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Benefits of pedestrianization and warrants to pedestrianize an area

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ABSTRACT

With the rapid increase in numbers of private vehicles on the road, many transportation related issues like congestion, crashes and injuries, pollution, noise etc. have grown very rapidly. Urban settlements like core CBD and heritage town, which were planned for NMT and pedestrians, are worst affected. Environment, in such areas, has degraded to the extent that people do not wish to visit these areas anymore. On another hand, these areas have very significant role in economy and identity of the city. Due to unavailability of space and socio-economic system, only feasible way to upgrade mobility and environment in such special areas is to pedestrianize them. Pedestrianization of the congested street is a very effective, low-cost and sustainable solution. Other than congestion reduction, Pedestrianization has numerous benefits. These list of benefits can be used to advocate Pedestrianization of any street. It can also help in estimating the cost to benefit ratio of such schemes. The first part of this paper summarize various benefits of Pedestrianization from the experience of Pedestrianization scheme around the globe and various researches conducted on its impact. These Benefits can be separated in various categories based on impacts on Transportation, Society, Environment, Economics, and Health. The second part of the paper list down various warrants that can be used as the indicators for the need of Pedestrianization in an area. These warrants can also be used as justification to pedestrianize an area. This paper will help various urban policy makers, land-use and transportation planner, environmentalists and citizens etc. in decision making to solve various urban issues related to transportation.

1. Introduction

With the rapid increase in a number of private vehicles on the road, many transportation related issues like congestion, crashes and injuries, pollution, noise etc. have grown very rapidly. Urban settlements like core CBD and heritage town, which were planned for NMT and pedestrians, are worst affected. Environment, in such areas, has degraded to the extent that people do not wish to visit these areas anymore. On another side these areas have very significant role in economy and identity of the city. Due to unavailability of space and socio-economic system, only feasible way to upgrade mobility and environment in such special areas is to pedestrianize them. Narrow streets, low car ownership (due to lack of parking space), high population density, mixed land-use and small size of trip length creates a favorable environment for Pedestrianization in such areas. Pedestrianization of congested area and commercial streets has been implemented in many cities around the world for a long time. The policy of Pedestrianization has also been adopted by many Asian cities in the last 20 years e.g. in Japan, Singapore, Shanghai, and Beijing etc. There must be a lot of benefits of Pedestrianization that attracted town planners and policy makers around the world. But whenever a street is about to get pedestrianize, there is huge opposition from businessmen having shops on those streets. Most of the times, it becomes impossible to justify the policy of Pedestrianization. The argument often put forward by retailers that their customers need car access (presumably in order to carry the goods home), is simply not correct (Kumar and Ross, 2006).

1.1. Objective and research goal

The goal of this paper is to list down various benefits of Pedestrianization from the experience of Pedestrianization scheme around the globe and various researches conducted on its impact. Another objective of the paper is to list down various warrants that can be used as indicator and justification for the need of Pedestrianization in an area. This paper will help various urban policy makers, land-use and transportation planner, environmentalists and citi-

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zens etc. in decision making to solve various urban issues related to transportation.

1.2. Concept of pedestrianization

Cambridge dictionary defines Pedestrianization as "to make an area into one where vehicles are not allowed to go". Hence, Pedestrianization is to convert (a street) into an area for the use of pedestrians only, by excluding all motor vehicles. "Car-free" space or city is another popular term. An area cannot be pedestrianized in isolation. It is always coupled with improvement and creation of effective and sufficient public-transportation facilities, pedestrian infrastructure and non-motorized transportation (e.g. bicycle) infrastructure. Absolute Pedestrianization is not possible in real world. Compromises have to be made in order to continue with proper functioning of urban system; for convenience of public and various government authorities and to make Pedestrianization scheme acceptable and popular among citizens. For example emergency vehicles like ambulances, police, fire-fighting trucks etc. must be allowed to enter in a Pedestrianized area. Similarly Public buses like urban transportation and school buses must be allowed to pass through pedestrianized area. If a pedestrianized area is having commercial activities, delivery vans and freight trucks must be allowed. Similar nature motorized transportation can be given permission. This permission can be time bound e.g. freight can be allowed for limited and fixed time period in non-peak hour or night. Streets to be used by these permitted vehicles can be predetermined. There are lot of ITS solutions and electrical systems are in market that can allow only permitted vehicles to enter an area and block others. Based on level of compromises there can be three types of pedestrianized area as following:

1.2.1. Full-time pedestrianization

Pedestrians have absolute priority. Vehicular access is restricted to emergency services only but service vehicles may be allowed in specific period, for selected locations.

1.2.2. Part-time pedestrianization

vehicular access is only allowed in specific periods. In order to minimize vehicular access to the area, there is no on-street parking space. However, loading bays are provided for loading and unloading purposes.

1.2.3. Traffic calming

Footpaths are normally widened and on-street parking spaces are reduced as far as possible. Taxi stands and green minibus stands are only provided if relocation is not practical. There is no restriction to vehicular access. However, vehicles are slowed down through the use of traffic calming measures, such as speed tables, curb build-outs, sharpened corners, road narrowing, gateways, etc.

2. Benefits of pedestrianization

The most common positive impacts of Pedestrianization can be categorized into following five categories:

- Transportation related
- Social
- Environmental
- Economic
- Health related

3. Transportation related benefits

3.1. Mobility & accessibility improvement

In most of the cases, poor access for pedestrians in an area is due to improved access for the car and other personated vehicle users (Ravetz, 1980). Hence, banning cars and other personalized vehicles must result in improvement in mobility and accessibility for sustainable mode users. The safer, more favorable and more enjoyable environment for personalized vehicles like cars result into the low levels of walking and cycling (Kumar, 2006). When the pedestrian-friendly area is created, Pedestrian traffic has a tendency to increase dramatically (TEST, 1989). The pedestrians get more space to walk in pedestrianized areas as compared to other areas, which allows them to walk with desired and most comfortable speed. TEST (1989) research proves that the number of pedestrians tends to double after a pedestrian friendly area is created and the physical environment for pedestrians radically improves after Pedestrianization. Pedestrianization makes an area more accessible for all and mobility of all users improves significantly. In locations like Chandani Chowk (Old Delhi, India), where pedestrians, NMT users and transit users have high mode share, mobility and accessibility improvement is maximum.

3.2. Reduction in car use, congestion & parking need

Very high motorized-vehicle friendly infrastructures with lavish parking amenities, wide roads, and flyovers etc. serve as a catalyst for increasing car dependency (Poboon, 1997). Pedestrianization discourages motorized-vehicle friendly infrastructures and facilities that results into discouraging car dependency. If the walking distance to the public transport stop is further than to where the car is parked, the average human being will use the car (Knoflacher, 2006). In such areas, public transport gives tough competition to cars. Cars no longer provide last mile connectivity. Parking is now as far as a bus stop or more. Hence, a large number of visitors shift from private to public transport. It leads to reduced car use, hence decreases parking needs.

3.3. Increase public transport & NMT use

The pleasurable shopping experience, safety, improved air quality and low noise levels attract customers to pedestrian commercial streets (Newby et al. 1991; Forest, 1981). This attraction makes them shift mode from personalized vehicle to transit or NMT. Pedestrian count (volume) is the most recognizable indicator of Pedestrianization scheme success (Hall and Hass-Klau, 1985). In research of Monheim (1980), it was concluded that the biggest pedestrianized areas, among studied cities, showed the largest increases in pedestrian traffic. TEST (1989) research concludes that public transportation usage increased in all cities and as a result, car usage became constant or decreased. For example in Vienna, when a comprehensive Pedestrianization design was executed, the city experienced a 34% growth in railway transport usage and a 53% increase in bus travelers (TEST, 1989). US Department of Transportation (1994) research shows that the number of travelers who drive alone changed their habits due to Pedestrianization. Roughly 30% of these travelers were ready to shift to a different way of transportation if appropriate pedestrian and cycling facilities were provided.

3.4. Road crashes & injury reduction

Urban congestion is in such condition that pedestrians are regularly sufferers of crashes. The main cause behind pedestrian crash and fatality is interaction and conflict of pedestrian and