

Strategies for Pedestrianizing Central Business District of Sabzevar City

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ABSTRACT: Walking is increasingly gaining importance and it is one of the oldest modes of transport between places. Every one prefers to walk as some part of every trip. However, walking has generally received little attention while planning, designing, and developing commercial areas in cities. Pedestrian movement is considered to be one of the important factors in urban planning and movement pattern of transportation system. Due to increase in number of vehicles in the CBD, the pedestrian movement has greatly affected the lifestyle of the people. While, pedestrian have significant role to economic boom, vitality and freshness of CBD area, that are faced to reduce pedestrian volume compared to vehicle volume which has increased. Besides, it is imperative that more attention to identify factors that are cause to increase pedestrian volume in CBD. The paper attempts to assess pedestrian movement pattern in the central area of Sabzevar City and propose strategies for pedestrianizing the Central Business District.

Keywords: Pedestrianizing, walking, Pedestrian Zone, Side-walk, Land Use

I. INTRODUCTION

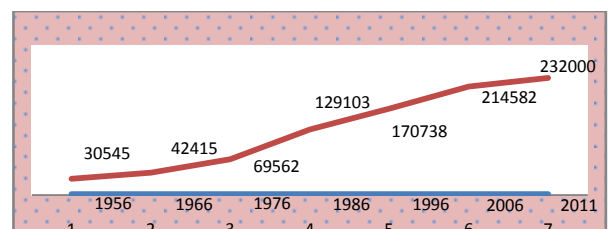
Walking is the most vital mode of transportation upon which all societal activities depend. As a transportation mode, walking offers predictable travel times; continuous availability; ubiquitous and easily maintainable routes; reliable, free, non-polluting, non-energy-consuming service; and, for many, healthful, relaxing exercise [1]. The pedestrian mode is gaining recognition as a basic building block in urban system design [2]. Walking is an effective means of internal transportation for short trips. With the exception of cycling, walking is the only means of human movement by which one can dramatically experience the sensory gradients of sight, sound, and smell that define a place. Providing walkable environment in cities has increasingly become more desirable, as they can increase property values and streetscape vibrancy. More walkable may encourage physical activity, stimulate local economies, and lessen environmental detriments caused by vehicular emissions [3]. Citizens in any liveable community tend to increase the amount of time they spend walking to do their work. Walking

as a part of popular form of physical activity is losing its weightage or priority or importance in Sabzevar due to absence of adequate and well developed sidewalks and footpaths and its infrastructure in almost all roads of central area coupled with high volume of vehicular traffic in major roads. Sabzevar, as a developing city continuously has been increasing importance for pedestrianizing the central area with the ever increasing retail commercial and recreational public spaces. The paper discusses the issues of pedestrian movement and proposes strategies for pedestrianizing the Central Business District of Sabzevar city.

II. BACKGROUND OF SABZEVAR

Sabzevar city is the second largest city in Razavi Khorasan province of Iran. The city is located at distance of 220 kms from Mashhad as province capital and 645 kms from Tehran. According to Census 2011, the city had a population 232000. It is located at longitude 57°43' and latitude 36°12' and surrounded by two mountain ranges at north and south. The city is known for academic, cultural, and historic centers in North Eastern Iran and it has good relational position and historical context. The population of Sabzevar has grown at the rate of 3.34 percent during the decade between 1956 and 1966; the rate has been increased for the decade 1966 to 1976 at 5.07 percent. The population growth rate for the decade 1976-86 was 6.83 percent. The population growth for different periods of city is depicted in the fig.1.

Figure.1: Population of Sabzevar City from 1956 to 2011



Source: Statistical National Centre of Iran, 2013

III. CENTRAL BUSINESS DISTRICT

The central part of city has a traditional tissue and the older part of the city built with narrow streets which were constructed 50 years ago. The Central Business District (CBD of Sabzevar city has an extent of about

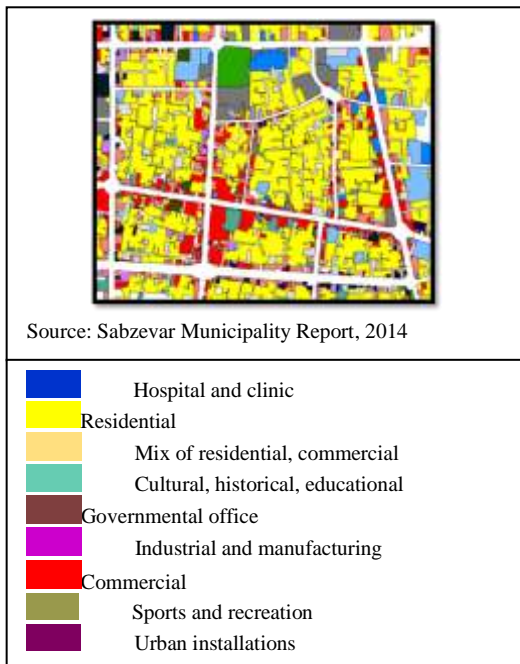
781,000sq.mts. The land use in CBD accounts for 46.69% residential followed by roads network 23% and commercial land use 15.21%. The rest of the area is devoted to sports, green space and cultural activity and recreational space as well. The CBD has major trading centres and business units, financial institutions and credit offices like banks, hospitals, religious sites, companies, law offices which attracted vehicular traffic and these roads experiencing heavy volume of traffic which affected the speed of the vehicles during the peak hours.

Table 1: Land Use of Central Business District -2010

Land Use	Area Sqmts	Percentage	
Residential	364649	46.69	
Commercial, service, private office	118790	15.21	
Public	Educational	94501	12.1
	Healthcare		
	Military		
	Sports		
	Administrative		
	Hospitality and Tourism		
	Cultural		
	Historical cultural		
	Religious cultural		
	Warehousing and transportation		
Urban equipment and facilities			
Bare land			
Green space	14839	1.9	
Industry	8591	1.1	
Roads and Networks	179630	23	
Total	781000	100	

Source: Municipality Report of Sabzevar City, 2013

Fig. 2: Land Use Pattern in Central Business District 2010

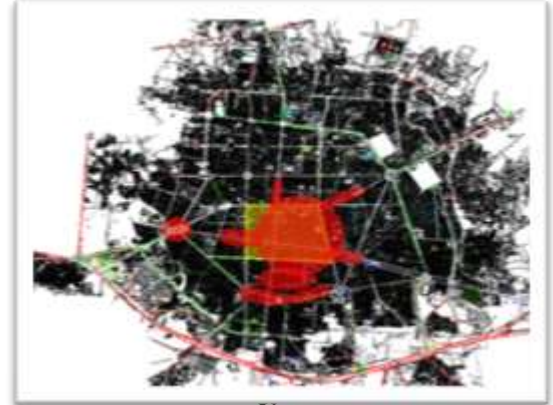


Source: Sabzevar Municipality Report, 2014

IV. PEDESTRIAN MOVEMENT

People walk in groups, two to four people together. Pedestrian density depends on land use pattern. Pedestrian movements are not uniform and homogeneous. There is a significant level of pedestrian volume due to high intensity land use pattern causes pedestrian congestion in CBD particularly on southern and western part of Sabzevar (see fig.2).

Figure 3. Pedestrian Congestion in Central Area

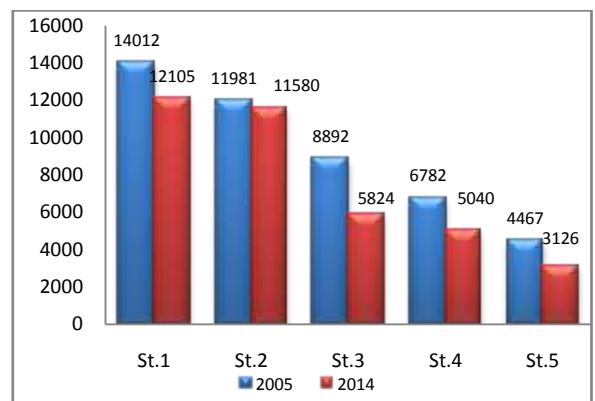


V.

VI. PEDESTRIAN VOLUME IN MAJOR ROADS OF CBD

Walking is one of effective means of internal transportation for short trips in CBD. Due to existence of attractive places in CBD, there is more pedestrian volume when compared with other parts of city. A pedestrian traffic volume count was undertaken by the researcher on five major roads on both sides of sidewalks in CBD in 2014. At each point a person was deployed to collect the number of pedestrian movement from 8 am to 1 pm at the busiest working hours and from 5pm to 7 pm, during the busiest time of shopping.

Figure.4: Pedestrian Volume in Busy Streetsof CBD in Sabzevar



The pedestrian volume in 2005 is greater when compared with 2014 in spring, but the volume has reduced. In winter, the pedestrian volume significantly becomes lesser than other seasons and thus changing seasons also affect the pedestrian volume.

VII. LEVEL OF SERVICE OF SIDEWALKS

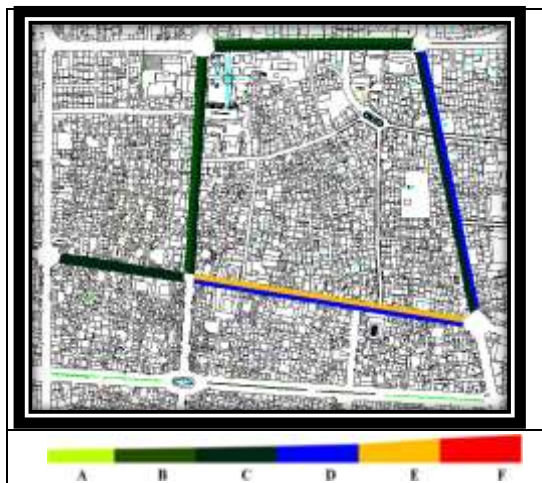
Level of Service, is a qualitative assessment which describes the traffic operations and understanding of the situation by users. It assesses the service level, and then rolls up to evaluate and determine the density to facilitate the sidewalks. Levels of Service depend on factors like speed, travel time, freedom of manoeuvre and sidewalk safety. Service levels are classified into six categories from A to F. So that level of service A represents the best conditions and level of service F represents worst traffic conditions. The level of services of different streets in CBD is depicted in table 2.

Table 2: Pedestrian Movements in Busy Streets of CBD

Street name	Width of sidewalk (m)	effective width (m)	Service level
South sidewalk St.No.1	3.85	1.95	C
North sidewalk St.No.1	4	2.1	E
West sidewalk St.No.2	3.5	2.6	C
East sidewalk St.No.2	3.7	2.8	C
South sidewalk St.No.3	3.95	1.8	C
North sidewalk St.No.3	4.05	2.3	C
West sidewalk St.No.4	4	2.2	B
East sidewalk St.No.4	4.2	2.35	C
South sidewalk St.No.5	3.9	3.05	C
North sidewalk St.No.5	4.1	2.9	B

Source: Municipality Report

Figure 5: The Pedestrian Level of service on Five 5 streets of CBD

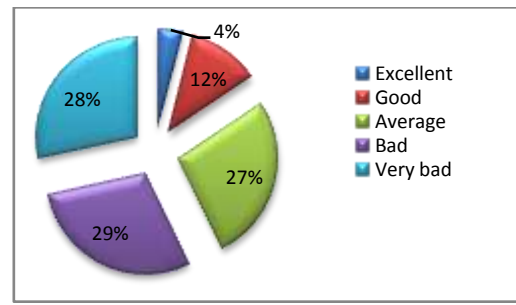


Taking consideration of the walking patterns, during different times of the day (morning/afternoon) analysis of pedestrian traffic volume shows that pedestrian flow is greatly affected by the land-use patterns. Fig.5 depicts that in these streets there is significant pedestrian volume due to the presence of the main market, some religious places and most of the health clinics. Thus, during evening (shopping time) the streets tend to increase the pedestrian volume.

The opinion of the people on sidewalk was obtained from primary survey and about 29 per cent people have expressed that the condition of the sidewalk was very

bad followed by 28 percent is bad condition, and 27 percent is average condition and rest 16 percent of people have good opinion.

Figure 6: Conditions of Side Walk

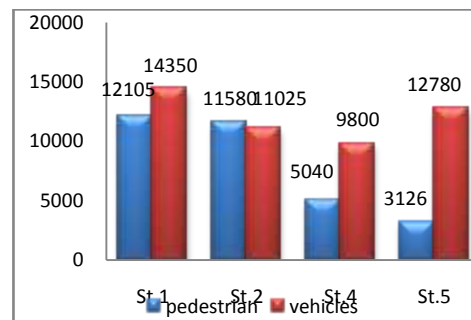


Source: Opinion survey result of 384 people, 2014

VIII. TRAFFIC SITUATION ON MAJOR ROADS OF CBD

The vehicular traffic in Central Business District comprises of vehicles viz. private cars, motorcycles and public vehicles such as bus, minibus and taxis creating congestions due to the lack of a separate lane for public vehicles. According to 2009 report on traffic congestion, one-way lanes improve vehicles speed at the four busiest streets of CBD. There is a special lane in the opposite direction of one-way lane for emergency services. All the streets contain sidewalks with standard width, although the part of its width occupied by vendors. Thus giving rise to high pedestrian volume. The comparison between pedestrian and vehicular volumes on important roads of CBD is depicted in the fig. 7.

Figure 7: Pedestrian and Vehicle Volume on major roads of CBD, 2014



IX. PEDESTRIAN MOVEMENT IN IMPORTANT STREETS IN CBD

A) Beyhagh Street (St.1)

Beyhagh is one of the oldest streets of CBD where the city originates. It is one of the most important, one ways running west-east axis in this region. The street is not only the main commercial street but also accommodates numerous heritage architectural monuments along some important religious-cultural places. The oldest including monumental buildings of the city are located in this street; therefore it has an old unique architectural character to its location in terms of

function and material which has been attracting people by walk.

B) Kashefi Street (St.2):

Kashefi, St.2 is also busy like Beyhagh, St.1 and it is one of most important commercial streets. According to the pedestrian volume count, peak hour is during mornings are from 11:30 am to 12:30 pm and 17:30 pm to 18:30 pm. The main purpose to travel during morning hours is for schools, offices and cultural centres and in the evening for shopping and medical affairs.

Fig 8: Kashefi Street



C) Asrar Street (St.4)

Asrar Street is a north-south route that connects the north traffic to Beyhagh junction. Unlike other streets of CBD, this street does not have a commercial role and in fact its main function is to carry the north-south traffic as being the oldest north-south line and being home to many banks, offices, amphitheatres and other public spaces. On the northern side, it is attached to Hakim square and southern side it reaches to Beyhagh junction. It is a one-way street and since has many offices housed on this road, the street has crowded during the working hours. The street does not have heavy pedestrian traffic after working hours but vehicular traffic remains the same throughout the day since it is an important connecting bridge to the central part and south of city.



Fig 9: Asrar Street

Figure 10: Asadaabadi Street

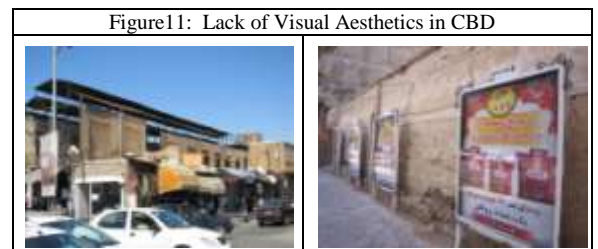
D) Asadaabadi Street (St.5)

This street is a one-way axis from east to west carrying the traffic load to the main lanes and feeds the CBD network. Despite of being present in CBD, this street does not have many commercial buildings, but it has many public offices to include Main Judiciary, Municipality, Hospital, Schools, Pharmacies, Medical Sciences department, Civil Registration and City Council offices. The pedestrian movement is limited to

working hours and during evening as it acts more as carriage than a place to walk or to shop.

X. ISSUES AND PROBLEMS

a) The streetscapes of CBD areas, especially in the busiest streets viz. Beyhagh and Kashefi streets are not adequate to meet the present day challenges and community aspirations in terms of greening and design of street furniture, paving etc. Lack of existence of visual beauty is a common problem at the major streets of CBD. The commercial facades are very simple but non-homogenous. Main elements of streets are not conducive for attracting pedestrians.



b) Existence of many governmental and non-governmental departments, banks, financial institutions occupy on major streets of CBD, which attracting people from different parts of the city for public works and these areas have not been made pedestrian friendly by necessary infrastructure including visuals and aesthetics. Many a times the entry to these public is restricted after the office hours. One of a reason that is effective to non-enjoyable and lack of beauty visual of streets. Especially after working hours that the public places remain closed.

c) Sidewalks are mainly occupied by shops owners, hawkers and urban facilities including street infrastructure that have been installed by the authorities which reduced the effective movement of pedestrians. At some points, the sidewalk surface has not been maintained properly by the municipality and pedestrians are facing difficulties to walk footpath, which encourages them to walk on roads. The Sidewalks are not disabled friendly (see. Fig. 12)

Figure 12: Barriers on Sidewalks



d) All the five streets do not have appropriate lighting as a result inappropriate public lighting for pedestrian areas which is greatly affecting on non-facilitation of smooth traffic flow, non-promotion of business activities and public interactions during the night hours and also on personal security.

XI. PROPOSALS AND RECOMMENDATIONS

The following strategies have been proposed for pedestrianizing the central business district of the Sabzevar City.

- a) Revitalizing the city core by transforming into commercial-cum-recreational areas by shifting government and non-government offices that are located on Beyhagh, Kashefi, Asadaabadi and Asraar Streets which are working during working hours away from CBD as a transfer and change of land use.
- b) Pedestrian Zones to be identified in the Master Plan for enhancing the public spaces and encouraging priority for pedestrian movement in the CBD.
- c) Development of pedestrian strategies by making all public places and spaces as barrier-free; high priority for safety of pedestrians and high quality design that creates a positive experience for everyone who walk in the CBD.
- d) Pedestrian Friendly Street Guidelines to be developed: A street needs to be attractive. Besides accessibility and safety, streets are places to be enjoyed, people should love to stroll and do their daily chores by walk. They need to be planned and designed to accommodate all modes of transportation. But pedestrian-friendly streets to be designed with pedestrians as a high priority. Streetscape design and street improvements are two of elements for pedestrian –friendly streets.
- e) Pedestrian priority, street lights, signages and other design considerations to be adopted while designing a streetscape for adopting a pedestrian oriented street lighting policy, street tree strategy and supporting attractive landscaping, paving materials and high quality design features.
- f) Improving the footpath network by providing sidewalks with high level of service and infrastructure appropriate to the urban road hierarchy for increasing the pedestrian volume.
- g) Promote walking as active and environment friendly mode of transport amongst citizens.
- h) Pedestrianization of Identified Streets: Promoting full-time pedestrian friendly that can bring about the most significant improvement in terms of pedestrian safety and mobility as well as streetscape enhancement to encourage people to walking in CBD of Sabzevar city.
 - Shariatmadari is one such Commercial Street in city. Located at the busiest part of CBD. It is too narrow for vehicles to move. The existence of 300 commercial units in this street and the proximity to key places has great potential to be a full time pedestrian zone.

Figure 13: Suggested Full-Time Pedestrian Street in CBD- Shariatmadari



- i) The other pedestrian measures are to be adopted are:
 - [1]. provide clear wayfinding to encourage people to explore the CBD
 - [2]. improve existing and create new pedestrian crossings for enhancing links between key activity areas
 - [3]. improve pedestrian permeability along narrow roads;
 - [4]. pave footpath surfaces fully to create a consistent overall theme.
 - [5]. maximise shade on all footpaths through the use of street trees;
 - [6]. pedestrian crossings to be made highly visible,
 - [7]. widen footpaths at corners of intersections to narrow the road carriageway widths and
 - [8]. Incorporate street furniture elements including bench seats, rubbish bins, bollards, balustrades, bike racks, street signs, street lighting
- j) Encouraging people to walk by changing attitudes and behaviour for ensuring to make walking the top of mind choice by creating pedestrian-friendly built environments, streets and public spaces and integrating walking with public transport.

XII. CONCLUSION

Pedestrian movement is considered to be one of the important components of urban transport system. The Central Area of Sabzevar city is attracting people to from within the city and surrounding region for its commercial and institutional establishments. There has been increasing importance for pedestrianizing the central area with the ever increasing retail commercial and recreational facilities. The strategies for improving pedestrian facilities are need of an hour. The pedestrian strategies to include encouraging people to walk, and creating pedestrian zones, providing pedestrian infrastructure facilities and adopting pedestrian friendly approach could solve the problems of Pedestrian movement in the Central Business District of Sabzevar city.

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BIOGRAPHIES



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