Comprehensive Urban Mobility as a Necessity in Sabzevar City, Iran

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Abstract— Urbanization in Sabzevar City has increased dramatically during the past two decades. Mobility is undergoing change. Urban mobility is one of the toughest challenges that Sabzevar faces today as existing mobility systems are close to breakdown. It is required to establish new philosophies and innovative mobility concepts in order to ensure a cleaner and healthier Sabzevar. This paper explores ways to contribute and solve understanding of attitudes and conduct of urban residents in relation to daily travel, and to use this awareness to assess the potential for behavioural change and to identify more targeted policy interventions through a Mobility Plan by focusing on mobility attitudes and behaviour in the context of new and emerging urban transport opportunities.

Index Terms— Comprehensive mobility, Transport policy evolution; Traffic congestion, Sabzevar city, urban mobility, Land use, Network system.

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1 INTRODUCTION

Sabzevar is a developing city and an urban complex poised for a higher growth in coming years. During the past decade, the number of personal vehicles has risen and increased the public transportation system rapidly in the city; but still it has not been able to keep tempo with the personal vehicle traffic congestion in city which continues to grow at an alarming rate. Irregular growths of number of vehicles, lack of appropriate culture for personal usage of vehicles among citizens and weak public transportation system, are some important reasons of unsuitable mobility services in Sabzevar city.

Changes in urban mobility no longer follow traditional patterns of motorisation and policy makers need to embrace an increasing number of alternatives, including cycling and walking as main modes of travel, bike and car sharing, multimodal travel options and electric vehicles. In recent years, and particularly over the past decade, significant change in relation to urban travel, lifestyles and the spatial structure of Sabzevar has become apparent. In the 20th century, urban development was overwhelmingly defined by the rise of the automobile and spatial dispersion. Today, 64% of all travel made is within urban environments and the total amount of urban kilometres travelled is expected to triple by 2050.

Delivering urban mobility to cope with this increasing demand will thus require massive investment in the future. The evolution of urban mobility can be seen as the outcome of a complex and changing set of interactions through Comprehensive Mobility which is a vision statement of the direction in which Urban Transport in the city has to grow. In order to pursue a sustainable mobility policy there is an essential need to understand the growing mobility demand and its repercussions on people, the economy and the environment. It should cover all elements of Urban Transport under an integrated planning process.

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2 BACKGROUND OF SABZEVAR CITY

Sabzevar is, and the capital of Sabzevar County, in Razavi Khorasan Province in northeastern Iran. At the 2011 census, its population was 232,000. It is approximately 220 kilometres west of Mashhad, the provincial capital and approximately 651 kilometers east of Tehran, the capital of Iran. Its geographical coordinates are 36° 12' 52" North, 57° 40' 47" East. The history of Sabzevar goes back to the 1st millennium BC. Ancient remains include fire-temple 'Azarbarzin' which is still visible. By considering to Antiquity and historical background of Sabzevar city, this city, particularly in central parts of city is having Traditional tissue.

3 EXISTING TRANSPORT SYSTEM IN CITY

Registered motor vehicles in city:

With respect to the increase in population and also a rise in vehicles and travel time there is inadequate street capacity crisis, As a study made, Vehicle population which was around 1,27,000 lakh motor registered in 2012 ; total 1,54,000 vehicle have increased in city up to 2013 as shown in the below Table 1.

TABLE 1
NO. OF VEHICLES REGISTERED IN SABZEVAR CITY: 2011-2013

Year	Four wheelers	Heavy vehicles	Bikes	Total
2011	30000	6000	75000	111,000
2012	40000	7000	80000	127,000
2013	52000	10000	92000	154,000

Source: City Traffic Police

Bikes account for around 60% and Cars around 34% of the total vehicles registered. Vehicles have a growth rate of 1.221% in 2013 whereas vehicle growth rate was 1.145 in 2012. According to the report made by the City Traffic Police, Motorcycle ownership in Sabzevar city is the highest in Iran.

This is an indirect indication of inadequate public transport services in the study area. The increase in use of private vehicle directly contributes to the increase in total vehicle kilometres travelled which in turn increase traffic congestion on roads and high emission levels of vehicular pollution.

4 PUBLIC TRANSPORTATION IN CITY

Understanding how a city's physical attributes affect its inhabitants is perhaps best examined though the lens of a legibility study, as first pioneered by Kevin Lynch (1960). In Sabzevar city there are two modes of public transportation, Buses which ferry 80 passengers and taxies with 4 passenger's capacity.

Bus: There are two kinds of public bus system in Sabzevar city, urban and suburban. At the moment number of active buses in Sabzevar city are 155, of which eight of those buses are already scrap and are ready for being sold. Suburb bus system is managed by private sector and it covers up to 35 kilometres outside the city limits. Studies show that peak hours are between 9 to 10 am (12.5%), 11 to 12 pm (16%) and 17 to 18 pm (14.5%) through the mass bus transportation system.

Currently, there are around 19 main urban bus lanes with 52 actives buses. The number of urban and suburban bus system passenger during daytime is more than 55000. In the urban bus system some of the buses are equipped with card ticketing system, where 50% of passengers use ticket card. There are some buses to charter services and there is no exact statistics available of the passengers. The average age of the bus fleet is 8.5 years and buses above 10 years are scrap.

TABLE 2
COMPARISON OF IMPORTANT INDICATORS
IN URBAN TRANSPORTATION

Indicator	2013 – early 2014	2014 – early 2015
The total number of bus	113	113
Average age of buses	6	7
Scrap buses rate to total buses	-	7.8%
Governmental buses rate to total buses	18.5%	24.7%
Average of waiting time	20min	15min
Number of buses equipped with card ticket system	53%	56.7%
Number of buses equipped with AVL(Automatic Vehicle Location) system	53%	56.7%
Bus stop with shelters	52%	55%
Total path length of bus lanes	126km	173km
Number of passengers in all bus lanes	48000	55000
Gasoline station	2	2
Bus wash	1	1

Source: traffic police of city

The physical separation of residential areas from places of employment, markets, schools, and health services force many residents to spend increasing amounts of time, and as much as a third of their income, on transportation. Reasons for using bus in terms of bus passengers in Sabzevar city are:

TABLE 3
DIFFERENT REASONS FOR USING BUS IN
TERMS OF BUS PASSENGERS

Reason	Percentage
Access time, less than other vehicles	4.63
More economical than other vehicles	68.87
More comfortable than other vehicles	17.48
Lack of access to other vehicles	8.71
Lack of accountability	0.31

Source: municipality annual report

The above data analysis shows that amongst the trips by

bus for different purposes, travelling for education and for recreation have maximum and minimum percentages respectively. The most age group of bus users are between 15 to 29 years old. In terms of gender, women (around 56%) use buses more than the men (around 44%). By considering the user's occupation, as can be seen, the most of passengers are student community (around 24%) and military is the lowest (around 0.74%).

With respect to the standards mentioned, waiting time should be 5 to 10 minutes. But in Sabzevar city it is around 18 to 20 minutes. Average distance between bus stops in the city limits is around 370 meters which is within the normal range.

Taxi: There are three kinds of taxis in Sabzevar city:

1. Organized taxis (Yellow color), for airport, suburban bus station and Tohid settlements

2. Unorganized taxis (Yellow color),

3. Taxis equipped with wireless communication -133 nos (Green Color).

Taxis equipped with wireless communication cover the city limits and within a range of 20 kilometers of the fringe. There are 235 taxis above 10 years old which are in need of upgradation. Most passengers are in Beyhagh and Kashefi streets which are located in central part of city. Reasons for using taxi in terms of taxi passengers in Sabzevar city are as following:

TABLE 4
DIFFERENT REASONS FOR USING TAXI IN
TERMS OF PASSENGERS

Reason	Percentage
Access time, less than other vehicles	37.02
More economical than other vehicles	4.2
More comfortable than other vehicles	39.79
Lack of access to other vehicles	17.94
Lack of accountability	1.05

Source: municipality annual report

Data analysis mentioned above show that the trips by taxis are short while it aligns work related commute and recreation related trips maintain maximum percentages. The user groups fall within the ages of 15 to 29. In other words, more than 50% of taxi users is the younger population. In terms of gender, women (around 51%) use taxis more than the men (around 41%). By considering to user's occupation, as can be seen, the most of passengers are housewives (around 23%) and military is the lowest one (around 0.86%).

When questioned on the other options preferred for commuting, 80.53% of taxi users are not interested in any other public vehicle. 16.7% of taxi users like to use bus, but due to some reasons such as lack of appropriate access to bus and long waiting time, they are not keen to use such facilities.

5 CITY LAND USE

The initial core of the Sabzevar city goes back during 1826 where the city took its shape around Asrar and Beihagh streets. In the eastern and western edges of the city there are illegal constructions and that is where the low income group and slum settlements are situated. Overall the city has been divided into 3 land use categories: Residential, Road Networks And Waste Or Vacant Lands. The residential land use is 7995075.18 Sqm and it is 23.89 percent of the city, the Commercial Land use with 655937.52 Sqm has 1.96 percent of city land use. Park and open spaces is 759682.74 of the total city area.

This form of urban analysis is very useful in assessing how the pedestrian experiences space and perceives the urban environment on a daily basis and provides an indication of the cognitive factors which affect where they go and how they respond to the situations they encounter.
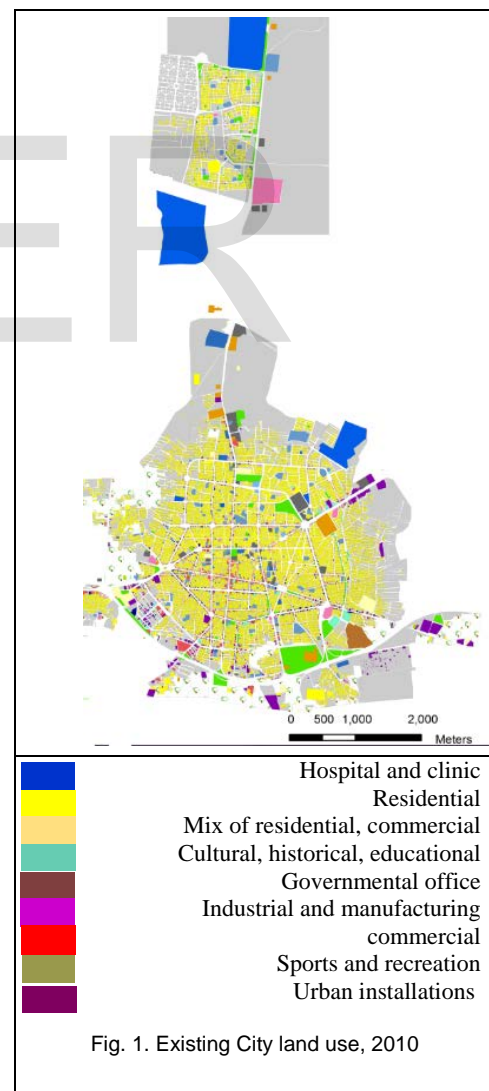

■ (blue)	Hospital and clinic
■ (yellow)	Residential
■ (light tan)	Mix of residential, commercial
■ (teal)	Cultural, historical, educational
■ (brown)	Governmental office
■ (magenta)	Industrial and manufacturing
■ (red)	commercial
■ (olive)	Sports and recreation
■ (dark purple)	Urban installations

Fig. 1. Existing City land use, 2010

TABLE 4
AREAS OF THE EXISTING CITY LAND USE,
2010

Land use		Area (Sqm)	Percentage
Residential		7995075.18	**25.89**
Commercial		655937.52	**1.96**
	Preschool	10039.86	**0.08**
	Primary school	97051.98	**0.47**
	Guidance school	87012.12	**0.3**
Educational	High school-Conservatory of	287809.32	**0.86**
	University	930360.36	**3.14**
	Other Educa-tional centers	1549485.06	**3.64**
Cultural- religious		147251.28	**0.44**
Sport		174024.24	**0.52**
Park and open space		759682.74	**2.27**
Garden		538805.82	**1.61**
Health		197450.58	**0.59**
Administrative		297849.18	**0.89**
Military		16733.1	**0.05**
Urban facilities		180717.48	**0.54**
Cemetery		33466.2	**0.1**
Industrial		562232.16	**1.68**
Hotel and tourism		46852.68	**0.14**
Warehousing and transpor-tation		307889.04	**0.92**
Animal husbandry		133864.8	**0.4**
Agriculture		1914266.64	**5.72**
Barren lands		7593480.78	**20.69**
Mixed use		712830.06	**2.13**
Roads and network		8236031.82	**24.61**
Total		**33466200**	**100**

Source: city municipality

6 SABZEVAR NETWORK SYSTEM

The most important aspect of movement in any urban area is the hierarchy of street network for two reasons: First, the skeleton and the composition of street network should be in such a way that movement is based on the defined roles, and second, the approximate width of the road network should be set on the basis of their role in the hierarchy.

Type 1 Arterial roads: In type 1 arterial roads, preference is given to connect the outlying areas of the city with each other and connecting the city road network to the suburban net-work. Side street parking is not permitted in this type of roads. Social role is deeply in contrast with the performance of main arterial roads and for this type of road no social road is consi-dered, therefore to control that function, pedestrians and cycl-ists should not (except for Interchange) cross it. Highways and freeways are type 1 arterial roads.
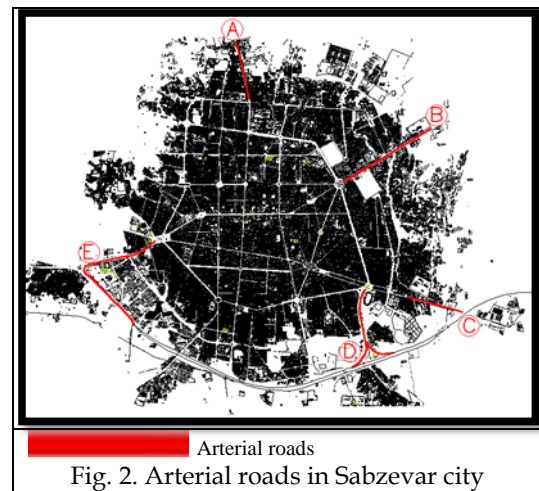

Arterial roads
Fig. 2. Arterial roads in Sabzevar city

Second class arterial roads (Sub Arterial Roads): Type 2 ar-terial roads constitute the core network within the city; unlike the type 1 arterial; function and accessibility compete with access. Due to the conflict between the accessibility and mobil-ity, the roads becomes more accessible, moving vehicles traffic also gets reduced.
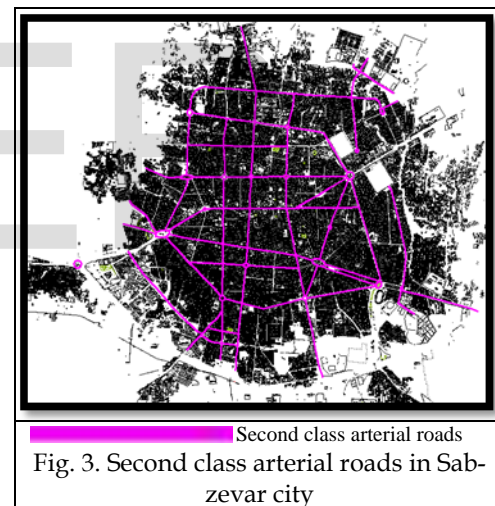

Second class arterial roads
Fig. 3. Second class arterial roads in Sab-zevar city

Second class arterial road counted as main urban structure of Sabzevar city. The Sub Arterial Roads connect through traffic between arterial roads plus the local and arterial roads. It facili-tates movement across a suburb or from one suburb to another by giving priority to main public transport and by dividing the movement of public transport through separate walkable routes and vehicular accesses.

Subsidiary Roads (Minor Second class arterial roads):

Fig. 4. Subsidiary Roads in Sabzevar city
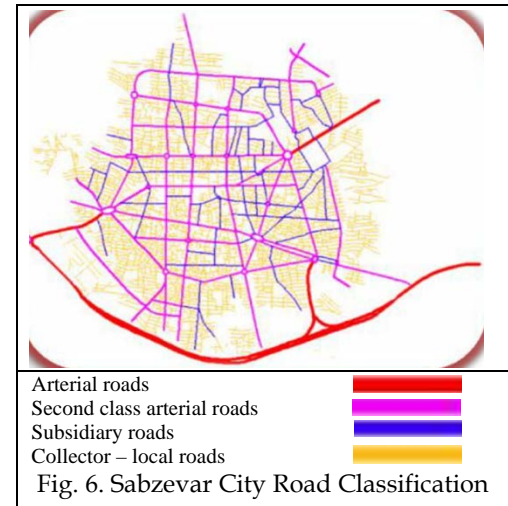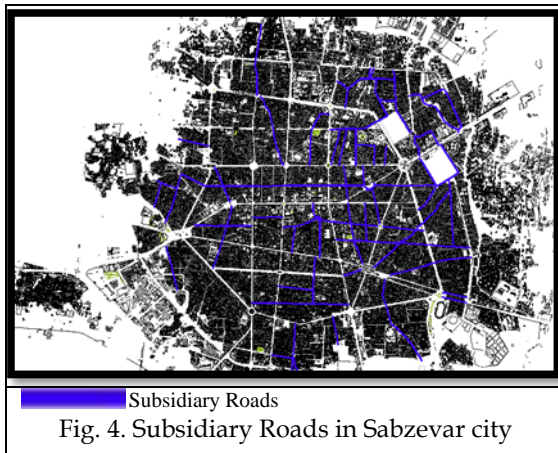
Collector-Local Roads: In local roads priority is given to social and accessibility roles, so that the vehicular movement is lesser in such a way that the street can perform its social responsibilities. One of the main functions of such streets is providing access for motor vehicles.

Fig. 5. Collector roads in Sabzevar city

6.1 Sabzevar Street Network Hierarchy

The three types of roads that has been identified in Sabzevar city are represented in the below figure. As it can be interpreted from the figure; majority of the vehicular traffic movement is carried by Type 2 Arterial Roads (Major) which almost spreads equally within the city and it follows a grid pattern. These roads along with Type 2 Arterial Roads (Minor) or known as Subsidiary Roads play an important role in trade and commerce of the city as they are mostly commercial axis within the city border especially in the city core and in CBD areas.

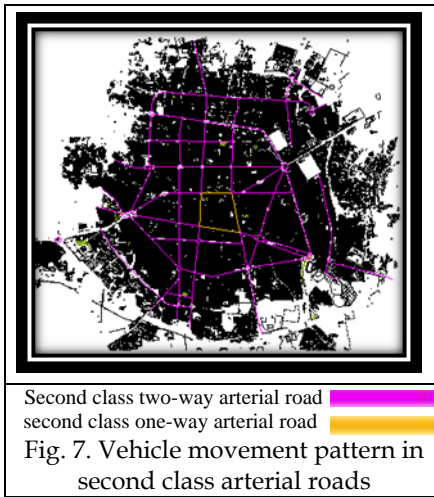Fig. 6. Sabzevar City Road Classification

7 VEHICLE MOVEMENT PATTERN IN CITY

Analyses presented are based on personal experience of the author through an experience in local urbanism and the knowledge of experts from government reports which have elaborated the issue of mobility through transport development.

The CBD due to existence of old market and main commercial units, cultural and religious places, many banks, institutions, schools and government departments the travels in the morning are relative to education and work related and by those people who travel from their rural areas for any business related activities; and in the evening and after working hours, most of travels are related to shopping and religious affairs. Unfortunately, people tend to use private vehicles even for shorter distances thus increasing the vehicular traffic causing congestion especially during peak hours.

Since 2009 the urban planners have created many one way movements to recede the traffic congestions in the busiest part of city. This plan was created in 2009 to revitalise the inner city through large-scale traffic calming and infrastructure projects in the field of sustainable urban mobility. The confluence of these factors requires a major reconfiguration of several major streets in the City Centre in order to not only allow for efficient operation of public transport alongside private vehicles, cyclists and pedestrians, but also to provide room for the expected growth in trips over the next several years.

This has the effect of making cycling and walking more attractive as there is more freedom of movement with these modes and usually a faster travel time. Consequently these users can enjoy the environment in which they are moving through more as it has been created for walking and cycling and not car use.

Second class two-way arterial road

second class one-way arterial road

Fig. 7. Vehicle movement pattern in
second class arterial roads

8 PEDESTRIAN MOVEMENT PATTERN IN CITY

Pedestrians are not homogeneous. An alternative and non-conventional urban evaluation which places emphasis on the psycho-spatial landscape of the city is a useful starting point in reimagining and re-mapping the urban environment from the perspective of the pedestrian. Everybody has specific physiology for itself (age, space requirement to move, height and etc.). The study of human experience provides policymakers, planners and designers with the essential knowledge required to produce responsive and engaging designs for public space. According to observation, people walk in groups, two to four individuals.

Distance between pedestrian groups depends on pedestrian volume on sidewalk, existing obstacles and walking speed. Even the distance among the group members does not remain constant. Pedestrian density depends on the land use pattern. In any area with high density of commercial units, there is a significant level of pedestrian volume due to the existing land use pattern, in CBD area and some surrounding streets, like the southern part of city and some squares at the western part of the city have more pedestrian volume while compared to the rest of the city.

Fig. 8. Busiest parts of city in terms
of pedestrian congestion
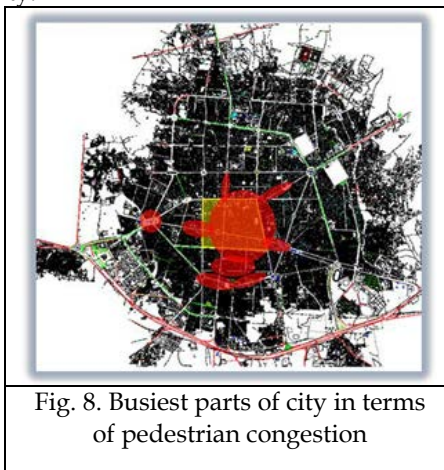
9 CURRENT TRAFFIC SITUATION IN CITY

A survey based on questionnaires was conducted in 2014 with 384 samples and analysed by SPSS software. For transportation trips alone, almost 35 percentage of people use car, 19.5% motorcycle, 15 % use public buses and taxis and 4.5 % are pedestrianized. According to same survey, 83% of respondents are not satisfied with the prevailing vehicle traffic conditions.

The following figure shows the transport movement in most of the major and busiest streets of Sabzevar city.
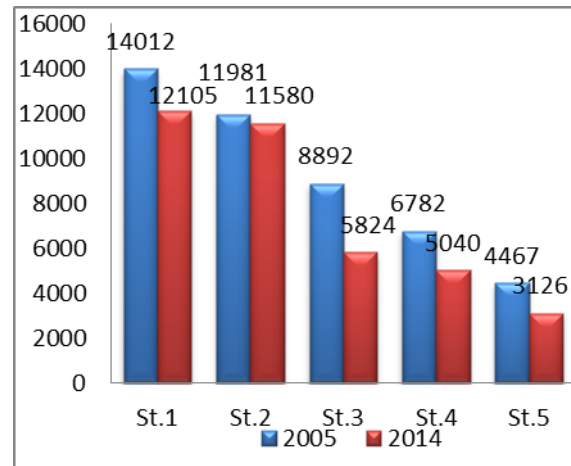

Fig. 9. Pedestrian traffic volume at the busiest streets of
CBD

In the pedestrian volume information made by the municipality in 2005; the pedestrian volume in 2014 (winter) when compared to 2005(spring) has eventually decreased where the analysis shows, even the seasonal changes also affect the volume of pedestrians. In winter, pedestrian volume significantly is lesser than other season.
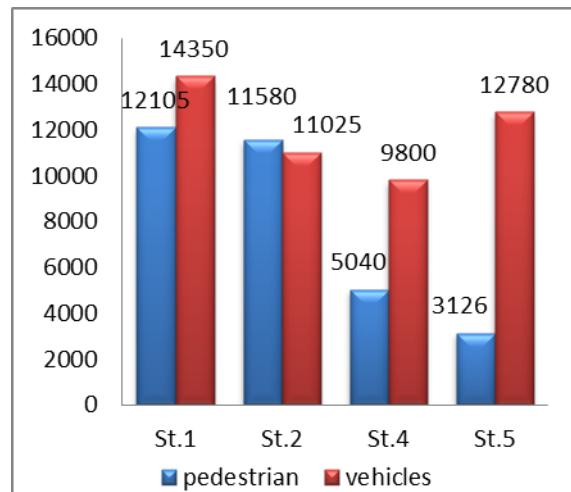

Fig. 10. Compared pedestrian and vehicles volume at the
major roads of CBD, 2014

Analysis of collected data of the traffic composition in Sabzevar city indicates very high share of two wheelers (motorcycle) on the majority roads and the split level of cars is also growing. Also, as it is quite clear, public transportation and pedestrianisa-

tion don't have sufficient share of transport movement in the city and it is one of causes for congestion in streets, especially in the central part of city.

10 VEHICLES PARKING IN CITY

In Sabzevar city, On-street parking is predominant. Vehicles are parked in perpendicular or parallel systems relating to a low width of carriage way and limited space especially in CBD. Existing on-street parking has occupied significant part of roads which results in effective width of carriageway being reduced. The volume has also shown an increase in the major roads and this makes it typically unsafe, unattractive and is inefficient. Combined with the parking cars alongside the traffic lines, this creates a rather unpleasant and often dangerous environment on slow mobility.

In order to bring vitality to the parking spaces in the central part of city, a parking voucher has been introduced in the CBD area during peak hours from 8 am to 2 pm and 4 pm to 9 pm except during holidays. At the beginning, it was piloted in 3 or 4 main streets, today it has been developed in almost all Second Class Arterial Roads and Subsidiary Roads of CBD. But, despite the implementation of the plan, there is a serious parking problem in the central part of city. Thus, it was observed during the physical survey that the card system was not much effective as it was anticipated and it was not able to meet the parking demands holistically in the CBD because of increasing number of commercial activities followed by increased volume of traffic in all important roads in CBD.

11 CAUSE OF ACCIDENTS

Urban transport is responsible for about a quarter of CO2 emissions from transport, and 69% of road accidents occur in cities" (European Commission, 2011, pp. 7, Section 2.4 article 30).

To determine frequent illegal crossings which could cause accidents as pedestrians try to hurry and rush across the road, an analysis was made with the traffic congestion statistics and information of street network. Target was to understand the causes of accidents, which may be related to drivers, vehicles or roads. And also provide services for vehicle users' security through reduction of accidents.

Accident zone
CBD area
Fig. 11. Heavy accident prone zones in Sabzevar city
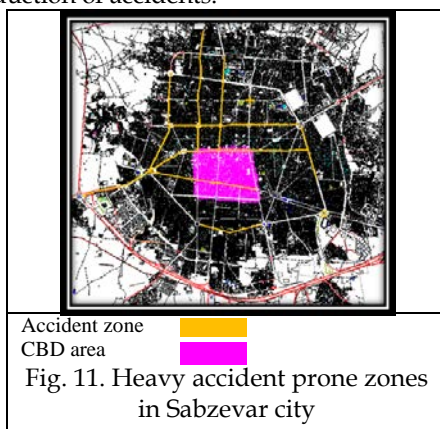
After reviewing the most accident-prone points at Sabzevar city, interview with local experts was made to define the factors which came up as:

- Daily increase in vehicles make up to the excessive vehicle congestion compared to passage capacity in city especially at the central part of the city.

- Lack of sufficient culture to control traffic volume, vehicles move with high speed especially motorcycles and ignore existent traffic rules,

- In north - south axis there is lack of pedestrian road crossing safety due to longitudinal slope and non-existence of appropriate facilities to reduce vehicles speed,

- Reasonable width in some passages like Asadabadi street encourage people to drive with high speed so there is a twist in the movement which decrease accidents

- Lack of facilities to separate pedestrian road crossing and vehicles movement in main passages like Beyhagh.

According to a report made by the traffic department, motorcyclists are causing accidents in Sabzevar city and 4% of those accidents are leading to death. Factors like breaking the law, lack of appropriate culture to use of motorcycle, driving with high speed, spiral movements and etc. are causes to accident.

12 PROBLEMS AND RECOMMENDATIONS

Interesting proposals on how to remove cars from the core of planning and introduce the vision of pedestrians, seeking alternatives from car use and to improve streets design; and finally how to give voice to citizens and listen to their experience in the streets of Sabzevar city especially in central part of city creates better equality between the motorists and pedestrians while not taking much away from them as we know that this city has quite lower street widths.

To create special way for public buses, minimum width of carriage way should be 30 meters and preferably more. Also, special way for bus is justified if more than 60 buses pass every hour. So according to lack of existence of this kind of road in city, implementation of this proposal is impossible.

Central part of Sabzevar city is facing high vehicular traffic congestion due to constrained traffic activities and parking demands (mainly personal vehicles). Even in all streets leading to central area of city there is vehicle traffic congestion..

Urban surrounding and urban mobility can rarely be successfully transformed through a single project, and therefore systemic changes of public spaces have to be based on long-term planning of the city. It is also important that negative effects (e.g. gentrification) are reduced, and that the local population feels part of the project, whereas the refurbishment of pub-

lic spaces has positive effects on them.

The problems have resulted with the first-time appearance of traffic jams, the lack of parking space and further pressure to pedestrian and green zones in middle-sized cities. But, this problem with urban mobility has been more visible with the rise of these actions. Nowadays, both professionals and public are aware that this situation needs some solutions. But, it is very questionable how to improve mobility in the time of scarce financial resources and limited institutional capacities (Pantic et al 2013).

The challenge is to propose 'normally' developed urban fabric, where the most noticeable problems are related with bad management of the open urban space. The special actions and interventions should be addressed to the most problematic issues, such as the general clog of streets by parked cars and informal use of this space by retail. But, the main issue is probably to set all these actions in organised way, to enable the formation of a decent management system and thereby the real support to the adequate network of "smart" types of transport.

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Generally, the creation of a mobility policy for better urban mobility is desirable. But, it should also had to include "soft measure" documents, such as design guidance, the-best practice presentations and the documents with comparison of different experiences and solutions.

13 PLANNING STRATEGIES BASED ON RECOMMENDATIONS:

1. Developing a more sustainable transport mode:

This strategy has its primary focus on promoting efficient use of a shared and limited resource: street space. How we use and plan this resource plays a decisive role in the city's ability to reach its targets for sustainable social, economic and environmental development.

2. Promotion of public transportation:

The planned expansion of public transport will help, but more is needed according to the city's action plans for climate and energy, including

- More lanes for public transport and cycle lanes/cycle paths
- Raised on-street parking charges
- Increased capacity utilization for goods vehicles

Provision of better service to citizens, reduces waiting time,

encourages people to use public transportation and reduces the tendency to use personal vehicle.

3. Strengthening the Institutions in charge of Mobility:

Well-functioning institutions and a high level of political support are essential for creating and maintaining good quality infrastructure and services for urban mobility. Urban mobility is also impacted by parties from outside the transport sector associated with land use, and social and environmental impacts. In developing countries in particular, powerful non-specialist stakeholders can exert influences that seriously undermine efforts at achieving integrated development between urban movement and land use.

Efforts need to be coordinated by a single authority to ensure efficiency through common planning and addressing the area as one, effectively cutting costs on infrastructure development.

4. Integration of parking restriction, public transportation improvements and constructing multi-level car parking:

Shifting from free to cost recovery parking rates can reduce automobile commuting by 10-30 per cent especially if linked with other transportation choices. People will opt for alternatives; delay journey to avoid peak parking charges. Deploy parking innovatively to facilitate shift to other modes. Promote shared and collective parking instead of individual owner parking.

Positioning and multilevel parking construction has an important role in reducing the traffic, saving of fuel, reducing air pollution, the process in accelerating and an act of easing in urban transportation. It is including the assumptions embodied in all hypotheses that the above proposals could restrict parking through constructing multi-level car parking and at the same time improving public transport service. These measures can simultaneously be applied to conduct an effective solution in case of dramatic traffic situations.

5. Promotion of non-motorized transportation:

Non-motorised transport (NMT) modes are an important and integral element of urban transport worldwide to create more liveable communities and cities. They provide healthy exercise and enjoyment. It is a fact that human beings are walking animals. Environments that are conducive to walking are conducive to people. Walking is a fundamental and critical activity for physical and mental health.

Non-motorized transport is the cleanest mode of travel. Walking and cycling do not emit any emissions or pollute while being used when compared to the cars which is economically viable and hence protect participants from heart diseases, obesity and diabetes

A supply-driven approach rather than a demand driven one has to be pursued. Time, speed, costs and flexibility are reasons why people prefer bicycles over a motorbike or public transport.

14 CONCLUSION

Mobility in an urban context cannot be considered in isolation. It has been proven that the morphology of our towns and cities has a profound impact on the way in which people move within and use public space. A greater awareness and understanding of the relationship between spatial dynamics and mobility is crucial for planners and other professions in providing enhanced mobility within urban environments.

In this paper, a study was made for analyzing the necessity of a comprehensive mobility plan for Sabzevar city with reference to the existing land use pattern, roads classification, public transportation, movement pattern, traffic situation, accident zone and an automobile growth rate in city by reviewing the proposals and suggested strategies for Sabzevar city. Therefore, all interventions should respect all elements which are not a problem for development.

The rational solutions, such as elements of integrated street/traffic, will probably be used here. Small projects need to be integrated in the overall strategy, such as the establishment of an extensive non-motorized transport network. Design must also improve cycling infrastructure and enhance safety for all the different categories of motorists. On the other hand, a holistic approach made up of political and cultural interventions, such as strong governance, cultural influence and good design, are fundamental to promote sustainable mobility; with a key role in bringing people together, enhancing the environment and securing a better quality of life.

REFERENCES

[1] Ministry of Urban Development, India, Preparing a Comprehensive Mobility Plan (CMP) – A Toolkit (Revised), 2014, institute of urban transport (India), http://moud.gov.in/upload/uploadfiles/files/CMP%20Report%20Revised.pdf

[2] Draft Final Report - July 2009, Comprehensive Mobility Plan for Chandigarh Urban Complex,

[3] Aly Hassan, Mohamed Maher Shahin, Desember 2011, Area traffic capacity in centeral areas – Alexandria city center as a case study, http://www.sciencedirect.com/science/article/pii/S1110016811000706

[4] Bertolini, L., and Clerq, F L. (2003). Urban development without more mobility by car? Lessons from Amsterdam, a multimodal urban region. Environment and Planning A. 35, 575-589.

[5] United Nations Human Settlements Programme - UNHABITAT (2013a) Planning and Design for Sustainable Urban Mobility: Global Report on Human Settlements 2013. Oxon: Routledge

[6] Jaipur development authority, COMPREHENSIVE MOBILITY PLAN FOR JAIPUR, Wilbur smith associates

[7] Ehsan Amimi. Dr.B.Shankar, 2017, Strategies for Pedestrianizing Central Business District of Sabzevar City, International Journal of Engineering Trends and Technology (IJETT) – Volume 46 Number 5 April 201,

[8] Climate works foundation, 2011, Review of comprehensive mobility plans, final report, New Delhi

[9] Pantic M, ilic Z, Depolo V 2013, 'Social Impact Assessment in the Large Transportation Projects - Case Study of the Belgrade Metro Project'. In Martins N, Rubonjoni Z, Popović M, Grubišić M, Blečić M, Tadić M, Rye T, Macario R, Plevnik

[10] A, Evmolpidis Y, Rupprecht S & Colaco V (Eds): Sustainable Urban & Transport Planning – SUTP 2013 – Proceedings, UNDP Serbia: Belgrade.

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