

A Detailed Study on Car-Free City and Conversion of Existing Cities and Suburbs to the Car-Free Model

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Abstract

Manufacture and use of cars are increasing day by day. This is creating environmental, social and aesthetic issues that we never imagined in last few decades. These problems force urban planners to think and design the cities which will work without cars. The transformation of existing towns and outskirts to car-free model is possible by providing better and faster public transport, better biking and by increasing density and reducing street width. Car-free development will help in reduction of traffic generation and parking problems, improvements to the urban environment and economy of government. This paper defines Car-free related terms. After describing the problems caused by the Cars, this document discusses alternative means to resolve those problems regarding replacement of cars by introducing the rapid economic, public transport. Design standards are also explored to make a city, Car-free. In a later section of paper, its major focus is on the methods of conversion of existing cities into the Car-free model. Four Indian cities viz. Pune, Mumbai, Hyderabad and Bangalore have already taken initiatives to promote the Car-free movements by various means. The paper discusses popular Car-free places and their character. There are some objections to the Car-free model like Congestion, Noise, Mixed uses of land and, of course, the people's love towards their cars, which elaborated in the later section of this paper. This review is expected to be helpful to planners for alternative means to release some major issues caused by cars.

Keyword- Car-free, Conversion, Densely populated neighbourhoods, Public Transport

I. INTRODUCTION

Car-free cities are those cities, where cars or the use of cars are put aside of usage on city roads. People pursue the habit of moving around using cycling, walking and public transport. Citizens avoid the use of motorbikes, scooters, vans and lorries also. The only liberty to vehicles is for the manoeuvring of heavy goods (but they must travel slowly and give side to pedestrians first) and the emergency services. Car-free cities offer citizens a much better quality of life, despite the danger, pollution and noise that car bring.

A car-free city is in the centre of a population which depends primarily on facilities of public transport, walking or cycling for movement within the urban area. Car-free cities highly decrease the petroleum dependency, automobile crashes, noise pollution, air pollution, GHG emissions, and traffic congestion to a considerable extent. Some cities have one or more areas referred as Car-free zones where motorized vehicles are not allowed. In Europe, Asia, and Africa many elder cities are in existence since centuries before the origin of the automobile, and some cities had continued to have car-free areas in the oldest parts of the city - especially in areas where it is impossible for cars to fit mostly due to narrow alleys.

II. BACKGROUND

Up to the start of the twentieth century, almost all cities were car-free. The Roman Empire put restrictions on horse-drawn carts to reduce noise in many central districts. Vehicles with wheels were not allowed to move in the daytime on the streets of Rome (Lloyd, 2005). From the time cities first appeared some 10,000 years ago, until the mid-nineteenth century the conceptual "walking cities" best described the nature of urban structures (Newman P., 1999). During this period, high densities, mixed land use, and narrow streets that allowed access principally by pedestrian means were among the predominating character of cities. Around 1860, the first train appeared which allowed city expansions along rail corridors and thus giving rise to the "transit cities" (Newman P., 1999). By around 1930, the "automobile cities" came into existence along with the ensuing lower-density suburbanization and longer-distance travel between home and workplaces (Newman P., 1999). The latest concept of "car-free

cities” development owes its invention to research during the 1960s and 1970s which emphasized the high environmental and social costs of uncontrolled automobile usage. Following are some of the terms related to the word “Car-free”.

- 1) Car-free city: a city where a ban on motorised vehicles from all parts of the towns is in practice with only a few possible exceptions such as emergency vehicles.
- 2) Car-free shopping street: Pedestrianized mall street which focuses on commercial activity; motorised deliveries may still be allowed during off-peak hours.
- 3) Car-free historical centre: A historical area which bans motorised vehicles.
- 4) Car-free housing: Residential area with a restriction on motorised vehicles and, in some cases, restricting the ownership of motorised vehicles.
- 5) Car-free day: Special day providing an experiment with the car-free living; citizens avoid vehicle usage either in the entire city or just in selected zones.
- 6) Car-free lifestyle: Term used to describe persons who individually choose to live without the use of motorised vehicles, even if they live in a car-dependent area.

III. PROBLEM AND STRATEGY

For improving urban mobility industrialized nations used the automobile as an instrument that became the terrible mistake in after decades. The car caused the major unanticipated consequences for urban life regarding environmental, social and aesthetic issues in the cities. The different problems of an urban automobile are it kills the street life of the city. It separates people, encourage suburban sprawl and risk other street users. Not only that, but it besides mess the city's beauty, disturbs people by noise, creates air pollution, and slaughters thousands of people and animals every year. It also adds of worsening the global warming and wastes energy and natural resources. The major challenge for the urban planners or transportation planners or traffic engineers is to replace cars and trucks from cities in such a way that mobility is not disturbed in general, however; costs are also not compromised.

If a better alternative to the urban automobile is available, then and then only private cars can be replaced. The city designed to work without cars is a complicated and a challenging task. People’s behaviour will play a significant role in that, and the city should make social, economic, and aesthetic sense.

Public transport is typically an unpleasant and slow replacement of the car. It requires becoming an enjoyable experience and should achieve the average speed of a car in light city traffic. It can be achieved using advanced technology, but densely-populated neighbourhoods are essential for this option of rapid mobility and further to obtain economically viable low-cost public transport. Fortunately, dense cities can also offer a high quality of life.

The planners must think about the creation of more and more car-free cities. Venice of Italy, a largest existing example of a car-free city which is loved by almost everyone and is a haven of peace despite being one of the densest urban areas on earth. It accommodates 8, 46,962 persons (as per 2011 records) with a population density of 340 persons per square kilometre. Conversion of existing cities to the Car-free model is also possible over a period of decades. Below image shows an interesting comparison of intersection per unit square mile of the city area. Laurence emphasises on a smaller size of neighbourhoods to make citizens, walk (Aurbach, 2010). Importantly in Venice, cars are seldom used.

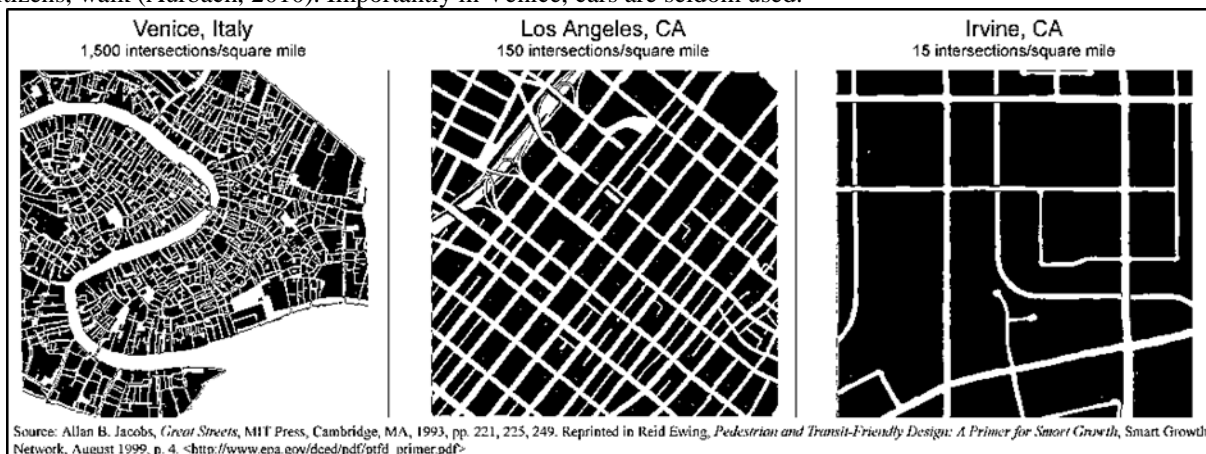


Fig. 1: Street-maps (partial) for cities of Italy and USA
Source: (Aurbach, 2010)

IV. DESIGN GOALS

Four of unique and principle needs drive the plotting of car-free city: (1) High standard quality of life, (2) Efficient and sustainable use of resources, (3) Faster transport of people and goods; and (4) Design Standards.

The fulfilment of the above needs in a car-free city gives rise to the following design standards:

A. Rapid Transport

It should provide fast access from and to all parts of the city. For example, in a town of one million population, it should be possible to reach anywhere in the city in minimum time. Travellers should never have to move more than once or at a maximum, twice.

B. Nearby Stations

Nearby transport needs halts. Both in consideration of time and the limited mobility of small children, the elderly, and the infirm. The design standard suggested is a five-minute walk.

C. Nearby Green Space

The Green space is also an essential function of the design standard. It should be available on the five-minute walk from almost every front door.

D. Four-Story Buildings

All buildings should be limited to four stories because the higher height of buildings will appear to be dangerous and add risks of a different kind to residents.

E. Economical Freight Transport

Every city's economies depend on the fast, economical freight transport. So, a city that plans to keep trucks off its streets must make appropriate provisions for freight transport to ensure adequate economic activities.

V. CONVERSION OF EXISTING TOWNS AND AREAS INTO CAR-FREE REGIONS

Following are considerations that devise methods for converting existing cities and suburbs to the car-free model.

A. Gradual Implementation

Besides many workers and residents who choose to walk or cycle to their destinations, almost any car-free conversion demands some form of public transportation for a part of travel within the city. People need a comfortable, frequent and reliable service. A conversion should start at the locations that are already relatively well served by rail or bus services. It is governing principle that as soon as good cycling infrastructure is in place, the area can be called-off for car-free movements. Public transport should not be distant than a five-minute walk, and suitable arrangements for freight delivery needs to be in place. The important consequence is that the route of carriage system must permit reasonably quick, easy and direct service to all substantial portions of the city.

B. Incentives to Reduce Car Traffic

One of a measure that authorities use popularly is to make a car travel much annoying and mentally disturbing that citizens consider taking public transport, bike or walk instead. Some cities like Groningen in the Netherlands have divided the city into several zones. The Netherlands have state-of-the-art bicycle policy, practice and infrastructure already in operations. Private cars are not allowed to move directly from one zone to the another. The car drivers must go all the way out of the city, around the ring road, and then back into destination zone. Buses and cyclists can move freely between the zones. Due to this mechanism, car traffic in the city centre is lessened to a larger and considerable extent.

C. Better Public Transport

In most of the places today, public transport is termed a service for second-class citizens commonly. It is a must requirement that the public transports becomes a first-class service and serve citizens of all class from the society. It must be safe at night, operated by professionals, clean, reliable and in time.

D. Faster Service

Service of public transport must become faster than it is today in most of the places. Ideally, it should be more rapid (30 kmph at least) within core city areas so as citizens opt to take public transport than private drive. It specifically motivates citizens to give up their cars.

E. Better Biking/ Bicycling

The cycling improvements are quite obvious to make a car-free model. All allied infrastructure needs to be designed for specific requirements of a cycle. For example, the sewer drains and inlets thereof need should not trap the wheels of a cycle. Potholes require fixture correctly. Good cycle racks are needed. In substantially populated parts of the city, multi-storey cycle parking garages may be necessary.

F. Increase Density and Reduce Street Width

To encourage the high quality of public transport, most of the towns will require increased population densities near transport halts. In some cities like Manhattan and Hong Kong, the population density overreaches by a significant margin against the

density needed for a safe public transport. Hence, buildings will have to be built multi-storied, and streets will have to be made narrower. These actions can increase enough density while also release some land for green space out at the edges.

VI. INDIAN CASES OF CAR-FREE DEVELOPMENT

A. Pune

Walking Plazas, M. G. Road, Pune is a very successful case regarding Car-free development. In this area, the shopkeepers and merchants have initiated procuring shops on the pedestrian friendly street. However, the Pune Cantonment Board was forced to close down the walking plazas due to the terror attacks of 26/11 in Mumbai, which put this area also into the issue of safety. However, the authority is making efforts to bring this area to a Car-free zone as earlier.

B. Mumbai

Mumbai city is putting an effort to create awareness and educate people on “how your day will be without cars” by celebrating the car-free day for the past two years. Reports claim that the events got a huge success in past two years. In 2011, it held successful two car-free days celebrated in Mumbai, systematized by different organisations.

C. Hyderabad

Hyderabad city tried to make initiatives on the car-free development, but the authority could not finalize the project due to various reasons. For a successful and sustainable program like this, the local government should play a significant role in initiating and implementing.

D. Bangalore

In 2009, Evangelical Social Action Forum (ESAF) had started the awareness program named “Liveable Cities” in Bangalore (ESAF, 2012). The special reference to the program was to focus on the needs of children. In the first year, the Forum carried out a study to identify the existing state of affairs based on the indicators of transportation, health, governance, education, safety, land use and neighbourhood.

VII. CONCERNS TO MAKE CAR-FREE CITIES IN INDIA

There are some certain and most common objections raised while conceptualizing for car-free cities. According to J. H. Crawford, Some of major concerns that may hinder the car-free concept to develop in Indian cities are as discussed herewith (Crawford, 2013).

A. Congestion

Those usually live in suburban areas may find the proposed densities much high, and it is also true that not all want to live in a dense core of urban. The densities which are proposed are not unusual, and the small suburban densities now generally have only grown since the automobile started the process of urban expansion. The detected congestion of modern cities is greatly due to a significant volume of trucks and cars.

B. Mixed Land Uses

Many urban planners are in a favour of the separation of land uses. While the recommended design for the car-free cities could be changed to allow separation of uses, it is obvious that a town with integrated mix uses will be a much better place to live. Such a practice will demotivate the use of cars to a larger extent and promote walkability. It is also viable to practice both approaches. In the case of mixed uses, certain precautions while planning and protective measures are necessary.

C. The Love of Cars

People have passionate affection for their cars. In fact, it appears to be an increasing awareness of the costs of cars, and people are giving up their liking level due to traffic jams. If the developed countries set a better example by discarding their cars, it is possible that the rest of the world will also stop the use of cars.

Following are some of the car-free spaces depicting the characteristic information.

Sr.	Location	Character
1	<i>Fazilka, Punjab, India</i>	– <i>India's First Car-free town</i> – <i>In 2008, Main commercial area of city centre declared 'Car Free Zone.'</i>
2	<i>Matheran, Maharashtra, India</i>	– <i>No automobiles for keeping the area free from pollution</i> – <i>All people including residents depend on horses and have to walk</i>
3	<i>Shimla, Himachal Pradesh, India</i>	– <i>Mall road main street of Shimla, a popular tourist spot with some stores, cafes and restaurants is automobile-free</i>
4	<i>Venice, Italy</i>	– <i>Medieval city highly concentrated on tourism</i> – <i>Mostly transport by water or by walk</i>

7	<i>Fire Island, New York</i>	– <i>Most of the island are approachable only by ferries, or by walk or bicycle from the parking lot at the western end</i>
8	<i>Lamu, Kenya</i>	– <i>Lamu town is an old settlement where only pedestrian, bicycle and mule traffic is allowed within town</i>
9	<i>Andaman Sea, Thailand</i>	– <i>Most of the islands are not accessible to cars, but the large ones have motorbike routes</i>

*Table 1: List of Car-free Places (Car)
(Source: www.carfree.com)*

VIII. CONCLUDING REMARKS

- Car-free developments offer significant benefits in respect of Upcoming paradigm shift, Reduction of traffic generation and Improvements to the urban environment;
- This type of development will eliminate most of the vehicle parking problems from within the urban area;
- Car-free cities promote the public transport which ultimately enhances the economic conditions of the society;
- It will contribute significantly to reducing the air pollution and noise pollution;
- Car-free cities will also improve the health of people with fresh air and exercise from a daily walk;
- Specific design principles need to be derived from local circumstances to convert an existing urban area into a car-free region. While planning such a region, planners will need to overcome the common objection.

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