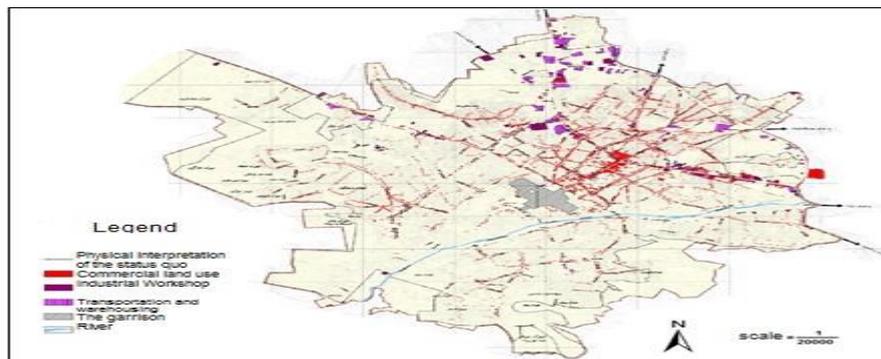
**Figure 1:** Geographical location of Urmia in province and country, authors, 2014

## Methodology

In this research, conducting field study along with using quantitative approaches, maps, tables and graphs, helps us to evaluate and analyze the current status of the area. Finally, results were given to analytic and graphical software programs like Arc GIS, Auto CAD, Excel, SPSS; the data was collected by questionnaires and direct observations. Since the population of research was vast and couldn't be studied entirely, then sampling was used. According to the subject of this study, to gather basic statistics and data, in survey mode questionnaires were used for cases that have been to the area being studied. The population of this study includes all people that have entered to the area being studied and after sampling, 320 cases were selected to be given the questionnaires.

## Findings

From the very beginning, the downtown core of Urmia has been the main bazaar and though a superior area compared to its surroundings. The scope of the study, Imam Street, lies there too. Most interactions and services take place here; hence, it attracts many people from other areas of the city. The high price of these lands in the downtown has led to have less open and public spaces and more focus on other usages, esp. commercial. Commercial land use in the scope of the study which is a part of Urmia's central core, from the first years that it became a city, has been a commercial place. But the concentration of trade centers never has been as much as we see today. One reason for that increase might be historical background of this area; another one might be receding of residential land use and being replaced by commercial use. Thus, the land owners, using their authority and wealth, convince the city managers to agree with their irregular construction which is against what was first designed. What was elaborated in the first chapter according to the exploitation theory obviously shows why the land use of this area is changing from residential to commercial. There seems to be some reasons for it to be a compact commercial area. Figure 2 shows the dispersal of commercial land use in Urmia. As you can see, the concentration in scope of the study is much more than the other areas of the city.



**Figure 2:** The dispersal of commercial land use in Urmia, source: findings of the present study

## Testing the hypotheses

**First hypothesis: “The space dispersal of (commercial) land use is the most influential element in urban traffic and transportation problems of Urmia downtown.”**

According to the evaluations and studies carried out and statistics and data recorded in official documents, we can see that due to: 1-the trade centers and services related to them are mostly focused in the central core 2-necessity of people’s needs to such services and 3-most people go there to buy what they need, this area is very attractive and most travelers prefer to use their own personal vehicle; hence, it’s the most effective element on the downtown traffic of Urmia. As the data analysis from the questionnaires showed, about 57.8% of cases went there for buying goods; and 30.6% among them used their own vehicles. So, the first effective element in downtown traffic of Urmia is the high concentration of trade centers and services related to them in that area. Since the commercial land use and services related to them has the most fitness in analyses, then this hypothesis was proved and accepted.

**Second hypothesis: “concentration of the commercial land use is against the optimum land use distribution and urban sustainability”.**

To test this hypothesis, the AHP model was used. To do so, 8 indexes from urban land use were ranged and given degrees with this model and then, combining these indexes, the fitness of locations determined for every usage in the target area was evaluated considering the sustainable expansion matters. The findings showed that all the lands of that area have less than average value so that from 523 units, 68.45% are in the edge of crisis. So, on one hand, according to low safety level and capability of the lands of this region for commercial land use, and on the other hand, over concentration of this usage (that according to the first hypothesis caused overload of transportation traffic in downtown) along with low capacity of the roads has led to problems like overpopulation, more pollution caused by vehicles in traffic, waste of time and energy, additional unwanted costs and altogether may decrease the citizen’s quality of life; these are against the sustainability of the city. Thus, this hypothesis was confirmed to be correct, too.

## Results and discussion

This study was conducted to evaluate how the commercial land use and services related to them affect the traffic currents in Urmia's downtown. To gather data in need, a questionnaire was used according which all information related to urban travels to the targeted destination, commercial land use and eventually identifying factors affecting the traffic in that area was obtained. Also, the traffic amount of area in question was determined by registering all transportations in and out the downtown during the rush hour. Finally, with having these data processed and transportation capacity analyzed, we reached our final conclusion a summary of which is presented below:

- Transportation capacities of the roads in the city center of Urmia are designed based on previous body of the city and hence don't meet the needs of current traffic status.
- Construction within the central core of the city is more compressed compared to other regions, especially in commercial land use which attracts more people and travels and increases the traffic problems.
- Most of the travels to the downtown were made to visit trade centers (51.66%); 80.8% of all travelers came from neighborhoods of the city itself; 33.3% of those who traveled downtown for buying goods used their personal vehicles. Most of these travels have been made in the afternoon (82.5%). Thus, it can be concluded that after 3 PM the rush hour for this area begins.
- There are several factors which affect the urban traffic of Urmia. One of them is lack of a potent public transportation system which has led to more usage of personal vehicles; these one-passenger vehicles cause more traffic then, what we observe everyday in the downtown. From another point of view, traffic overload and deferment as a result of it, has another reason: combining vehicles which are headed to other regions of the city but choose the same road (Imam Street) which passes from the downtown with those that are headed to the trade centers.
- One approach which seems to be logical for decreasing the number of cars in the downtown is to restrict the number of parks and open spaces there. It was thought that this can help to decrease the number of vehicles in that area, but in turn, it didn't work out. Not only it couldn't decrease the amount of traffic, but also what we can see there is very inelegant. Due to the high concentration of commercial centers in the downtown of Urumiyya, considering that most of the travels to this region are obligatory travels for reaching the necessary services and goods, drivers have to park their cars in the verges of the street, even sometimes duple and triple. Thus, it takes longer for every driver to turn and find a place for parking their cars. This leads to more rush, pollution and extra costs. This is a fact that can be observed in the target area.

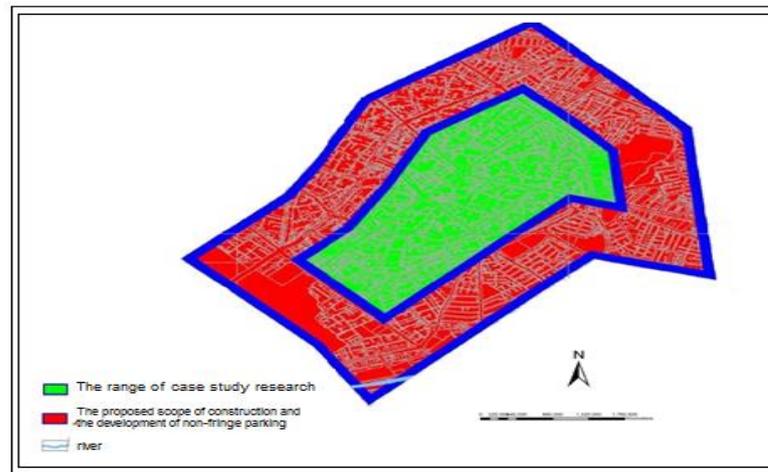
## Suggestions

Every solution must be based on scientific studies and awareness of the facts related to the city being studied along with considering the relationship between transportation and other sectors of the city like transportation network base, land use, economy, culture, and so on. So, after analyzing the results and findings of the present research, we offer the following suggestions:

- According to the evaluations and studies conducted in the area in question (Imam Street), the most critical problem of the Urmia traffic matter is lack of enough parking lots

compared with the requested amount which caused many problems for the people both residents and clients.

- To build non-marginal parking lots in specific distance from the area in question is very important. In figure 3, we presented the proper area in which such parking lots can be built in adjacency of the central core of Urmia.



**Figure 3:** Suitable areas for building (non-marginal) parking lots around the downtown

- Decentralization of the downtown and equal distribution of commercial land use which attracts urban travels in all regions of the city.
- To combine various land uses in different localities in order to reduce the travels to the city center.
- Paying more attention to the traffic problems of the city center by the authorities and their cooperation in constructions and designs.
- Adding new systems to the public transportation plans to improve it.
- Informing people about the privileges of walking or cycling along with improving their safety level.
- Encouraging people to use the public transportation systems to help the reduction of traffic and environmental pollutions. Other positive effects might be factors like safety, reduction of costs, and less waste of time and energy.

## References

- Rassafi, Amir Abbas (2009).** transport engineering, Imam Khomeini International University Press.
- Ziyari, Keramatollah (2010).** planning for urban land use, Tehran university press, 8<sup>th</sup> pub.
- Counselor engineers of the 7<sup>th</sup> plan (2010). “reconsideration of the general design of Urumiyya”, 3<sup>rd</sup> Vol, secretary of urbanism and settlement, Western Azerbaijan.
- Asadi, Mahdiye. Rahnama, Mohammad Rahim. Lagziyan, Mohammad (2012).** “A study on mutual relationship between management of land use and urban transportation and traffic status;

case study: Almase Shargh trade center, Mashhad". Urban management magazine, 10<sup>th</sup> year, No 30, pp 131-144.

**Zhao, P. (2010).** "Sustainable expansion and transportation in growing megacity: consequences of urban sprawl on the urban fringe of Beijing", Habitat international, volume 34 issue 2, pp 236-243.

**Teguh aditijandra, Paulus. (2013).** "The impact of urban development patterns on travel behavior: Lessons learned from a British metropolitan region using macro-analysis and micro-analysis in addressing the sustainability agenda", Research in Transportation Business and Management, pp 69-80.